Design, Learning, Empathy & Intuition

An experience-centered research and design approach for digital, mobile, museum learning application design

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CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Student

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Abstract

This thesis aims to develop an experience-centered research and design approach for designing digital, mobile applications that facilitate personally, emotionally significant and transformational learning experiences for people in museums. A set of three design proposals result from this research. This approach aims to contribute the following new knowledge: a process for experience-centered design and research *for* design; and new knowledge encased within the digital, mobile, museum learning application designs, resulting from this research.

This experience-centered research and design process proposes a ***philosophical focus***; a set of ***contextual considerations***; and a set of ***methods*** for researching and designing for individualised, free choice, museum learning experiences, facilitated by digital, mobile technology.

Philosophical Focus

Philosophically, an individualised, free-choice, museum learning experience could likely comprise of ***an aesthetic experience***—because someone would encounter and respond to an artwork, an object, or a space and/or ***a flow*** experience if they are given a challenge that they can accomplish and enjoy. I propose that an individualised museum experience can become more personally emotionally significant if it comprises these two types of experience.

Dewey's *Pragmatism* proposes that "an experience" is different to the continuum of "experience" because it is defined with a beginning and an end. Dewey saw *"an aesthetic experience"* as being different to "an experience" because it possesses some sense of individualised 'quality' (an emotion) that defines it. It is therefore more likely to be the type of experience we have with art or design as opposed to science or mathematics. Also *"an aesthetic experience"* is conceived as a series of experiences that are tied together based on a thread of experience: emotional, spatiotemporal, compositional or sensual.

Similarly Csikszentmihalyi's concept of *Flow* speaks to the 'quality' of an experience, but defines it more specifically as an 'optimal', enjoyable experience. *Flow* also speaks to an individual's sense of awareness within an experience, wherein a person is so immersed that they are no longer aware of themselves being present in the here and now.

In addition to offering a perspective on experience, *Flow Theory* and *Pragmatic Aesthetics* also offer their own perspectives on learning. A *flow* experience occurs as the result of skills being met by challenges, skills improving and new attainable challenges being presented. *An aesthetic experience* defines one experience as independent from another and gives it meaning through it's autonomy. Meaning is then given depth when an experience is incorporated with other experiences.

Contextual Factors

Meaning and the potential for learning are defined by the context in which the experience takes place. This research also looks at the impact 'context' can have upon the attainment of these experiences and how they effect someone's ability to learn.

In order to understand the impacts of context upon learning potentials, I have used Falk's *Contextual Model of Learning* to understand the museum specific learning context. It proposes that three contexts—the *Personal* context, the *Physical* context, and the *Socio-cultural* context—predefined someone's ability to learn. Factors such as: an individuals prior knowledge and interests; whether they are able to share; or whether they can orient themselves, can define this.

Research and Design Methods

Once the contextual factors have been considered, a designer can focus, more specifically, on designing to support the qualities of *an aesthetics experience* or a *flow experience*. This experience-centered research and design approach encourages a designer to support these levels of experience by designing *for* and *with* unique individuals.

By considering someone's *personal context,* (their personal interests, knowledge, perspectives, skills, and concerns); their *physical context,* (objects, spaces and orientation); and their *socio-cultural context* (cultural factors, potential mediation for learning, and their abilities to communicate with others) a designer will consider the "whole person".

I hypothesise that by designing a mobile, learning application with empathy for "the whole person", it is more likely that *an aesthetic experience* or *a flow experience* could occur, because it is more likely that a person will feel comfortable, familiar and emotionally tied to the application. To help myself within this process (and other designers in the future) I've developed a model for designing to support optimal experience, aesthetic experience and learning. It considers all of these aspects, not to reduce them to absolutes, but to make them accessible to a designer as a tool within the design process.

The opportunity within this research is to develop an experience-centered research and design approach for designers to use when designing digital, mobile museum learning applications focused on facilitating, optimal, emotionally rich, aesthetic, personally and contextually meaningful museum learning experiences; and to show this process within the design outcomes. This focus is under catered for and under researched and is the gap in current research that I will be filling.

Section 1: Introduction & Context

Research Question

How can an emotionally focused, experience-centered design approach improve the design quality of individualised, digital, mobile applications, for use within museums and how can these designs enhance and support meaningful, transformational learning experiences
for individuals?

1.1 Objectives & Hypothesis

Objectives

1. To discover how a philosophically and contextually grounded, experience-centered research and design approach can support a designer working with individuals, conceive, conceptualise and visualise individualised, personally, emotionally, significant, learning experiences with digital, mobile, museum learning applications.

2. To develop a set of individualised design concepts that could be perceived to create emotionally significant, learning experiences; *an aesthetic experience;* and a *flow experience*.

3. To evaluate whether the designs could add more purpose, engagement and creativity to a museum visit as well as improve an individuals understanding of what they've learned and whether they felt that the learning could be transformational.

Hypothesis

I hypothesise that a synthesis of an *experience-centered design* approach; a Pragmatic approach to understanding *aesthetic experience*; a *flow psychology* understanding of the foundations of engagement and enjoyment; and a *contextual model of learning* will positively influence the design of three, individualised, digital, mobile learning applications for museums. I believe that designing an application with and for an individual can allow a designer to build a deep empathy for the person and their goals, and enable the designer to design from a position of intuition—making specific decisions about the idea, content, aesthetics and voice—to the point that the design becomes an extension of both the individual and the designer. I also hypothesise that a design made for an individual can also become useful and emotionally significant for other people, because it supports deep psychological motivations and has a strong voice and aesthetic. Once a design becomes so specific that it has personality and depth other people may be able to relate to its perspective.

1.2 Process, methods, tools and scope for this research and design

Research

This ***experience-centered research*** is undertaken as p*ractice-based* research. Practice-based research is:

> "research initiated in practice and carried out through practice" (Gray 1998: 82)

My experience-centered research approach is socially based and grounded in ***dialogue***. Dialogue has underpinned the processes of gathering contributions, discussion, reflection and review. This method has been instrumental to the research process—in particular for establishing a relationship between myself and each participant. Within this approach I have used processes, methods, tools and outcomes that will be relevant to designers, scholars, students, teachers, and researchers.

A **process** of ***reflection-in-action*** to gain knowledge. Reflection–in-action *(Schön, 1983)* asserts that professionals exhibit a skill of reactive evaluation and action that comes from the combination of professional training and experience. Reflection-in-action has contributed to my understanding on a micro level (as seen within the discussions) and on a macro level (as seen when reflecting on a transcript or the process). The knowledge gained through this research is the result of this constant oscillation between action and reflection.

The two main **methods** used for data collection are: an ***Insights Kit*** to learn about the 'whole person' and the qualities of their museum visit; and ***design reviews*** and ***presentations*** to elicit conceptual and aesthetic reactions from my participants and to drive personal *discussions* around subjects, themes, opinions and experiences.

Within these processes and methods I also used a set of **tools** to develop research findings, achieve goals and elicit responses from my participants: I used ***transcriptions*** to help me synthesise and distill ideas from key conversations; I developed a ***model for understanding optimal, aesthetic learning experience*** to visualise the complex relationships between the theoretical influences and the research process and design outcome. I created a ***chart*** to help me evaluate the designs from a theoretical perspective; and ***animation*** to present and receive feedback about the proposed design experience from each participant.

This research has taken place remotely between New York City, USA and Sydney, Australia with three participants and focusses on their experiences within the Powerhouse Museum, Sydney.

Design

This ***experience-centered design*** process has been enmeshed within this research process. I have used a number of techniques to utilise the research for designing.

I used a visual thinking ***mapping*** technique to help me synthesise the data from my research with my theoretical influences.

I used ***illustrations*** to creating tactile, emotionally rich and inspirational representations of design concepts and used their physicality to imagine reactions from touching and swiping during the design process.

I used graphic, photographic and typographic ***design elements*** to express each participants unique perspective within the application design and imagine the potentials for an aesthetic experience.

I used ***presentations*** to communicate the concepts to my participants. I placed the concept illustrations within a photo of a hand held device (iPhone) to evoke a first person experience within a context.

I used ***animations*** to communicate the feel of interaction with the application in a physical museum context.

The design process ends at the visualisation stage for this research. The visual designs are presented in the form of an animation, to simulate an experience with each digital, mobile, museum learning application. Further research and design could take place to refine and develop these applications, but that is outside the scope of this research.

This research documents the design of three individualised, digital, mobile, museum learning applications, one for each of three individuals. Each concept and interface aims to embed prior knowledge, experience, beliefs, themes, goals, interactions, content and aesthetics that are emotionally significant to each participant.

This research proposes that the Powerhouse Museum could differentiate itself from other entertainment environments by offering deeper learning opportunities and more emotionally rich experiences. I believe that this can be done by facilitating connections between individuals and objects, the history, material culture, space, themes, abstract concepts, and other people within the museum. I believe that the personalisation of such relationships could raise the status of the museum from simply being entertainment, to being connected to lifelong learning.

1.3 Limitations of research and design

This remote research and design was conducted between April 2011 and July 2011, from New York, USA, with three participants located in Sydney Australia. All contact between the participants and myself occurred over the internet via Skype (video or audio), email or chat, except for the cultural probes kit (paper and digital diaries) which were sent and returned by mail. I never met the participants in person.

The three participants knew of each other and two participants turned out to be friends, but they didn't discuss their design processes or outcomes with each other during the research process.

The research utilised the Powerhouse Museum as a reference for experience, so the designs and themes may seem geared towards it's context and content. The designs, however, aren't limited to the Powerhouse Museum.

The design concepts were limited to smart, touch phone interface restrictions and are optimised for the iPhone and iPod Touch devices.

The concepts are focused on individual experiences, not group activities within the museum. They do however, consider social interactions mediated by the application design.

This research and design process is focused on designing innovative experiences and therefore focusses on the insights and concept design phases over the prototyping and production phases. The final concepts are presented as animated "proposals" for experience. The design was not reviewed within a museum context and all feedback about the designs focused on the proposed experiences.

Some of the proposals utilize emerging or developing technologies and therefore may not be realised within the next few years. Some innovations however are not far off. For example; content tagging and database organisation are rapidly improving and could facilitate some features within the next year. Other proposals would require additional research and development initiatives to realise.

1.4 Theoretical influences on the research and design process

This approach to research and design is aimed at addressing the following research question:

> How can an emotionally focused, experience-centered design approach improve the design quality of, individualised, digital, mobile applications, for use within museums and how can these designs enhance and support meaningful, transformational learning experiences for individuals?

In order to answer this question I have drawn upon a number of philosophical perspectives on experience and learning and have used these to influence a set of experience-centered research methods (insights kit and interviews) and experience-centered design processes aimed at embedding emotional significance into mobile, digital, museum learning application designs.

In order to understand how to consider 'experience' within the design and research process I had to develop a position on the nature of experience. Our lives are full of unique experiences that occur on numerous levels of consciousness. Sometimes we are asleep and our experience of life lies on the unconscious plane; sometimes we feel so comfortable in a situation[1] that we start to daydream and lose our awareness of place and time; and sometimes we encounter something surprising or challenging and become highly present and highly conscious of our selves and our situation. As we move through this kaleidoscope of experience, the one thing we can count on is that no experience will ever be the same. What we can rely on is that we will continually oscillate between the states of *unconscious*, *mostly conscious*, *conscious of the here and now* and *conscious of ones self in relation to the world*.

Through a deeper understanding of experience I believe that designers can create designs that have the potential to facilitate certain types of experiences within the web of experience. I believe the key to this is to firstly understand the "whole person" behind the user, and the context that they are experiencing. I have identified a set of theoretical influences that I believe will help me and other designers design for specific types of experience that can lead to emotionally significant, meaningful, transformational learning experiences within Museums.

1 See Apendix B, section 4.3 Waterworth, Waterworth and Riva

In order to firstly understand the context of the museum I have utilised a Contextual Model of Learning (Falk, 2000) because it has identified a set of considerations for learning within museums. The model divides the Museum context into three parts: the personal context, the socio-cultural context and the physical context. It proposes that all of these three factors should be considered when designing for successful museum learning. This research proposes that contextual awareness within a design process, can not only increase the probability of someone learning from an experience with a design, but also potentially increase the probability of that experience being emotionally rich.

Emotion is considered by Dewey to be the core thread of experience:

> Emotion is the moving and cementing force. It selects what is congruous and dyes what is selected with its color, thereby giving qualitative unity to materials externally disparate and dissimilar. It thus provides unity in and through the varied parts of experience. (J. Dewey 1934)

The emotional thread of an experience is highly variable and not always good. For example, some of the experiences my participants had within the museum were described with emotional words like, frustrating, confusing, unsure. This research focusses on creating positive emotional experiences for people in museums and for the cases where negative emotions like frustration arise they should be in reaction to the narrative content rather than as a result of a poor experience with the application.

The two positive experiences that I am focussing on in this research are experiences that I believe will help people ***enjoy*** museums, ***learn*** and ***grow***. These are *a flow experience* (Csikszentmihalyi, 1998) and *an aesthetic experience* (Dewey, 1934; McCarthy et al, 2010). I believe that the occurrence of learning through these two types of experience can increase the experiential value of a museum visit and the emotional significance, depth of meaning, and transformational potentials on offer.

Experience-centered design already has a strong philosophical and theoretical base that I will be building upon; such as the approaches of McCarthy and Wright (2010); Hassenzahl (2010), and Wallace, (2008). Where I will be adding knowledge is both in the specifics of my approach; the design outcome; and in the way I combine and utilise my three theoretical and philosophical bases: *flow theory*, *pragmatic aesthetics*, and *a contextual model of learning*.

1.5 Philosophical approach to experience-centered research and design

> "Experience-centered design is concerned with designing for the richness of human experience." (McCarthy & Wright 2010)

Experience-centered design is different from HCI, experience design, and participatory design because it proposes that one can't design an experience, only the opportunity for one.

My experience-centered research and design process supports the idea that design can help make technology a transparent facilitator of deep, emotionally rich and significant learning experiences with museums. I am hypothesising that when design is influenced by research that focusses on the *felt* qualities of experience—and when *that* research understands that experience is influenced by a range of personal, socio-cultural and physical factors—design can posses the potential to facilitate emotionally significant, transformational learning experiences that comprise *an aesthetic experience* or a *flow experience*.

I've chosen to use an experience-centered research and design approach because together they support an holistic understanding of "an experience"—not only focussing on a user's tasks and objectives (their "what?" goals) and whether they achieve them through swiping, clicking or typing (their "how?" goals) as user-centered design does; but it also considers people's motives, psychological needs, sensory and emotional desires (their "why?" goals)[2]. In doing this, it moves beyond considering people as *users* or personas with tasks to achieve, and instead considers them as unique individuals that bring their lifetime of knowledge, beliefs, values, hopes, fears and desires to every experience.

Both the research and design processes are focused on understanding the 'whole person', their experiences and their imagined experiences.

There are two primary aspects of experience-centered design and research that have influenced this approach:

Firstly my experience-centered approach[3] proposes a set of considerations, processes, methods, tools and philosophical perspectives aimed at embedding emotional significance into a design. The key to this lies in focussing on understanding the *felt* qualities of experience through a socially embedded process of immersion, action and reflection.

> "When researching experience, methods and approaches that open up dialogue between designers, researchers and participants are the most appropriate" (McCarthy et al., 2010)

Secondly a set of key landmarks for design practice. McCarthy and Wright's definition of experience-centered design builds upon Dewey's and places focuses on processes and perspectives that help designers consider the *felt* qualities of experience. The five key landmarks that define an experience-centered design approach for a designer throughout this process, according to McCarthy and Wright are:

- Valuing the whole person behind the "user".
- Focusing on how people make sense of their experiences.
- Seeing the designer and user as co-producers of experience.
- Seeing the person as part of a network of social (self-other) relationships through which the experience is co-constructed.
- Seeing the person as a concerned agent, imagining possibilities, making choices and acting.

Also, in addition to the above I will employ a similar experience-centered research method to that used by Jayne Wallace[4]. The reason for this is that she was able to successfully add personal, emotional significance into three digital jewellry designs by tailoring a cultural probes model to her audience and research question. Aside from being impressed by the emotional depth she embedded into her digital jewellry designs, I was intrigued by the idea that I could use a craft process to attempt the same for a purely digital design. I took similar liberties and developed a unique set of cultural probes specific to my research question and context.

These perspectives have been a philosophical base throughout the design and research processes and have shown me that different considerations tend to be more important within different phases of the research.

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[2] See Appendix A, Section 2.1: Holistic Continuum

[3] See Section 1.2: Processes, methods, tools and scope for research and design

4 see Appendix B; Section 4.2: Design influences

Experience-centered research

To conduct *experience-centered research* I developed a process, set of methods, and tools[5] to learn about the 'whole person', their experiences and their imagined experiences.

I found that this approach gave me a sense of empathy for each person through immersion in their cultural probes kit—a collection of personalised visual, textual, video and audio stimuli contributed by participants— and by talking to them and sharing stories with them.

I also propose that the process of co-designing an application with a designer and using a designer to articulate a vision for a desired digital, mobile, museum application can enable the individuals to focus on the construction of deeper and more meaningful museum learning experiences and thus push the design of the applications they are involved with further in those directions.

Experience-centered design

My *experience-centered design* process focusses on helping designers understand how to translate the information received from the experience-centered research process into a design process and inversely use design iterations as a research tool to gather further feedback from the participant. Essentially it helps the designer make sense of the empathy and intuition they have established during the process.

The process combined with nurturing empathy for each individual enabled me to understand and interpret design decisions. Acts, like sharing personally meaningful stories, opinions, emotions, ideas, aesthetics and relationships, deepened my sense of empathy and inspired me to embed layers of meaning and significance into each design. I believe that this empathy can allow designers to intuitively improve the emotional qualities of a design.

Experience-centered design is relevant to this research not only because it helps designers focus on emotionally rich experiences, but because it sheds light on the unique experiences that occur between an individual, a space, objects, and others—and in this way it is particularly relevant to museums.

5 See Section 1.2: Processes, methods, tools and scope for research and design

1.6 Flow Theory: *"an optimal experience"*

The state of ***Flow*** is defined as a deep sense of enjoyment that is reached when there's: effortless involvement; a sense of control; when the sense of self disappears; and when the duration of time is altered.

Flow theory proposes that an optimal experience—a mixture of immersion and enjoyment—occurs when skills are matched with appropriate challenges and an individual's emotional state fluctuates slightly between anxiety and boredom as they succeed with these challenges.

Flow theory was developed by Csikszentmihalyi in 1991 and since then has been employed widely and broadly as a technique for understanding and designing for optimal experience. Optimal experiences are the types of experiences that we undertake purely for the experience itself and the flow state is one in which we are so engaged and stimulated by what we are doing that we lose track of time.

The broad pursuit of flow is tied to the desire for a life that is full of enjoyment. Flow proposes that enjoyment results from focusing on tasks that are challenging and that deliver a sense of accomplishment when that goal is achieved. A flow state can arise from any number of experiences: from reading, from game play, from sport to anything that requires a skill that can be challenged and improved.

Csikszentmihalyi states that enjoyment is the main goal of Flow psychology and in this it becomes more of a philosophical pursuit. From a sensory perspective we can experience pleasure through bio-chemical brain activity however it's evanescent and ephemeral and does not act as a building block for the self. Enjoyment on the other hand is characterised by a forward moving progression resulting in personal growth from achieving something unexpected.

The Flow Antecedents state that: a challenge must use tasks we have a chance completing; we must be able to concentrate; we must be presented with clear goals and we must receive clear feedback.

I've used flow theory as a guide to understand how a designer can construct an optimal experience by matching challenges to skills and reducing potential distractions. I believe that this is the type of experience that could occur while the participant uses the application within the museum—I will explore this in more detail later in this thesis.

Flow is relevant within the model as it proposes a set of considerations that flesh out the Personal context to include, the flow state, challenges, skills and immersion as unique considerations. It overlaps with the contextual model of learning with regards to choice and control.

Optimal Experience
- Flow skill
- Challenge
- Control
- Immersion
- Emotion

Flow Antecedents
- Ability to concentrate
- A challenge we have a chance of completing
- Clear Goals

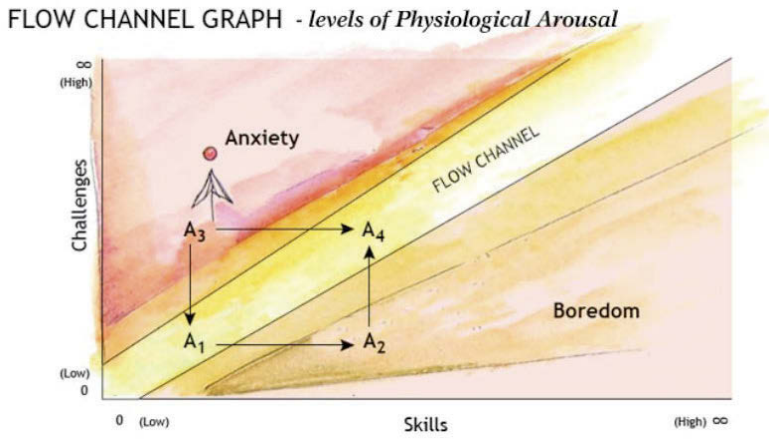


Figure 1: Flow channel
Chloe Walker 2011 from Csikszentmihaily 1990
(Falk & Dierking, 2002, p. 37)

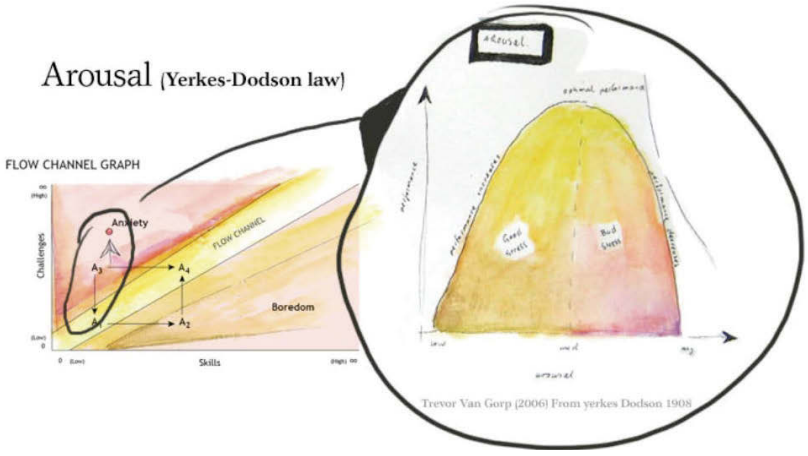


Figure 2: Chloe Walker 2011 from Yerkes Dodson , 1908

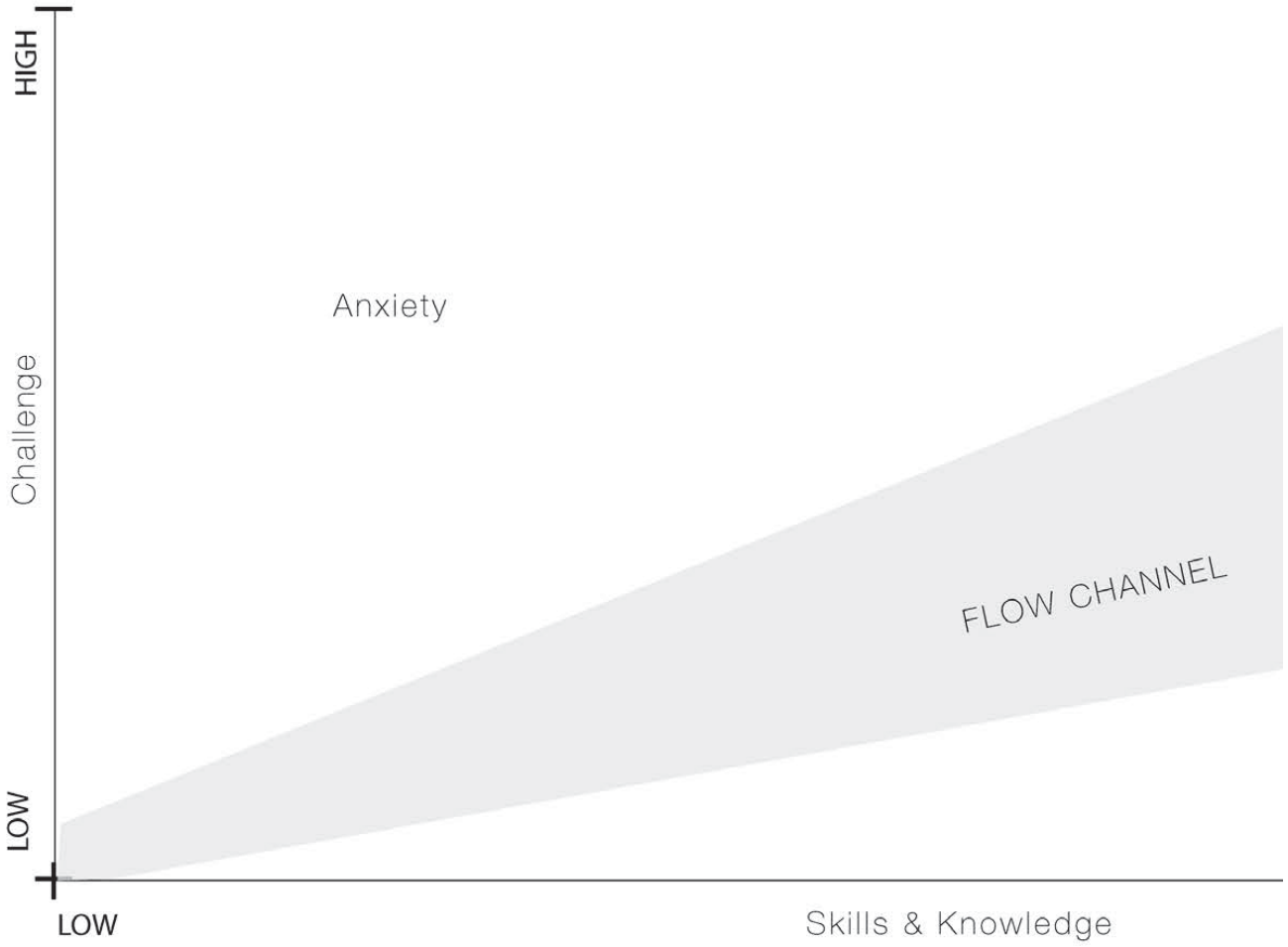
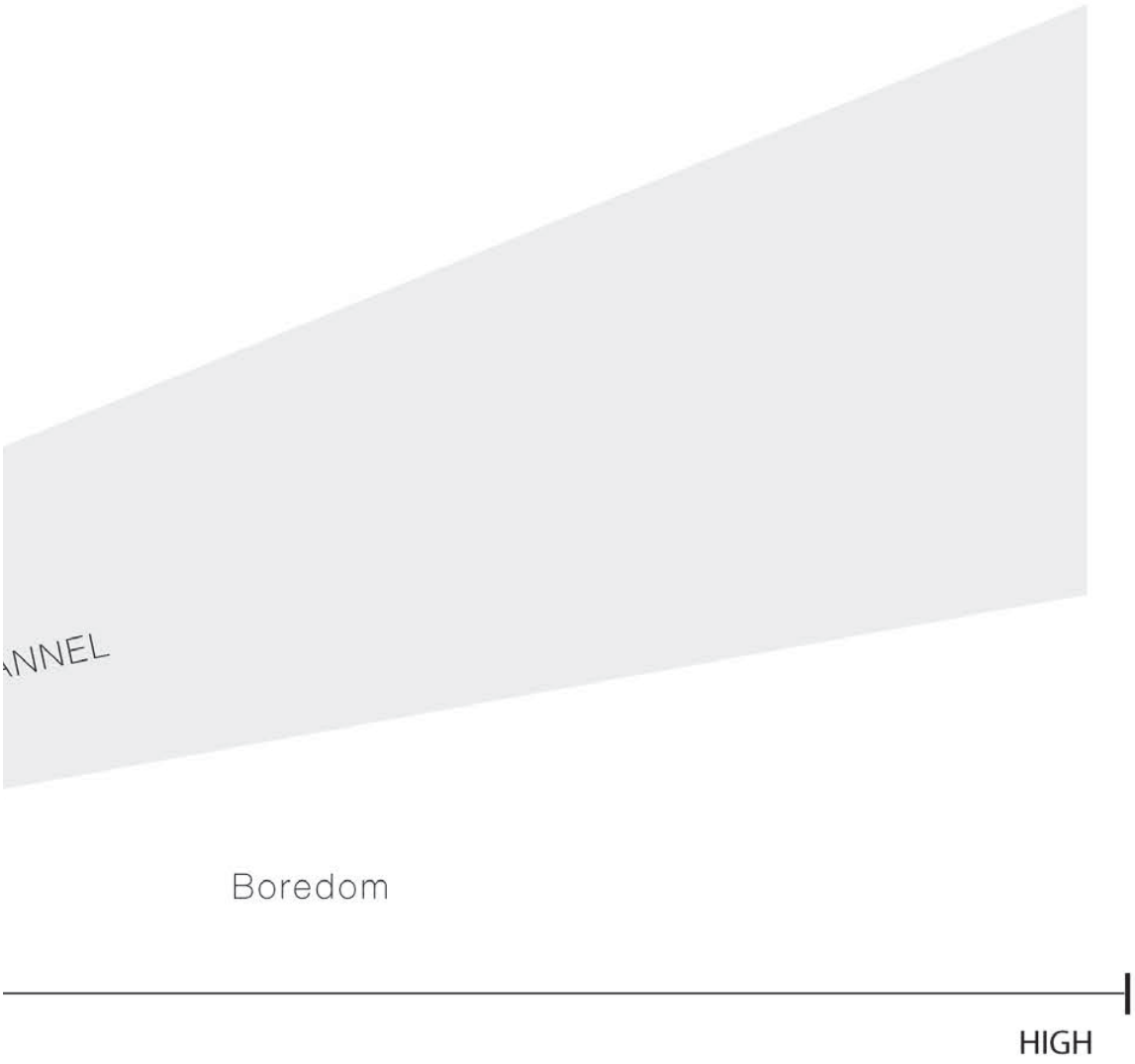


Figure 3: Flow
Chloe Walker 2011 from Csikszentmihaily 1990, Yerkes Dodson 1908, Van Gorp 2006


ANNEL
Boredom
HIGH

1.7 Pragmatic Aesthetics: '*an aesthetic experience*'

I've chosen to use the philosophical perspective of *Pragmatic Aesthetics* to explain the specific type of *felt* experience we can have within a museum—with objects, technology, the space and others and I've choses to focus on supporting this perspective within the application designs.

Dewey's *Pragmatism* proposes that "an experience" is different to the continuum of "experience" because it is defined with a beginning and an end. Dewey saw *"an aesthetic experience"* as being different to "an experience" because it possesses some sense of individually felt 'quality' (an emotion) that defines it. It is therefore more likely to be the type of experience we have with art or design as opposed to science or mathematics. Also *"an aesthetic experience"* is conceived as a series of experiences that are tied together by personal classification.

I believe that an aesthetic experience is a type of flow experience, that occurs on an aesthetic level primarily. Even though it is aesthetic it still requires us to make sense of it and classify, bundle and store it with other experiences, thus learning from it.

Dewey argued that experiences with art should be understood as a part of everyday, ordinary experience and not simply considered as separate and prosaic. He wanted people to understand that art was available to the masses and that the way we experienced it should change too.

> "What men do and what they strive for, love, believe, and endure, and also how men act, and are acted upon, the ways in which they do and suffer, desire and enjoy, see, believe, imagine—in short processes of experience[...] it is double barreled in that it recognises in it's primary integrity no division between act and material, subject and object, but contains them both in an unanalysed totality." (Dewey, 1925, p11, 11)

Dewey's version of Pragmatic Aesthetics proposes that "*an aesthetic experience*" is a unique type of experience because it possesses some sense of individualised 'quality' (an emotion) that defines it. Dewey believed that the aesthetic quality of an experience is grounded in emotion "*Emotion is the moving and cementing force*" (Dewey, 1934).

An aesthetic experience is an experience that occurs when we encounter and engage in a process of making sense of an object, a space, a person, or a technology on an aesthetic (and emotional) level. "Aesthetic" refers to experience as both appreciative and perceptive on an emotional and intellectual level. Dewey proposes that *Aesthetic* satisfaction of an object must be linked to the activity that gave rise to it and speaks of the concept of creating a dialogue between an individual and an artwork. He says that an aesthetic experience arises when there is a combination between the idea of consumption and that of creation. If creation can be imagined through a sensual connection to the materiality of an object and if we are able to perceive the subjective quality of the object, we can be immersed in *an aesthetic experience*.

McCarthy & Wright's experience-centered design is grounded in Dewey's Pragmatist[6] philosophy of experience (1934). In their book Experience-Centered Design they reference the quality of an aesthetic experience:

> "We have habitual ways of doing things that we do not consciously reflect upon. I don't think about how to get on my bike or, indeed, how to ride my bike once I'm on it; I just do it. This kind of tacit knowledge or unconscious doing is borne out of previous practice and habits formed over time. [...] This form of pre-linguistic, non-conscious engagement with the world is often associated with Dewey's idea of an aesthetic experience. It refers to a situation in which our usual experience of being a self separate from the world and acting upon it is replaced with the experience of our body being directly connected to the world without the usual mediation of a 'thinking or talking self'. This is what Dewey and others mean by the collapsing of the subject-object distinction." (McCarthy et al. 2010; 15)

McCarthy and Wright believe that *an aesthetic experience* can emerge through the dialogue between a person, an object, context, culture and history but in the context of a museum and a digital, mobile application most specifically between the *viewer* and the *artifact*, *subject* and *object*, *user* and *tool*. McCarthy and Wright explain that this type of experience can engage a persons senses and values in a lively, creative and expressive way; and like *Flow* it can be an experience worth engaging in for it's own sake.

McCarthy & Wright (2004) build upon Dewey's *Pragmatic Aesthetics* and explain the special quality of an aesthetic experience:

> "an aesthetic experience is the lively integration of means and ends, meaning and movement, involving all of our sensory and intellectual faculties is emotionally satisfying and fulfilling. Each act relates meaningfully to the total action and is felt by the experience to have unity or wholeness that is fulfilling [p58]" (McCarthy & Wright 2004)

To focus on the *felt* and *emotional* qualities of experience with technology. This approach proposes that designers combine an *holistic* perspective on experience with an understanding that experience is a process of *continuous engagement and sense-making* that can be understood through a *relational and dialogical* ontology.

An *holistic approach* to experience, considers that the *sensual, spatio-temporal, emotional* and *compositional* threads of experience combine equally to define 'an experience'.

6 (Dewey 1934)

A *continuous engagement and sense-making* experience cycles from *anticipating*, to *connecting, to interpreting, to reflecting, to recounting*, to *appropriating* and back to anticipating as our values shift between the self, objects, settings and others. This cycle expresses the complexity and ambiguity of the dialogue between the history of personal and cultural meanings and anticipated futures, yet it also defines the act of learning, particularly in the recounting and appropriating steps. The sense-making process reflects the act of learning, within an aesthetic experience.

A relational and dialogical approach considers that experience is understood and defined by the frame of reference given to it by the individual. A dialogical ontology describes a process whereby the:

> "self, object, setting, technology and others are actively constructed as multiple centers of value, with multiple perspectives and voices, and when an action or utterance of a thing is desired and produced it can never be finalised since the experience of it is always completed in dialogue with those centers of value." (Wright & McCarthy 2008)

McCarthy and Wright then go on to express how experience can be defined:

> "We can see how with a dialogical lens, recounting experience becomes not simply an act of reporting but rather an act of co-construction of meaning. " (Wright et al. 2008)

They propose that this dialogical approach isn't only about sharing experience, it's about creating experience in the process of reconstruction. They propose that good experience-centered design comes from the designers ability to engage:

> "with the users and their culture in rich ways in order that they can understand how the user makes sense of technology in his/her life." (McCarthy & Wright 2010)

MCCarthy and Wright's take on an aesthetic experience pushes it beyond the actual act of *an aesthetic experience:* that is sensual, compositional, emotional and spatio-temporal threads, but they consider the appreciation of it to be part of the experience.

In this way it also ties to learning and growing and therefore is highly relevant to this research.

'the holistic threads of experience & continuous process of sense making"

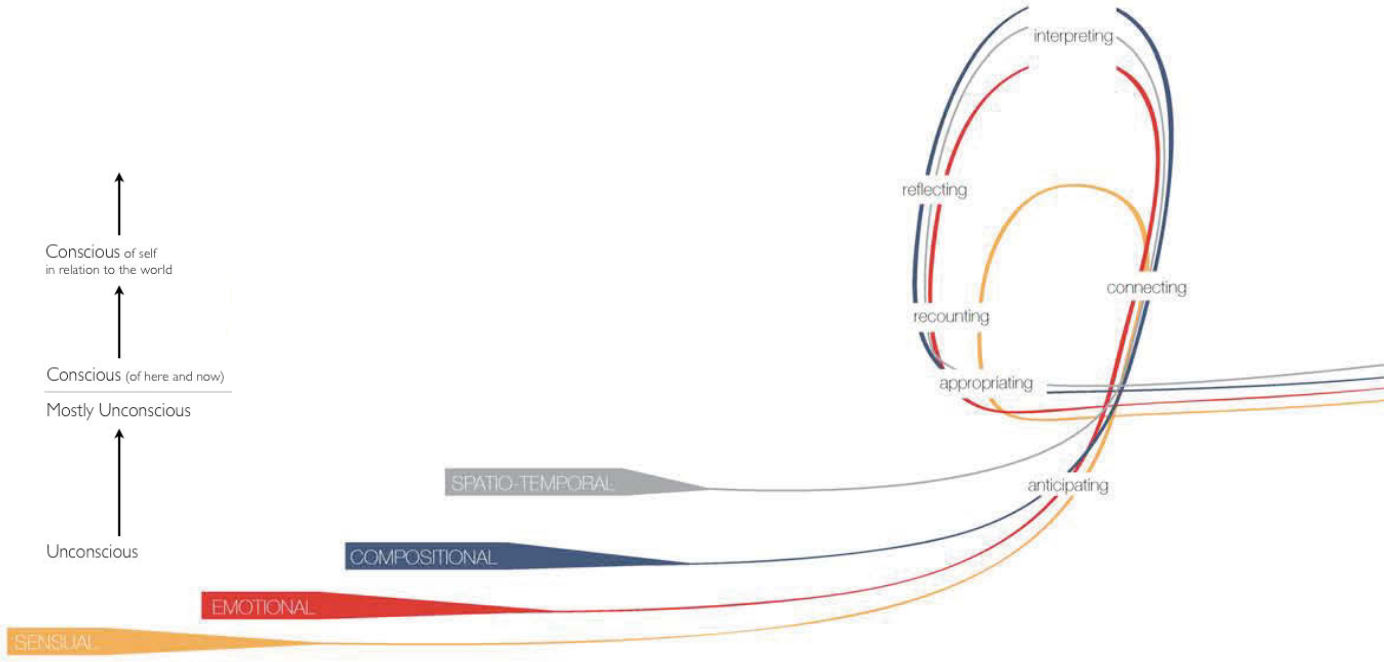


Figure 4: "an aesthetic experience"
Chloe Walker 2011

1.8 The contextual model of learning

The *Contextual Model of learning* focuses on understanding the phenomenon of learning within free-choice environments to be effected by the complex interplay between the contexts. The *Contextual Model of Learning* has helped me understanding the factors within a learning experience and how learning can change an individuals perspectives and deep motivations.

Falk & Dierking's (2000) explore the phenomenon of free-choice learning[7] within their *contextual model of learning*. Free-choice learning supposes that learning occurs on a personal level and that every individual's experiences expand upon existing mental models constructed from lifetime's set of experience and understanding. This shift reflects a shift of focus from the place or type of learning to the learner (Falk & Dierking, 2000). Hooper & Greenhill explain the complexity of the situation as encompassing:

> 'a broad range of dimensions involving knowledge, skills, aesthetic responses and emotions' (Hooper-Greenhill, 2004, p. 163).

This model has become widely appreciated as a framework and tool for understanding, evaluating and explaining free-choice learning within museums.

> "The Contextual Model of Learning" is an effort to simultaneously provide a holistic picture of learning while accommodating the myriad specifics and details that give richness and authenticity to the learning process" (Falk & Dierking, 2000)

The *contextual model of learning* is influenced by a combination of Vygotsky's theory of Sociocultural learning and Paiget's theory of Constructivist Learning.

Vygotsky's theory of Sociocultural learning defines that learning is filtered through someone's person and family history, their cultural background and their environment (Vygotsky, 1925). Vygotsky believed that learning occurs in two phases, firstly within the social level and then on the personal level where the knowledge is later fused with existing mental models. He also believed that this cycle occurs within and is dependent on the individual's "zone of proximal development". This asserts that learning occurs most effectively when an individual is cognitively prepared to learn and when the next level of knowledge is delivered socially. This is of particular relevance to my research as my designs must remain acutely aware of each individual participant's knowledge background.

In slight contrast Paiget's theory, *Constructivist Learning* proposes that learning is derived from the combination of learner participation plus the learner making sense of the experiences themselves through active participation such as measuring, checking temperatures, rotating, weighing and feeling textures to, for example, finding out the age of an object in an environment (Hein 95, 98). The *Constructivist learning* approach supports user created outcomes that allow more personal choice and involvement. Collaborative analysis is encouraged and it's common to use a notebook or observation journal to make their deductions and conjectures as notes. These conclusions are often shared before they gain access to the right answer. As a result of this the learner makes decisions and choices for themselves in their own way.

The Contextual model of learning takes a more philosophical and less tactical view on learning and acknowledges that the personal, the sociocultural and the physical contexts combine to effect the nature of experience as it occurs over time. The model below suggests the organic nature of these relationships. Falk argues for a contextual perspective on understanding the dynamics of the museum:

> The contextual model of Learning in museums combines the Personal Context, the Socio-cultural Context, and the Physical Context. The Personal Context consists of an individual's motivations and expectations; prior knowledge; interests and beliefs; and choice and control. The Socio-cultural context reaches beyond the individual into within-group socio-cultural mediation and mediation facilitated by others. The other element in pay is the Physical context consists of advanced organizers and orientation, design and reinforcing events and experiences outside the museum. (Falk 2000)

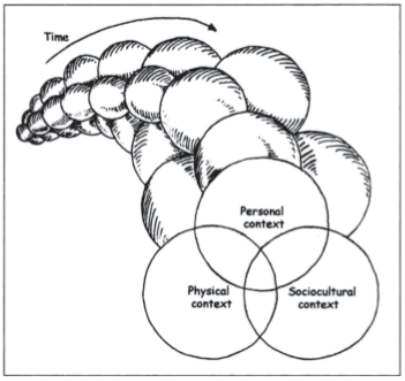


Figure 5 Diagram of Contextual Model of Learning
(Falk & Dierking, 2002, p. 37)

7 See Appendix A, Section 2.3:Free-choice learning

Personal Context

Falk and Dierking's definition of the *Personal* context considers an *individual's motivations and expectations*; *prior knowledge*; *interests and beliefs*; and *choice and control*. In relation to the design of a mobile, digital, museum learning application here are some further considerations.

Motivations are the fuel behind most of the things we do and most of the decisions we make. There are two basic types of motivation - intrinsic and extrinsic. An Intrinsic motivation is a motivation that comes from within and an extrinsic motivation is the result of an external pressure—something you want to do or something someone else tells you to do. Generally something we want to do can be inspired by a range of intrinsic motivations. Generally there are two groups of intrinsic motivations: either *psychological needs* or *experiential needs*. Sheldon, K. M. et al (2001) determined that the top-ten psychological needs are as follows: being *autonomous*; being *competent*; being *related to*; being *self-actualized*; being *secure*; being *wealthy*; being *influential*; being *physically thriving*; being *self-esteemed*; and being *pleasured*. The types of experiential needs that motivate people are feelings like *enjoyment*, *excitement*, *enchantment*, *fun* and *thrill*. Psychological needs and experiential needs don't necessarily motivate people separately; in fact it's likely that both operate together. Most often, the particular psychological need exists on a more subconscious level and we identify the feeling with the motivation. Deci and Ryan (2000) provide this example:

> "a man who, in the evening, sits at the keyboard and begins to play a piece of music, may become lost in its beauty and experience great pleasure would not experience the pleasure if he were coerced to play, or if he felt unable to master the music. Thus need satisfaction, which in this case means experiences of autonomy and competence, is necessary, but his explicit purpose in playing the music is not likely to be need satisfaction." (Deci and Ryan 2000)

Someone's *interests* and *beliefs* are important to consider because this will determine what someone is drawn to within a museum and how they will interpret the experience. Not all people are driven to learn by personal interests, but those that are, will self-select objects based upon those interests. If a design allows people to focus on what's interesting to them, this can increase their level of attention, commitment to task and continued engagement and curiosity. In addition, but by no means less important, their beliefs will define the way information is understood. Emotional cues and expectations directly affect learning. If emotional expectations are met it is much easier for learning to be facilitated.

Prior Knowledge is essential to understand when designing for learning as it effects the ability someone has to absorb new knowledge. People can become anxious or bored when presented with new knowledge that's either too simple or too complex for their level of knowledge. An excellent technique for capturing and catering to different levels of knowledge within a group is a Personal meaning map. This teaching tool is used to evaluate personal learning that arises from a learning session and a group discussion. In this technique, people are asked to individually write down a central word representing the subject of the lesson. They then surround that word with other words that reflect their knowledge around that subject. After the lesson they're asked to edit the map to reflect potential changes to their understanding or knowledge. Through this process and the reflection upon their learning they can effectively tie the new knowledge to existing knowledge in meaningful ways. This technique is particularly relevant to individualised free choice learning environments, as it could help people solidify their learning and identify the potential transformation that has occurred.

Once within any free-choice learning situation, *choice and control* are essential interrelated needs that permeate all contexts: *personal*—control over oneself (autonomy); *physical*—control over the environment (security); and *socio-cultural*—control over the social situation (self-actualisation). It's important that people can choose what they're in control of and what they can control to choose. Bitgood said that:

> "visitors tend to have a more satisfying experience and gain more knowledge if they're given information about: What to expect, How long it might take to visit, How to navigate and find rooms, exhibits, etc...,"as well as "... Pre-knowledge about themes and content of the exhibit". (Bitgood 1996)

Socio-cultural context

On a more specific level Kaptelinin, Wardi (2006) explore the 4 key elements of a collaborative visit: Communication; Localization—Awareness of context is critical (Kaptelinin, Wardi 2006); Mutual observation and Orientation.

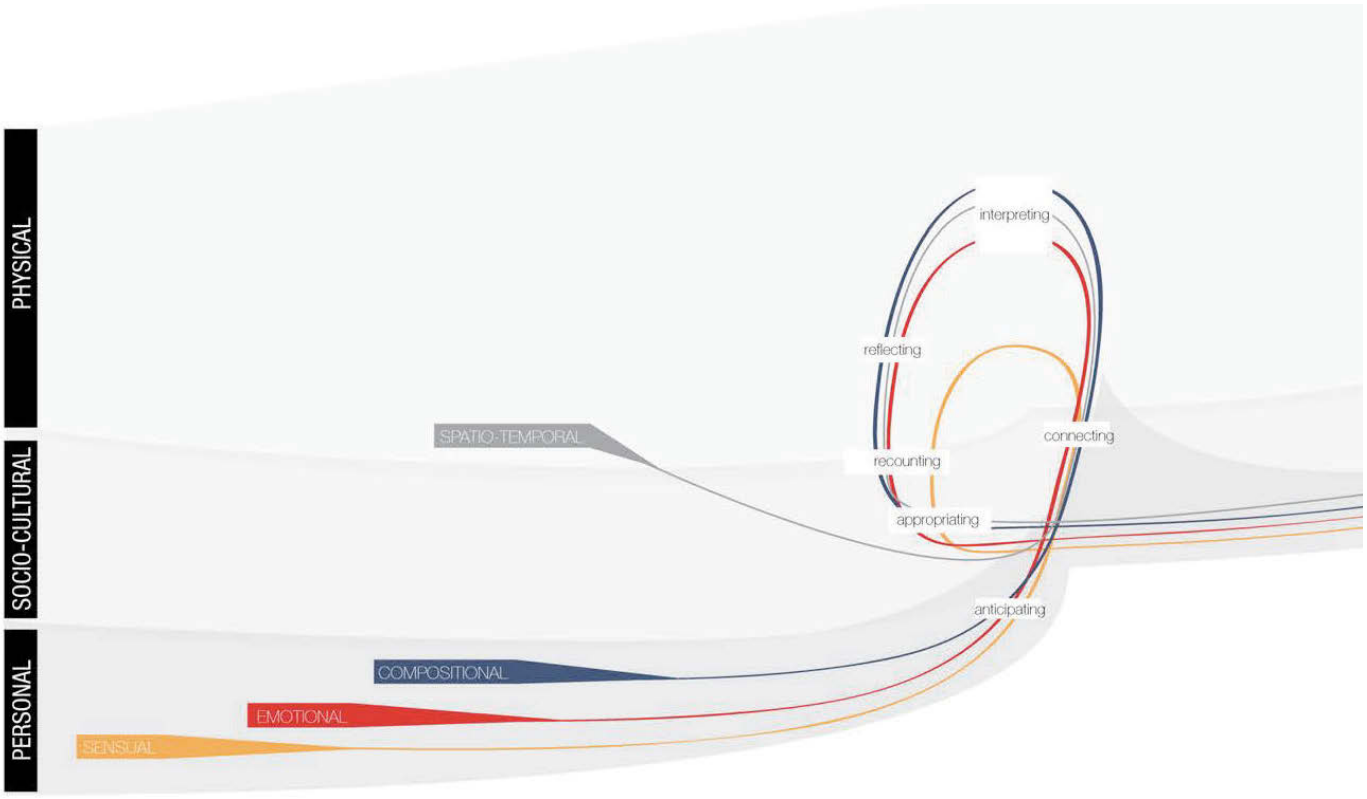
> "Social engagement is in a large part mediated by objects and environments as much as by direct contact with others" (Kaptelinin, Wardi 2006)

Falk noted the four types of socio-cultural learning approaches: Firstly that cultural and historical factors influence the perspective people bring to a situation and they define what and how people learn. Secondly group mediation is a way of learning through the process of sharing and deciphering meaning from contrasting and comparing beliefs and ideas with others. Individual learning mediation is the most common formal education style and it focuses on learning from people who are experts in their fields. Lastly people learn by talking with each other and communication between and among learners is essential as it helps to solidify ideas and learning.

Physical Context

Falk defined that the physical context of the museum is traditionally comprised of the architectural space, the interior space, the light, the sound, objects and installations. The physical space is largely designed to funnel people through particular curated pathways and it uses the interplay between all the elements above along with signage to achieve this.

The physical space contains particular sights, sounds, textures and smells, that effect the "feel" of the place and therefore our ability to learn[8]. These are the ephemeral and organic elements that are often unconsciously reacted to. In terms of supporting a learner in decision making the museum generally prepares advanced organizers and ensures that orientation is possible as this is very important. When people are oriented some novelty can enhance learning. When people feel disoriented learning is impeded. In addition Falk says that a structure that reinforces events and experiences helps to reinforce learning.



8 See Appendix B, Chapter 5.3: Constructing Emotional States

Applying the Model

When it comes to applying the model in practical terms Falk admits:

> "However, though we now understand the factors, we do not yet know how to consider them holistically. We do not conduct research as if all these variables were important. In addition, we have not sufficiently incorporated scope and scale into our research models." (Falk & Dierking, 2002)

Falk and Dierking's lament presents a great opportunity for more holistic research approaches, a fate that many digital, mobile, museum learning applications seem to suffer from. They cater for generalizations but rarely focus on experiences of unique complex individuals. The Contextual Model of Learning expresses an understanding of the background filters that an individual brings to an experience, but the experience itself is comprised of different elements and activities. This research will attempt to apply the model to the design of a digital, mobile, museum learning application.

In the model below and in my final analysis, I have draw out the factors considered important in a Contextual model of learning and consider how they relate to an aesthetic experience to create a more "whole" learning experience within a Museum context.

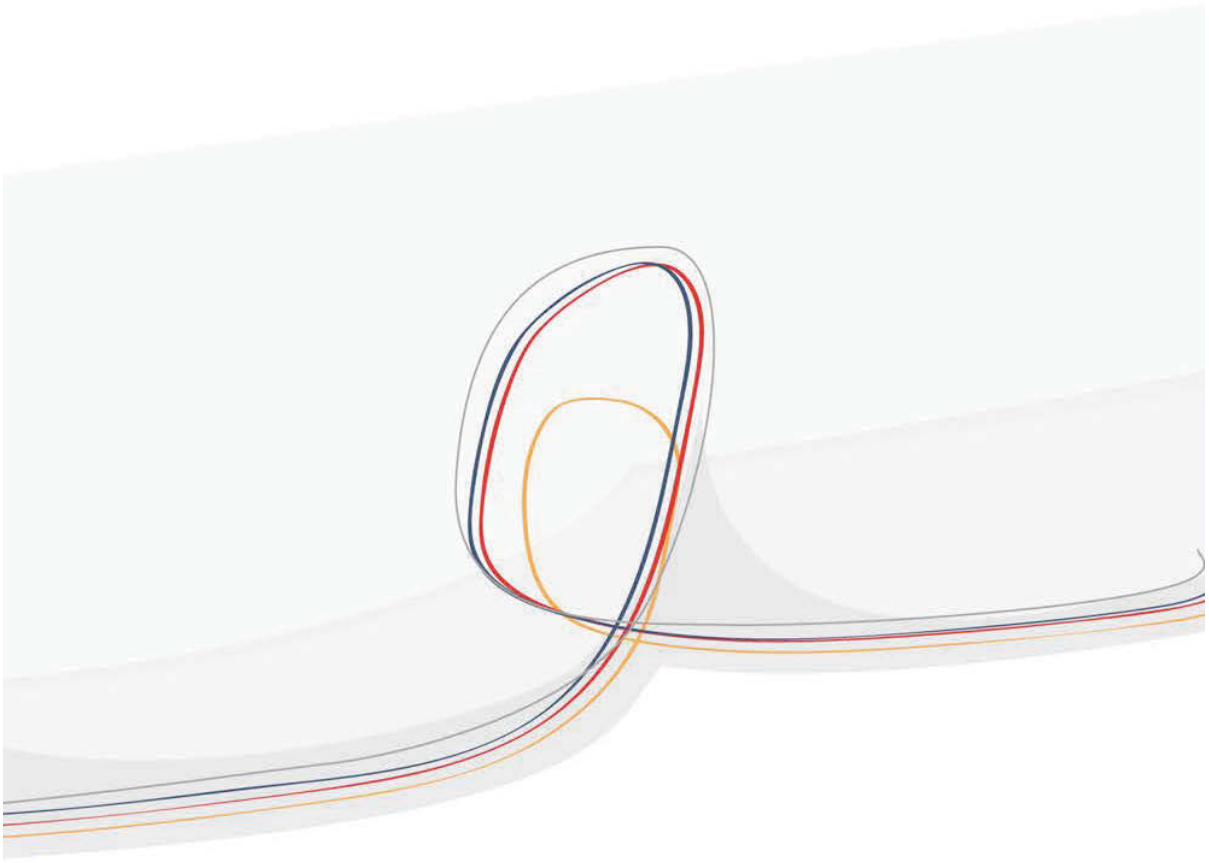


Figure 6: the contexts of learning and an aesthetic experience
Chloe Walker 2011

1.9 The context

In the introduction to Peter Higgins' talk at the Tate Modern's 2003 symposium on "emotional engagement" called User-Mode, he identifies a current concern for museums and considers a solution:

> "It is an emerging realisation that visitors to Museums merely see them as part of the fast expanding leisure environment. How can we protect them from a potential mauling in the commercial marketplace? Material culture has preoccupied us for many centuries, it may be argued that it has always been threatened by the need to, curate, classify and conserve, presenting sterile objects in glass cases. Survival of such institutions may be enhanced by exploiting the power of the real, real time, real people, real space, real objects. Real objects have an indisputable emotional pull, surely it is important to provide more than a simple descriptive to capture the essence of an object, or a person or a concept. It is possible for the displayed object to provide inspiration with personalised gateways using intuitive, interpretive delivery mechanisms appealing to our sensual and perceptive attributes… Real people and real time can revalue a participatory social activity. By actively immersing participants in live reactive experiences, we are able to involve and engage them in powerful narratives. In our domain the mantra for interactivity was born from the San Francisco Exploratorium. This valued prototype of memory learning involves the understanding of an object's phenomena through physical exploration, initiative and experiment." (Higgins 2003)

It's almost 10 years since Peter Higgins drew attention to this challenge for museums, but today the challenge is only beginning to be addressed. As technological advancement catapults western societies into a faster paced, digital world, there is an expanding divide between the historical role of the museum and the potentials for a museum of the digital age. Information has become democratised, social networks have become digitised and behaviours have radically shifted. The Museum has long withstood its role as the keeper of rarified and exotic objects, but within the last 10 years, museums have been challenged to support new behaviors and expectations for what, why, how, when and where people consume experiences.

This shift presents museums with an opportunity to redefine and differentiate themselves as a place for unique experiences with objects, knowledge, spaces and others by embracing and engaging with digitally equipped and savvy visitors9. Recently many museums have come alive with innovative and amazing developments are being made in the ways content is being delivered and presented both inside and outside the physical space, for example: Voyagers (Light Surgeons, Kin and UVA) at The National Maritime Museum, Greenwich is an experiment with innovative content presentations within the physical space; Floating Numbers & Statistics (Art+Com) experiment with interactivity in physical space; and mobile applications like WeARMoMA, ArtEmuse, StreetARt, xwashier, Scapes, UAR, phillyHistory and the American Natural History Museum applications are exploiting location awareness and augmented reality opportunities for content presentation. These developments are well on the way to differentiating museums as unique spaces and museums as caretakers of knowledge, and this is essential to their survival.

Hawkey (2001) proposes that this shift will effect both the perception of the objects and the role of the learner. He said that in 1880s objects were *exotic*, in the 1990s they were *marginal,* but perhaps by the 2020s they could become *essential*; and that the role of the learner is shifting: from *tolerated*; through *encouraged;* to *empowered.* He predicted that this shift would occur due to the integration of "interactive computer technology"—which he said was an *alternative* in the 1990s but will be *integral* in the 2020s.

But in order for objects to become *essential*; technology to become *integral*; and learners to be *empowered*, I propose that new media designs aren't simply designed for the sake of the new, nor to replace objects, but instead focus on creating deeper and more meaningful connections between people and objects, so people can learn about them and through them more personally, richly and independently. I propose that the activity of design should be grounded in personal, emotional significance and not be engaged with simply for transient pleasure or thrill.

Higgins speaks of immersive live experiences and although most of the immersive innovation is tied to actual or virtual space, I'm keen to observe whether similar powerful narratives can be constructed from the relationships between a mobile device and objects within the museum.

9 see Appendix A, Section 2.4: Museum Audiences

1.10 The object, the space and others

This thesis explores the potentials for digital, mobile technology to facilitate new relationships between people, objects, the space and others, and proposes that these relationship are one key to defining the museum of the future.

After identifying the current challenge for museums, my hypothesis is that of these three dimensions (object, space and others) the primary key to differentiating the museum experience from competing experiences, lies in the potentials for unique emotional relationships between the visitor and the object:

> "Real objects have an indisputable emotional pull, [...] with personalised gateways [...] the understanding of an object's phenomena [is] through physical exploration, initiative and experiment." (Higgins 2003)

Objects are generally the most meaningful and historically rich aspects of the museum experience and because of this they embody a unique type of emotional significance. Knell argues that:

> "the object will inevitably remain the ultimate repository of knowledge, even if technology provides possibilities for sophisticated interpretation. Museums may wish to present their audiences with challenges but they will still want control of the thrust of the interpretation." (Knell 2003)

The attitude above towards curatorial control has placed culturally defined value and relevance on objects through narratives for centuries, but perhaps it is not the best way for contemporary audiences to learn about and from objects within museums. The singular curatorial definition of meaning can be difficult position to take considering that:

> "individual objects have shifting and ambiguous meanings. Their significance is open to multiple interpretations and is highly dependent on context" (Freedman 2003).

Perhaps it's fair to argue then that the key to an individual learners understanding, is the opportunity to construct a large number of meaningful conceptual connections based on a framework, theme or idea that's personally meaningful. It would be exciting for museums to create platforms that facilitate multiple readings of objects and enable museum visitors to deepen their own perspectives and interpretations.

> "Museums of the 21st century should be places to explore and learn through discovery. The Exhibits should not provide all the answers, but be interactive and stimulate the visitor to ask questions. [...] museums encourage discovery through the power of objects [and] they help visitors link their worlds to those of other times and places. Through both the content and the context Museums teach visual thinking skills, using tangible objects to help visitors understand and respect the diversity of their worlds" (Sheppard 2001)

This research proposes that mobile technologies can become a powerful way to add layers of depth and personal significance to museum experiences by building on their already "personal" perception. Plus they could facilitate richly meaningful and uniquely individualised relationships between people and objects—with objects being the keepers of knowledge.

> "Contextualizing objects according to ideas rather than Physical or functional taxonomies represents a significant paradigm shift" (Cameron 2002).

By considering mobile technology as a channel for deeper and more meaningful experiences, mobile technology can move beyond the role of a tool and beyond the walls of the museum.

Oven though this research will explore relationships between people and objects, it will not ignore the importance of the space. As Sheppard noted "Through both the content and the context Museums teach". Not only are Museum spaces unusual but they frame and add power to the objects they encase; the museum building itself is an object of significance; and the unique interior of each museum reveals its own stories not only through its contents but also by the way it impacts the pace and dynamics of its narrative flows. The space defines where you are directed and where you can weave moments of contemplation into your experience.

Lastly, even thought this research focuses on individualised experiences, it is essential to recognise the importance of the social aspect of the museum experience, as it is through the act of sharing thoughts, feelings and opinions that meaningful relationships with objects are formed. The results of this research reinforce the importance of sharing within museum experiences.

I believe that if a mobile, digital, museum learning application can facilitate a transition from sensation, through emotion, to cognition, to sharing, to learning, to transformation, it will help to transform the museum.

Section 2:
The process

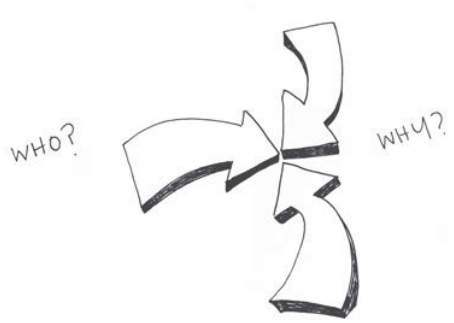
This section documents the phases of my *experience-centered research* and *experience-centered design approach*. The goal of this research process is firstly to learn about an individual by discussing and observing their experiences and to then apply this knowledge to a design; and to use the design process to gain deeper knowledge and empathy for each participant.

The *experience-centered* ***research*** process and methods I've used are aimed at helping me, the designer, understand how an individual makes sense of and values their experiences; how they could attain ***a flow*** or ***an aesthetic experience***; and how they could learn.

The *experience-centered* ***design*** process and methods are focused on using this research to create a design that is personally, emotionally, significant and relevant for each participant; that appeals to them and addresses their skill levels, knowledge and interest; and that can facilitate a flow or an aesthetic experience. This experience-centered design process it is not as much about solving problems as it is about creating a design based on imagined experiences. [10]

The research and design process progresses from engagement, through ideation, through conceptualisation, through visualisation, to animation.

10 The focus on imagined possibilities is remniscent of Fictional Inquiry (Riceour, 1983) and A Critical Artifact Methodology (Bowen, 2009)



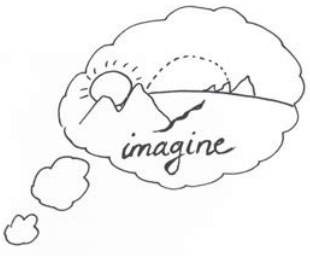
Engagement

The engagement phase uses an *experience-centered research* approach to find out about a person (the personal context); how they learn; how they see the world; and what they like or dislike about a museum visit. It is essentially focused on finding out *"who?"* they are.

To attempt to answer even part of such a broad question, I've used a set of cultural probes—called an "insights kit"—to elicit personally meaningful reflections for understanding how people make sense of their experiences. The contents of each *insights kit* helped me understand aspects of each persons unique experience of the museum and their background, perspectives, beliefs, interests, prior knowledge, and values.

Figure 6: Experience-centered design process illustrations
Chloe Walker 2011

WHAT?



How?

Ideation

The ideation phase used an *experience-centered research* process to uncover an idea for an application for each participant. It focused on answering "***why? & what?***" [11] by having them ***think*** about and ***imagine*** potential desired experiences for museum learning. It used dialogue as a tool for uncovering deeper personal perspectives, dreams, knowledge and insights (the personal context); plus actual ideas that could inspire a design process (the physical and spatio-temporal context).

Each participant and I discussed their 'engagement' experience and reflected upon their insights, prior knowledge, skills, interests, museum experience, motivations, goals and ways of making sense of the world to explore opportunities for design. Our conversations remained broad and high-level, and only considered design details when they could strengthen our dual understanding of a potential idea. After the brainstorm and discussion sessions I transcribed and reflected upon our relationship, the ideas and the process. I then presented each participant with a written set of ideas and they chose their favorite to progress into the conceptualisation phase.

Conceptualisation

The conceptualisation phase contained both *experience-centered design* process and *experience-centered research* processes.

For the design portion, I asked myself ***"what"*** could I ***imagine*** them wanting an experience with each design to ***feel*** like? I referenced the insights kit, recorded interviews and transcripts, and used the sense I had for each person to help me imagine the answer to that question. This phase was focused on defining features that the application could present and a paradigm or metaphor that could frame the experience conceptually. I spent a number of weeks sketching and illustrating concepts for each individual.

This phase placed importance on conceptualising each participant's idea in a way that made sense to them. I considered every aspect of the design—interface concepts, content components, emotional potentials, narrative styles, and the interaction paradigms—from each individual's perspective and considered how and when a *flow* experience, *an aesthetic experience;* and a *contextual learning* experience could occur.

I then presented each unique concept to each participant and used them as a point of discussion. From this I was able to gain an even deeper understanding of each participant.

I chose to use illustrations instead of computer rendered wireframes as a tool to facilitate discussions around the application concepts. I did this to communicate to the participant that the ideas were expressive and not final. I also wanted the illustrations to spark each person's imagination about the potentials for the application in the hope that I could learn more about them and their perspective on experience.

11 "Why?", "How?" and "Do?" Goals are explained further in Appendix A, section 2.1

Visualisation

The visualisation phase explored "***how***" the application design could *look and feel*?

Within this phase I explored the ways each person's personality and aesthetics could be expressed and strengthened through visual elements like icons, colors, textures, typography, metaphors, spacial representations and interaction ideas. I considered how each of the elements could influence the potentials for *an aesthetic experience* (the sensual, emotional, spatio-temporal and compositional) and a *flow experience*. The visualisation could help achieve these two experiences by using familiar metaphors and clear functional communications to ease the usability, along with an aesthetic that made the experience desirable, immersive and resonant as an object of self-expression.

Animation

The animation phase focused on simulating an experience of "*using*" the application within a spatio-temporal context—***when?*** and ***where?***

Even though the applications have not been built, the animation of each application demonstrated the features and simulated the experience of interacting with the application. This phase involved the participants the least, and relied more on my intuitive sense of their desired experience.

The animation technique proved to be a more time sensitive and feasible alternative to prototyping for this process. Instead of having each person use the application I presented the feeling of using it as if they were familiar with it (which they actually were). I presented a potential experience with the application and the details of how the application might operate.

Since the animation was able to simulate an experience with the application it has been able to present the application as the embodiment of new knowledge. The animation is therefore, for the sake of this research, the design outcome—a proposal.

2.1 Engagement

This section explains how I used *experience-centered research* to get to know each participant. Within this phase I recruited the participants, designed and delivered a set of *Insights Kits* (Cultural probes variant), met the participants over Skype, received the completed kits from the participants, reflected on them, reflected on my process.

This phase focused on answering the question: ***Who** are they?*

The engagement phase is influenced by Jayne Wallace's experience-centered design process[12]. Three particular aspects were of particular relevance to my research: Firstly the inter-personal communication and social aspects of craft-centered jewellry practice as applied to digital jewellry; Secondly her goal of embedding emotional significance; and lastly that she recruited and designed for only three people. Wallace's work emphasises the importance of creating designs with personal emotional significance, for both her and her participants and advocates designing for empathy and emotional awareness.

The engagement phase of our processes are similar but I decided to build upon her suggestion to take the dialogical aspect further.

> "If I was able to conduct the research again I would still use the stimuli methods, but in addition I would spend more time talking through the stimuli responses with each individual before beginning the design of the digital jewelry" (Jayne Wallace 2007)

[12] See Appendix B: Section 4.2 Design influences; for further commentary on Jayne Wallace's design and process

2.1.1 Recruitment

Primary qualitative research often considers between 6 and 12 people to be a minimum, but for experience-centered design, due to the focus on depth and emotional experience, it is sufficient to recruit 3 people[13].

I chose to recruit my participants in Sydney, Australia for a number of reasons. Considering that I am based in New York City, USA—and far away from the Powerhouse Museum, in Sydney, Australia—I had to decide between having the participants close to me or close to the museum. Despite wanting to meet my participants in person, I decided that it was more important that they had first hand experiences of the Powerhouse Museum than in-person time with me.

I found my participants through reliable sources. I chose them because they were interested in the research subject matter and promised to be committed to the project. One participants had expert knowledge on museums and industrial design, another on fashion design, and another in writing. I considered that expertise was the most important factor to vary because it would allow for differing depths of conceptual and professional engagement, content and reflection.

The three participants are referred to with fictional names throughout this research. Alice, Lexi and Sarah are experts in their respective fields of fashion design, industrial design & museum research, and journalism.

2.1.2 The Insights Kits

The "cultural probes" technique (Gaver et al. 1999) is a widely used method for helping designers gain personal perspectives from individuals within specific audience groups, with the aim of exposing potential design opportunities.

In this research, I've designed a unique set of cultural probes that I call *Insights Kits*[14], to help me learn personal and contextual information about each person. Each kit contains a collection of stimuli, aimed at inspiring each participant to contribute their unique perspective, ideas and feelings about themselves, their world, the museum and learning.

Each *Insights Kit* contained two streams of *contexts* and each item in the kit used different affordances to suggesting appropriate activities, mindsets, content types and time frames (ranging from 5 minutes to 2 hours for each item) for contribution. I handcrafted the kits, and personalised the colors so they'd feel valuable and intimate and in turn set a tone and perspective for the project.

The first stream focused on the ***Personal Context*** and asked about emotional insights and core values, through: an album "*what's your story?*"; a diary "*what do you do and feel?*" and emotion stickers "*how you feel*"; and postcards "*what's your opinion?*".

The second set of items asked for their insights about the museum: the ***Socio-cultural*** and ***Physical*** contexts, through: a notebook "*share your ideas*"; 4 theme cards "*what interests you?*"; and an iPod touch "*your digital moments*". I geared the Museum related activities around a museum visit organised for them. I requested that they record approximately 45 minutes of their experience at the museum on the iPod Touch. They were given free passes and asked to attend within a two week window during April 2011.

13 As a precedent, Jayne Wallace designed for 3 people

14 See Appendix B, Section 3

The *Insights Kit* focused on receiving input into all four theoretical areas:

Experience-centered research and design—the iPod Touch, Diary, Album, Emotion Stickers and Notebook all focused on finding out about experience, whether it's remembered experience or documentation of a particular time period.

Contextual Model of Learning—The iPod Touch, Two postcards, the Diary, the Album, the notebook, the theme cards. These all revealed aspects about their personal, socio-cultural and physical values, core values, beliefs, perspectives, interests, communication styles,

Flow Theory: optimal experience—one postcard, the iPod Touch. I asked a question on one of the Postcards "What do you do simply for it's own sake motivations?"

Pragmatic Aesthetics: an aesthetic experience—iPod Touch, Album

Instead of the term *cultural probes* I chose the term *Insights Kit*, because I felt it more accurately communicated my perspective on the value of the relationship my participants had to this research. The emotion stickers, the album, the diary, the notebook, the theme cards, and the iPod touch were all created specifically for this research and therefore are innovations. The postcard technique, however, is taken directly from Bill Gaver's original cultural probes kit, but the questions on the postcards were specific to this research.

One of my initial concerns with the insights kit was that the intimate nature of some of the activities may have made some people feel awkward. To counter this I made sure that the questions were general and open to interpretation and that the items varied the levels and modes of engagement, mixing up storytelling with reflection, challenge with simplicity.

2.1.3 The Kick-off

To help prepare each participant for the process prior to engaging with the kit, I arranged a Skype kickoff meeting and presented the kit through a sequence of photos, simulating the process of "unboxing". I reinforced that my aim was to learn about them, their ideas, opinions, passions, concerns and approaches to life and to museums. I told them that I was interested in discovering what was meaningful to them and relevant to the design process and outcome; and that they would be helping me improve the quality of design for mobile technology in museums.

During this briefing session I was intentionally vague about the exact purpose of the research and the way to use the kit, although I did explain the goals and theoretical influences behind the project. I explained that they could complete any amount of items, in any manner and sequence. I specifically expressed that they could contribute insights by taking photos, videos, sending postcards, mapping their journeys, writing about their experiences, drawing, collaging, or collecting keepsakes or ephemera from their travels. I wanted their engagement with the kits to be as undirected and natural as possible.

It was important for me to learn as much from how and when they revealed something as from what they said. By forcing them to express themselves naturally and in their own style I hoped to gain an understanding of their non-verbal language, revealing both their thought process and their preferred modes of communication and engagement (attributes that were not always necessarily embedded within the words they chose to use).

This kick-off session was an important step in the process for a number of reasons. Firstly so I could introduce myself and the project to the participants; secondly, so I could gauge their level of interest and understanding of the topic and themes; and thirdly so we could start to build a relationship and foster trust.

2.1.4 Immersion

My process involved me becoming immersed—reading, listening, looking and watching their personal expressions and stories; reflecting upon the responses and taking notes; taking notes of particular ideas that their insights inspired. Through this process I built up a set of notes that I'd refer to throughout the design process.

After receiving the *Insights Kits* back from the participants, I spent between 1 to 2 weeks studying them before I organised to speak with the participants. I found I needed to focus on a single person within a single day to achieve deep immersion in a process of discovery and reflection. I was delighted that each individual had taken a completely unique approach towards their contributions and that the kits revealed aspects of their personality through how they engaged with and prioritised the items. I became aware that I had begun to develop an empathy for them.

It is important to note that although I was deeply absorbed in the process, I consider that the specific responses in the insights kit only represent the individual's thoughts and feelings during the time they were completed and are by no means definitive.

I reflected on the following set of questions:

Questions for myself

How does this make me feel?

What do I understand about this person?

What aspects have been the most influential?

What ideas came to mind early on?

Which ideas could be articulated easily?

What are the design challenges for this person?

What particular process would work best for this person?

The album *(personal context)*

The album generally gave me insights into a person's *prior knowledge, beliefs and experiences*, *personal interests*, how much and how they wanted to *share,* and what gave them *purpose* in their lives, and how *immersed* they became within the creative process of expressing themselves within the album.

The album asked "*what's your story?*" and was one of the richest and most positive areas of personal contribution. The album was the only item in the kit that contained completely blank pages and was therefore the most open to playful expression. Each participant used it in completely different ways, but all of them told me the most about how they saw themselves and what they valued about themselves through it. Everyone started at the beginning and focused on key events in their lives that brought them to their current situation. The stories were told in various ways, through sketches, writings, page foldings, train tickets, festival brochures, postcards, paper collages, chocolate wrappers, magazine clippings, feathers, leaves, little books, and a sudoku game. It was this richness of expression within the album that made it one of the most inspiring items from a design perspective. Not only did I learn from what the participants said, but from how they said it as their communication style gave me an insight into their visual and verbal language sets.

Emotion stickers *(personal context)*

The *emotion stickers* gave me insights into a person's *feelings* during their experiences; their *motivations* (whether their emotions compelled them to act); and how comfortable they felt about *communicating* their emotions through the stickers.

I was aware that asking people to open up about how they feel to a stranger was a potential challenge, so to address this concern I designed the set of small, round, emotion stickers that said *"I feel……"*. All three of the participants used the stickers to express emotions. They were mostly used within the diary to express emotional states surrounding a story. In total, the participants expressed 16 negative emotions and 10 positive emotions expressed on all of the stickers. Some concerns were: *"I feel impatient"*, *"I feel like an intruder"*, *"I feel angry and anxious"*, *"I feel I should be writing this down in my journal too"*, "*I feel confused"*. Of the positive emotions, most were fun exclamations like *"I feel like designing"* and *"I feel like a coffee"* and some were more intimate like *"I feel cosy"*, *"I feel calmer"* or *"I feel sleepy"*. Overall the stickers were an effective item within the kit, allowing participants to focus on defining an emotional state for a particular experience and allowing me to see particular emotions as more impactful or overarching that others.

The diary *(personal context)*

The *diary* gave me insights into a person's *daily experiences,* how they *made sense* of their experiences, whether they felt in *control* or out of control within their experiences, whether they felt *challenged* by daily occurrences and how they dealt with challenges.

The *diary* was intended to be used for narrative responses to daily events. It said *"what do you do and feel?* on the inside cover. One participant placed a large sticker saying "feel" across the front cover. Their diary told the story of their experience of learning how to use the iPod Touch and the excitement that preceded their museum visit. This same participant used the diary to extrapolate on the theme cards. Another participant used it to share their story of walking to the Museum of Contemporary Art in Sydney and afterwards, expressing their thoughts on the exhibit, art, museums, society, and sharing. Another participant used their diary to tell me a story of a family crisis and how it was resolved. All participants used the diary to document one or two days of activity. The diary was very personal, present and intimate. All of the participants were eloquent and their thoughtful openness enhanced my empathy with them. The diary helped me gain a sense of specific personal spaces and moments.

The notebook *(Socio-Cultural & Spatio-Temporal context)*

The notebook gave me insights into their *museum experience*, their *personal interests*, their *motivations* with regards to the museum visit, how they *felt* about the experience, how they felt about the *physical context*, how they *made sense of* their museum experience, whether they felt like they *learnt* something from the museum, whether they felt *oriented*, and whether they had *clear goals*, *challenges* and *immersion.*

The *notebook* contained part lined and part graph paper. I found that only one person used the graph paper for anything other than writing (Alice used it to shape the letters of a word), which was interesting as I thought it might have inspired people to draw maps or at least color in the squares. It seems that the they were directed in their task of writing down ideas about museums. Unfortunately the purpose of the notebook and the diary seemed confusing to most of the participants as they mixed them up. In future versions I may make these clearer if the confusion hindered their ability to use them, but since in this case it didn't hinder peoples ability to contribute, it was still beneficial to see how each person chose to interpret the items.

The postcards *(Personal Context)*

The postcards were geared towards receiving specific feedback on particular topics related to this research. They gave me insights into the following areas through the following questions:

Values
Please tell me a piece of advice or insight that's been important to you.

Technology
"Tell me about your favorite device."

Skills and learning
"How do you learn and what are your most valuable skills?"

Museums, Values and Motivations
"What's the role of Museums in your life?"

Aesthetics and function
"What role do art and design play in your life?"

Values & Prior experience
"Tell me a story that has changed your life."

Gameplay & skills
"Tell me your favorite games and why you love them?"

Flow
"What do you do simply for it's own sake?"

The *Postcards* were the most targeted items within the insights kit. They asked *"what do you think?"*. Each card asked a direct question about one of my research areas: games, flow theory, technological devices, art & design, stories, values, museums, learning & skills. They were intended to elicit intellectual responses from the participants but were more about telling stories. Two of the three participants engaged with the postcards and one participant did not, due to a lack of time. Both contributing participants used their postcards to write the following: insightful personal reflections, memoirs, opinions, relationship or flow diagrams, quotes, keywords, and sketches. The most challenging question was *"what do you do you it's own sake?"* One participant wrote *"This is a tricky question..."* and the other wrote *"It has taken me a while to write this postcard..."*. Despite the expressed difficulty, both participants responded with rich insights that taught me a great deal about their values and personal awareness. Overall the postcards were extremely insightful and at times emotionally moving.

The theme cards *(Personal & Museum Context)*

The theme cards gave me insights into 4 key themes of *interest* to each participant. I asked for a single word or phrase expressing a theme of importance in relation to *time, space, culture* and *emotion*.

The *Theme Cards* were the most tactical piece of the kit as they were intended to become the springboard for initial ideation discussions. They asked *"what interests you?"* and were meant to capture a perspective on the broad themes of *time*, *space*, *culture* and *emotion*. Two of the three participants completed the theme cards and the other didn't due to time constraints. The theme cards were important to me, but not obviously important to them. Upon reflection I could have either made the theme card design more impressive and important to encourage contribution or made them compulsory, which may have made the kit feel like a chore, something I was careful to avoid.

The iPod Touch *(Personal & Museum Context)*

The iPod touch gave me insights into the individual and the museum. It enabled the collection of very rich data: their *perceptions* of space; how they *interpreted* the museum content and context; how they brought their *prior knowledge, beliefs and experience* to the museum; what their *personal interests* were; how much *control* they had over the technology; how much *control* they had within the museum visit; what their *motivations* were; what they felt their *purpose* was; what *emotions* they experienced and why, what their *aesthetics* were, how they *constructed a narrative*; how they *made sense of their experience*; how they *connected with exhibits and the space*; how they *oriented* themselves; and how and what they *shared* with me.

The *iPod Touch* was the richest data set in the insights kit as it spoke to actual experience instead of remembered or romanticised experience (which was still valuable, as a key to individual's prioritisation of experience). Despite two of the three participants never having used the iPod Touch technology before, everyone managed to access at least two of the three recording applications and contributed to the kit digitally. I wanted people to use the iPod Touch for recording so they if they weren't familiar with it, they could learn about the interactions and interface paradigms and to form a relationship with it.

There were numerous reasons for using the iPod touch as a recording device within the museum: I wanted to experience the museum through their senses; I wanted to see what recording mode they gravitated towards or felt comfortable with, for example, video, audio or photos; how they felt about using the device as they moved within the space; I wanted to see what type of museum visitor they were, what subjects and exhibit types drew their attention, whether they were hands-on or hands-off, passive or actively engaged with the exhibits; What their opinions on the museum experience were; for example what they liked and what they didn't like; and finally what they thought could be done to improve the museum.

Everyone used the camera, two of the three used the audio and a different two of the three used the video. Surprisingly it was one of the novices that used all three applications fluently. This showed that all three were able to discover ways to contribute even if it required the help of others. The fact that they had a purpose (going to the museum on my behalf) made this task more necessary. The data that was delivered was an extremely rich and valuable way for me to learn about them. I felt personally connected with their individual museum tours.

Summary

Alice took 67 photos and 14 videos (33 minutes) and contributed thoroughly to every item within the kit. From this I deduced that Alice was a visual thinker and enjoyed experimentation. She used the iPod Touch for two purposes: firstly to critique the museum and secondly to simply take me on a visual and auditory journey (for example she recorded 10 minutes of walking across various textured surfaces within the museum). When critiquing she seemed dissatisfied with exhibits when they were out of date or shallow, for example she didn't like the bed in the eco-logic exhibit as it seemed to serve no real purpose. She also wished there was a way to facilitate more ecologically minded action from within the museum. This spoke volumes about her personal ethics and commitment to causes she believed in. The second half of her experience was more exploratory and exposed her appreciation of aesthetics: the textures, the light, the sounds, even in her cultural probes kit she remarked that she enjoyed "looking at clouds" simply for the sake of it. This exposed that she possessed a sophisticated understanding and appreciation of materials and patterns.

Lexi took 8 photos and 7 videos of (37 minutes) and contributed thoroughly to all items in the insights kit. She focused on evaluating the success of the museum. She pointed to things she liked and things she felt could have been achieved more effectively. She covered the broadest set of topics and subjects of the participants; took a very practical approach to her critique of the museum; and managed to mesh a very sophisticated knowledge of design with a simple perspective on user desired activity. She said that a sign saying "don't touch" was giving the wrong signal, because you could neither break the object nor get hurt. From this I understood that she liked complexity displayed through a lens of simplicity. This initial assessment of her perspective was validated in our discussions.

Sarah took 5 photos and 11 audio tracks (7 minutes) and contributed to the diary and album from the Insights Kit. Sarah focused on audio recording as it was perhaps more comfortable to her (being new to using an iPod Touch). She mentioned that it also resonated with her desire to simply speak and tell stories. She spoke about exhibits that she felt I would be interested in (I had mentioned I wanted to look at the emotional qualities of experience so she told me about an exhibit called "emotive epoch"). She felt comfortable reading from the placards and explaining how she felt about the experience. From this I learned that this activity came naturally to her and from her insights in the following interviews that she enjoyed it.

2.1.5 Reflection

As I began to understand each person's perspective on the museum and other experiences, I began to understand the potential value of a design which is created for an individual and how a position of empathy could create a more emotionally significant and meaningful process and outcome for the designer, the individual and for others who would experience the final design.

In a discussion between Wallace and Bartels and Lindmarck Vrijmann in 2004, Wallace states that they explored the way that empathy can effect the participant in a contemporary art jewellry design process.

> "Ulrike also asserted that empathy was significant in terms of giving the participants a feeling of being respected and vital to an environment of trust and security within the dialogue and creative process." (Wallace, 2011)

This is true and an essential part of the engagement, but it is more than an act of respect, it is about understanding. Designing with empathy is designing with a sense of feeling what it is like to be in someone else's shoes. To feel emotionally and physically connected to another persons experience of life. It is a feeling of emotional understanding and harmony with another person that can only be achieved by getting to know someone on a personal level.

Empathy can be seen in a number of ways. Husserl believes that empathy isn't simply received passively but is the result of active creativity. An act in which someone has to develop an emotional and physical sensitivity to someone else's experience of life through active immersion in the stories, biographies and aspirations of others. Designing with empathy leads to an awareness of what the user might feel about something and therefore to a degree, what kind of experience they may have. Similarly Fenchel describes that empathy occurs in two stages: firstly as an ability to understand another persons perspective and secondly as an awareness of your own feelings after such an identification and Jenkins (1999) suggests that we explore other *possible selves* when we develop empathy.

For a designer, designing with empathy allows for an empathetic understanding to combine with existing professional knowledge and can result in richer more meaningful design decisions. Even from a remote location, I've experienced the value of a dialogical and socially embedded process for building empathy.

The insights kit made an impact on me and through immersion and reflection I built a sense of each participant. The following phases served to strengthen this base with empathy being the by-product.

2.2 Ideation dialogues

This chapter documents the discussion processes that led to a set of ideas for digital mobile applications. Philosophically it focusses on how a designer can learn from and about an individual in order to define an idea specifically for them. As the designer, I emphasised *valuing the whole person behind the user, seeing the designer and user as co-producers of experience* and understanding *how people make sense of their experiences..*

This phase was focused on answering the question: ***Why** will the application appeal to them and **what** could it be?*

This ideation process is grounded in dialogue. I'm using the term *dialogue* in the way McCarthy and Wright use it when comparing methods such as *Grounded theory*, *Discourse analysis*, or *Narrative theory* to the rich potentials of *dialogue*.

> "If you are starting to do research in experience-centered design, how do you attend to the phenomenon and people, engage with the person's experience, rather than using methods mechanically? At one level, the answer is in the dialogue. It is in the listening, the responsiveness, and the openness of dialogue. It is in the commitment to engage with the other person and linger over their story and experience until an understanding is created. At another level the answer is in the kind of rich understanding that happens between friends. Think about a friend telling you about an experience that is very important to them. Do you focus on the content alone? Or do you focus on the form of what they are saying, how it stacks up as a narrative similar to or different from other stories? Or even do you focus on the social function, how they are representing themselves in the experience and what response they expect from you? You know your friend as a person and how they are likely to respond in certain situations and to other people, the kind of empathic response you have to any person telling you about something that is important to them. you know how they might feel about their ow part in the activities they recount to you. You listen carefully, and you respond with concern, and by opening yourself to their experience, you open yourself to being wrong. Being wrong is not the point between friends. What matters is being open, caring and responsive. Being wrong is easily forgiven when it is clear to the other person that your concern is for them." (McCathy et al., 2010)

This particular perspective resonated with me, above and beyond a great deal of alternate perspectives, because it focussed on being "holistic" and on caring for a person and their experiences. I decided therefore that I would use an immersive and empathic approach to understanding the "whole person".

In addition I found that act of working together, towards a common goal, strengthened and deepened my relationships with the participants. Having a friendship during the creative process allowed for more unbridled exploration of ideas and made the act of 'being wrong' (an act that I believe is essential to the creative process) possible.

Rather than focussing on dissecting the data into pieces for re-assembly, I focused on building friendships with my participants. Finding out about their lives and caring about them became more important than analysing the words they used. This process involved discussions, reflections, brainstorms; and story sharing.

This phase was valuable as it gave me a *sense of them* to intuitively define the choices I made without their presence. I also found that I began to see aspects of myself within each participant and I used this sense of identification to strengthen my sense of empathy.

The ideation phase was focused on understanding what each person would bring to an experience and how they would interact with the museum context during that experience.

2.2.1 The Ideation process

The process took place through conversations over Skype video, chat, screen-shares, phone calls, emails, shared transcripts and presentations between New York, USA and Sydney, Australia between April 2011 and May 2011.

Within this phase, Lexi, Alice, Sarah and I spend between 1-3 hours in one-on-one sessions, discussing the insights kit, their experience within the museum and potential ideas and themes for a mobile application that they felt could improve museum experiences.

I prepared a presentation to keep our discussions on track but generally the process with each participant was slightly different. The ideation phase involved the following steps:

Reflection on the insights kit (focused on building trust and empathy)
- to validate my current understanding of each participant;
- to expand upon their observations through discussion;
- to build greater empathy for each participant;

Ideation discussion (focused on brainstorming a set of ideas)
- to use the insights from each kit as a basis for discussions about potential ideas for digital, mobile, museum learning applications.

Immersion and reflection (focused on synthesising the discussion)
- To transcribe the discussions and distill a set of ideas to present to the participant.

Validation (to show support and build trust)
- to reflect the ideas back to each participant

Identification (to progress to the next phase)
- to define a single idea to progress into the design phase.

Questions for myself

Why do they go to museums, or other venues?

Why would they use a mobile application?

What type of experience do they want in a museum?

What could an application do to improve their experience?

We began by reflecting upon the *Insights Kit* experience: what they liked; what they thought could improve it; more information about the project and about me.

During the discussions we elaborated on their recorded opinions and experiences. I guided the discussion by saying things like "you said ___, what did you mean by that?". I did this so they would feel comfortable and validated.

We then explored ways in which their experience within the museum, and the themes and ideas that they identified in the kits could inspire design solutions. For this phase I made sure they new that there were no restrictions other than being focused on mobile devices in museums.

They started by discussing the issues with the museum, way-finding, outdated exhibits and lack of connection between related objects in different exhibits. Their experience of using the iPod touch within the visit was successful once they passed a learning barrier, but even then, two of them felt that it was awkward walking around filming and talking into the device.

We took turns in the discussions—their role was to tell me about themselves and my role was to help them understand the technical and conceptual potentials for their application. The ones that resonated the most with each participant became part of a "proposition" that I typed and sent after each discussion. Once the participant chose their single idea we moved into the conceptual design phase.

The design goal for this phase was to define a single idea to take into the conceptualisation phase. The process explored potential desired opportunities for experience; and design ideas that could facilitate these desired experiences. It was essentially brainstorming and it required creativity and imagination, but also trust and of course, empathy.

I found this phase to be critical, because it focused on blending my professional training and experience for understanding design potentials with a philosophical understanding of museum learning experiences and an empathy for each individual's values, beliefs, prior knowledge and experience. It allowed me to immerse myself in their thinking processes and opinions— as I gauged how they responded to particular suggested ideas. This phase gave me a strong sense of value for each person and helped me reach the level of immersion I wanted and to feel I could design for each person.

2.2.2 Ideation with Sarah

Sarah recorded audio and photos from her Powerhouse museum visit, and completed the diary and album components of the kit. Some important questions were unanswered, so we used our ideation meeting to answer questions and expand ideas that arose.

I focused on the theme cards as I planned for them to raise potential "why?" goals. Regarding *time*, she was intrigued by the idea that a museum displaces time, because it is a "world unto itself", so we decided to use that the term "individual time". Regarding *space*, she instantly recalled being stunned by the size of the Smithsonian Museums in Washington, DC, and appreciated how a museum like no other place, can showcase the volume and vastness of human creativity. Then, when we spoke about *culture*, she instantly recalled all the different cultures she had lived within, and reflected upon universal aspects such as family and gender struggles prominent in each. For the *culture* theme card she decided to use the word "civilisation". *Emotion* was a difficult theme to discuss, as definitions of emotions mean different things to different people. Sarah focused on intellectual definitions of *emotion* such as "intellectually stimulating", "stimulated" (either positively or negatively), "excitement", "amazing". She decided that "stimulated" was the emotive state she was most interested in exploring as it reflected the state of "seeing something in a new light, or learning something". After defining the key themes, she began expanding upon the idea of enjoyment as an emotional concept and unofficially answered a few of the postcard questions by recounting what she defined as an enjoyable art gallery experience (because she rarely goes to museums).

> "When I go to an art gallery I want it to be enjoyable [...] you want to see beauty [...] you want it to be a richly enjoyable experience on many levels. [...] If you're with somebody or not with somebody, if you're able to communicate, if you're able to see something in a new light, if you then finish it up with a really nice meal, or cup of coffee, or snack at the end and then you go buy something in the shop that you really treasure [...] and that helps bring it home to you and is the thing that is going to be meaningful."

This insight was fascinating because it described her "ideal art gallery experience". To her, the ability to communicate, to learn, to be stimulated, to reflect, to eat or drink, and then to obtain a personal treasure, were all important contributions to an enjoyable experience. This description raised important perspectives and themes. In particular the act of selecting a treasure to take away, the ability to learn, and to communicate, all seemed to be potential roles for an application to perform during an individualised experience. She mentioned that going on my behalf gave her a greater sense of purpose.

> "it was more than exciting [...] it was more meaningful [...] you take away so much more [...] capture it and relive it.

She also commented that she enjoyed the act of recording her audio snippets within the museum and that the iPod touch became her "compliant" companion. We probed the idea of the compliant companion further at the end of our discussion and she said:

> "for me to resolve something I have to talk about it. [...] Actually articulating something makes it more real"

This discussion was extremely insightful as it made it clear that talking was her preferred communication mode and that this could be key to the design direction. I probed on this and she said that she saw huge potentials for talking to an application—for children in particular. She said that it would be:

> "a wonderful thing for children to take into a gallery [...] learn about yourself by sharing. Often children don't have the vocabulary to identify feelings - to be able to talk and talk about their feelings, so it would be mind-blowing, absolutely mind-blowing..."

During our discussion we identified that she wanted her application to be the following things;

> "a memory prompt; a compliant companion; a connection to infinite space; a reflection on civilization; a reflection of individualized time; a stimulating experience; the potential for infinite creativity."

At the start of our discussion we reviewed the Insights kit, as I was curious why she hadn't completed it. Aside from running out of time, she said she would have been more engaged if she had known the rationale for the research:

> "I think people need to know why they are doing something.[...] I would have been more excited.[...] What I feel, being a very word person [..] I thought that the instructions you gave were, it was gorgeous and very thoughtfully put together, but for me coming at it from the outside, it missed the most crucial element which was explaining the context and rationale for doing the exercise at all."

I agreed with her that a more specific directive would have made her visit feel more purposeful, but I was concerned that too much information may have propelled her into a problem solving mode, which may not have been a natural situation for her within the museum. I hoped to elicit a naturalness from the vagaries, to observe how she made sense of her experience, and for my purpose it worked well because it exposed that she found it easy to talk to the iPod Touch and saw value in it; and that she needed to know why she was doing something (which I may not have discovered had the kit been rationalised). I do acknowledge, however, that my approach made sense for the museum visit, but perhaps not for the personal items in the kit. I realised that I needed to be more instructional about the purpose of each paper item within the kit and explain what it is working towards and why it is important. For Sarah, perhaps it would have worked better to break up the components into firstly: the museum related exercises; and then the personal exercises.

Overall I gathered a great deal of specific feedback from Sarah and I felt a strong connection to her perspective on experience, what she liked and what she didn't. She liked to feel in control of a situation and liked to have purpose and direction for her activities. This made my ideation process more focused and directed.

Contextual insights gained from this process: Prior knowledge, Beliefs & Experiences, Personal Interests, Motivation, Purpose, Emotions, Architecture & potential sensations, Orientation, Communication/ sharing, Time, Mediation, Skills, Learning.

2.2.3 Ideation with Lexi

Lexi and I spent 2 hours and 45 minutes discussing ideas and sharing stories across two separate days.

For the brainstorming part of our first discussion session we focused on elaborating on the contents of her insights kit. Lexi contributed a great deal to all of the items within the kit so we had a great deal to discuss. We discussed the process of designing, the potentials for museums and the processes of researching, as well as numerous ideas for potential design directions.

She identified the themes that were important to her: *Belonging*; *Immersion*; *Respect* (togetherness with autonomy); and *Your time, my time*. We spent about half an hour discussing these themes in detail and considered ways that they could be addressed by a mobile application.

She also identified a set of experiential issues within the museum that could be improved by design: "wayfinding" *(better navigation)*; "an open invitation for discovery" *(more engaging calls for participation)*; "fun here", "Surprise", "awesome" ,"try this", "why not this", "Go there for some really cool stuff", "Mum, Dad: Here!" *(a fun conversation)*; Small labels *(a more engaging delivery of knowledge)*.

She also expressed a desire to be active and playful within museums and regretted that the museum wasn't as easy to navigate as she hoped it would be.

We developed a call and response style of ideation, consisting of identifying an issue within the museum, then considering ways those issues could be addressed. We spent most of the initial session working in this way and sharing ideas.[15]

Lexi had conducted research into people's behaviour within museums and during our discussions, shared a number of insights with me. She said that she had focused on group experiences and noticed that there is a lot of "pushing and pulling", and numerous interruptions during a visit. One insight that was very valuable to this research is that even though the experience is fragmented due to these distractions;

15 see the Appendix C, Discussion with Lexi

> "it's the sum of individual experiences" (Lexi, 2011)

She was interested about the role that the application could play in a museum experience. She said:

> "So to what extent do we want to fill their minds, and to what extent to we just want to generate that curiosity? If we just let them know that this is just the beginning, I think people can catch up their own rhythm" (Lexi, 2011)

To build on this she said:

> "I kept thinking of ways you could remember, like if you're exploring something it would be interesting to know more about this, but how do I remember that? Will I remember? You know how you sometimes are in the street and you see something and you think, oh I should write that down, but you think "no I will remember", but you don't" (Lexi, 2011)

We also spoke about personal experiences and elaborated on her stories of travel, family, feelings and relationships.

From this discussion process I learnt that Lexi was very interested in engaging with the world, and had a desire for varied and broad experiences.

The empathy that I felt for Lexi from the insights kit expanded—as I identified with more of her interests and perspectives—into what I perceived as a bond with her. I began to care for her and her well being.

After the first discussion I had planned to validate the ideas we had discussed and suggest a range of potential directions within which to go, but I realised that we hadn't taken our ideation into a personal realm and we had essentially discussed 'design' as designers, keeping the personal perspectives separate.

As reflection-in-action supposes, future action is defined by present reflection and rather than work with the set of directions from the first discussion, I felt it was necessary to have a second discussion and push the ideas further into the personal realm.

As soon as we started our second brainstorm session, I realised that it was important to explain the purpose of the research in more concrete terms. Lexi felt the purpose of the research needed to be articulated. She said:

> "I wanted to know the final purpose of it so I could give you feedback that addresses that specifically."

Also at the beginning of our second ideation discussion Lexi realised that the application was all about her.

> " so now I have to think about me, ha, ok. [...] it is it is, ok, alright let's do that [...] I just want to know what to focus my feedback and how to fit to you, like if you tell me that this is something that really needs to work for you, I'll put more attention on the things that I really desire and really need, rather than the things that I believe people need"

My attempt at using ambiguity to generate a more realistic set of data, wasn't successful and in future versions I would inform them of the purpose without revealing too much information.

I'm glad we used a second discussion to define a second set of ideas, as they were much richer and deeper for her than the first set. Both the private and public social aspect was very important for her.

Contextual insights gained from this process: Prior knowledge, Beliefs & Experiences, Personal Interests, Motivation, Purpose, Emotions, Objects, Architecture & potential sensations, Orientation, Communication/sharing, Time, Technologies, Mediation, Skills, Learning.

2.2.4 Ideation with Alice

Alice and I spent an hour and fifteen minutes discussing the museum and potential ideas for an application.

We approached the brainstorm by conversational turn-taking and sharing. I would ask her questions about the entries in her insights kit and she would expand upon them. We covered a range of themes and came up with a number of potential ideas.[16]

We discussed her relationship with the Powerhouse Museum, *connectivity*, *conservation* and *sustainability, museum experiences and virtuality*.

Alice had been a visitor, a volunteer, and an exhibition contributor at the Powerhouse Museum—a relationship that had existed since childhood.

> "I remember going to it as a kid and had great experiences, since childhood and of course some of my work's there and I did some work experience in the conservation lab, so I really love the place. It just seems to be running down a little bit at the moment, a but underfunded, that sort of thing." (Alice, 2011)

From her experience she lamented that the way-finding and signage within the spaces was confusing and important exhibits to her were hidden from sight. She also wished the exhibits were more current and connected to action and activity, particularly in the case of the Ecologic exhibit, where it would be helpful to be able to buy a book and continue further reading on subjects of interest.

Within her collection of insights kit videos I observed her appreciation of the physical space (she filmed the floor and the path she traversed as she made her way through the muesum):

> "I like textures and surfaces, and I like the variation, it helps you find your way" (Alice, 2011)

16 See Addendum C for transcript of conversation with Alice

We spent the majority of our time discussing the theme of *connectivity* and a range of ideas for improving connectivity within the Powerhouse. Alice percieved connectivity to mean:

> "people's past experiences, how that influences with their interaction with future experiences and also how people connect with other people in their environment and other objects in their environment and the spaces themselves. So for me it's sort of an overarching, more holistic idea of sort of how we're working in the space and I guess it goes into that whole actor network theory... umm idea... of um, even inanimate objects being actors within the space." (Alice, 2011)

She thought it would be useful if an application could help make connections:

> "I was thinking of, you know if you had a device, so if you look at the innovation exhibition and you sort of scan in the little code that it's got it says, oh, there's a related exhibition" (Alice, 2011)

She also saw the potential for an application to make connections beyond the walls of the museum:

> "I've got some friends into the concept of caching [...] it's where you sort of get a little object, you bury it somewhere, or you hide it somewhere [...] they tend to be a little sort of logos [...] with their group logo or something like this (people do it in teams). And you go around collecting and moving these little things. I think the aim is to collect and it's all about the treasure hunt and how sort of for moving pieces around the world. [...] I love the concept" (Alice, 2011)

She told me about a particular experience with mobile technology that stood out to her. it was an activity called "*Riders Spoke"* whereby people left written messages around the urban space and people on bicycles would ride around the city collecting and listening to stories that had been left at specific locations. She found this interesting and inspiring, but lamented that she hadn't participated in these things as she is "time poor".

From these discussions I learnt that Alice cared deeply about the environment and people's roles within their communities, and wanted to use the application to inform people of these issues in some way.

Contextual information gained from this process: Prior knowledge, Beliefs & Experiences, Personal Interests, Motivation, Purpose, Emotions, Objects, Architecture & potential sensations, Orientation, Communication/sharing, Time, Technologies, Mediation, Skills, Learning.

2.2.5 Immersion and validation

After discussing the museum experience, the kits and potential design ideas, I transcribed and reflected upon each recorded discussion to distill the most essential ideas and to further immerse myself within the participants perceptions, beliefs and opinions. It also helped me conceive potential conceptual directions for each idea because I began imagining the feel of each person's idea and the type of experience they might have with it.

While transcribing, I noted specific words that I felt could help refine the idea. The act of listening and transcribing each discussion, helped me understand each person and the nature of our relationships better and the typographic playfulness reflected my response to them visually. I began to understand that my sense of each individual was deepening and enabled me to clearly see how design decisions (content, aesthetics, interactions, voice, etc..) felt right for some people and not others. When I considered each idea I began to see compliments or clashes. For example; when I imagined the feel of Lexi's design I saw bright colors and strong typography; for Alice I saw organic, quirky, offbeat patterns and textures; whereas for Sarah, I imagined clear, straightforward, word driven interfaces.

Everyone connected with issues of way-finding. Everyone mentioned memory as an important aspect of a museum visit—whether it be during the experience or afterwards.

Everyone also mentioned that they wanted autonomy. they didn't want to be led around or sent on a single path, but wanted to discover their own journey.

From these points I realised that the applications should complement the museum visit and not become the actual experience.

Once I found the set of ideas within the discussions I typed each one up with a title and a synopsis and sent it via email to each participant for feedback.

2.2.5.1 Sarah's ideas

> **"A tool for encouraging learning through shared experience in museums.**
> This application will allow you to take someone on a virtual journey through a museum with you. You may share personal stories and feelings, observations and readings, visualizations and answers to questions with an individual who cannot go to the museum. You will be giving them the opportunity to experience the woven fabric of memories, stories, history and cultural knowledge from your museum visit vicariously. They may be from another culture and want to learn about Australian history; a blind person who would like to see the installations and artifacts through your words; or a child in hospital who cannot gain access to a museum." (Chloe Walker, 2011)
>
> She replied: "I think you have captured the key points of our discussions perfectly."

The process of locking off on an idea for Sarah was relatively quick. This was partly due to her insight into the benefits of having a *"greater purpose"* and a *"compliant companion"* by telling stories to the iPod Touch and partly due to the fact that she was clear and definitive about what she did and didn't find interesting during our brainstorming discussion. She gave me a very clear perspective of her likes and dislikes. She didn't want the application to be *"for anyone"* she wanted it to be personal. She also wanted the application to have a greater purpose and allow her to talk and tell stories.

From our discussion I understood that Sarah didn't want an application that told her what to do. She wanted to be in control of her own experience, but she wanted to be able to share it and found great joy in the thought of that. I developed the idea of sharing the museum experience with someone who may be off-site or unable to physically visit the space.

2.2.5.2 Lexi's ideas

Primary Idea - *"Cultural Pulse"*
This application will allow you to navigate your own journey through the museum based on your read of the cultural pulse. What do people around the world think and feel about "family" of objects within the museum. How are different groups of people expressing their beliefs and understanding of certain objects?
This concept could do the following:
a. Filter narrative pathways based on specific cultural reactions - Select a "reaction" e.g. "love" and see what artifacts and installations you are lead to.
b. Explore cultural reactions to an Object. When you see an artifact, object, installation etc... you could explore the different ways other cultures have reacted to that family of artifact or object.

Supplementary Idea - *"Like me"*
A way to expose emotional reactions and perspectives in relation to museum exhibits/artifacts. Do other people see things the same way I do? If so show me.
This concept could allow you to do the following:
a. Add a comment or reaction to an artifact/installation
b. Read what others are saying about the reactions
c. Start to filter the museum contents by their recommendation

The process of defining Lexis' idea went through two phases. After our first discussion I considered a range of ideas, but noticed that they reflected me more than her. Clearly I needed additional time with Lexi to understand her on a more personal level. When we had our second discussion we reached a personal level and defined ideas that specifically satisfied *her* needs and desires rather than hypothesised needs of others. She told me that she missed home and that she wanted to understand more about what other cultures thought, and if they felt as she did. This focus on belonging and social identification was an early theme but it was not until we spoke personally about the stories behind them that I understood what would make sense to her.

2.2.5.3 Alice's ideas

Primary Idea - The Memory Maker
This application will allow you to tag objects as favorites, then visit the list later to find out more.

Secondary Idea - Sharing Mementos
It will allow you to share virtual objects or messages outside the physical space with other people. It will enable you to leave the virtual objects in places, so you can pick them up and take care of them then pass them on to someone else.

Secondary Idea - Display related stories and virtual objects
You will be able to display digital records along side physical objects and it will reveal the story of the object restoration

Tertiary Idea- Environmental education
The application will enable you to build empathy with the physical environment e.g. plants, books

Alice and I spoke about a range of themes in our discussion. Each theme identified a number of ideas. What resonated most strongly with me was her focus on valuing physical things: objects (by telling their detailed histories), materials (by teaching people about recycling), books (as items to be shared), and plants (to be given away during a museum visit). It was interesting for me to see how she wanted to utilise a digital mobile device within the museum despite analogue sensibilities. To marry the two together, we defined that the application would teach her and others how to value histories and the environment and to care for and respecting the things within it.

Although I didn't know it at this point, I had already begun thinking about how to communicate delicate environmental politics within the design. I essentially wanted to see if the application could shift the balance of power from the person to the objects and the environments they rule.

2.2.6 Reflection on the Ideation Phase

The ideation phase evolved differently for each individual. Different levels of familiarity and knowledge were brought to the experience. I discovered that both the participant and I adopted our own unique collaborative process.

Initially everyone wanted to focus on designs that had broader appeal, beyond themselves. I had to reinforce that I was more concerned with *them* rather than others. Perhaps because of an assumption about research processes; a lack of clarity that this research was different; and, for the designers, a natural instinct to focus on others. I shifted the conversation away from solving a problem and into a more creative, value based discussion. This focus on personal, imagined experience allowed us to reach deeper and more innovative solutions.

Because Sarah was a design novice, our roles as user and designer became distinct. I didn't discuss design possibilities as much with her as I did with Lexi and Alice. Instead we discussed high level experiential and narrative desires that she had along with the insights she gained through the process of recording her museum experience for me. My role within this relationship was to translate her insights and opinions into a design idea. This role made the design process relatively straight-forward (as I'm familiar with the role and the autonomy associated with it) and it is why I chose to present her with a single definitive option that reflected all of the points we discussed. If she liked it we could move to the next phase, and if she didn't we could use it as a springboard for discussing other directions.

Sarah was confused by the process at first but after I explained the goal more effectively she understood that we were designing for her and she embraced it. The museum and design experts found it more difficult to focus on their own personal desires and needs, as they wanted to solve many of the broader design problems they had encountered at the museum.

The designer role was shared in my relationships with Alice and Lexi. We discussed themes and exchanged examples to express our ideas. We established ways to communicate through knowledge of design. When we got too caught up in examples I would try to bring the conversation back to experience and personal themes and desires. Lexi and Alice were largely responsible for the ideological direction of their designs and I became more of a facilitator, listening for anything expressed which might generate an idea or image which could then translate to a conceptual and visual design direction.

It's important to note that although no-one was told what to say, they were undoubtedly influenced by the discussions and ideas that arose during them. The subjects covered and emotional qualities of the interviews were also the result of individual perspectives and the nature of the relationship that we had formed. I am also aware that the experience of being designed for, may have biased the perception of the design process and outcome, which is perhaps a valuable consideration as a positive inclusion in future experience-centered design processes. This means, that even within this phase, the designer's ideas may still be involved.

I hoped that my empathy for each person could allow the design to become an extension of the individual it was designed for. I learned, however, that I could not simply intuit an application idea for them, but that I had to work towards helping them articulate what they wanted. In this way my role became more of a facilitator than a designer in this phase of the process.

Aside from generating ideas I had focused on gathering knowledge about what each person would bring to the museum experience and how they would react to the contextual factors. This set of discussions was essential and together with the insights kit I was able to gain empathy and an understanding for what would be meaningful for each individual within a museum experience and why they would go to a museum. As well as finding answers to these high level questions I obtained insights into their perspectives that would influence design features, paradigms, interactions.

Ideological similarities

Interestingly, most participants wanted similar things.
All of the ideas focused on:

1. being social/sharing
2. learning
3. navigation/orientation
4. filtering
4. memory (remembering/capturing)
5. culture

The unique focuses were:

6. the restoration process
7. altruism
8. storytelling
9. sustainability
10. belonging

It became apparent that the ideas were more about using the phone as a personal assistant rather than the actual experience of the museum.

This reinforced my assumption that mobile technology could be most innovative within museums if it were aimed at creating relationships with people and objects, the space and others.

2.3 Conceptualisation

This phase focused on creating a conceptual presentation of each idea.

It asked the question:s ***Imagine how it will work? What*** *will the application feel like to use and what features, functions, metaphors and interactions will it use?*

It was enriched by my empathy for each persons potential experience and an intuitive sense of what design decisions would *work* for each person as well as the model of contextual learning and flow theory. I asked questions such as: how could they apply their skills; how do they make sense of their world; and how could an interface reflect their mental models and conceptual frameworks? Answers to these questions could define how the application could feel, how it could work, what features it could contain, and what interaction paradigms made most sense. This phase was aimed at conceptualising each persons idea in a way that would make sense to them.

With experience as a central value in this process, I also took a tactile approach to the interface design activity in order to gain a greater sense of the sensual aspects of the design. I drew the interface wireframes in pencil at actual size so I could pretend to swipe and play with them in different ways. Undertaking this activity away from the computer was highly valuable as It allowed me a greater sense of the feel of the application and allowed for a calmer and more exploratory process. I felt that it also gave me a deeper sense of connection with the designs.

I considered how each person would make sense of a museum experience and how the application could facilitate learning and support optimal experience. All of the ideas

2.3.1 Conceptual Design Process

I intuitively designed the interface concepts with a breadth of knowledge: the values inherent to an *experience-centered design approach*; a deeper philosophical understanding of *experience*; and a consideration of the contextual model of learning and flow psychology, but it wasn't until after the exercise that I validated the designs with the details of those theories.

The philosophical frameworks direct focus to the user's *be* goals are essential to this process,. However, within this phase the designer also has to consider a user's *do* goals and *motor* goals to consider the whole experience. In order to find a balance between maintaining empathy and executing on the details of each design, I decided to return to a hand generated illustration process. I had learned that this process inspired me to have visceral and emotional connections to knowledge during my visual thinking, mapping phase, and I was interested to see if the same creative and reflective process could enhance the experience of designing and the quality of the conceptual designs.

For each design, I spent between one and three days working from rough sketches to the rendered illustrations. I imagined the sense of using each screen while designing it. I touched sketched buttons and created paper prototypes when I needed to get the sense of an animation or transition. I considered the designs in a multitude of environments; parks, cafes, etc... I did this to try and generate a range of fresh perspectives.

When planning on presenting it to the participants I focused on capturing the feel of an experience with the application, even for base concepts. To do this I placed my presentations within a photo of a held phone and presented them as slides with captions. I had considered interactive prototypes but I wanted the feedback to remain focused on features rather than the details.

Questions for myself

How will their Prior knowledge, Beliefs & Experiences; Personal Interests; Motivation; Purpose; Emotions be satisfied by the concept?

Where will they have Choice and control?

How will they build a relationship with the objects?

How will they interact with, visualise, orient themselves and connect to the physical space?

How will they communicate and share?

Objects; Architecture & potential sensations; Orientation; Communication/ share

Challenge; Clear goals; Feedback; Immersion

How could the design help them: Interpret; connect; reflect; perceive time; make-sense; appropriate; experience a transformation experience through learning?

2.3.1.1 *"Infinity of Creativity"* concept for Sarah

The Idea - ***"Infinity of Creativity"***

This application will allow you to take someone on a virtual journey through a museum with you. You may share personal stories and feelings, observations and readings, visualizations and answers to questions with an individual who cannot go to the museum. You will be giving them the opportunity to experience the woven fabric of memories, stories, history and cultural knowledge from your museum visit vicariously. They may be from another culture and want to learn about Australian history; a blind person who would like to see the installations and artifacts through your words; or a child in a hospital ward who cannot gain access to a museum.

I went through 3 rounds of sketching before defining the concept. I began focussing on recording, viewing, sharing and navigating features as well a narrative storytelling structure. When I presented the ideas to Sarah she said that she loved the recording functions and the sharing functions and and was surprised by the navigation function as she hadn't considered anything like that being possible. She wasn't, however, interested in a guide to storytelling nor a tool to help her structure the narrative. She made it clear that she was interested in complete autonomy and empowerment but not subjugation to a structure.

Within the conceptual illustrations I captured a sense of the simplicity Sarah was interested in. I began seeing the application through her eyes and evaluating my decisions by my perception of her needs, wants and desires.

I considered Sarah's design as a toolkit of single purpose applications, allowing her to record her journey; find and capture information within the museum; and then send it across to her participant.

Interestingly this application proposal facilitates an experience similar to the one she went on for me at the museum, where she recorded stories about herself and told me about exhibits she thought I might be interested in. Perhaps this is partially the result of us sharing in this process and both identifying with it; or perhaps because it was simply the main insight from the museum visit. Either way it was something that resonated with both of us on a number of levels, and something that spoke to a potentially broader audience.

A potential user journey with Sarah's application could touch on the key considerations for a transformational experience: she could experience the museum *aesthetically*; she could be engaged in a *flow* experience while telling the stories; she could be *challenged* by the museum content and learn more about using the application: recording audio, navigating within the museum, capturing video or reading about objects. Then she could *learn* about herself and the experience by *reflecting*; and finally she could experience a *value shift* after feedback from the recipient.

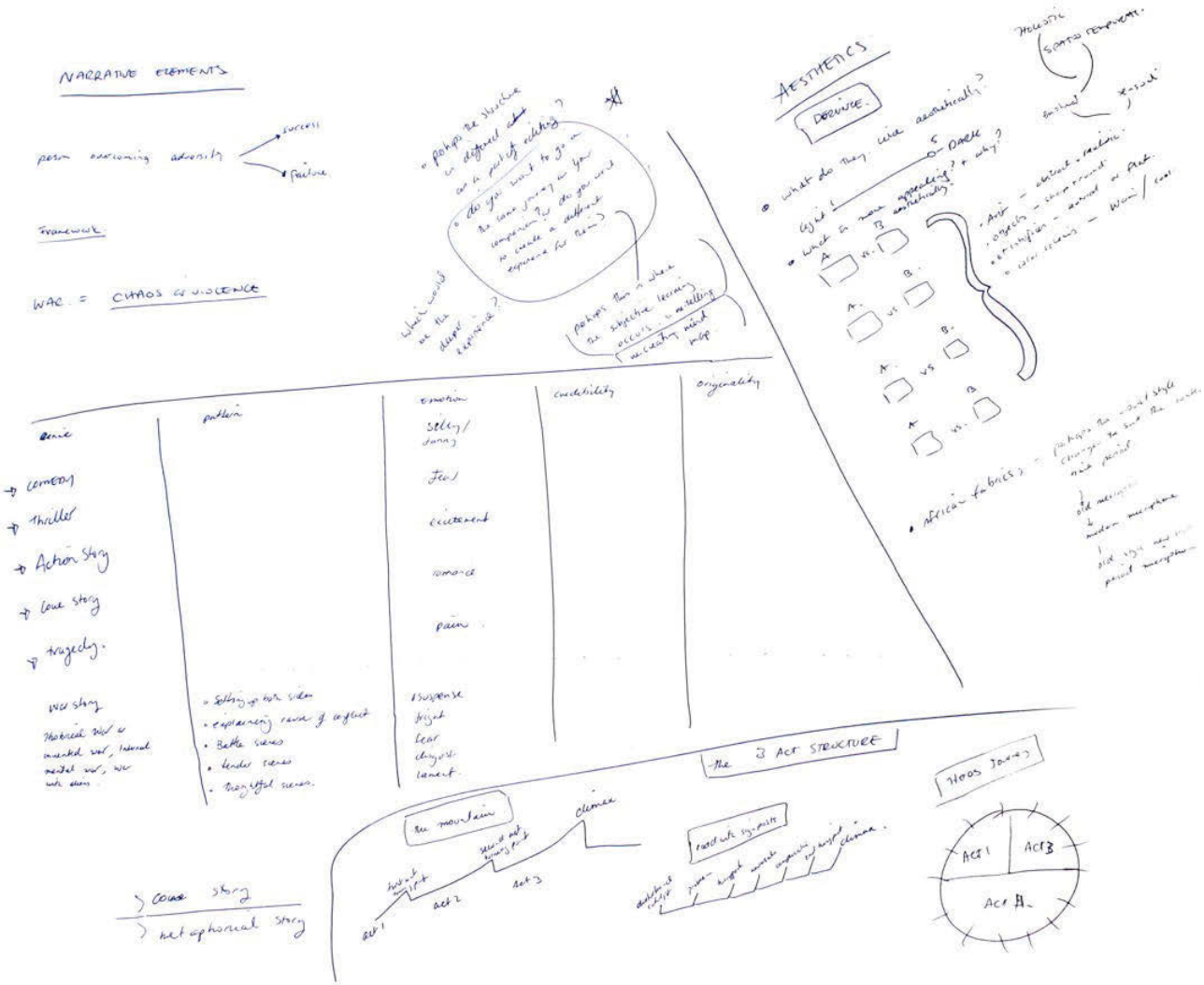


Figure 7: Conceptual Sketches
Chloe Walker 2011

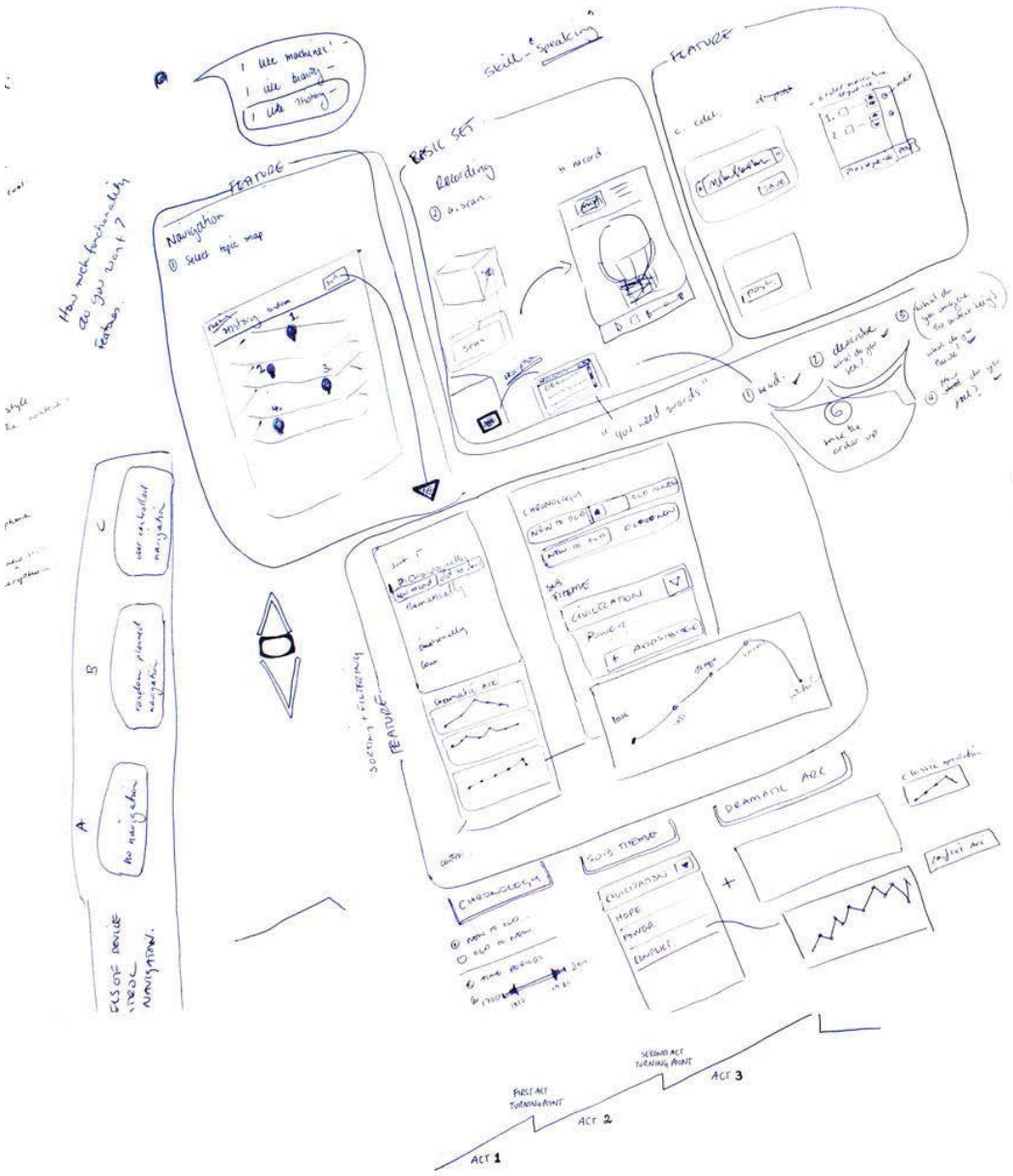


Figure 8: Conceptual Sketches
Chloe Walker 2011

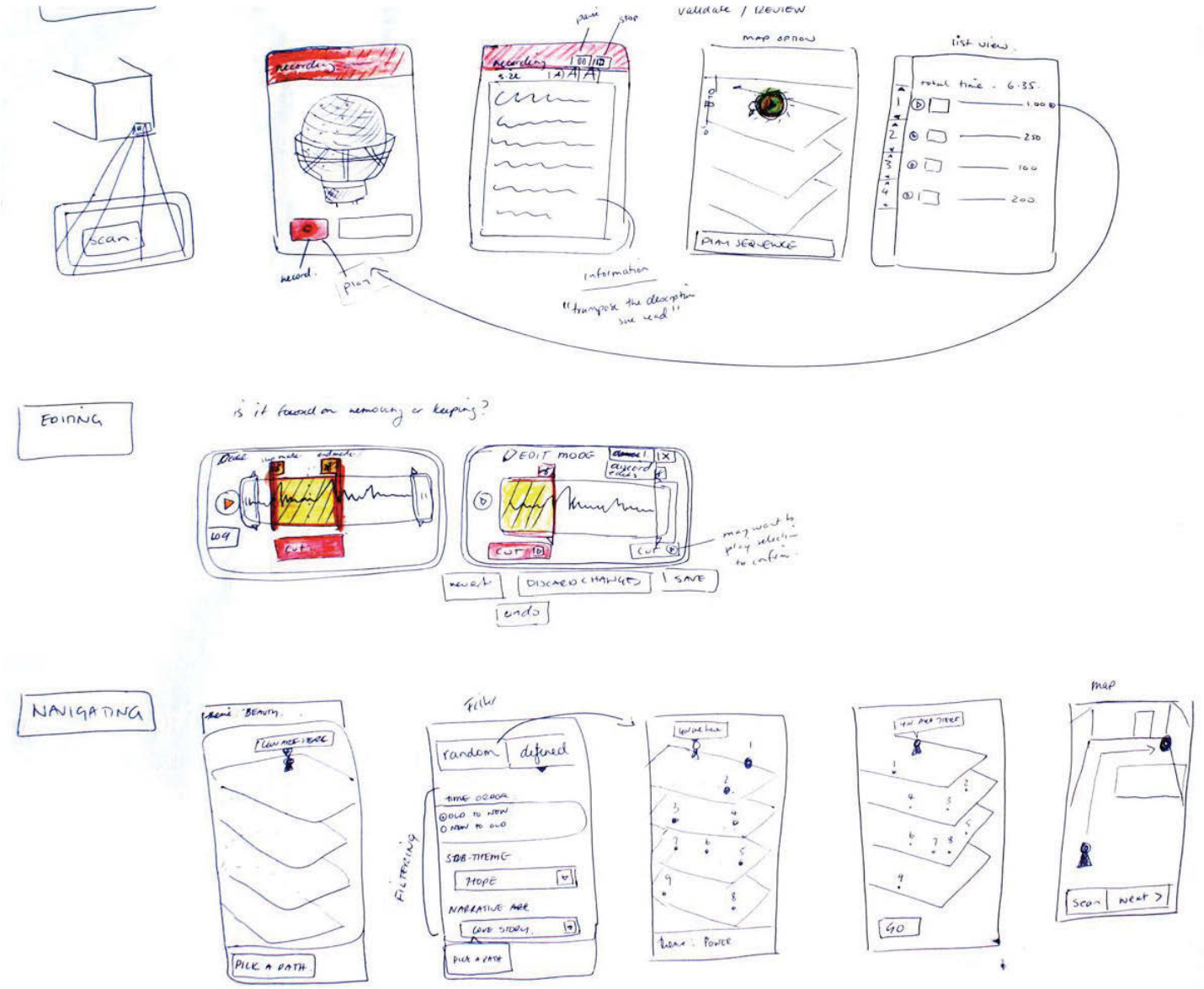


Figure 9: Conceptual Sketches
Chloe Walker 2011

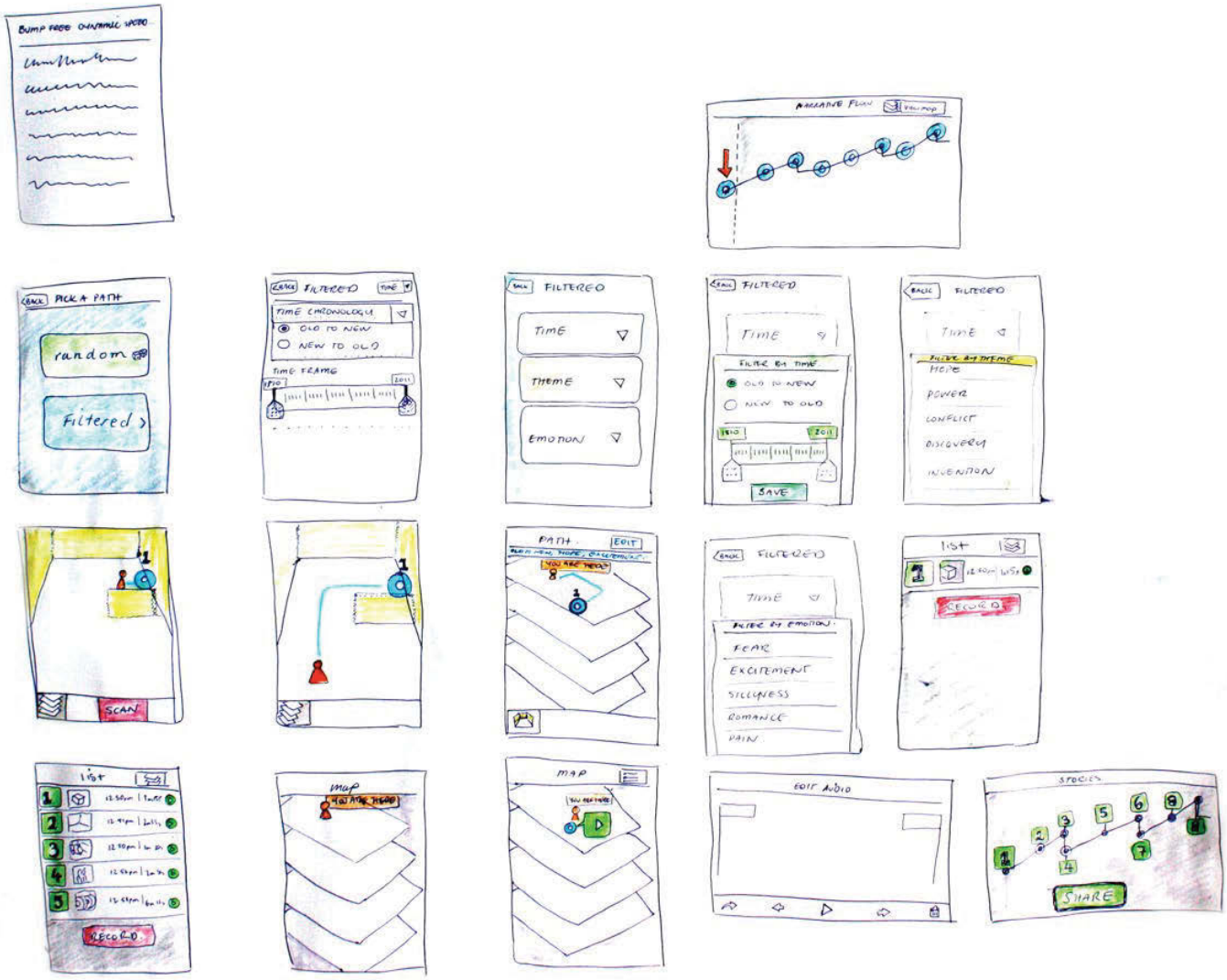


Figure 10: Conceptual Sketches
Chloe Walker 2011

2.3.1.2 *"Cultural Pulse"* concept for Lexi

> **The Idea - "Cultural Pulse"**
> This application allows you to navigate your own journey through the museum based on your read of the "cultural pulse" defined as what people around the world think and feel about a "family" of objects one of which is found in the museum. The main learning goal is to discover how are different groups of people expressing their beliefs and understanding of certain objects.

Lexi's concepts required significant design problem solving. I found myself repeatedly listening to the conversations we had and looking through her insight kit to clarify my sense of what would work for her. The challenge was that she wanted a great level of depth and breadth plus a simple interface.

When Lexi spoke about experience she said "there's always something new about something". This sentiment was captured within the design in the way that it allows you to curate living collections of objects, opinions on objects, or feelings about objects.

This concept was received very well by Lexi. It presented options for her to explore complex relationships in a very simple way. The simple drag and drop metaphor is indented to help her feel like she is creating a personal collection. That the object's details are only revealed once you collect it, gives the experience an element of chance and surprise (for control requirements, of course you can always remove objects you're not interested in). Not only can you select items from around the world, but you can chose to filter the spaces by emotions, or people as well. For example if you choose to filter the spaces by "love", you will see which artifacts and installations people love within the museum or around the world.

The thrilling thing about this design is that it ties to many of her desires and perspectives. It is voyeuristic in a similar social way to facebook, but with a focus on museum objects, thoughts and feelings. She wanted to be able to see what people said or felt about an object and then to see if anyone shared her perspective. She asked the question *"Do other people see things the same way I do? If so show me."*

The concept contains 5 features: *Capturing objects of interest*; *Viewing the cultural pulse*; *Capturing distant objects, people and feelings*; *Re-Filtering*; and *Adding thoughts or feelings*.

The design enabled her to discover social connections within the museum and other museums and to find people with similar opinions and thoughts to her. She could look through comments and feelings to for resonance. She could even saving an emotion or a person to her bay and then re-filter the content, for example: if she chose to save a person to the bay she could see what they had most recently found interesting or relevant and what range of emotions they had felt throughout their experiences.

The application would display comments chronologically and the emotions by most popular. I intentionally restricted filtering as it was more important she could explore the content in a consistent manner until she decided to focus on a particular aspect. If for example, if she wanted to filter emotion by time she could add a particular emotion to her bay and view the "we feel" tab. This would then filter the emotion, for example 'loss', in chronological order.

I designed the piece to satisfy 3 modes of exploration. On the lowest level of engagement, she could use the application to simply read theme specific content about the items at the museum. For engagement on a level deeper she could explore related content (items, comments or feelings) either within the museum or around the world. Both of these levels would require the deliberate activity of dragging content into your bay to collect it. This act has been designed to reinforce the importance of collecting something and creating a unique, curated collection for yourself.

The next level down considers the act of contributing . This is a personal act and one that requires a commitment to either an opinion or a feeling. This level of engagement forces reflection and assists learning.

The deepest level could be the level of reviewing the connections and getting caught in the process of deep-diving into a unique and specialized direction. Perhaps you find an artwork or object somewhere in the world and then a person from that place, and then the works that they like and soon you are within a very specific sub-cultural reference, learning from the thoughts and feelings of someone you have identified with somewhere around the world. The application can become very specific very quickly and allows you to get lost in the act of surfing relationships between people, places and objects.

Of the concept she said:

> "I like making things mine[...]make it a part of my experience in a possessive way"

She also liked that she could "get to relive the experience" and visit it again at another time to see what's changed.

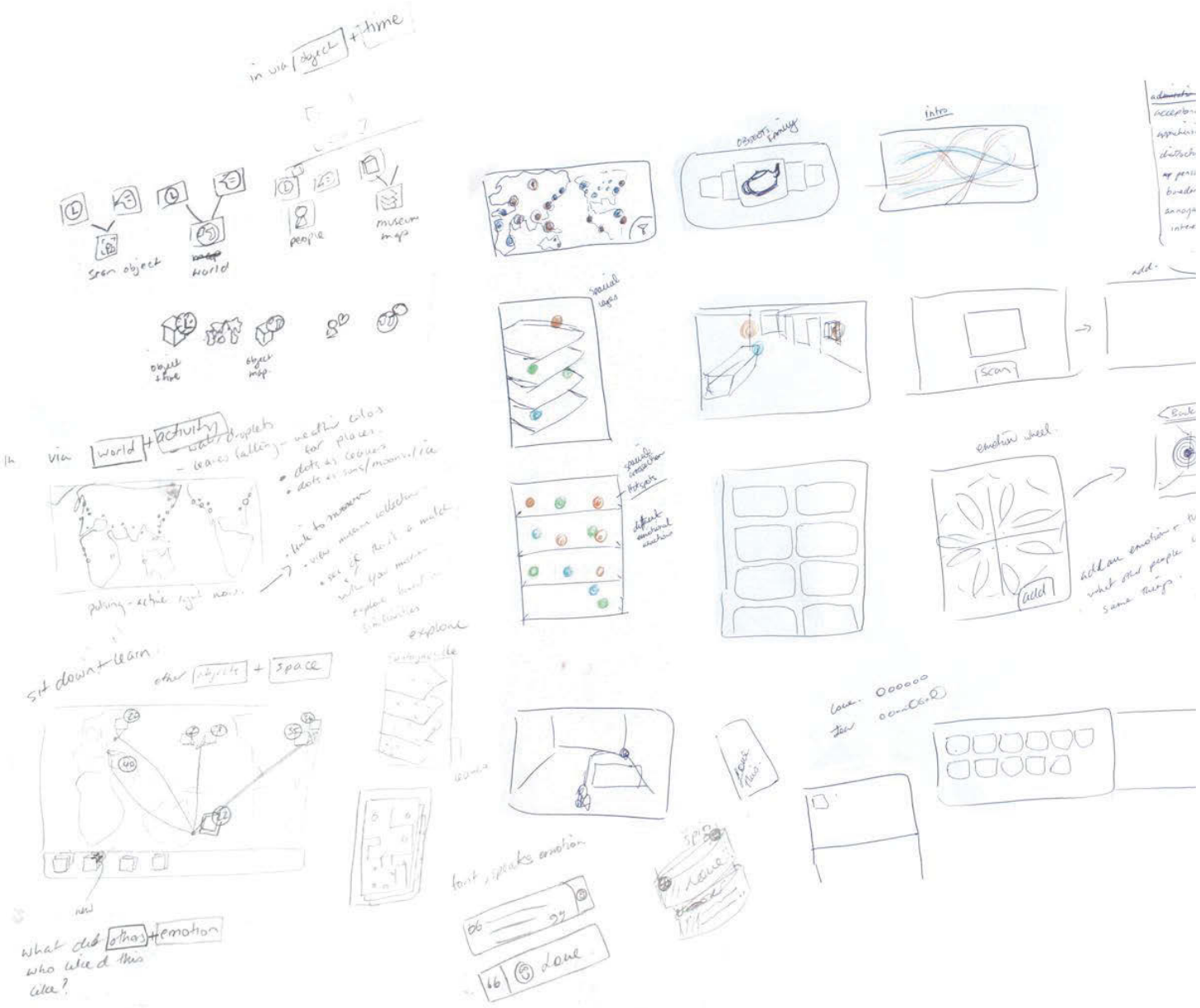


Figure 11: Conceptual Sketches
Chloe Walker 2011

Figure 12 Conceptual Sketches
Chloe Walker 2011

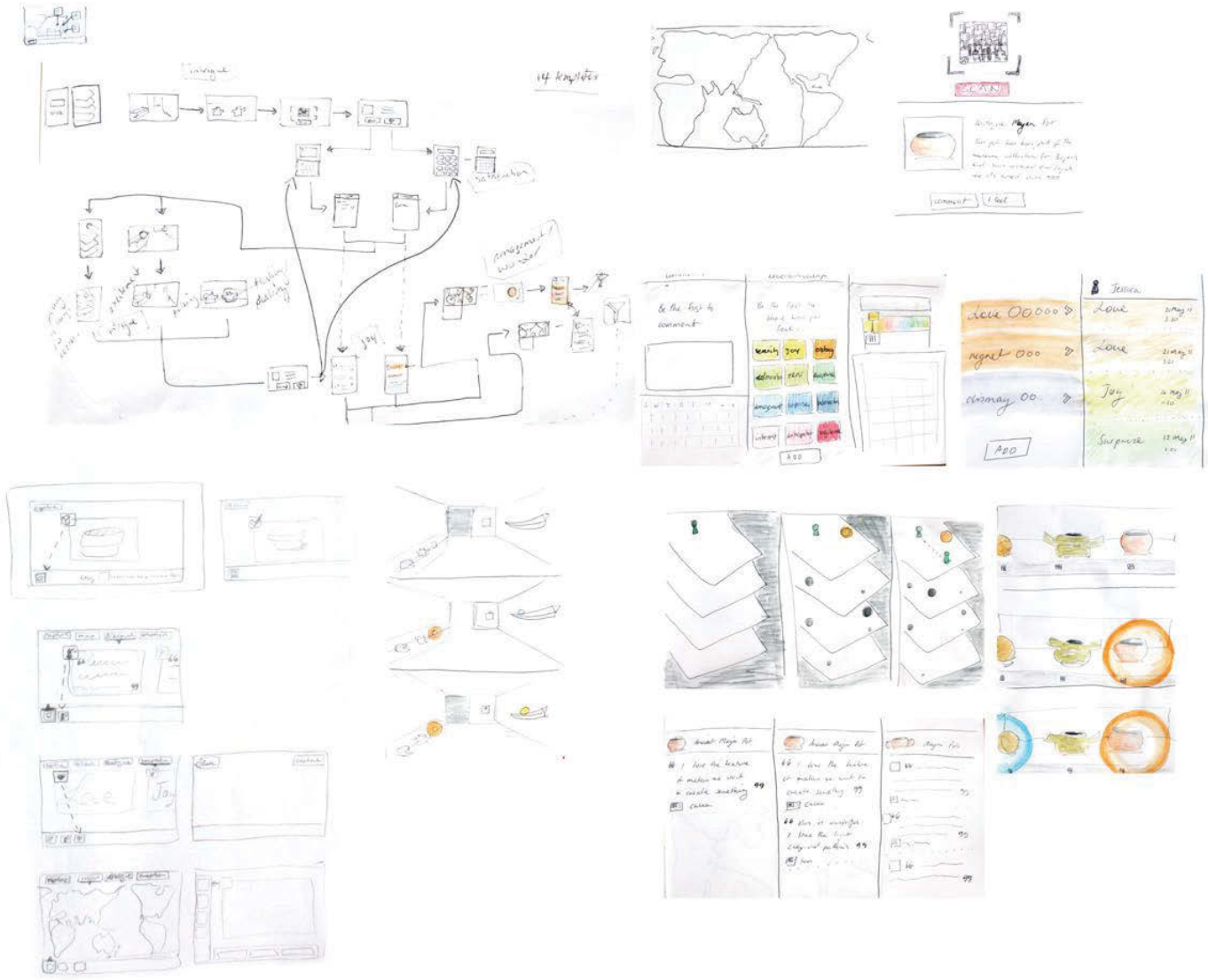


Figure 13: Conceptual Sketches
Chloe Walker 2011

Figure 14: Conceptual Sketches
Chloe Walker 2011

2.3.1.3 *"Remember me"* for Alice

> **The Idea - "Remember me"**
> A tool for connecting memory threads between the museum and the environment"

Alice's design combined a number of ideas together into a single application. Firstly she wanted an application that helped her remember the things that she liked within a museum visit. She then wanted to be able to share and care for virtual objects within a physical space. While within the museum she wanted to be able to access information about the restoration of an object. Ideologically she wanted the application to help people gain awareness of the inter-relationships between objects, knowledge, the environment, and people and through this awareness gain a sense of responsibility and caring for the preservation of these things.

Within her insights kit she focused on an appreciation of the journey. She liked to walk around and discover hidden treasures within record shops or simply watch the clouds for enjoyment. The insights from her kit helped me consider a presentation of the ideas above from an experiential perspective specific to her.

I used this sensitivity as a guide in my conceptual decision making process. I decided that the application would comprise the following features: capturing objects of interest; defining threads; viewing memories; learning about the recent history of an object; building new threads; reviewing multiple memory threads; adding to memory threads; sharing and preserving memory threads.

To capture the idea of a sensitivity and connection to objects I decided to make the act of capturing the object an intentional gesture. I wanted it to be a positive sign and decided to make it a circle. So within the application, you draw a circle around the object to capture it.

I also wanted to reflect the idea that you were creating a memory fragment of an object not a direct link to that object, so I designed that when you captured the object it would fragment in an irregular geometric shape like a thin sheet of ice or shell.

The application was designed to tell stories as a spatio-temporal event. When you actively select an object within the museum, you are asked to define the topic of the story you will be told. It could be a different curatorial defined set of options for every object, but you would only be able to select one. Also, you could never initiate a new event within a story, but you could select how frequently you wanted an event to occur. Essentially you are given control over the parameters but not the event. This was important to keep a chance element within the application and reinforce the serendipity of stumbling upon memory triggers.

I also used the thread metaphor as an augmented reality layer for navigating to the next connection. When you reached the connection and learned about the site, the thread would then be sewn into the ground as a record of the connection being made. You could be the first person sewing the connection or you could be adding to other people's threads. You may decide to leave a note for others or respond to existing notes others have left.

I toyed with the idea of giving each connection within a thread an expiration date that you had to revisit to strengthen, but I decided to instead allow you to strengthen the thread by sharing it. If a thread was about to expire you could prolong it by sending it out to someone else. The idea then becomes that you may be receiving threads because people care about them and want to share in order to preserve them..

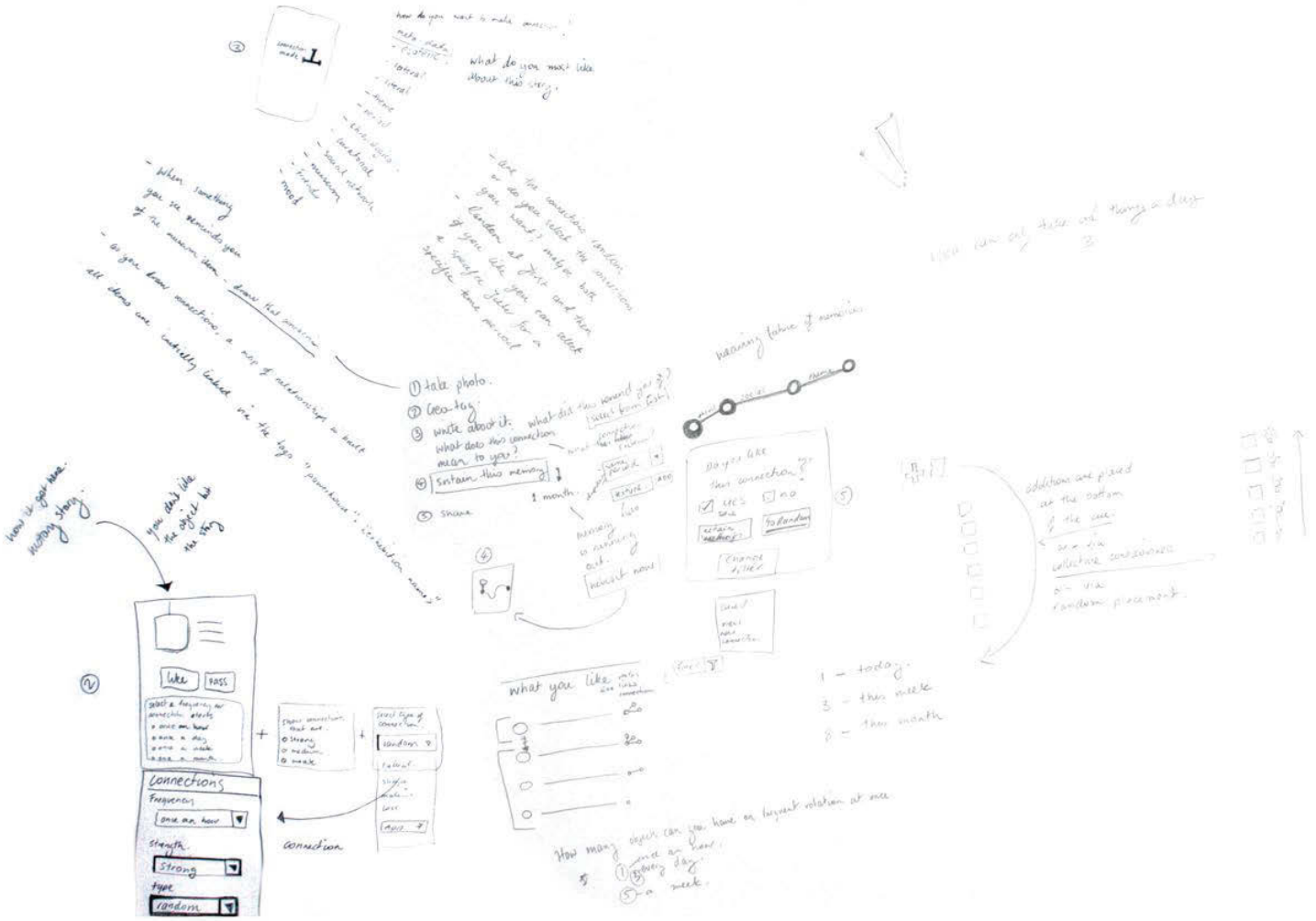


Figure 15: Conceptual Sketches
Chloe Walker 2011

Figure 16: Conceptual Sketches
Chloe Walker 2011

Figure 17: Conceptual Sketches
Chloe Walker 2011

Figure 18: Conceptual Sketches
Chloe Walker 2011

2.3.2 Reflection on the Conceptual process

Conceptualisation ties to understanding of personally relevant metaphors, themes and perspectives.

During the ideation phase each participant and I explored ideas without practicality or feasibility boundaries. Then the conceptual phase focused on interpreting the high-level ideas and finding practical and tactical ways of translating them into designs.

There were a number of design considerations. The biggest design challenge was developing a way to apply potentially complex design requirements to a smartphone sized screen and therefore each application had to be as logical and simple as possible and either used spatial depth, swiping or menus to help people access the layers of content or tools.

The other challenge was combining best practices with innovations. I was conscious that my participants all had different levels of expertise with the smartphone interfaces. Sarah was a novice to the iPod Touch and therefore I used a traditional iOS structure for her design. Lexi already had a smartphone and Alice had used a iPod touch before, so I explored more innovative and custom interface layouts for their design concepts, including an augmented reality option, which they were interested in.

I asked everyone whether they wanted to take advantage of alternate interaction modes, like shaking or tilting, but no-one was particularly interested in them. This may be because they didn't care for these things or perhaps that it was difficult to see the value of them at this point in the process.

The application concepts all support ***an aesthetic experience*** for the following reasons: firstly because they construct a compositional framework for viewing the object within; secondly they compliment a museum visit and don't interfere with an aesthetic experience by taking people away from the objects; and thirdly they support the moments before and after by supplying knowledge and opinion; by reflecting on the visit and captured objects/stories.

The application concepts support ***a flow experience*** in the following ways: firstly by giving them greater purpose and deeper meaning to their visit; secondly through enjoyment from using the application and by learning it's functions and features; and thirdly by reflecting on the museum visit and making sense of the connections.

The application supports ***a conceptual model of learning*** in the following ways: firstly by considering the personal context and making the application interesting and relevant to them; secondly by considering the socio-cultural context and allowing them the ability to share and view the opinions and feelings of others; thirdly by considering the physical context and using *augmented reality* to display that actual objects in virtual spaces; fourthly by allowing for reflection; and lastly by offering deepening opportunities for learning over time.

2.4 Visualisation

Within this phase of the process, I combined my sense of intuition for the individual with my personal aesthetics, and a working knowledge of best practice design, to transition the design from hand illustrated wireframe to computer rendered, visual concepts. It also heavily relied on the influences of pragmatic aesthetics, as I imagined what it would feel like to use the application. I started considering how each design would address each of the holistic threads of experience.

This phase focused on answering the question: ***How** could the application look and feel?*

All of the threads of experience are relevant when considering the visual impact of a design, but the sensual and emotional threads are the most instantly effected.

Don Norman (2003) explains that the different levels of emotional brain operation are the *visceral*, *behavioral*, and *reflective*. Initially physical objects engage our emotions through pure aesthetics when we respond instantly to color and form with our '*lizard brain*' (Norman, 2004) (the visceral, gut reaction); then through their behaviour, be it that of novelty or pure functionality; and finally through the meaning they embody on a reflective level in relation to our lives.

We may respond instantly to color, but the mobile phone sized screen is no cinema experience. It has its benefits for a wondering museum visit, but it presents more of a challenge for immersion. One way to make them immersed is to give the phone purpose, and to use the interactions—haptic, gestural and vocal as intuitive as possible; and the visualisation—movement, sound, colour and shapes stimulating for our lizard brain. The context requires a design that is aesthetic, responsive, intelligent, and dynamic.

It's obviously impossible to design an emotional experience, but it is possible to effect the *sensual* level and thus the potential for emotional experiences. Sensual experiences are more easily defined by human physiology, for example, when we hurt ourselves we feel pain [17]. To focus on the sensory thread I needed to consider the input and the output possibilities—What can we feel and how does the application react to our actions?

The emotional thread is more complex and meshes beliefs and past experience with the sensory, spatio-temporal and compositional thread.

> Emotion is the moving and cementing force. It selects what is congruous and dyes what is selected with its color, thereby giving qualitative unity to materials externally disparate and dissimilar. It thus provides unity in and through the varied parts of experience. (J. Dewey 1934)

17 See Appendix A, section 2.2 for information on perceived physiology of sensation and emotion

To understand how to design for the *emotional* level of experience is much more complex, but requires an understanding of personal significance to effectively reach this realm. Games do a great job of effectively stimulating peoples psychological needs[18]. Action can align with emotional states, and so too can gameplay. We can "play to express", "play to learn" and "play to challenge the psycho-motor skills".

The *spatio-temporal* layer needs to take the pacing, speed, flow and sequencing of an experience into account. This is the layer in which the stories can be told and unveiled.

The *compositional* layer explored the way in which we make sense of our experience and how we develop an understanding for the meaning of experience. We compose meaning by reflecting on the relationships between things.

On the compositional layer, visualisation can communicate by using metaphors (buttons, levers, textures). I have explored a range of metaphors within the applications to help people intuit the functions or behaviours.

Where possible, I used augmented reality because a literal display requires less visual language to explain it.

In 2004 Fishkins[19] developed a taxonomy for defining the degree with which "the state of computation" is perceived *near* or *in* the tangible object. He plotted *Embodiment* vs *Metaphor* across 2 axes of a graph and defined the the optimal location for a TUI to be placed is in the top right - "*Full metaphor* and *Full embodiment*". Full metaphor spoke of the closest to "real" as possible, and full embodiment spoke to the degree with which the computation existed within the object. Instead of placing computation within an object, I placed it on top of a virtual representation of the object. Within all of my applications I made sure that the narrative sequencing included a transition from the AR state to a state where the object is re-represented in it's digital form, so the object in the application then feels like an extension of the real object, particularly when a layer of additional knowledge is accessible.

18 See Appendix B, Section 5.3 :Emotionally reactive media, for examples

19 See Appendix A, Section 2.6: Blend of the real and the virtual

2.4.1 Visual Design Process

The Visual design process was the area within which I added the most of my expertise regarding best practice for application design. It involved the following phases:

1. Explore a range of "feels" for the application.
2. Re-immersion in the insights kits and discussions to filter any aesthetic references.
3. Define a feel that I felt was the best for the participant.
4. Present and validate the visual direction.

When I presented the visualisations, I presented the same sequence I had used for the conceptual presentation (so the flow would be preserved and the polished screens seen in context), however certain illustrated screens were replaced by newly refined versions.

In all cases, I only presented a single visual design direction as I wanted to evaluate the effectiveness of my sense of intuition at this point in the process. Everyone said they loved the aesthetic directions and only wanted to make minor changes to the interface. For example, Lexi's offered up a suggestion to use color to communicate a single meaning throughout the application, as I had previously designed it to have multiple meanings and this was very helpful and the design worked more effectively for her as a result.

I do understand that presenting only a single design begs the question of whether something else would have been better, but I felt that it was more important to test whether a focused effort could result in something that was loved by each participant rather than present less focused options as a tool to find the 'perfect' solution.

2.4.1.1 *"Cultural Pulse"* Visualisation for Lexi

A focus for Lexi's application was finding a fine balance between functionality and feel, to create a bright, rich, simple and exponentially deepening experience. I used icons to drive the interaction. This was important as there needed to be clear interactive cues and high contrasts to the augmented reality view and other views of "spaces". I made them appear to sit on top of the items and spaces that sat within. Perhaps they could also include a subtle animation to draw attention to their accessibility and movability. The icon designs are simple black and white abstractions of the actual items they represent. They then become colored versions when they are presented within the bay. The bay is the area that contains each person's collection. Visually a distinction is made between your colored icons and the remaining greyscale icons. The colour of the icons is defined by the most prevalent emotion connected to that item. If most people say that an item makes them feel 'joy', then the icon will appear yellow. If it makes them feel 'loss', then it will appear blue. From this coding you can see how certain topics have prevailing moods and also, how over time people's opinions of these objects can change.

The spectrum colour graphic used on the title screen and menu bar, reflects the idea of cultural and emotional diversity, directly tying items and objects to the diverse cultures that give them multiple meanings. Lexi and I talked about how colour could have a singular meaning, "it's about how much information I get" so we decided to use color only for the items that you have collected.

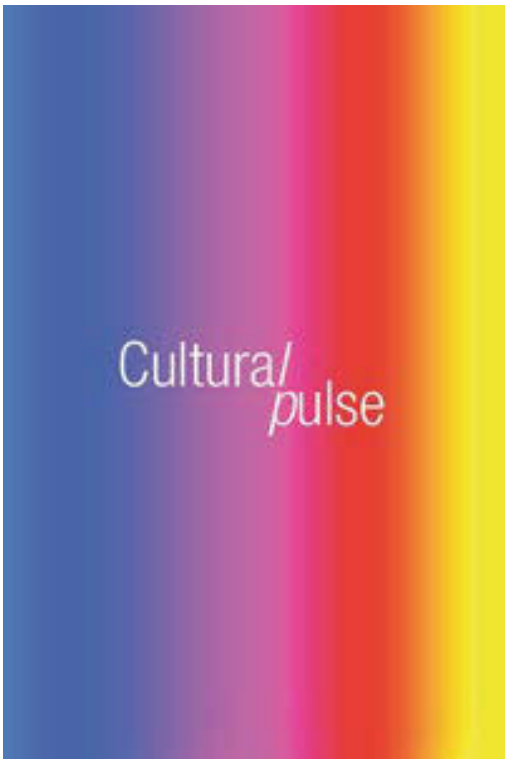


Figure 19: Visual design screens
Chloe Walker 2011

2.4.1.2 *"Infinite Creativity"* Visualisation for Sarah

Sarah didn't contribute much visual content to her insights kit, so I came to understand her value of aesthetic from this and from speaking with her about it. She told me that she was more interested in words than images and liked things to be straight-forward and simple.

The process for visualising Sarah's design went from experimentation, to refinement, to presentation, to refinement to animation. I chose to reference the Apple iOS interaction and layout guide to create an application that was orderly and intuitive. Within the final refinement and animation phase I made a number of changes to the application to accommodate her request to add a video tool and individualised icons to the design. I completely re-thought the structure of the application, with a simpler base screen and more complex action screens with unique navigation.

I used a clean, white, fresh feel with basic icons and 3d texture to suggest interactive cues. I color coded each of her participants within the application so each experience would feel different. I used purple as a base color after she said she liked it within the first visual review. I used block serifs to convey a friendly feel and showed the map and the room as simple empty 3d spaces. These simple visualisations were intended to give her a sense of calm and order. Sarah's application visual design needed to be treated more like a tool than an experience in itself so it didn't detract from her storytelling. Fonts needed to be clear and large and actions obvious. This level of refinement was necessary and improved the final design.

Figure 20: Visual design screens
Chloe Walker 2011

2.4.1.3 *"Threads"* Visualisation for Alice

From our interviews I came to understand Alice's aesthetic as a mixture of classical simplicity, organic softness with an modern edge.

The process for visualising Alice's application was iterative, as I went through iterations of concepts until I found one that *felt* the best for her. After three attempts I found the right mixture of elements and expanded the style to a set of screen templates. I presented her the direction, received feedback, then applied the design to the remaining screens prior to and during the animation process.

I used a combination of typography, textures, icons and colors to convey the right balance of classical, organic and modern. The serif font on a black background spoke to the sense of a classical modernity. I used the metaphor of a thread to connote the idea of connecting time, space and memory through activity. The idea of the thread wasn't simply a reference to Alice's fashion design background, but about the idea of sewing connections and memories into the physical and temporal space. The visualisation then became about the sensual connection to the concept of sewing and viewing threads across the land from place to place and reflecting upon the threads of the past and anticipating threads of the future.

Stylistically, Alice told me that she liked music or graphics that were a little unpolished or irregular in a humanist, hand-crafted way. To add this edge to her designs I used angular background hashing as a fabric of the map space. I also used bright and strong colors to differentiate the threads.

Within this phase I also refined some of the coded visual signs and symbols. In the threads browser, and I used a spatial metaphor to represent the depth of the space and presented the amount of stitches below each memory image as little squares—becoming more complex over time. I intentionally limited the amount of menu options for this application to keep it clean and focussed on a single task at a time.

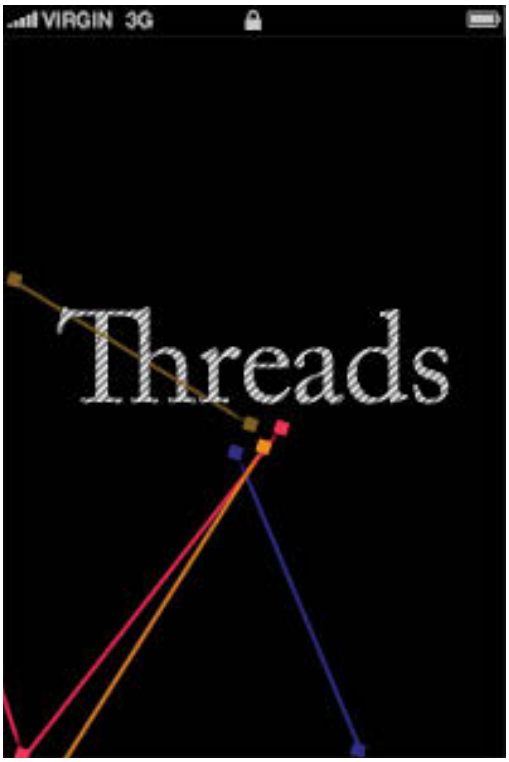


Figure 21: Visual design screens
Chloe Walker 2011

2.4.2 Reflection on the visual design

Everyone was positive about the visual concepts and they received comments like:

> "I love the design and function of the application, particularly how the 'virtual thread' sits on the 'real life' viewfinder." (Alice, 2011)

> " I love it!!!!! Great work Chloe! Fantastic!!! Yay! (Lexi, 2011)

> "the whole thing was great, I mean it was just wonderful" (Sarah, 2011)

During my visual design definition process I experimented with a range of visual styles until I found one that felt 'right' for each person. I used the insights I had gathered in areas unrelated to visualisation to influence the *feel* of the application. I knew the values that were important to each person and how they positioned them within their lives; I knew the objects that they appreciated within the museum; how they took photos; and what their fashion sense was like from photos in the kits. I gathered a sense of their aesthetics from the data.

In one of the interviews I asked each person what they liked aesthetically and a few people showed me examples of things on their walls or postcards they liked. This was useful, but not vastly more useful that what I'd already gathered.

I could have orchestrated a presentation to elicit this feedback from them, but instead I wanted to see if I was able to use the data I had gained to define a sense of style for the application.

Even though the participants were less involved within this phase, they still contributing ideas. Sarah contributed an idea for an additional feature: "to video" and Alice wanted more social engagement. To accommodate these requests I rework the designs and improved the experience.

This showed that people found it easier to imagine the experience with the application when it was visualised, rather than simply illustrated (as it was in the conceptual phase). The visual designs therefore elicited more detailed feedback from the participants and became a useful conceptual and user interface refinement tool.

2.5 Animation

Within this phase of the process, I presented an animation of a potential experience with the application.

To illustrate an experience within a museum space and within a physical space outside the museum I used the Google Art Project's room view of MoMA, New York, USA and Google Maps street view in Sydney, Australia.

I chose to show the application within a context as I wanted: firstly to feel what it would be like to use the application; secondly to be able to see where i needed to add more screens or states; and thirdly to give the participant an immersive simulation of the concept in action.

This phase included the following phases:

1. Continue to refine the design to the point of completeness.
2. Add the screens into an animation presentation.
3. Present to the participants.
4. Receive feedback

2.5.1 Animation Process

I used Adobe Flash to create the animations. Firstly I gathered the designed screens and imported them into Flash. I then sliced additional graphics for rollover states and created the simulation of interactions. I took a photo of a hand, an iPhone and screen captures from Google Maps and the Google art project to create the spaces. (I also used some photos from the participants and the Powerhouse Museum website). Then I animated the sequences with timing to allow the participant to read and imagine using the application intuitively within the space.

I found that as I progressed and reflected on the animation as an experience, some aspects were working well and others needed to be re-rendered. In some cases I needed to create new screens and in others I had to re-design parts of the application.

It was also within this process that i designed the logos and title screens for each application.

2.5.1.1 Animation for Lexi

Animating Lexi's design was mainly a production task—slicing and exporting images. However I did notice a few aspects of the application that I wasn't previously aware of: firstly that the filtering could become even deeper than I had originally imagined and that you could focus on a single thread of thought or even a single place, and only on that place. You could essentially stalk a museum to see what people are saying and feeling about it's about it's contents.

I designed Lexi's title screen and logo to reflect the idea of tilt-shifting your focus and the colors represented all the perspectives around the world.

2.5.1.2 Animation for Sarah

In the case of Sarah's application, I used the animation phase to rework the layout and navigation structure for her application. I modified the designs three times to find the most logical and harmonious way to integrate all of the features for capturing content. The animation phase was effective for this process as it allowed me to feel the application and make changes quickly.

2.5.1.3 Animation for Alice

Since Alice's application was mostly tied to an augmented reality viewer, I had to find numerous contextual images to present an experience with her animation. While layering the the application interface into the phone within a range of environments, I found myself deeply immersed within a flow of design, load play, whereby I ended up designing about three quarters of the total number of graphics used in the animation during one session. The contextual representation made it much easier and more intuitive for me to design.

2.5.2 Final Review/reflection

Perceptions of the animations were glowing and everyone was overjoyed with the results.

Alice said:

> "I'm very happy [...] it works with the key ideas that I would like to engage with more through museum experiences.
>
> "[the type of experience I imagine having with this is] A greater connection between what is on a pedestal in exhibitions, what is hidden in the vaults and what is everyday and on the street: possibly resulting in a greater appreciation of how the everyday is actually exceptional, depending on your perspective."
>
> "[I could learn] Greater connection to myriad histories in my environments."
>
> "Current museum experiences are still rather disconnected in many ways: from other exhibitions in the space as well as from what is happening in everyday environments that don't carry a media agenda."
>
> "Despite the odd hours because of the distance i feel that the design process was collaborative and worked well." [...] "My enjoyment of collaboration was reinforced by the process."

Lexi said:

> "I get to choose whether I want to share something or not. Instead of it being a compulsory, immersive, social experience I get to explore it on my own and choose exactly what I want to share, who I want to share it with, who I want to hear experiences from— I love that! For me it's an individual yet social experience"
>
> "I like the interactions that 'oooh, you don't need me,I'm gone', I like how it moves and both the upper and the lower bar disappears. I can see that happening."

Sarah had become more familiar with the design process and became excited by potentials, saying"

> "it definitely speaks to me"
>
> "Once you have familiarity with the device, which was a big learning curve for me, then I think it's great."
>
> "[other people could join you] imagine you're at the museum [...] they can look at the device and look at you. They could actually be with you in real time."

Section 3: The Model/Framework

I've used experience-centered design to help me define a process and perspective for my research (data collection):

> "When researching experience, methods and approaches that open up dialogue between designers, researchers and participants are the most appropriate" (McCarthy et al., 2010)

In addition, I've used a *contextual model of learning*; *flow theory*; and *pragmatic aesthetics* as philosophical and design considerations throughout my ideation, conceptualisation and visualisation phases. By designing with a base knowledge of these theories, I aimed to embed an awareness of the potentials for learning, the potentials for optimal experience and the potentials for aesthetic appreciation into the designs.

After reflecting upon my design process, I decided to created a model and framework for considering the *contextual model of learning*; *flow theory*; and *pragmatic aesthetics* together, as a design evaluation tool, to further refine the designs and consider their *personal*, *physical* and *social* contexts more completely. Instead of iterating the designs by actually building them and testing them with users in context, I have focused on developing this model to evaluate and improve the designs' experiential potentials prior to prototyping or developing them. From a philosophical position, it is impossible to completely capture or understand experience through testing anyway, so I have considered that a model for evaluating the potentials of experience could be an effective tool within this particular experience-centered design approach, because the earlier phase has focused on individuals and their experiences.

This model is helpful for understanding the broader context within which the mobile application can apply. It has helped me, as a designer, understand the potential states of awareness that people may fluctuate between while using or considering a design. It also helps highlighting how important it is that the design satisfies each individual on the *"why?*, *"how?* and *"do" goal* levels (and it has made me realise that there also needs to be a *"who?"* , *"what?"* and a *"when & where?"* level when designing for emotionally rich museum learning). *Pragmatic Aesthetics* deals with the felt qualities of experience, such as the appreciation someone has with symbolism, color or shape, movement or texture; and *Flow theory* deals with the optimal experience that results from a balance between challenge and skill satisfaction. The *contextual model of learning* helps to focus on learning as well as frame the experience within the socio-cultural and physical contexts as well. This section explores ways in which the model can improve the process and design of digital, mobile, museum learning applications.

3.1 Creating the model

I've developed the model (table and diagram) to guide designers through a process of considering all the necessary factors for an optimal individual, museum learning experience and how they can apply it to their audiences and design contexts.

To build the model I've used the contextual model of learning as a structural base and have expanded the *personal*, *socio-cultural* and *physical* contexts to include the *aesthetic experience* and optimal *flow experience* considerations.

By considering the factors raised by these three perspectives, a designer can evaluate how their design can effect the *personal context* (a person's experience, prior knowledge, beliefs, values, interests, and motivations); the socio-cultural context (whether they feel supported or challenged, comfortable or unfamiliar, belonging or alien); and the physical context (the size of spaces, materials, lighting, access, symbolism, objects and technology)

The following framework links all of the factors together in a meaningful way and highlights the considerations that a designer can be made aware of when designing for a contextual, optimal, aesthetic, learning experience.

The model shows how each design can contribute to each particular value and reveal areas of weakness, in need of improvement.

3.1.1 Evaluating the designs

I created the following table to help me understand the various ways each person could experience a museum visit. It follows the model and segments the considerations into three sections: the personal context; the socio-cultural context; and the physical context.

After completing this table I discovered that certain designs had not paid as much attention as others to certain aspects. This tool is therefore, also useful for identifying areas than still require refinement and expansion. It can be a bridge from this phase of the application design and development process to the next.

Because I completed this table after creating the designs, it also functioned as a way to validate that my sense of intuition and professional knowledge had taken me most of the way to addressing the considerations for an aesthetic experience, a flow experience and a learning experience.

I found that the most unique and important aspects resulted from the knowledge that I gathered in the *Engagement* phase. This knowledge helped me make sense of the ways that the application could help to construct a *flow experience* or *an aesthetic experience.* All of the applications were designed to give the museum visit a greater purpose and frame the experience with a conceptual thread. There is a beginning and an end, and the potential for the application to induce a *flow experience* or *an aesthetic experience* either by using the application or by responding to an actual object is highly probable. Because all of the experiences are tied together under a collective frame, each individual can reflect upon them, compare them and have them co-exist relatively within people's minds. This frame can promote a deeper reflection on experience and therefore a deeper level of learning and enjoyment.

3.2 The personal context

Personal Context	Sarah	Lexi	Alice
Sensual Thread			
Museum context (smells, sights, sounds, tastes)	listening, viewing, watching, smelling, tasting	listening, viewing, watching, smelling, tasting	listening, viewing, watching, smelling, tasting
Object, the mobile device (touch)	holding, tapping, watching, framing	holding, tapping, watching, dragging, sliding	holding, tapping, sliding, encircling, watching
Emotional Thread			
What are the felt emotional potentials?	broad reactions to the content (museum); excitement of sharing (application); Alert while learning and creating; comfort and happiness through companionship (application); Pride in sharing.	delight in an intimate experience; positive or negative responses to shared emotions and comments; thrill from discovering something new from somewhere else.	reverence of the historical depth; excitement to find other people sharing; intrigue and thrill in discovering the new connection.
What are the potentials for emotional expression?	creative expression through storytelling; the options in position of the recording devices.	dragging items could be rewarding and expressive, sharing emotions and thoughts in the application; sharing the collections with others.	starting a thread with a gesture; sharing a comment or location with someone else.
Compositional Thread			
Pre-reflection			
Unconsicous level of presence | the who?			
Prior knowledge, Beliefs & Experience	knowledge about the participant	knowledge about museums; prior knowledge about the content	knowledge about the powerhouse; prior knowledge about the contents; prior knowledge about areas in the city.
Skills	The skill of storytelling, the skill of recording and editing	Building collections. The "in-between" moments where she can concentrate on exploring the connections and making friends.	Navigating, contributing, saving, adding
Personal Interests	Story telling	being connected to other people around the world	environmental sustainability awareness
Purpose (be-goals)	Autonomous, competent, self-actualised (application)	Relatedness, Autonomy, Self-actualisation, competence	Caring & contributing, Self-actualisation, Pleasure
Motivation (Psychological needs) (repeat above)	To help other people, Influence, Autonomy, Competence	Relatedness, Autonomy, Self-actualisation, competence	Caring & contributing, Self-actualisation, Pleasure
Mostly unconscious - Flow and Pragmatic Aesthetics | "the who?" defines this state			
Flow	Flow: Intuitive interface; Act of storytelling.	Flow: the process of adding could become intuitive; swiping and reading could become immersive. Finding actual objects that match up with ones presented in the map space. Saving an object to visit elsewhere at another time.	The augmented reality may become intuitive to read and use; the locations of some connections might be convoluted; remembering the original thread may be challenging;

an aesthetic experience	appreciation of the objects appreciation of the space appreciation of the technology and design appreciation of the sensory content, music, video, imagery	appreciation of the objects appreciation of the space appreciation of the technology and design appreciation of the sensory content, music, video, imagery	appreciation of the objects appreciation of the space of the technology and design comfortably walking towards the destination - familiar with app appreciation of the sensory content, music, video, imagery
Immersion	Within the museum, within the act of storytelling, within the application interface; within the act of sharing	Within the Museum, within the process of collecting; within the act of exploration, within the act of sharing.	She may become immersed in the augmented reality hunt
Conscious of the here and now -Process of sense-making			
Reflection			
Challenge	Interface obstacles; Physical obstacles; To compose an engaging and meaningful story	To select items and construct preferred sets. to contribute	To trust in the unknown and be patient.
How/what can they anticipate?	excitement of waiting to start, waiting to complete stories, waiting for a reply from the participant.	what the objects actually are prior to dragging them what peoples reactions would be and what others would think or feel about it.	what the connection is going to be where they will be led whether people will have left comments
Choice and control	Navigate the space and the application, capture video & audio	Navigate the space, select themes, capture objects, add feelings & comments	capture objects, define interests, accept information & contribute
How can they connect?	with the space, other people, participant, technology, objects, interface.	with the space, the world, other people, emotions, opinions, technology, objects, interface.	with the space, other people, technology, objects, interface.
How can they interpret?	interface, description of individual, the space, the map and additions, the capturing tools, her own comments as she adds them	She can try to decode the icons to see if she knows each artwork she can interpret what people have said and felt she can interpret what she has learnt from the application and from her aesthetic experiences	she can interpret the interface the paths and connections the value of seeking out a thread the map and AR view the thread connection
narrative(sense-making)	recording voice or video; reviewing and editing; receiving feedback	creating a set of relationships ad viewing them continually live over time	Discovering congruous connections; viewing comments and suggestions
reflection (interpret to find comparisons to past experiences)	assessing what to include; assessing own skills	Seeing the museum through other people's eyes; seeing invisible connections.	being able to see growth on threads you have sewn.
sharing	considering companion during visit; considering companion after visit	Adding comments or feelings to objects, people, feelings or comments	adding comments and suggested links.
Repetition - Reinforced events	recording & saving	dragging and viewing	reminder messages
learning	learning from the museum; learning from reflecting	learning from the museum, learning from the connections	Gradual discovery, different topical filters; community awareness.
transformation	perception of self knowledge; reflection on relationship with another	ability to build connection to object. to learn that connections run deep; to learn how people think and feel	to learn from suspense; to learn from the real (places, objects); to learn from others and about others.

3.3 The socio-cultural context

The dialogical aspects of experience

Actions	Utterances	Things (objects)
What can the application do in dialogue with the user?	What can the application say to the user?	what do things represent to communities of people?
What can the user do in dialogue with others or the application?	What can the user say?	What can the user do to/with things?
What can other's do in dialogue with the user and the application?	What can others say?	What can things do to/with the user?

Social considerations

Socio-cultural context	Sarah	Lexi	Alice
Cultural and historical factors	Sharing personal and cultural histories	Uncovering meanings in different cultures	Community, Historical depth and preservation.
Within group mediation	The collection of stories, sharing the process with friends.	the potential for new content to be exposed in existing journeys.	Being part of a virtual community, sharing the experience with friends.
Facilitated mediation	Messages, alerts, new matches	Display of objects, comment and feeling buttons.	The directional threads, the connection messages, the new contribution visualisations, the fade status
Communication between and among learners is important.	Receiving requests, sharing the story, receiving messages.	Being able to favorite people and respond to their comments or feelings.	Leaving and reading messages at the stitches. Preserving someone's stitch for them.

3.4 The spatio-temporal context

The dialogical aspects of a physical experience

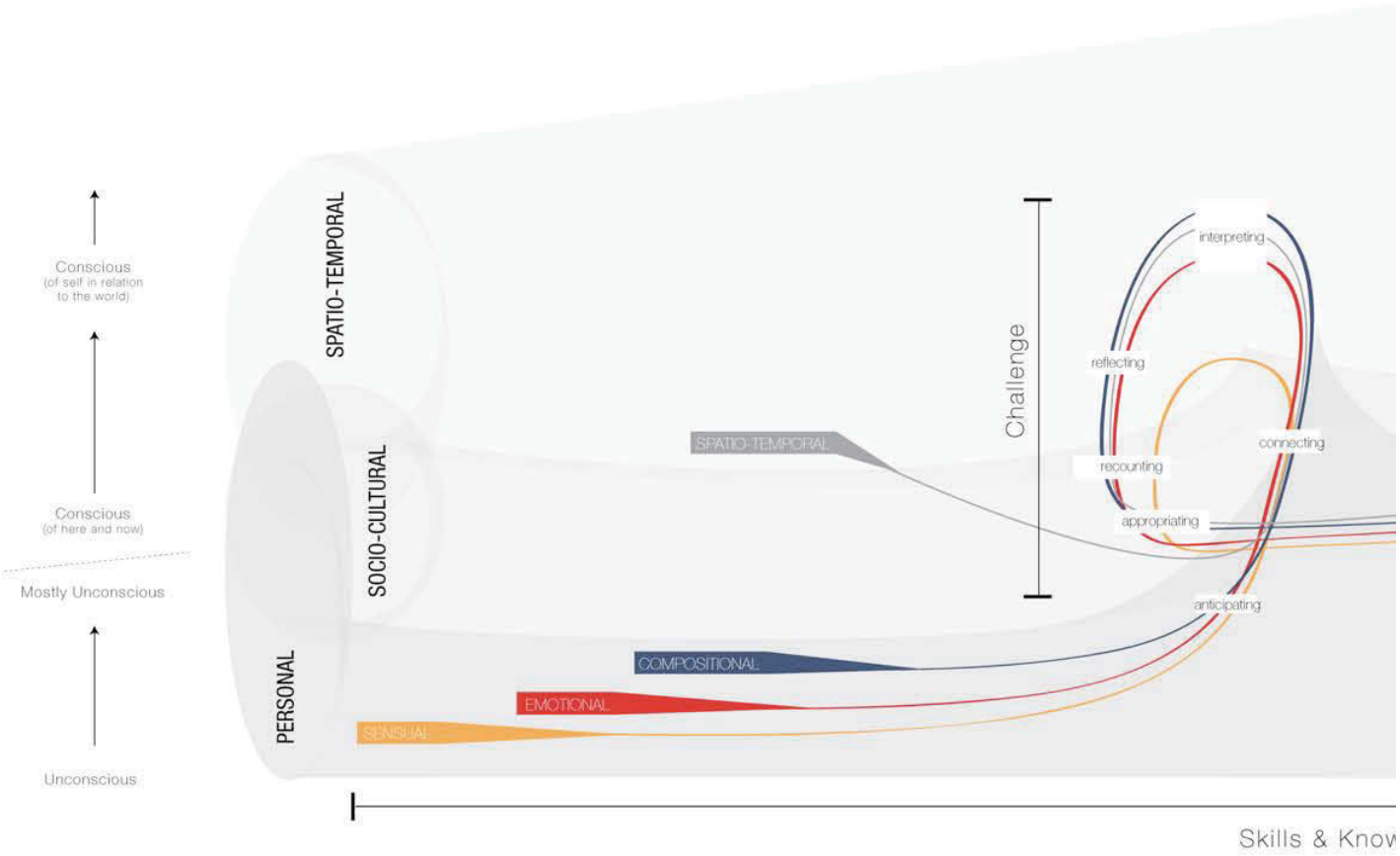
Actions	Utterances	Things (Application/objects)
What can the application do to the physical context and the application?	What can the application say?	That can things do?
What can the user do to the physical context and the application?	What can the user say?	What can the User do to/with things (objects?)
What can the physical context do to the user and the application?	What can the setting say?	How does the physical space present things?

Considering the physical context

Physical Context	Sarah	Lexi	Alice
Spatial			
Architecture & sensations	Record environment, view and navigate abstracted space view	Navigation within the space. ambient sounds in the space	Seeing an Augmented Reality view
Technologies	The interface is simplified to aid usability and promote ease of use. No uncommon interaction styles are used. The most cutting edge addition is the image recognition. Wifi & rfid tagging in the museum	she needs to be able to drag and drop. We spoke about shaking and tilting but she wasn't interested. Augmented reality is the most cutting edge technology used. Wifi & rfid tagging in the museum	The thread view in the augmented reality space is novel. Technically it may not always be accurate and therefore the map view may be more reliable. GPS, outside and wifi & rfid tagging in the museum
Objects	Responding to objects	Capturing objects	Capturing objects
Orientation	"You are here" marker and powerhouse isometric map	"you are here" marker and AR view	"You are here" marker and topographic maps and AR view
Temporal			
Presence & Absence (actual time, relative time)	Anticipating & planning for contribution; Engaged in contribution; interpreting value of the contribution; reflecting on contribution; Relaxing.	Personalizing everything straight to the phone; democratisation of space; comments and emotions time-stamped.	Strong sense of presence by being in exact physical location. sense of absence when not there, and by only being able to see the information on the phone at that location.
Virtual & Physical (Real and virtual space)	Museum Space and objects; Augmented Space	Museum Space and objects; Virtual space (map and world); Augmented Space	Museum Space and objects; Augmented reality Space; Urban. suburban space.

Figure 22: The table of consideration for a holistic, museum learning experience
Chloe Walker 2011

After combining the models together I realised that a flow experience and an aesthetic experience are similar types of immersive experiences (fluctuating between levels of awareness, sensation and emotion) but *an aesthetic experience* is more specifically sensory and emotional and less intellectual and abstract. With the construction of meaning taking place continuously, the fluctuations between states of awareness, emotions and immersion all produce a pattern of sense making that results in transformation and re-definition.


Conscious
(of self in relation
to the world)
Conscious
(of here and now)
Mostly Unconscious
Unconscious
SPATIO-TEMPORAL
SOCIO-CULTURAL
PERSONAL
SPATIO-TEMPORAL
COMPOSITIONAL
EMOTIONAL
SENSUAL
Challenge
interpreting
reflecting
connecting
recounting
appropriating
anticipating
Skills & Know

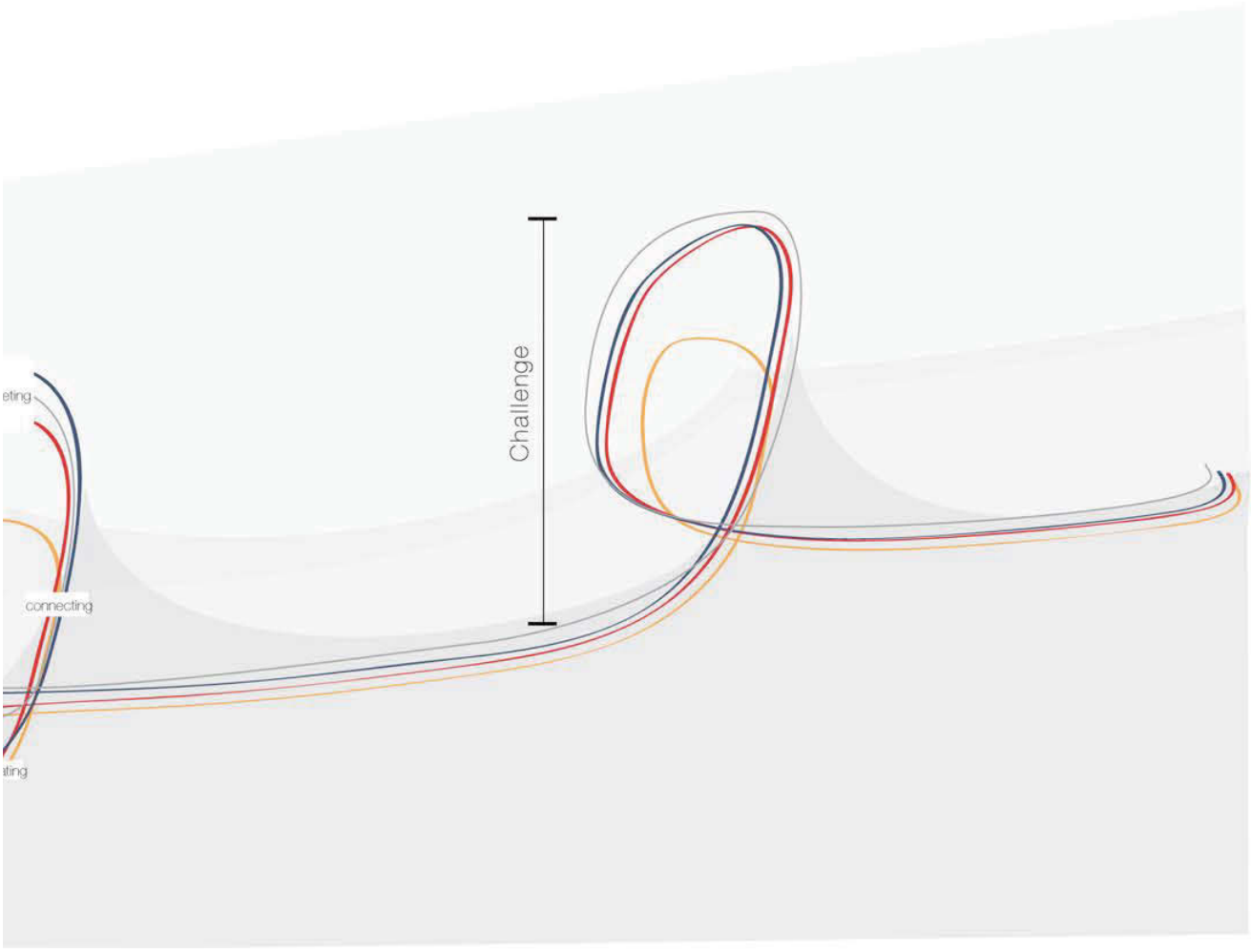


Figure 23: Potential flow of experience with the applications
Chloe Walker 2011

3.5 Reflection on the designs

Simplistically, from a 'features' perspective, the applications are not all that different, they all have:

1. Augmented reality capture
2. Ability to see content: audio, video, photo & text
3. Ability to share
4. Ability to view reactions of others
5. Navigation
6. Orientation
7. Filtering

But they are all realised in ways that capture and reflect my interpretation of each individual.

3.5.1 Personal Context

Spatial

The sensual thread will be stimulated mostly in the areas of sight and touch. As yet no sounds have been designed, but they may appear in future iterations. Visually, the applications have all been designed to appeal to each participant and therefore should make them feel good and positively stimulated.

The touching and holding required for most of the applications is not constant and therefore it will not be overwhelming. Only Alice's design "threads" uses a gesture for capturing objects. Threads also requires tilting and framing while using the augmented reality thread viewer.

With sounds and additional feedback there's the potential to make people even more connected to the goals and narratives for their experiences, for example: While alice is finding a new thread the phone could vibrate once when she needs to turn left and twice for right, this way she wouldn't need to have it in her hand constantly.

This research and design has not focused on this level of sensory feedback and input, but a following phase could.

Emotional Thread

The emotional thread[20] defines the quality of the experience. The applications however are intended not to replace the emotionally rich experience of connecting with a real object or artwork; it instead provides a supporting emotional role for a museum visit. By presenting a consistent narrative undercurrent throughout the museum experience, it can offer people: security, comfort, control, orientation, belonging, discovery, stimulation, knowledge and companionship. These offerings satisfy psychological needs that can improve the emotional significance of a museum experience.

[20] See Appendix A, section 2.1 and 2.2 for more information

Prior knowledge, beliefs & skills

Even though all applications share a set of 7 base features, all of the applications appear very different. This design process has enabled each person's unique perspective on the world to inspire the designer to conceive of all the features in different ways.

One interesting area of differentiation is in how each person defines their relationship with the space, objects, technology, content and others.

1. The following aspects set the applications apart:
2. The unique types of personally, emotionally significant relationships that they were able to create with the objects;
3. Their different perspectives: Alice - personal to environmental/person; Sarah - personal to personal; Lexi - personal to world/person/emotion;
4. The way that the design proposed different experiential qualities within those relationships, for example in control, intrigued;
5. How each individual's personal aesthetic was expressed in the design;
6. How their prior knowledge, values, skills & beliefs were taken into account to make the design intuitive.

What I ended up offering were unique ways for people to relate to the objects and unique types of relationships with objects and people. For Alice the relationship was a humbling one, in which she wasn't in complete control. The lack of features within her design help to reinforce the themes of respect and humility. These themes were important to her when considering the values we place on relationships with objects, each other and sustainability.

The relationship I designed for Lexi was one of safety, control and discovery. The act of collecting allowed her to feel a sense of possession over the objects and from this possession she felt particularly connected to the objects. The relationship of feeling safe and belonging were important for her as was the opportunity for her to chose to take someone through one of the experiences if she wanted.

For Sarah, the important differentiations were that the act of giving could give her a greater sense of purpose; that she could capture her journey, review it, edit it and share it with her participant; and that she could hear back from them once it was received and experienced.

Each individual's prior knowledge, beliefs and skills may not only effect their ability to perform certain tasks, but to perceive certain concepts.

Purpose, interests and motivation

These three considerations focus on the perspective someone has prior to experiencing the application. These are the aspects that will make them engage or not engage with an experience or a product.

Each participants purpose, interests and motivation defined the idea we chose for the design. For a flow or an aesthetic experience to be achieved, or more so, for learning to occur, a person must want to learn or to engage in an experience. This research and design focussed on removing the uncertainty around purpose, interests and motivation from the equation in order to focus on the potential for positive, emotionally rich learning experiences.

To design specifically for experiences people will believe in, be interested in and motivated to participate in along with the other considerations, is particularly rewarding and fruitful from the perspective of design innovation.

Flow state, an aesthetic experience and immersion

Within all of the applications I tried to embed a sense of *dialogue* to allow people to engage in a sense-making process. Dialogue is essential to the construction of an experience and to learning itself.

> "it is not easy to understand experience or it's meanings except through a kind of dialogue in which the parties engage with each other in constructing a variety of meanings and perspectives that help them to mutually recognise and understand each other, and, indeed, themselves. It may be that in talking about an experience, in recounting it to another person, in creating new understandings in dialogue, participants are organizing and making sense of experience for themselves too." (McCarthy et al, 2006; Sullivan, P., 2008)

All applications took on the role of the companion during the experience—they reacted to engagement and encouraged participation.

Process of sense making

Learning

Aside from learning from the experience of attending the museum, and accessing content through the application, the participants could learn from activities embedded within the application.

Alice could learn about connections between the museum and the physical spaces she encounters. She could build a deeper knowledge of the layers of content within her environment and that knowledge is easily lost if it is not preserved and sustained. The act of finding the next connection may build a special relationship between her, the space and the object. The act of revisiting a connection to find that other people have sustained it for you could be joyful.

Lexi, could learn by possessing and curating her own set of objects; by uncovering unexpected connections between the object she has seen in person and others she can only imagine having a real connection to. She could also learn about other people in other cultures by reading comments or emotions and then by sharing her own thoughts and feelings. She could build relationships towards other people, by selecting to make particular people filters for content, and then following their journeys.

Sarah could learn through the acts of experiencing the museum with a purpose, being able to create and design a story, being able to replay and reflect on her experience, and reflecting upon how it was received. She could also learn from the filtering and navigation feature as it would show her alternate connections between objects within the museum.

Navigation

Also, none of the applications forced an experience within the museum. They were all optional experiences.

For Lexi, the navigation was optional. She could find objects within the space and locate them afterwards, but it didn't actively send her or help her reach those objects. This was partly due to the fact that she didn't want her museum experience requiring her to hold the device for long periods. For Sarah the navigation was focused on helping her connect with content that would be of interest to her participant. For Alice, the navigation was mysterious and intriguing.

For Alice, navigation was a key part of her experience. She was given two levels of control over the navigation: firstly she could choose to be led to her next destination; or she could follow a map to the "new thread" location.

Sarah wasn't required to use navigation at all, but it was included in her application. She could either use it to simply orient herself within the space or to search and view content relevant to specific themes, time periods, or moods. The filters were designed as advanced user options and not necessary to the core value of the application.

3.5.2 Socio-cultural Context

Action, Utterances and things

Within the socio-cultural context it's essential to things of the relationships that can emerge.

The applications were mostly tools for the participant to control, except for Alice's application, which has behavioral logic aimed at "reminding" her of prior interests at times she had no real control over. In terms of actions and utterances, this application proposes an active, relationship with frequent power shifts. In addition to the "forwardness" of the application, it also askes you to engage with learning in a socially and physically conscious way, especially within the urban environment, as you have to cross streets and navigate your way to a "thread" point. It also gives you the opportunity to observe historical 'things, actions and utterances' within the physical space and through a rich layering of dialogues.

Sarah's application is like a walkie-talkie in that it requires you to compose a story then send it off into the ether, unbeknownst of its return. This application is unique in that it acts more like a phone line by connecting you to an individual rather than a chat room with many. All of the actions are supporting the storytelling and compositional act.

Lexi's application is a tool for observation and occasional contribution rather than an active dialogue. It is intimate and exploratory and offers activities that are distinctly personal and others that are public. It is tied to capturing 'things, actions and utterances' from around the world and making them personal. It could also be used as a tool to share past journeys with friends.

Mediation

All of the applications act as the mediators for learning within the socio-cultural space. They are the conduits for content and alternate perspectives on the museum/s. They are structured and offer a singular narrative thread through a museum experience. They also facilitate reflection and sharing, which are essential to learning.

The spatio-temporal Context

Cultural and historical factors

Cultural and historical factors are also supported within these applications. Although at the moment they are only showing a single language they could easily show others. Also by allowing people access to alternate perspectives on the connections between content, objects, people, spaces and technology the applications support and promote alternate cultural viewpoints. All of the applications not only show historical information, but they allow people to store their own histories within the application.

Communication

All of the applications support the ability to communicate as this is essential to learning within the museum. Communication is particularly important to include within these applications because they are designed for individualised visits.

The applications also cater for different modes of communication and the communication of different things. Alice's application uses the act of "sewing" a thread into the ground for others to see as a mode of non-verbal communication. She can also leave a verbal message but that is considered secondary. As more people visit your thread they leave their threads on top and you can gradually see that your addition to the knowledge base is being supported.

Sarah's application supports communication between people. Currently it's in the form of author and recipient, but it could also store stories you have been told, or the ability for you to form friendships with people and a more continual communication stream.

Lexi's application focuses on observing communication as a series of shared ideas, feelings or experiences with objects. She can also contribute but it would be relatively anonymous. The application could facilitate a two way communication stream, but at the moment it doesn't

Physical Context

The space has an important role to play in the significance of the applications. The Museum context can be augmented, abstracted, navigated, and viewed by the applications. They all reference the space as either the home for the objects and the place for the experiences, but the applications also allow people to compare the museum space with other spaces that may be within when referencing the application.

Moving the application and the museum contents collected on a visit outside of the walls of the museum will allow people to develop different relationships with the objects and the space as they relate to their lives.

All of the participants can however move in and out of an awareness of space as they move in and out of a flow or an aesthetic experience.

Temporal context

Time is a key consideration within all of the applications: firstly it defines a visit by capturing it and allowing you to revisit and refresh your memory. Within Lexi's application time is always current, but the past is revisited trough her ability to view past collections.

Alice's application places reference on memory and the importance of remembering in the discovery of new knowledge.

Sarah's application focusses on single visits as "experiences" and therefore the duration is a concern to her. She would also care for the length of the stories and her recipient's attention span. She can choose to speak for a long time or a short time, depending on how she feels.

All of the participants can however move in and out of an awareness of time as they move in and out of a flow or an aesthetic experience.

3.6 Reflections on the findings

Process & Innovation

Firstly, I discovered that experience-centered design can inform the process of designing digital, mobile applications aimed at improving the emotional qualities of learning experiences within museums.

Since the research was remote, the cultural probes and the interviews were essential in enabling me to empathise with my participants. From the Insights Kit I learnt some of what they value, believe, know, understand, like, and more; as well as what their experience of taking me around the museum was like. From the interviews I built a relationship with each person. This was essential in continuing to get to know them, and to make me care about them and the design I was creating for them. It is the mixture of this caring, and empathising that allowed us to design the applications.

There are a number of areas of innovation in this process. Firstly because this process has been undertaken remotely and through a series of connections with participants, it has shown how you don't need to physically meet the person to connect with them. Instead you just need to develop a friendship with them.

Designing for individuals allows designs to progress further and faster than a traditional mass market approach, than rounds of user testing, may have taken. I believe that this is an interesting approach to take towards mobile phone application design, whereby updates are constantly reissued and the design is improved via live user feedback.

The process of concept generation places the design in a positive light and alleviates the potential for "newness" to impact the experience. Once the newness is removed, the evaluation can take place on a level of familiarity and therefore contain the potential to reveal deeper types of engagement and appreciation.

Because the design process focusses on designing for experience, and not business, brand, technological or technical requirements, it offers up more innovative solutions. Some of the applications may be a few years off technologically, but they offer a futurist vision of experience focussed designs.

Designs

All of the applications were perceived as personally relevant, and emotionally significant by the participants.

> "I think you've done terrific, terrific work [...] I think you've made this project the most beautiful design and museum piece so far" (Lexi, 2011)

> "I thought it was great, absolutely super. It was easy to use. It was flexible. I was excited by it. I thought it's a wonderful way of sharing and giving. I thought you kept it simple, so that's great. I think It's very exciting! I think it's really really great" (Sarah, 2011)

All of the participants felt strong connections to the designs due to the facts that the designs were "for them"; that they were involved in the process; and also because they were genuinely attracted to them.

Part of the desired outcome is to make the experience feel personal, thus using a personal mobile device, in this case an iPod touch.

> "I loved as this process went on, discovering things together [...] that part I enjoyed, very, very much" (Lexi, 2011)

> "I thought that my feedback, either from a user or a designer perspective, had really been taken into account. [...] you didn't just say 'tell me your opinion so I can write it down', you said, tell me what you feel, what you think so i can actually design this in the proper way" (Lexi, 2011)

I discover that people were not interested in adding game-like challenges into their museum experience. The Flow Psychology framework was therefore only useful as as assessment of in-explicit skills and challenges, and was a useful checklist for the conceptual and visual interface design phases.

I discovered that a Contextual Model of learning can be effectively used to evaluate the potential learning opportunities in a design and to direct focus to those aspects.

I wondered whether this process would have enabled the design to satisfy a need that was missing from the museum experience initially. When I asked the participants how they felt it compared to their initial museum visit tit was unanimous that it was an exponentially richer and more engaging experience. The participants all felt that the designs would radically improve their experience of going to a museum and interacting with museum content. They all felt that they could have learned more than what they'd previously found on offer.

Emotional Significance

The participants responses showed that there were strong links between what they felt to be emotionally meaningful and the concepts. And in many cases the responses stemmed from the connection they have with museums and the connection they had with their values. The aesthetics were less valuable to them. The designs were perceived to be very personal because they were designed especially for them.

Jayne Wallace said that she found people were more personal with the jewelry when they thought it wasn't digital. This is in comparison to how some of my participants perceived their applications. Perhaps it's a comparative judgement in reference to expectations. In my case the expectation is that museum applications are public and generic, not unique and personal.

I found however that by taking the participants through the process of design and by designing it for them, they felt a personal connection to them. Lexi repeated "it's *mine*!", "how's *my* application going?" in email dialogues. This was an intended perception.

Learning

The application was based upon their existing knowledge, interests and perspectives so it automatically resonates with them. By the end of the design process they were privy to the purpose and benefit of the application.

This research process itself unveiling how learning that can occur through the process of design, between a participant user and a designer as well as from the application.

I have learnt that designing to satisfy these aspects allows you to focus on the the deeper levels of engagement that can build upon the rest and take the level of experience to a deeper and more meaningful level. The Socio-cultural level and physical level (the unique offering of the museum) can be enriched tremendously once the design is engaging someone on a personal level.

Section 4: Discussions, conclusion and future directions

This chapter articulates the claimed contributions to knowledge; my personal reflections on both the process of socially embedded design and the model that I developed to understand and improve the design. The thesis outlines the theoretical, participatory, conceptual, aesthetic and practical path that this process has taken. The outcomes are then discussed in reference to a model for understanding the designs in relation to potential experiences of learning from digital, mobile technology within museums. This chapter then goes on to review the objectives and to evaluate their success against the results of the research.

4.1 Contributions to knowledge

The research process has culminated in a body of work, both digital and conceptual that has relevance for both design and theory. The key contributions to knowledge are claimed in 5 main areas:

The investigation is novel in that it not only focusses on individualised learning experiences with digital technologies for museums; but also the relevancies and appropriateness for this to construct an emotionally significant experience.

Through a review of contemporary mobile, museum, applications I have discovered that current approaches focus their attention on what the museums can do for the user rather than what the user can do with the museum.

A contribution has been made to methods for innovation, interaction and visual design practice through the creation of a remote experience-centered design and research process: firstly, the Insights Kit items added a museum and learning perspective to prior uses of Wallace or Gaver et al's probes; secondly, the remote nature of the research required the creation of a set of tools and processes specific to remote, experience-centered design and research; thirdly, extensive theoretical review culminated in the creation of a framework that merges ideas from flow theory; pragmatic aesthetics and the contextual model of learning into a practical model for experience-centered design evaluation.

A series of digital concepts for applications were made and the contributions they yield are twofold: firstly, they are digital and conceptual propositions for museum learning applications, challenging current assumptions around the mainstream design of such items in that they treat the applications more like personal objects or commissioned art rather than mainstream tools; secondly, they explore a range of imaginative concepts that may push future technological development; and thirdly, the application concepts focus on individualised, personalised, multi-museum, emotionally significant, learning experiences and in that way are a new type of digital design.

Key insights arose from participant feedback. These related to three main areas: firstly, enjoyment of the process of innovation; secondly, strong connections to the application ideas and final designs; and thirdly shifts in perception about the potential for museum learning experiences.

4.2 Thesis Summary

This research set out to rethink digital, mobile, museum applications and uncover ways embed personal, emotional significance and opportunities for learning into mobile applications for use within museum contexts. Most current digital, mobile, museum learning applications echo the functions of hand held tours (as navigation); mobile games (for fun) or content delivery tools (AR, Audio, Text and video), but what I believe they miss, is the opportunity to enrich the design and learning experience with deeper purpose and personal, emotional significance.

After undertaking primary and secondary research to uncover design opportunities for individualized learning through digital, mobile technology in museum contexts, this research proposes that the key to designing for personal, emotional, significance is to design for relationships between individuals and objects.

Although the designs deliver less practical mass market potentials than designs using other processes, they do offer insights into the potential depth and personalisation that can be achieved when designing for personal relevance and emotionally significant experience. It is valuable because it offers a platform for future work to be built from.

Strategically, my approach was to shift focus from the institution's goals and agendas to the individual and their lifelong relationships with multiple museums. I believe it's important to focus on facilitating holistic experiences that are personally meaningful for people. A single application across multiple museums could allow for richer, deeper and more personally meaningful experiences to emerge as time and usage progresses. It may eventuate in the design of a series of connected applications that offer different types of relationships with museums, objects, spaces and others; and different types of experiences.

Also, contextually, instead of focussing on the potentials for the digital to separate people from the real, these applications help to empower objects, by deepening the opportunities for personal connections on aesthetic and intellectual levels.

As a designer and a researcher it was my job to learn from and about my participants. This was a consideration from the beginning and throughout. The Insight Kits focused on "who" they were; the ideation phase focused on understanding what they imagined; the concept phase considering how they could make sense of, get immersed in and enjoy an experience; and the visualization phase focused on making the interactions and interface intuitive, identifiable and aesthetically pleasing. During this process I discovered an intuition, and an ability for empathy that would help me to bring their perspectives to life in these applications, and as a result create designs that resonated on an emotional and personally significant level.

4.3 Reflection on Empathy

It is relatively common knowledge within the design industry that empathy is a key to design success, and I agree with this perspective. What is new about this approach is that it has been applied to a learning process and advocates an empathy for the deep, psychological "why?" goals a person has.

The process of designing with and for individuals has allowed for empathy and deeper levels of understanding to emerge. Working remotely was a test of the ability for a designer to form empathy with an individual and gain intuition about what "works" for them without ever meeting them in person. I discovered that gaining empathy for people and processes is a rewarding and motivating experience. Empathy expresses itself within a design process as intuition. I found that discovering an intuitive sense of what "works" for each person incredibly satisfying.

It is a highly educational experience for the designer. In some ways there are similarities between an artist and a muse, or an actors process of character embodiment. The designer's role is always present but they are able to switch into a mode where they can access and reflect different aspects of their knowledge into the design.

One benefit of designing for individuals is that you are able to design with an understanding for their personal context and prior knowledge and skills. This allows the design itself to progress further than a design for a mass audience would.

Layers of empathy

During the progression it became apparent that we were delving into layers of the individual. Firstly their ideology, then their behavior, then their aesthetics.

Designing for individuals encourages innovation because it focuses on imagined experiences rather than business goals.

Designing for individuals also allows for ideological depth in a variety of areas. Design concepts are much richer and deeper and more interesting than traditional processes. It is a boutique style approach, that allows for more personal perspectives and emotional depth to be included within a design.

As the designer I am aware that I'm not able to design an experience, nor was I able to fully understand the individuals. What I found that I did instead was to understand them as much as they reflected on my past knowledge and experience—if I had known someone like them before, or that they reflected aspects of myself. As Jenkins (1999) suggests, with Empathy, we explore other *possible selves*.

Designing with empathy gave me a greater degree of motivation and care for the project and my participants role within it.

As McCarthy and Wright propose, the key to experience-centered design lies in friendship. Testament to this is that even in the midst of the unknown, humour was a part of our empathy and trust building process.

4.4 Reflections on the process

This process has uncovered personal and inspirational information about each individual and has created a sense of personal, emotional, significance within a digital, mobile, museum learning application design.

I combined my knowledge of the considerations for an emotionally rich, transformational learning experience with my sense of empathy for each individual. It was through the process of engagement, immersion, ideation, conceptualisation, visualisation, and continual reflection that fleshed out an understanding of the 'whole person' as it pertained to this research and design (clearly it is impossible to know the 'whole person', but it is essential to consider how the design effects every aspect of their experience.

Engagement

I created the kit to understand each individual's *emotional, sensual, compositional* and *spatio-temporal* experience of the museum and the kit. The kit gave me an insight into what was valuable to each individual, how they engaged with the museum, and their preferred conceptual and visual language. Through discussions we reflected on the museum experience, ideas/themes captured in the kit, emotions and potential design directions.

Ideation

The interviews allowed me to establish an empathy for each persons perspectives. Ideation process is more intuitive and I felt more engaged in the process. After the kick-off meeting we established an approach for working with each other based on shared knowledge. Through discussion we worked out a balance of roles within the design process and a way to most effectively communicate about abstract design ideas.

The interview process went longer in some cases because I hadn't reached the "why?" answer yet with them. I was acutely aware that the "why?" had to be answered, but didn't want to push people to find that within the process.

Within this phase I was more focused on understanding how their motivations and "why?" goals could be meshed with the context or objects, the space and others, and what that experience could potentially feel like.

Conceptualisation

Empathy started to come into play more within this phase. I started to express a sense of empathy aesthetically and conceptually.

Each relationship was unique and further enhanced my understanding of each person. I tried to mirror each relationship in the design and in the end each design was befitting to each persons character.

Each participant's expertise allowed for greater depth to emerge within certain areas of each concept.

The conceptualisation phase took into account most of the holistic factors along with some of the more detailed factors around how the actual experience would play out.

Visualisation

After the conceptual design process I had wondered whether involving people within the design process would make our relationship feel too much like a business deal of rounds of approval and less personal. I did observe that the participants were enthusiastic during the concept phase, but seemed less enthused in the visual design phase, and then reinvigorated for the final design presentation. *Was this a validation of whether they felt heard and understood during the process? How can the enthusiasm be maintained throughout the process, or is it necessary to do so?* In the future to counter the concern about it feeling like a business relationship I would define more ways for them to own the design throughout the process, even the processes with which they are not skilled. I feel strongly that because they volunteered their time for altruistic reasons, the experience did not feel like a business relationship.

The visual design has a number of the same considerations as the conceptual design phase, just focused on a more aesthetic perspective for addressing the same issues. The visualization process becomes an intuitive process of sensing what "feels right" for people.

The two people with design backgrounds contributed more to the visual and conceptual phases, The person with no design background didn't contribute as much in those phases, but this didn't effect the idea it only effected the potential collaboration within the conceptual and visual phases.

During the process I'd wondered whether I'd be able to intuitively take on more responsibility for the design as the process progressed. I was concerned about making the correct aesthetic choices. One thing that I found was that everyone loved the aesthetics, although it was difficult to elicit a reaction to them prior to the final presentation, mainly because they were only able to assess a few of the final screen designs.

I also considered my ability to design for a transformational experience. I was concerned that the applications could become dull once the thrill had gone. I countered this by making them all very open to lifelong learning and discovery. None of them focused on constructing a journey for the participants. They all focused on creating an additional layer of opportunity to an existing museum visit. All of the tools became a way of bridging the museum with their lives outside the museum.

Throughout the process I was focused on seeing if I could establish a style that expressed each persons individuality from simply by talking to them and reviewing the insights kit.

Animation

Prior to the process I had wondered if people could develop a sense of the emotional significance by only viewing an animation of the idea. It seemed to me that the animation presentation, although not ideal, managed to communicate the potential of the design effectively. This reinforced each persons ability to imagine their experience.

4.5 Future Research

This research has exposed a number of potentials for further research.

By creating designs that are boutique, you run the risk of alienating some people, but at the same time if you create a series of richer experience that appeal to a few people you may effect those people in a deeper and more positive way.

To take this particular research further, I would like to be able to build these applications and have people test them within museums to explore the *contextual learning*, *flow* and *aesthetic experience* opportunities. I would also like to repeat this process and design more applications for individuals.

There's the potential to develop a framework allowing for people to build their own custom learning applications. This could be particularly motivating and rewarding for people who want to define how, when and why they learn.

I would also like to research how this design approach can extend to other digital design contexts as well as becoming a framework for emotionally rich design.

Not only do I want to undertake this process again and apply it more broadly, but I believe that individualization, focused on 'who?', why?' 'what?' goals as well as 'how?', 'do' and "where and when?" goals, can radically shift perceptions on, not only how we learn from museums, but on how we learn from and perceive mobile applications in general.

Additionally as more applications are designed and utilised, and as people's knowledge and experience grows, the mechanisms for delivery and lifelong learning integration can become more personalised and richer to reflect and support the uniqueness of each individual.

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Appendix A:
Literature Review

1 The type of research

Practice-based research is a new type of research and one that's continually evolving and re-defining itself. Because of this state of flux it is important to define the boundaries of this research and criteria that it should be evaluated by. In terms of understanding the scope of this research and the grounds upon which this research should be evaluated, I'm defining that the type of research I'm undertaking is one of Research *for* Design.

I've been influenced by a range of process-led design methodologies, but mostly by the perspective Freyling (1997) has defined as Research *for* Design and Scrivener's more contemporary interpretation of it. Scrivener maintains that research for which design is the outcome requires a unique set of evaluative criteria. He understands that the discipline of research within most knowledge domains needs to adhere to standards allowing for uniform evaluation and comparison, but believes that these forms are inappropriate for evaluating new knowledge that is contained within a design and design process. He asserts that in:

> "research *for* art [or design] production is an end in itself and the art [or design] produced must persist together with its transformational interpretation." (Scrivener 2010).

There is a difference in the outcome, processes and evaluation of research that is considered to be *for* Design as opposed to *through* Design (using design as a means to develop knowledge in other arenas; for example psychology) or *into* Design (which observes design as a subject for investigation).

Because the focus of Research *for* Design upon the knowledge that is contained within the design and design process, Scrivener (2010) proposes that Research *for* design should be judged by a different set of criteria to more traditional Research. He states that the process of evaluating Research *for* Design is a difficult task and one that has incurred heated debate, particularly when the research is asserting that the design embodies the acquired knowledge that is new to the world.

The evaluation of a design as a piece of 'new knowledge' relies on the Social, Collaborative and Collective nature of the research community. In order to validate and formalize a claim to new knowledge, it muse be accepted by the community. This claim and the proof of it lies in what can be acquired to the satisfaction of one's peers. Scrivener said:

> "It is concluded that the design-based research can be understood as a mode of research for design that seeks to enlarge knowledge of design by transforming the nature and character of design itself" (Scrivener 2010)

In traditional Research the conditions of the research are the *Goal*, *Intention*, *Method*, *Justification* and *Communication*. Scrivener argues that Research *for* Design, for which the design itself is the outcome that requires judgement, the conditions should be *Goal*, *Method* (Investigative and Productive), *Justification* and *Communication*. In terms of Conditions (which are the most general category) the big shift here is to remove the *Intention*. By removing the *Intention* he is suggesting that the *process* (Method) will uncover the new knowledge and the product at the end will contain the knowledge. The other important point that he raises is in regards to the Justification of the claims to new knowledge is:

> "research for design production is an end in itself and the design produced must persist together with its transformational interpretation" (Scrivener 2010)

2 Understanding emotionally significant museum learning experiences

I used the empathy I had gained from each individuals *insights kit* to develop a sense of the person, but I had to delve deeper into the philosophical perspective to understand how this empathy could translate to a digital, mobile, museum learning design. This section aims to expand upon the philosophical base in order to support the body of this thesis.

The following section investigates:

1. Understanding experience - *How does an experience occur and how is it defined? What is the core of experience? What are the levels of awareness within an experience?* and *What motivates an experience?*
2. Understanding emotions - W*hat is emotion and how is it understood?*
3. Free- choice learning - *How does learning occur within the museum context?*
4. The museum audience - *Who are they?*
5. Experience with technology - *how can technology facilitate experience?*
6. Virtuality - blending the real and the virtual - *how can the virtual blend with the real?*

After exploring these core questions around the subjects of my enquiry, this chapter looks at perspectives on museum learning experiences in particular, to understand, if, how and why they could differ from other types of experience? It is important to attempt to understand the nuances and unique qualities of a museum experience in order to design towards these strengths and further assist museums in differentiating themselves.

I determined that this awareness would help me understand the potential layers within each person's experience of contributing to the kit and visiting the museum; and help structure my knowledge and understanding of each individual participant in order to develop an awareness of the type of museum learning experience and design process that would be most valuable to each person.

2.1 The phenomenon of experience

After exploring the experience-centered design perspective on the phenomenon of experience and the influence Pragmatism has upon it, I decided to expand my definition of experience with different philosophical perspectives (as experience is a contentious topic for discussion and there are many perspectives). This section will present a set of philosophical perspectives that are relevant to this research, and that can contribute to a model for experience-centered design for digital, mobile, museum learning applications.

Sensation & Emotion

Baktin (1899) believed that the base of experience is the *felt* (emotional and sensory) quality of experience. Russell (2003) asserted that sensations combine at the base level of experience to form what we describe as an emotion.

> "**Emotional meta-experience** is the construction of a coherent narrative, interpreting, packaging, and labeling the episode —thereby integrating this episode with general knowledge" (Russell, 2003)

Emotion therefore is a *meta experience*, stemming from the combination of a number of base level sensations and a process of oscillation between the *unconscious* and the *conscious of here and now* states. These oscillations can occur on a macro scale too. When considering the types of experiences one would have within a museum, they are generally facilitated by oscillations between the self, objects, people, the space or the content (as noted in Pragmatic Aesthetics).

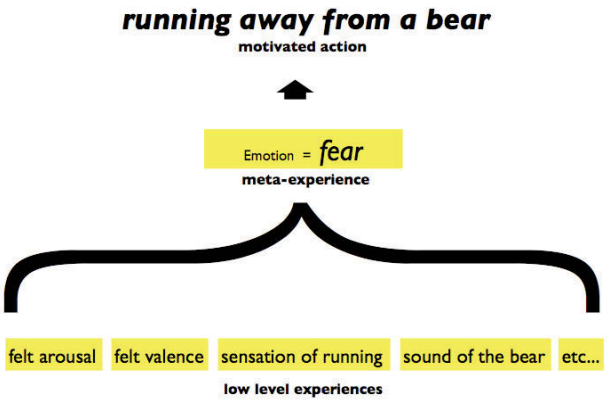

Figure 24. Emotional Meta-experience
Chloe Walker 2011 from James Russell, 2003

Engagement & Enjoyment

Don Norman (2003) explains that *enjoyment* is at the core of experience and that the different levels of emotional brain operation are the *visceral*, *behavioral*, and *reflective*. Initially physical objects engage our emotions through pure aesthetics when we respond instantly to color and form with our Lizard brain (the visceral, gut reaction); then through their behaviour, be it that of novelty or pure functionality; and finally through the meaning they embody on a reflective level in relation to our lives.

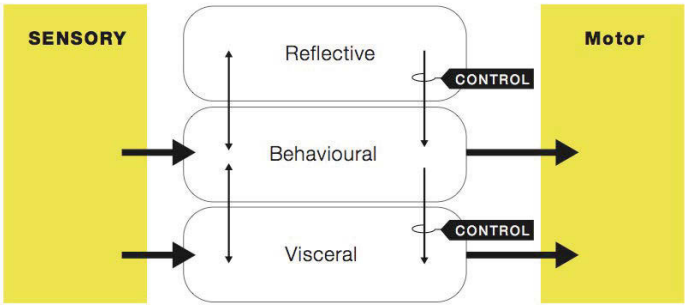

Figure 25. model of emotion
Chloe Walker 2011 from Norman, Ortony and Revelle 2004

When we look at more recent types of experiences, cinema is undeniably influential. Jon Boorstin's (1990) saw parallels in cinematic experiences and the ways that a film can capture and move an audience;

> "...the pleasure of something new and wonderful, the pleasure of emotional engagement, the thrill of a visceral response" (Boorstin 1990, p. 8)

Cinema drew focus to aesthetic experiences, experiences designed for aesthetic pleasure. Ciarán Benson (1993) looks at the main quality of an aesthetic experience as being absorption, entrancement, enchantment, and bewitchment. He believed that an aesthetic experience arose from the relationship between the self and an object and that the connection became an outpouring of the self into the object. This absorption (like Flow) can be described as attentive, engrossed, intensely concentrated, and immersed or lost in an activity.

More currently, new technologies have created new frames for experience. Brenda Laurel an interaction design pioneer and theorist, believes that engagement is at the heart of user-experience:

> "a desirable—even essential—human response to computer-mediated activities [in that] both have the capacity to represent actions and situations [...] in ways that invite us to extend our minds, feelings, and sensations" (Laurel, 1991)

Embodiment

Paul Dourish (2001) looked at embodiment as being a root of depth for experience and suggests approaches to the design of technology that focus on tangibility and sociality. Embodied phenomena he saw as being tied to the physical and concrete objects within experience. He argued that Husserl's phenomenology had considerable influence in turning attention to everyday experience rather than formalized knowledge, and to that experience as a phenomenon to be studied in its own right.

Shneiderman believed that experience with technology should support human needs and social relations in ways that enrich people's experiences and their sense of togetherness.

Holistic continuum

Hassenzahl (2010) expresses that the core threads of experience are Subjective, Holistic, Situated, Dynamic and Positive. I find this particular way of looking at experience very interesting because it explores the meanings associated with experience. He says that experience is subjective, meaning that as humans we cannot separate our past experiences and understanding of the world from our experience of it. He says that:

> "experience is subjective and its deduction from the objective is rarely straightforward. However a lack of correspondence between objective conditions and their experience should not be viewed as an error. The idea that experience is holistic states that it is comprised of perception, action, motivation and cognition, emerging from the interplay of the elements is the "imperceptible whole" (Hassenzahl 2010).

Hassenzahl discusses the "whole" as being made up of *Motor goals* which are sensory in nature and from a design perspective involve acts of grabbing, pressing, dragging and so on. *Do-goals* (which is the main focus of user-centered design) that focus on the desired outcomes of action and the plans we make to achieve those goals. These goals are concrete and easily mapped. The last set are the *Be-goals* are abstract and serve to provide meaning, motivation and emotion to an activity. These are the psychological needs, an individual subconsciously draws motivation from, but rarely acknowledges.

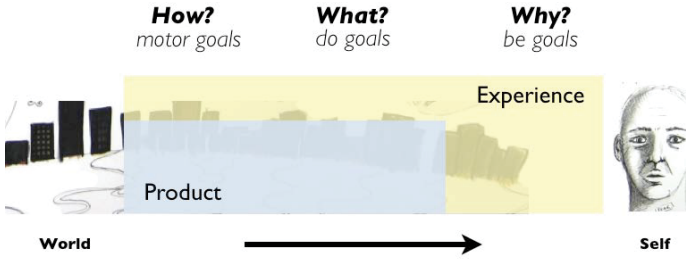

Figure 26. Goals for experience-centered design
Chloe Walker 2011 from Hassenzahl, 2010

2.2 Understanding the Emotional Thread

The fascination with understanding human emotion is innately human. Emotions are so integral to our experience of the world yet so elusive and at times indefinable. Emotions and emotional intelligence are integral to how we understand and express ourselves and how we communicate with each other. Unsurprisingly, it has been a topic of vast exploration throughout time (Plato, Aristotle, Descartes), across cultures and within fields of knowledge. In the sciences for example: Psychology, Neuroscience, Cognitive Science, Computer Science and Neuro-economics have all proposed ways of understanding emotion. It has been shown that emotions play a key role in our learning, knowledge, behaviour, social interaction and decision making processes. In the arts: Philosophy, Literature, Theatre, Art, Music and Dance all explore emotion as a complex and indfinable aspect of the human experience, requiring articulation, expression and reflection.

According to Cognitive Science research the brain processes emotions through the Prefrontal Cortex, the Limbic System and the Thalamus. The Thalamus sorts out sensory information and sends it to the cerebral cortex. The Amagdala integrates the senses and is thought to link emotions to sensory environmental input. The pre-frontal cortex is involved in problem solving, emotion and complex thought.

We receive input through our senses but our sense are not all equal. Our Major sense is Seeing & Hearing, our secondary senses are Hapatic - Touch and Proprioception (perception of our own body awareness); and out last senses are Taste & Smell.

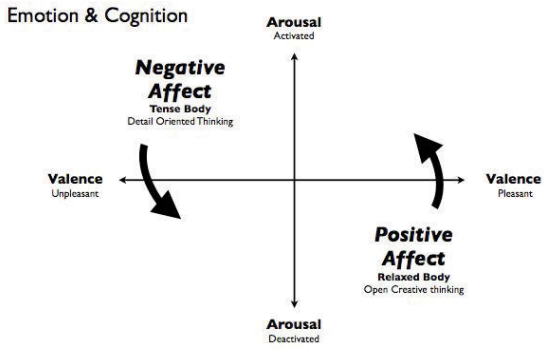

Figure 27. Emotion & Cognition
Chloe Walker 2011

According to Cognitive science research, when one emotional state it actively engaged other areas of the brain switch off. An example could be embedded in the term "blinded by love" (which doesn't go as far as to literally blind you) but it does mean that the rational areas of your brain aren't as active, the area that allows for logical evaluation isn't actively engaged and as a result you can see no wrong in the object of your affection.

It is obvious that emotions are complex and that it's common to find two individuals with entirely opposing emotional responses to the same signal, stimuli or message. This is generally understood to be the result of an individual's unique life experience and memories. In fact it's hard to gauge whether we have the same emotional responses even when we say we do, because, in the simple act of verbally defining an emotion we not only access our personal understanding of the emotion but we abstract it into language and redefine our understanding of it in the telling.

From the semiotic point of view, emotional responses can be linked to the reading of signs and signs can be powerfully ladened with the memory of past experience. But, signs are culturally specific and possess divergent meanings across multiple groups of people, so can only effectively communicate within certain groups.

Despite these complexities, however, emotions are easily transferable, almost phenomenally. Through our propensity for empathy, we can move from simply identifying someone else's emotion, to feeling and expressing it. Neuroscience claims to have an explanation for this in the recently discovered 'mirror neurons' and according to their research, mirror neurons cannot differentiate between the act of doing something and observing someone else doing the same thing, sending the same messages and igniting the same emotional sensation. They claim that this is why groups of people get so excited when watching sport.

Emotions are more than the result of an individual's evaluations and interpretation (appraisal) of events in the environment they are a core thread that gives value to experience.

Figure 28. Core Effect
Picard 2003

2.2.1 Identifying Emotions

In 1971, in a search for an understanding of the universality of emotion, Ekman discovered a set of "basic Emotions" that can be expressed. These emotions are: surprise, joy, sadness, disgust, fear and anger. This finding was the result of a lengthy multi-cultural study of over <1000> people and their expressions. Building upon this research in 2002 Pieter Desmet expanded the knowledge of emotion in his thesis 'Designing Emotions' (2002) and the associated tool PrEmo, aimed at identified 14 emotions that can be measured non-verbally. According to Desmet, there are 7 positive: satisfaction, fascination, pleasant surprise, inspiration, desire, amusement and admiration; and 7 negative: disgust, indignancy, contempt, disappointment, dissatisfaction, boredom and unpleasant surprise. Albeit business and consumption focused, the tool uses short cartoon style animations of emotional expressions to depict each emotional state. He discovered that the animation style animation communicated each emotion more effectively than words, and was therefore more universally useful for product evaluations.

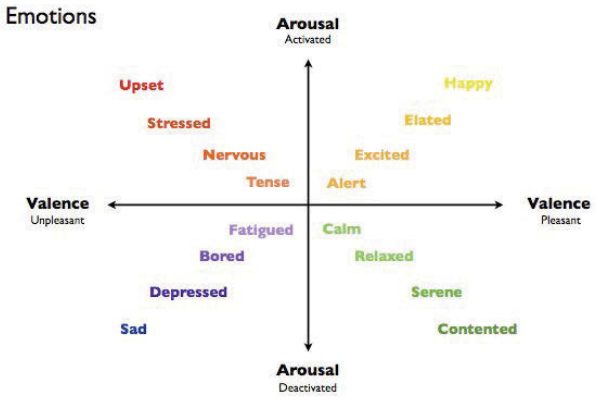

Figure 29. Emotion Circumplex
Chloe Walker 2011 from Plutchik 2001

Measuring Emotions - the quantitative approach

Scientific Psychology involves objective research "measuring … things like skin temperature, reaction time, or pupil size". Research in the field has developed and/or utilise a number of methods for recording emotional expression.

One area of interest is Biophysical sensing - useful for reading the emotional affect on voice rate, gesture, standing or walking and communication: another is GSR (Galvanic Skin response technology -similar to what's used in the lie detector test), then there's the ECG (Electro cardiogram), blood gas sensor, blood sugar sensor, EGM (muscle activity) etc… In addition to the cognitive science emotional measurement tools the Computer Science community has evolved a number of methods that they've found useful in understanding emotions. Facial Expression and Body language measurement works off the pretext that facial expression and body language are universal (Eckman 1980) And from this a vast body of research has evolved. here are some of the specific tools being used. Pattern analysis like FACS (Facial Action Coding System) for evaluating emotions through facial expressions, voice analysis, etc…

These measurement techniques are all very effective at isolating a particular aspect of emotion however they're ineffective at measuring or understanding the holistic nature of experience. For research where generalities are the foal they can be very useful however for research that is interested in deeper connections between emotion, cognition, and learning through experience they are unsatisfactory.

2.3 Free-choice learning

Learning in museums has shifted radically in recent years, from centers of *'message transmission'* and *'meaning-taking'* to environments of *'meaning-making'* (Ballantyne & Packer 2005). Museum's are now understood as places of free-choice learning.

Free-choice learning supposes that learning occurs on a personal level and that every individual's experiences expand upon existing mental models constructed from lifetime's set of experience and understanding. This shift reflects a shift of focus from the place or type of learning to the learner (Falk & Dierking, 2000). Hooper & Greenhill explain the complexity of the situation as encompassing:

> 'a broad range of dimensions involving knowledge, skills, aesthetic responses and emotions' (Hooper-Greenhill, 2004, p. 163).

Free-choice learning is different to formal learning and informal learning due to both the context and the philosophical perspective. Formal learning is a structured type of learning that occurs most commonly within a formal context such as a school or university, is controlled by educators and institutions and offers a limited level of choice or control for individuals within them (Cross, 2007; Falk & Dierking, 2002). They generally follow predefined learning progressions, within which learning is scaffolded and delivered within economically sized periods of time and frequency.

Informal learning is most commonly understood as the type of learning that occurs on the job, through practical application either within an apprenticeship or internship. This learning albeit, less formal is still structured around a approach for obtaining a skill set and an accepted body of knowledge. Free-choice learning on the other hand occurs within the every-day experience of life. When we consider that approximately 3% of the average citizen's lifetime is spend at school (Falk & Dierking, 2002) it's clear that the phenomenon of free-choice learning should be understood and explored in order to be optimised.

Free choice learning experiences present unique opportunities for learning.

2.4 The museum audience

In order to design for rich and emotionally significant museum experiences, prior to the selection of my participants I felt it necessary to investigate the following areas to see if they impacted on my choice of participants. Firstly the perspectives people bring into the museums; Secondly the approaches people take to the activity of learning in a museum; and thirdly the different attitudes towards museums.

Krauchyna & Hastings (2002) identified 5 categories of people within museum contexts: scholars, teachers, students, visitors and museum staff. Despite these groupings they found that 63% of them rushed to search a collection before anything else. Potentially illustrating a universal need for structure and narrative. With these categorisations and behaviour in mind, as well as the fact that some people may enact all these roles at different times, I decided not to exclude any cetegory of person in my recruitment process.

Krauchyna & Hastings also looked at the different approaches children and adults took towards the activity of learning. They found that children responded positively to the opportunity for interaction and choice within a goal based environment; but adults said they knew what they wanted and preferred to learn as directly as possible. Perhaps this was a result of time pressure, or purposefulness, either way I decided to exclude children from my research and to focus on adults as they represented the most likely candidate for a new type of individualised experience.

For adults, Murray (2000) discovered three distinct attitudes towards museums: the *interested observer* who likes to stroll and who prefers a networked structure which can be navigated by association; the *playful discoverer* who likes stories & games and mainly wants a narrative that's linear with a little interaction; and lastly the *encyclopedists* who like a hierarchy and prefer facts and figures organized in a hierarchical structure. From this they concluded that a combination of reference and play is likely to provide maximum appeal for most people. I determined that this would not play into my recruitment process as it seems possible for people to desire all approaches in different scenarios, are but would be useful in the design process to identify which participants align most with which attitude.

It seems that the perspectives, attitudes and approaches are all context and content driven. For adults, certainly a particular way of engaging may be preferred, but this doesn't mean people are or should be limited from being able to learn in different ways. In order to create a worthwhile differentiation between the participants I decided that the 3 adults should have differing types of expertise and be of different ages, offering differing levels of depth and perspective to the designs and resultantly appeal to broader audiences. I would argue that due to the deeply personal nature of this research, expertise and age are a rich enough set of differentiators to diversify this research.

2.5 Experience and technology

> Designing for the full range of human experience may well be the theme for the next generation of discourse about software design. —T. Winograd (1996, p. xix)

The final consideration for the conceptual phase is the consideration of the specific attributes of an experience with technology. In order to understand how to design for digital, mobile experiences, I've needed to understand the unique nuances that an experience with technology holds. Our experiences are colored by our interactions with and perceptions of the people, spaces and things that we encounter. They are evaluated via aesthetic engagement, situated creativity, centers of value, and sense making. In their paper *Technology as Experience* McCarthy and Wright look towards a new way of understanding our experiences with technology. They build upon the philosophies of John Dewey and Mikhail Bakhtin and they explain that experience is unique and irreducible because life is *lived* and *felt* and not assessable by any situational or functional technology perspectives.

> Ben Shneiderman (2002, p. 2) has recently argued that we are entering an era of "new computing": "The old computing was about what computers could do; the new computing is about what users can do. (McCarthy & Wright 2004)

McCarthy and Wright propose that an understanding of human relationships with technology lies in the awareness that experiences with technology are inextricably linked into an individual's web of prior and ongoing experiences. They propose that any assessment of how humans relate to technology must account for the *felt* aspect of experience.

> "Our aim was not so much to develop a theory of experience with technology as to suggest an approach to viewing technology as experience that is open to the sensual, emotional, volitional, and dialogically imaginative aspects of felt experience. [...] This lens makes visible the potential for charm, enchantment, love, excitement, alienation, and irritation in our relations with technology. (McCarthy & Wright 2004)

We cannot assess experience as devoid of emotion, because emotion is essentially at the core of experience.

Pragmatism sees knowledge as a participative process within which knowledge is constructed from the unique combination of a situation, the circumstances, technology, And actions that constitute its creation. It is knowledge that is not only understood but that is felt and sensed. Theirs is the perspective that knowing, doing, feeling and sense-making are connected and inseparable. Philosophically, Pragmatism is a creative pursuit which is not only focused on the acquisition of knowledge but on the ability for imagining futures and progressing towards creative outcomes.

Dewey's perspective on human action and the key to understanding *felt* experience is that action is situated and creative. There can be no separation of the journey and the destination when we consider that we are continually engaged. People create goals and decide upon the ways to achieve those goals while within the continuity of experience. Dewey's model of action is more akin to the notion of child's play, and the creative possibilities. For him, action is emotional, volitional, and imaginative, and experience is a process of continuous sense making.

2.6 Blend of the real and the virtual

For the design of any mobile, digital, museum learning application it's important to understand how Museums are currently designing for the space between the real and the virtual.

Along with established learning activities such as the Audio tour and individual or group exploration, the museum is currently a hothouse for experimentation with technology-enhanced learning activities. Interesting combinations and connections for learning are being explored across many conceptual, technological and physical layers (culture, history, art, science, space, technology, movement, mobility and interactivity).

Increasingly Museums are blending interactions between people, architecture, objects, and computers. Interactions between static installations (Dioramas, paintings); active installations (mist, robotics, animatronics, animations, video/film); digital interactive installations (touch tables, reactive environments); TUIs (tangible user interfaces); audio, video and personally guided tours; adaptive and highly interactive game based tours; augmented and virtual reality spaces; digitised maps; and web sites are being explored in an attempt to improve and differentiate museum experiences. While these interactions are worthwhile and interesting, I believe that a broad and holistic perspective should be taken and that the key to the integration of new technology facilitated learning within museums lies in the potential ways it can support lifelong learning; personal emotional significance; and comprehensive knowledge building strategies.

As one of a number of propositions for the future of museums Jones (2002) proposes the development of a self -learning hyper-museum where we could learn from objects rather than about objects. He proposes that museums would learn and adapt to new visitors based on patterns, preferences, and predilections of previous visitors.

> "The integration of real and virtual will provide further powerful learning opportunities" (Jones 2002)

Jeffreys (2007) took the idea of the *real* even further to suggest that the museum experience move from the inside to the outside and that:

> "this semantic shift permits a finer focus on the fluid experience of interaction in outdoor and indoor urban settings. This proposed theory for shifting the boundary of perception of cultural city-based events moves the focus from the object to the ephemeral." (Jeffreys 2007)

Both of these concepts are broad and revolutionary in their consideration of future museum paradigms, but I fear that part of Jones' idea is simply creating a zoo for objects and Jeffreys' idea could devalue power of the unique relationship between a person and an object. Objects and the stories that surround them define their cultural importance. I would argue that the power of objects must not be diminished but instead enhanced. Tangible user interfaces (TUIs) are embracing the physicality of objects and are an interesting way to combine technology into an experience with an object. They can be playful, poetic and imaginative. They help make sense of existing understanding and build upon it to form new knowledge of the physicality of an artifact. The power of TUIs lies in the effective communication of embodiment and metaphor.

In 2004 Fishkins developed a taxonomy for defining the degree with which "the state of computation" is perceived *near* or *in* the tangible object. He plotted *Embodiment* vs *Metaphor* across 2 axes of a graph and defined the the optimal location for a TUI to be placed is in the top right - "*Full metaphor* and *Full embodiment*".

The *Embodiment* scale moves along 4 points of a scale: *Distant*, to *Environmental*, to *Nearby*, and finally to *Full*. *Distant* is the perception that the Computing effect is distant to the object. *Environmental* is the perception that the computing effect is *in* the environment. *Nearby* is that the computing effect is proximate to the object. *Full* the computing effect is within the object.

The Metaphor scale moves from *None*, to *Noun*, to *Verb*, to *Noun and Verb* to *Full*. *None* represents the abstract relationship between the device and the response. *Noun* represents the metaphorical likeness to the real world response. *Verb* represents and analogous action to a real-world response; *Verb and Noun* combine the 2 previous levels; *Full* represents the intrinsic connection between real-world responses and the object which requires no metaphorical relationship.

What's interesting about this is that it speaks to the fact that people are expecting a relationship with the object and when the wholeness of the object appears fragmented, the potential for a relationship is lessened. It seems as though this relationship is very important and crucial to the ongoing success of the museum.

The relationship is not simply between the object as a static entity and the individual—although the emotional attachment is projected upon the object—but one including the narrative that enriches the object with meaning. Since many objects within museums are static, it's the narrative that's woven around the object that brings it to life in people's minds. New technologies offer the potential to deepen the personal relevance of those narratives. Although it is shifting, the majority of narratives associated to an object focus on the construction of single themed exhibitions. This is partly due to the tradition of the curator and partly due to the lack of rich metadata for objects. Most museums currently use Dublin Core metadata standards for the tagging of metadata for objects such as title, creator, date, material and movement. Togiya and Baba (2010), however, have developed a digital archive system that will allow museums to tag objects with richer data classifications and in turn allow users to draw upon the relationships between items based on a wide range of interconnections. They proposed this because they were full aware that :

> "various achievements had been gained with regards to removing the Physical and temporal space (previously barriers to viewing), while the collation of information and collaborative editing remain important areas for focusing future efforts" (Togiya and Baba 2010)

Their approach to categorization focuses on upper ontological, philosophical structures such as: space, time, concrete objects, abstract objects, attributes, quantity, roles, events, expression forms, actions, society, and phenomena.

Developments like this allow the museum collection to support multiple narratives and multiple perspectives on objects and relationships between objects.

Appendix B: Design

1 Reflective visual thinking

As one of the processes of reflection-in-action, this initial phase was highly intuitive and entrenched in investigative learning strategies. During this phase I undertook a number of tasks: firstly I performed a theoretical evaluation, then a contextual evaluation, then a visual thinking exercise for reflection. Throughout the process I've used reflection-in-action to gain knowledge.

I have used an illustrative mapping approach as a tool to visualise and synthesis the meanings and connections between philosophies, theories and topics relevant to designing for the emotional qualities of experiences with technology within museums. For the task of evaluating the phenomenon of experience between people, objects and spaces I looked at *philosophy, psychology, science, design, learning, emotion, narrative, ontologies, technology, environments* and *gaming* to uncover patterns and connections that could influence my process and subject for my research and design.

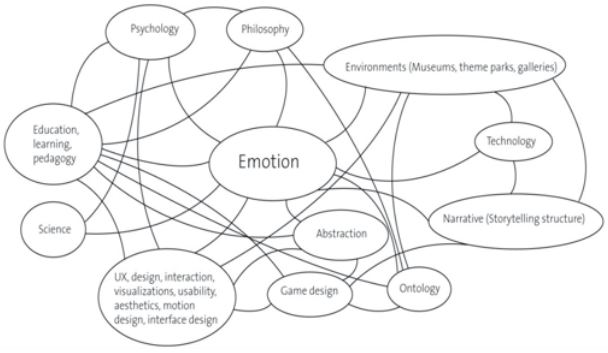

figure 30. map of connections in the field of study
Chloe Walker 2011

The connections noted in figure 1 reflect the breadth of inquiry and noted relationships between the fields of study. The depth is more accurately reflected by the sizes of the ovals. The depth was not a predefined decision, it was either the result of acts of chance or encounters with resonant ideas that inspired deeper inquiry.

My particular process of visual thinking has played a number of roles within my research process. Firstly to define a research question by clarifying ambiguous relationships and exposing potential knowledge gaps within the field as well as capturing progressive levels of knowledge on a topic and allowing me to see my learning progress visually.

Secondly as reflection of my perceptions—allowing me to see which theories or ideas were the most intuitively resonant to me—which became a subconscious and intuitive way to define a direction.

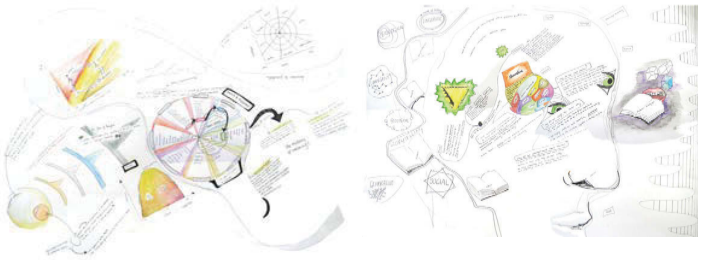

Figure 31 & 32. Flow Theory & Narrative Structure Maps
Chloe Walker, 2007-2010

Most of the references are from books, articles, phds, papers, workshops and conference seminars. I discovered that my approach supported action, reflection (on topics) and reflexivity (on self). Scrivener explains reflexivity as:

"the name employed in qualitative research for the cyclic process whereby the way we describe a phenomenon changes the way it operates for us, which in turn changes our perception, which changes our description and so on…" (Scrivener 2010)
Thirdly they also became a tool for ideation, inspiration and idea clarification. The maps are a record of my organic process of cyclic learning as layers of time, showing the process of continual reflection and integration.

Lastly, I learned that the mapping process further developed my spacial, temporal and visual thinking skills, previously unmatched in my design process. The emotional and temporal undulations are captured on the maps as visual tensions and spaces. The speed of handwriting; different pens or pencils; the lengths of strokes in gestural illustrations; and the layering speak to changes in perception or time distances. I connect ideas through the languages of words, shapes, lines, boxes and arrows and use watercolors to give each mark with a tone and perspective. Upon reflection I became aware that the visuals capture my emotional interpretation of each theory or idea, as well as the overall tone of the map.

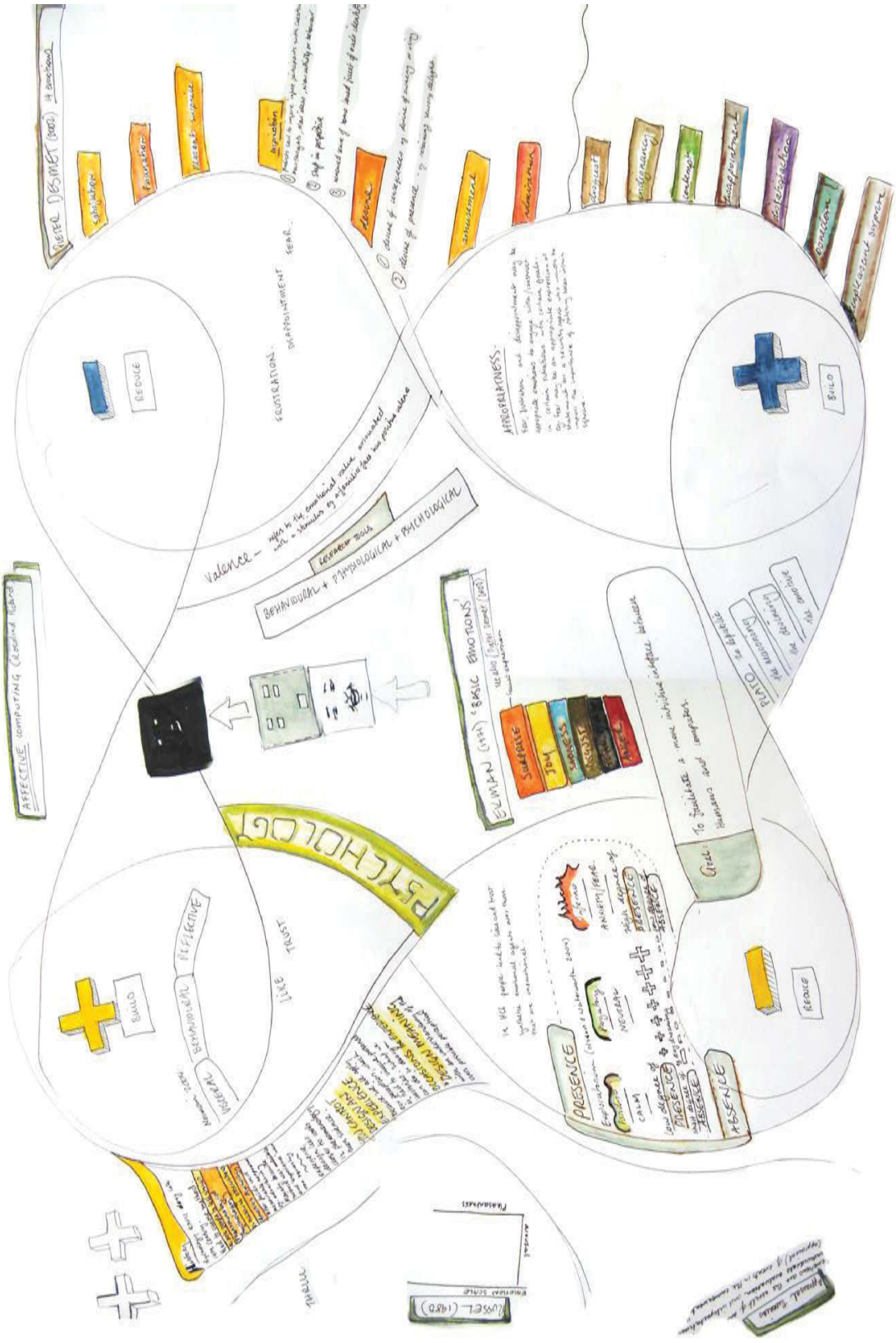

Figure 33: Mapping Process
Chloe Walker 2011

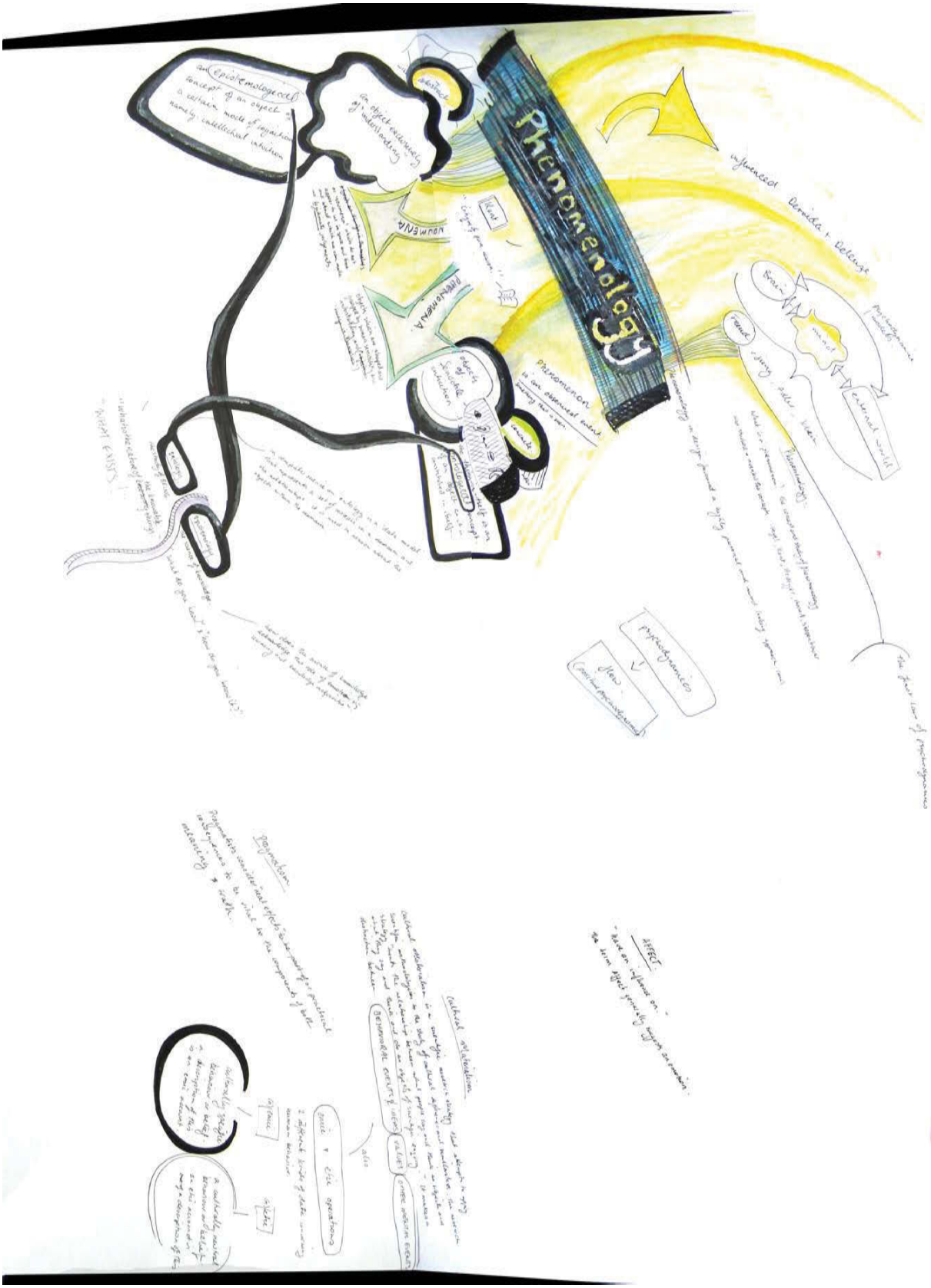

Figure 34: Mapping Process
Chloe Walker 2011

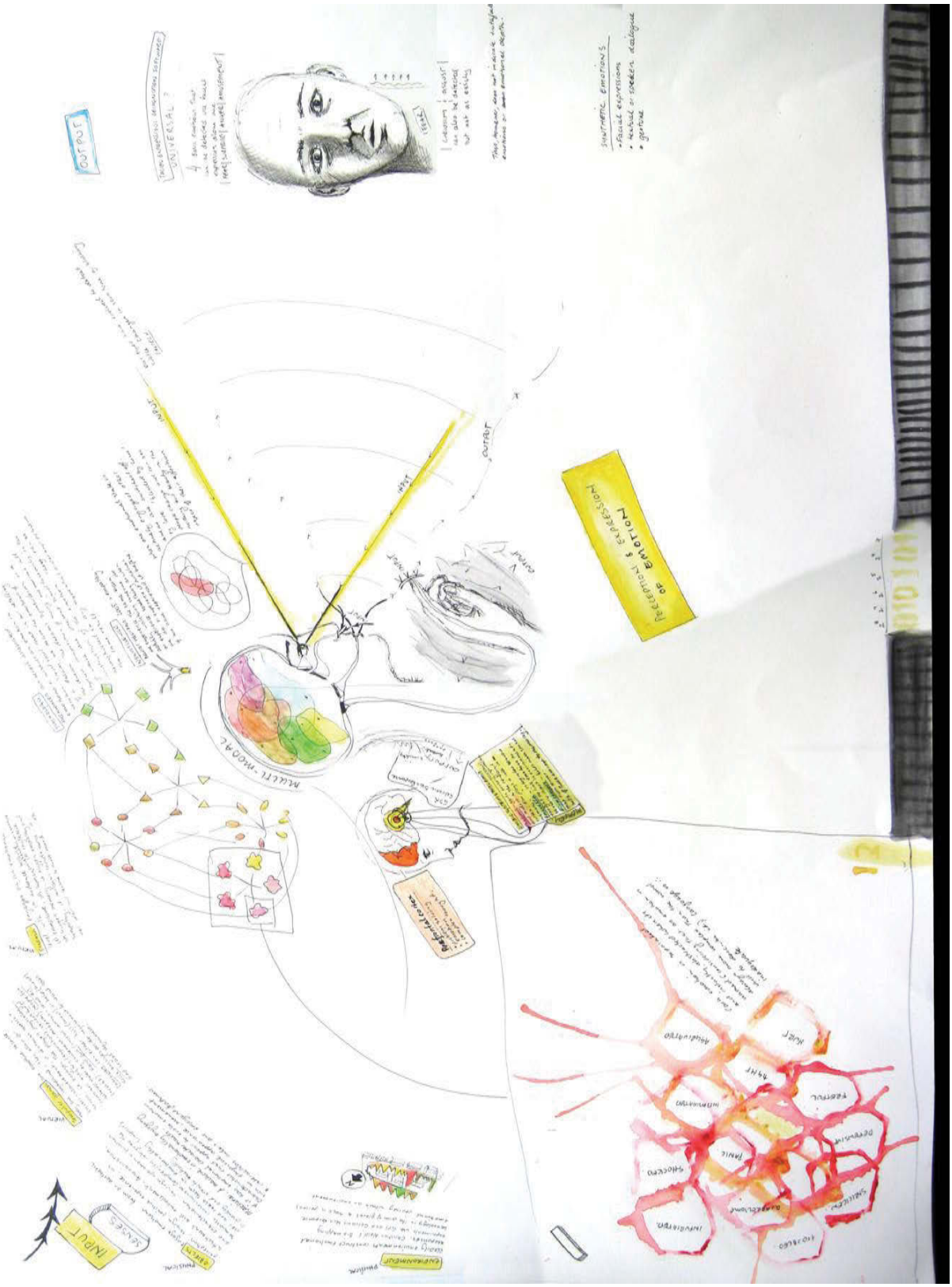

Figure 35: Mapping Process
Chloe Walker 2011

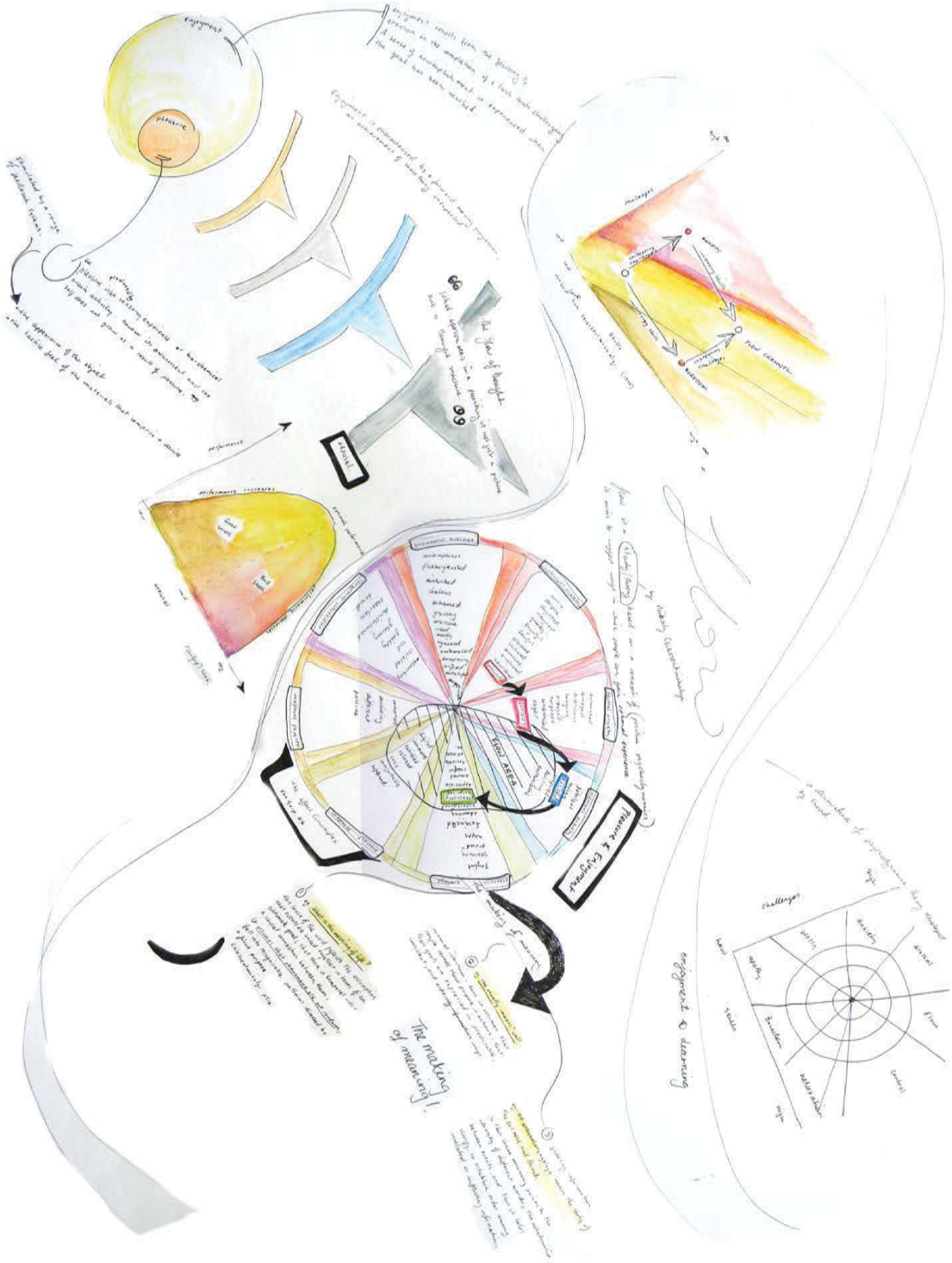

Figure 36: Mapping Process
Chloe Walker 2011

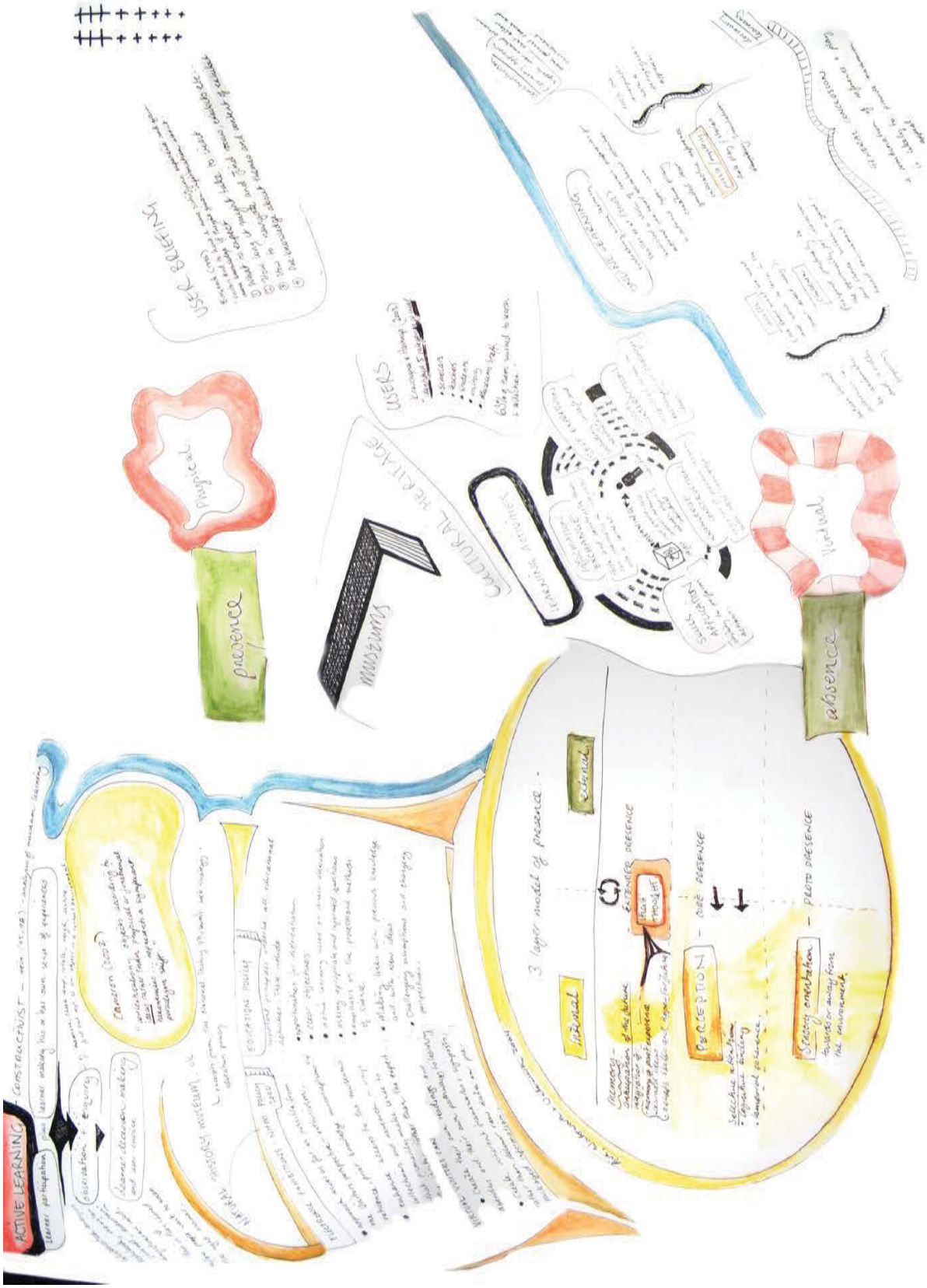

Figure 37: Mapping Process
Chloe Walker 2011

Figure 38: Mapping Process
Chloe Walker 2011

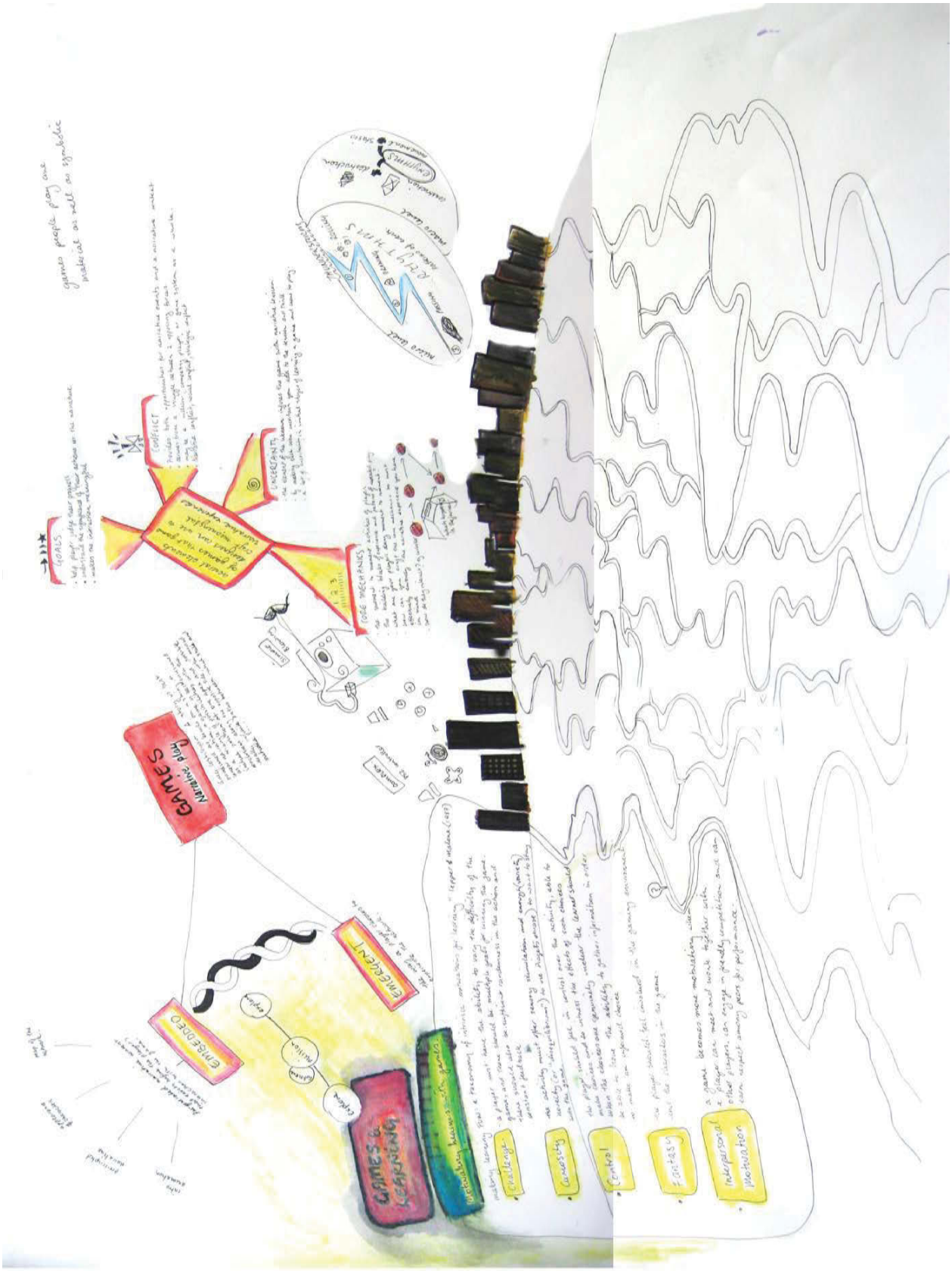

Figure 39: Mapping Process
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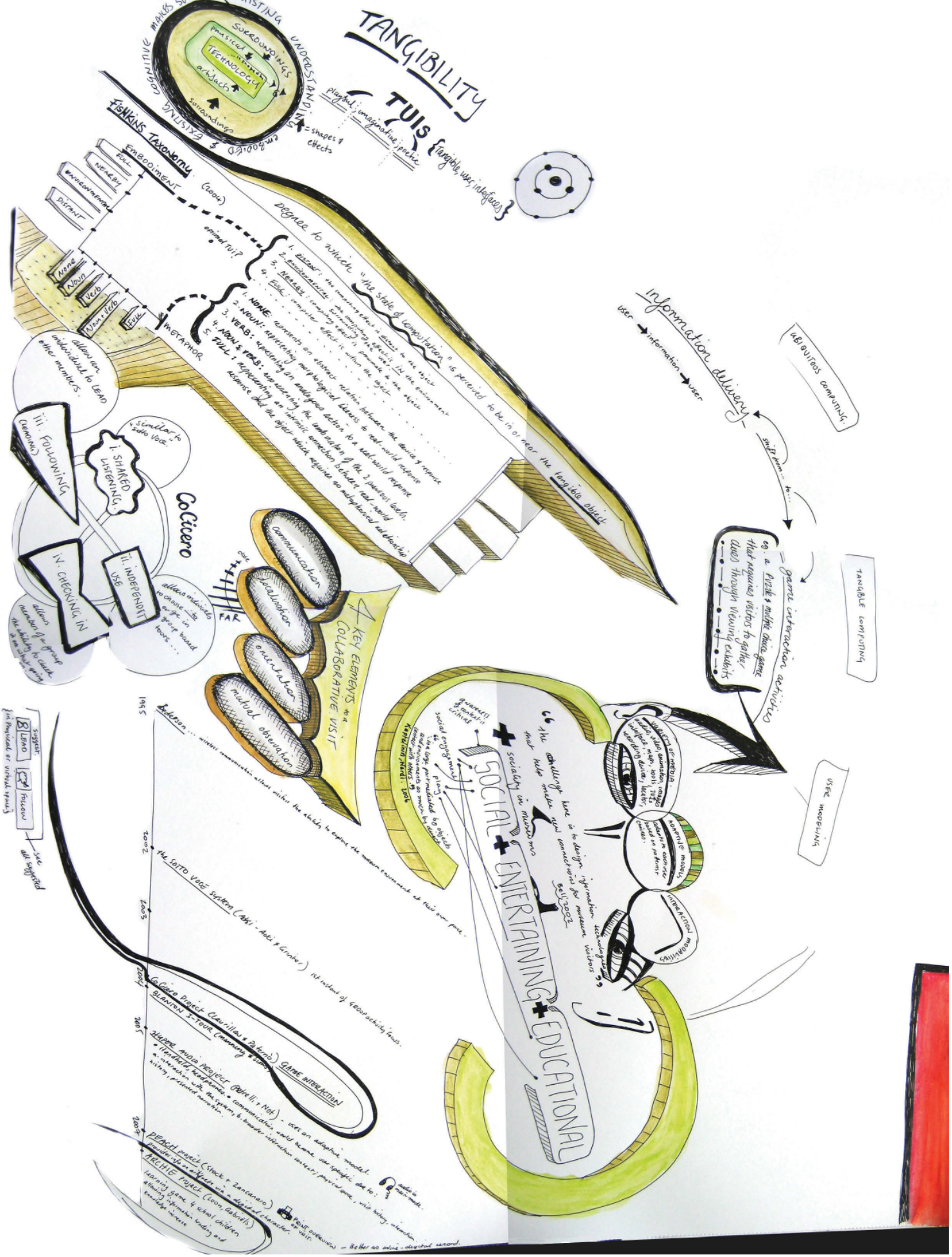

Figure 40: Mapping Process
Chloe Walker 2011

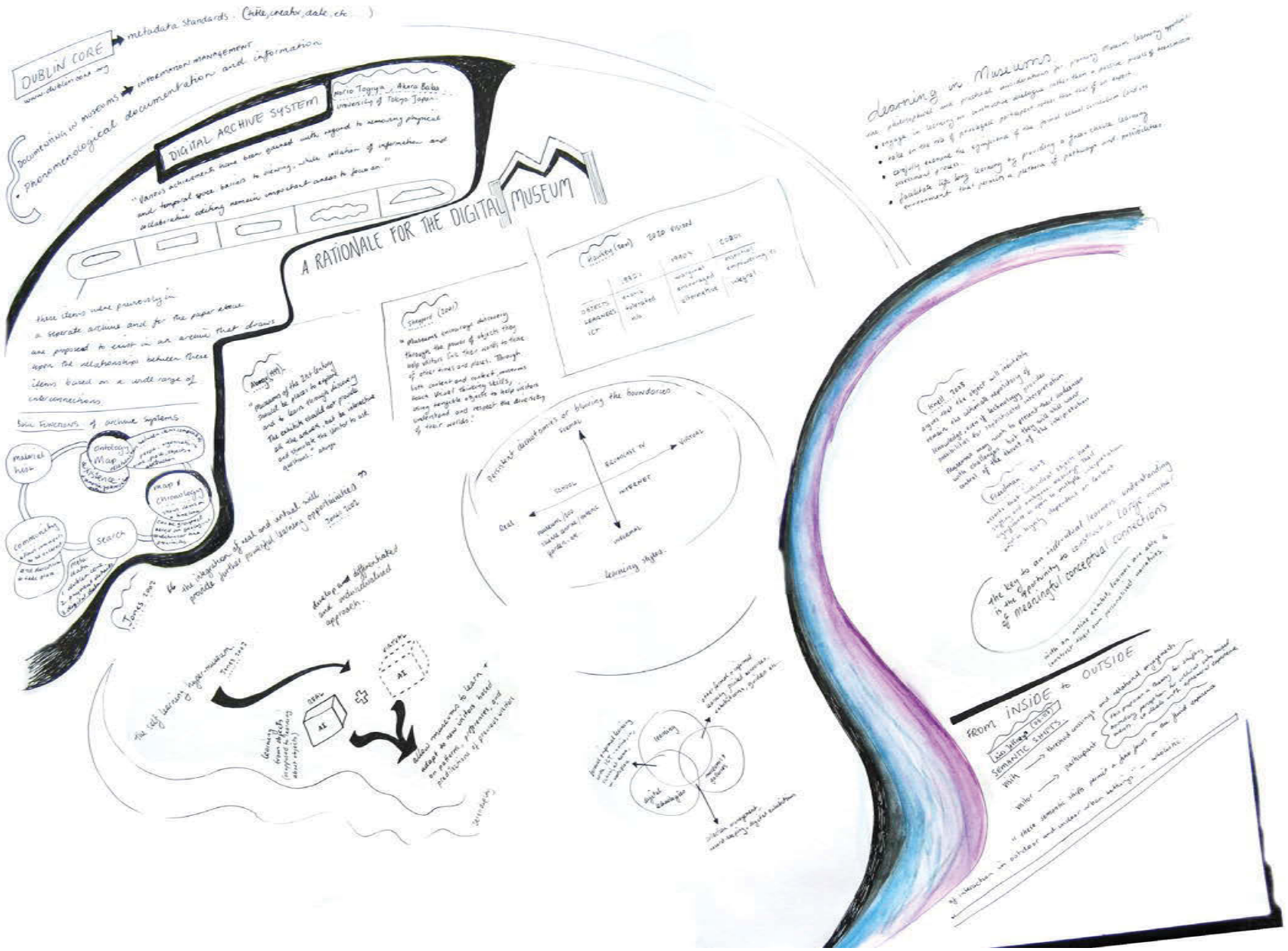

Figure 41: Mapping Process
Chloe Walker 2011

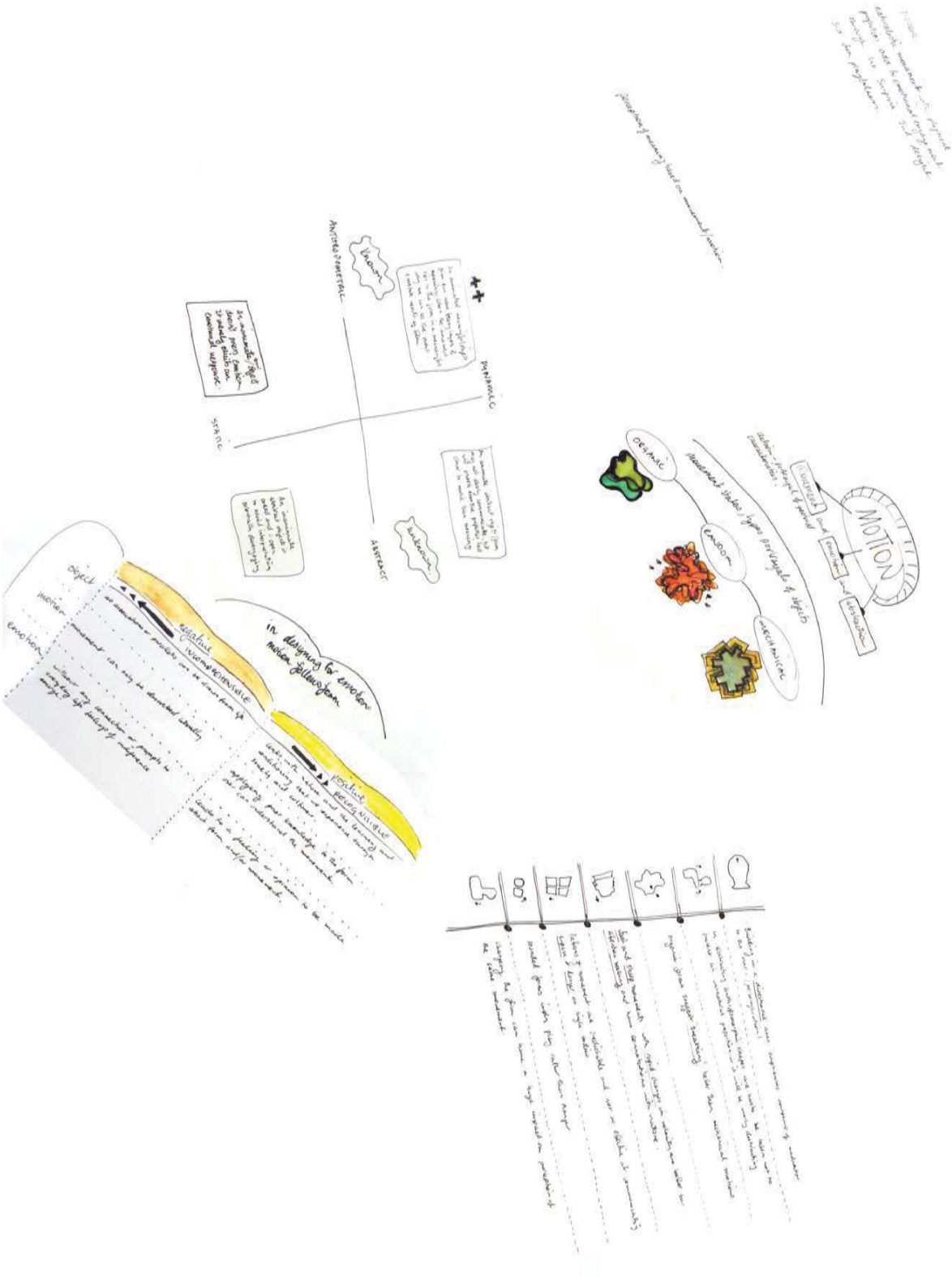

Figure 42: Mapping Process
Chloe Walker 2011

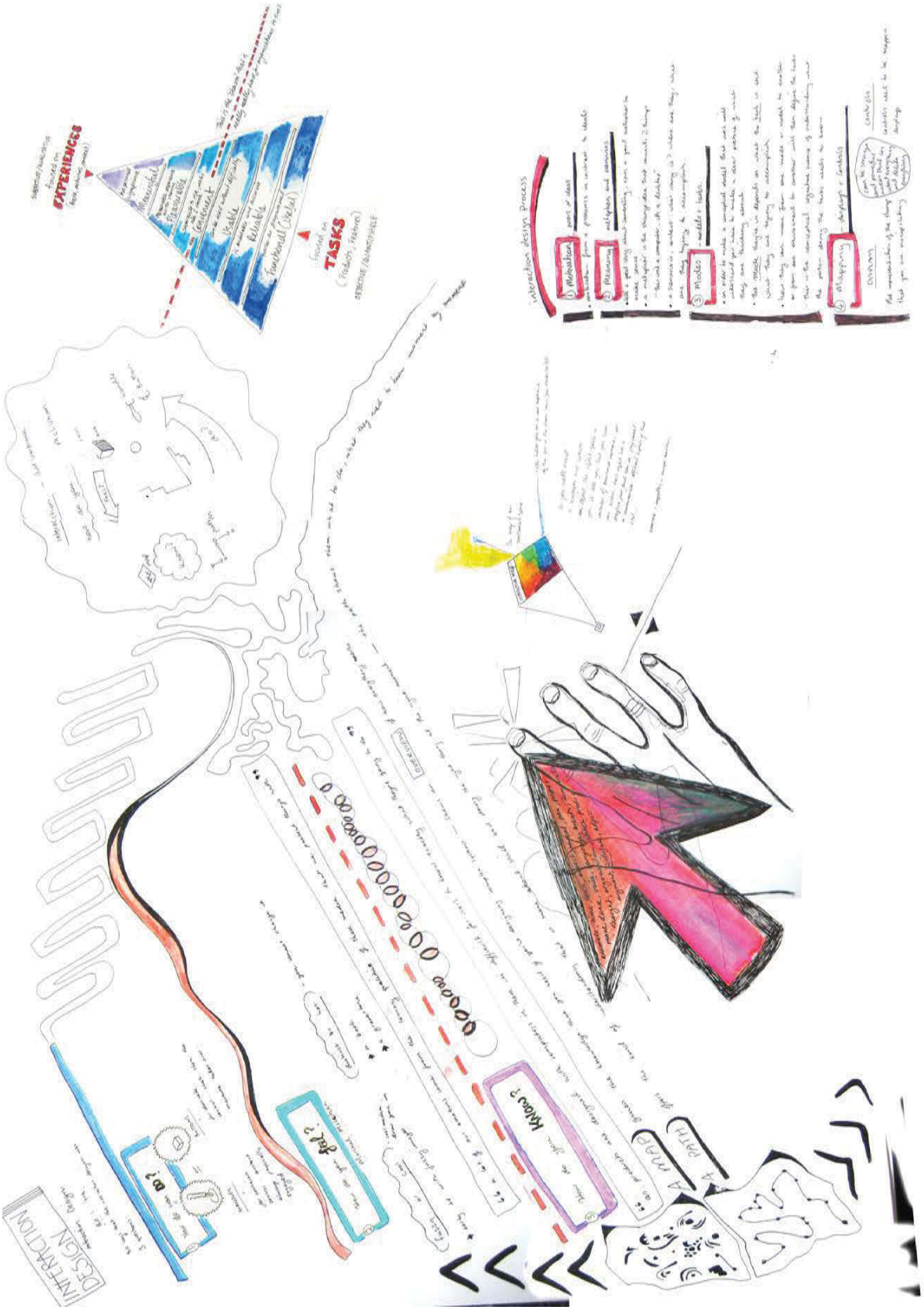

Figure 43: Mapping Process
Chloe Walker 2011

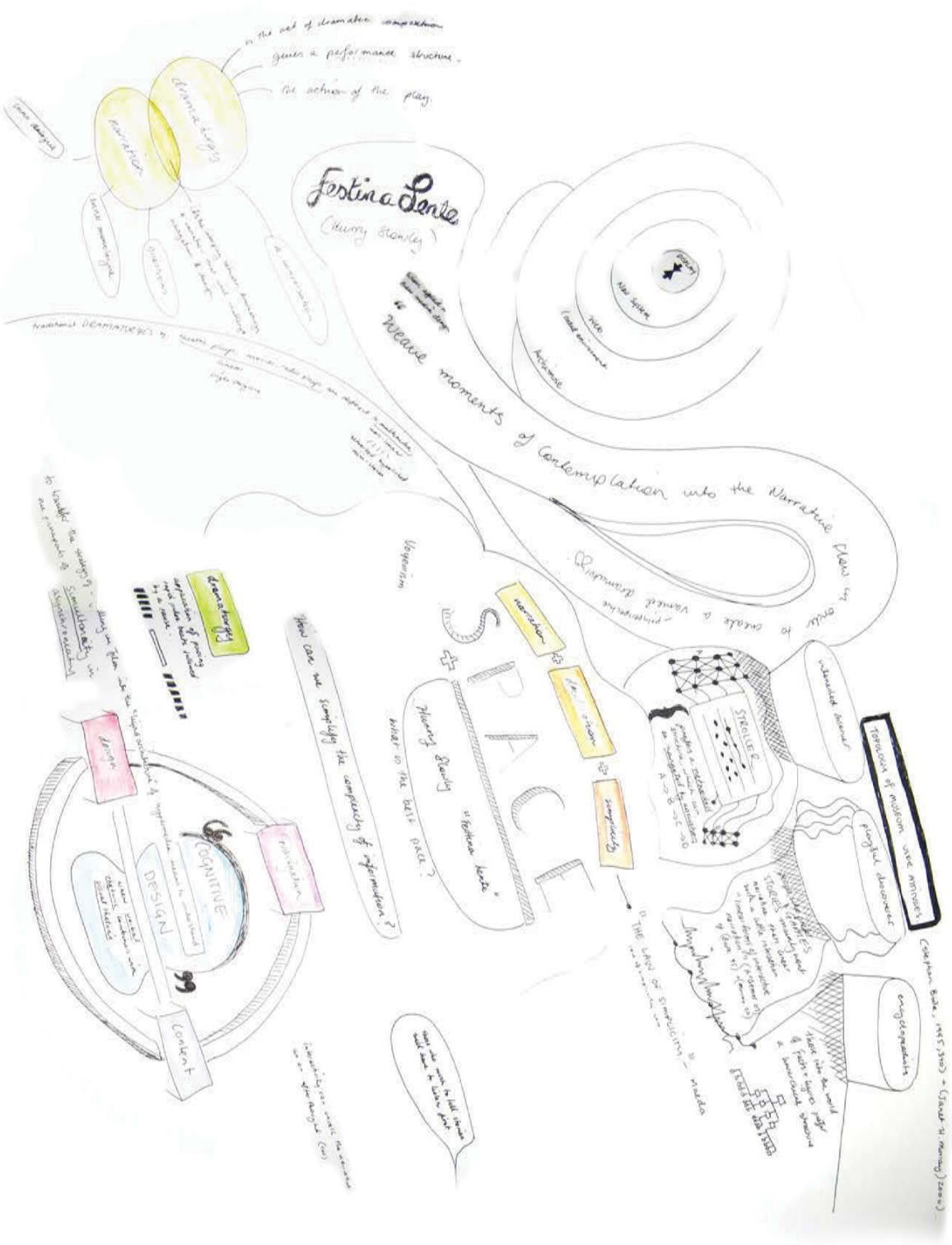

Figure 44: Mapping Process
Chloe Walker 2011

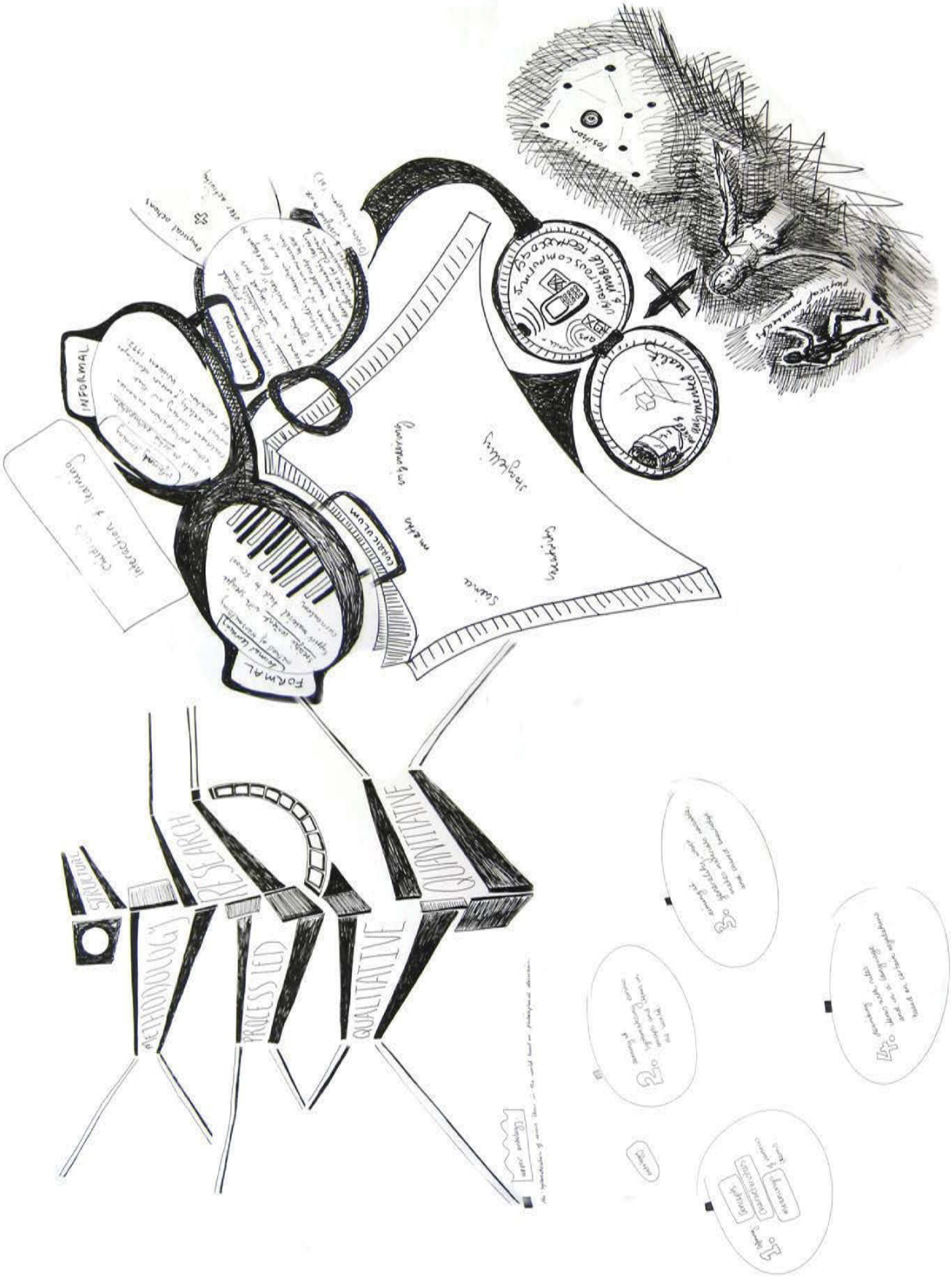

Figure 45: Mapping Process
Chloe Walker 2011

Figure 46: Mapping Process
Chloe Walker 2011

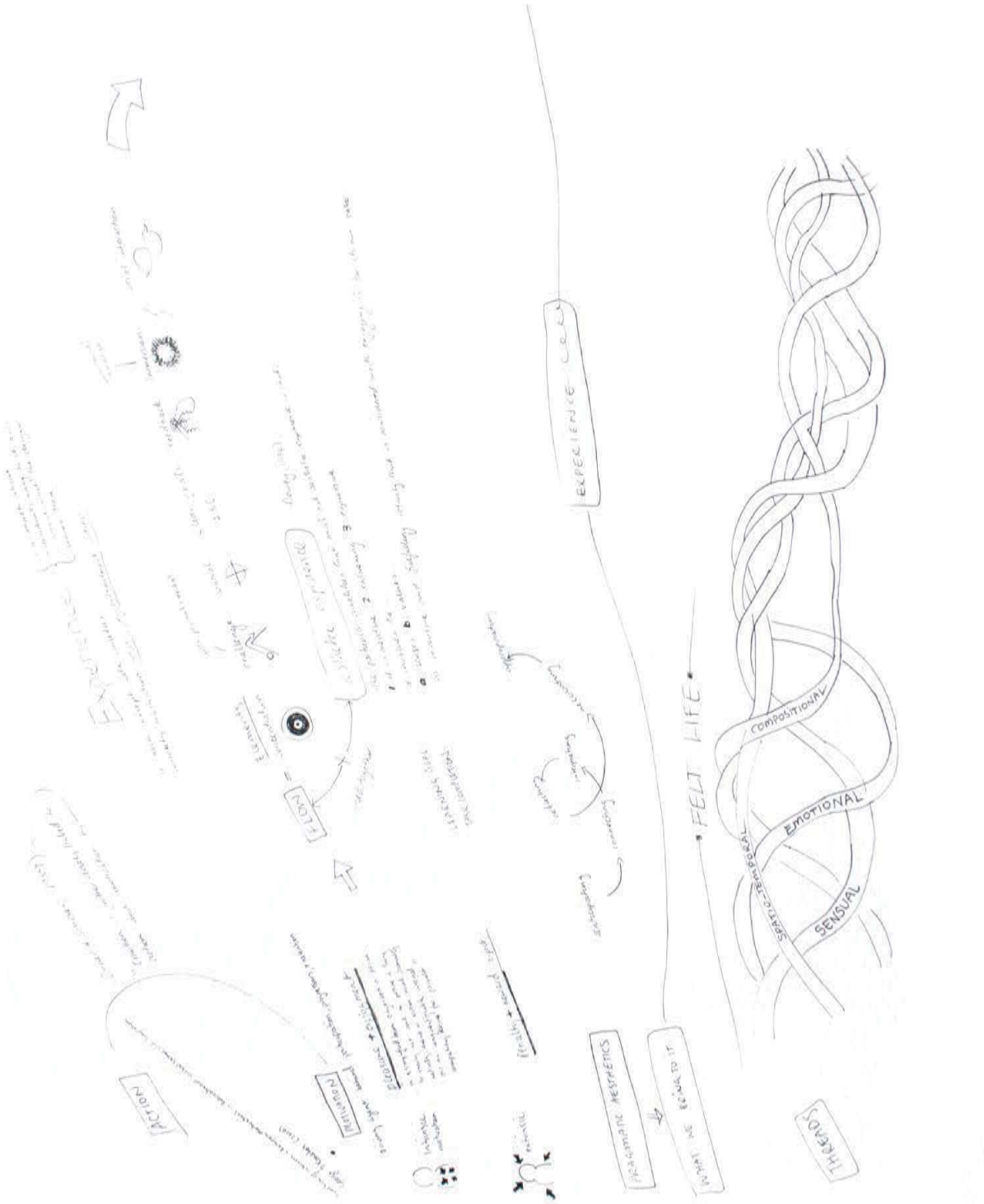

Figure 47: Mapping Process
Chloe Walker 2011

Figure 48: Mapping Process
Chloe Walker 2011

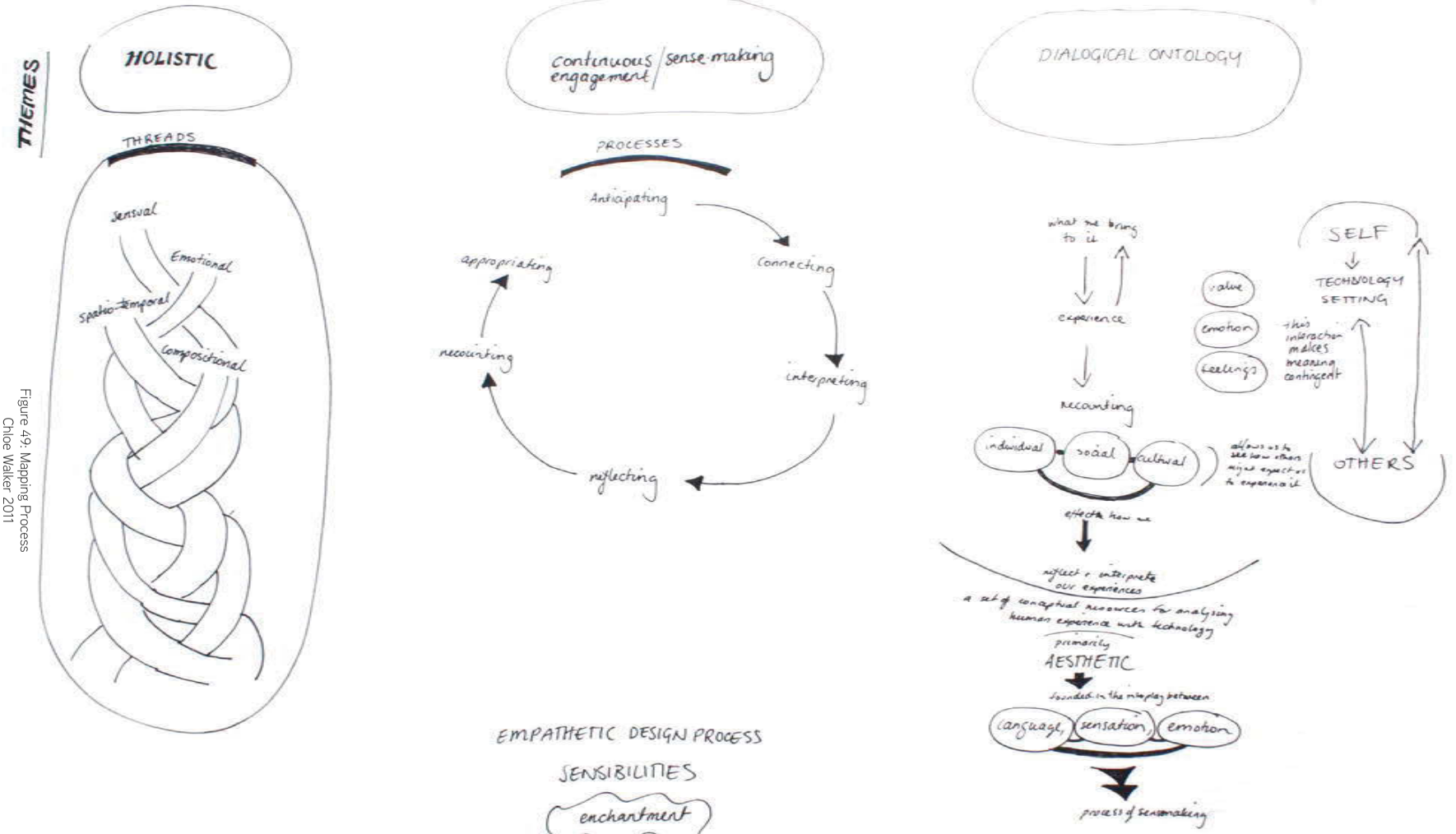

Figure 49: Mapping Process
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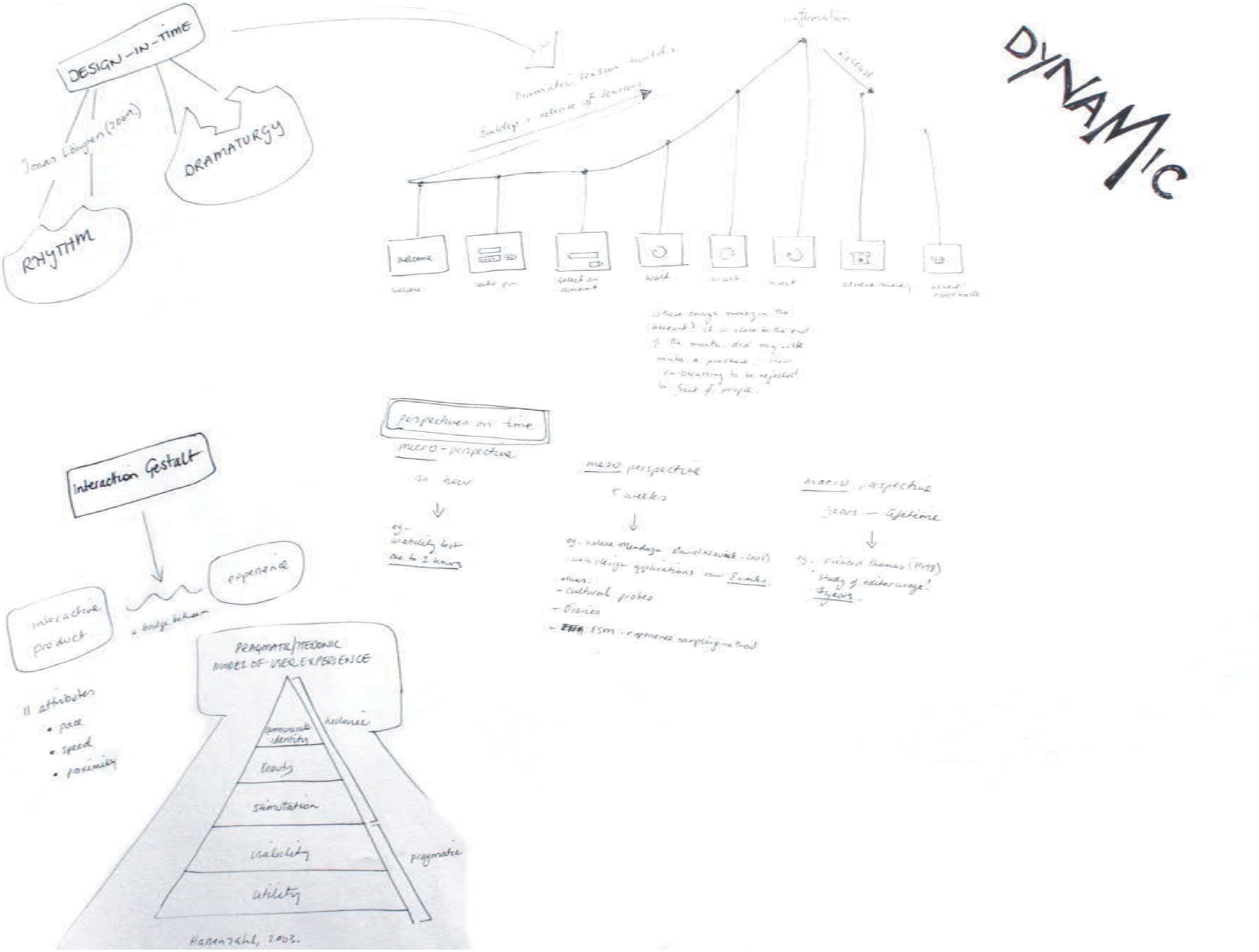

Figure 50: Mapping Process
Chloe Walker 2011

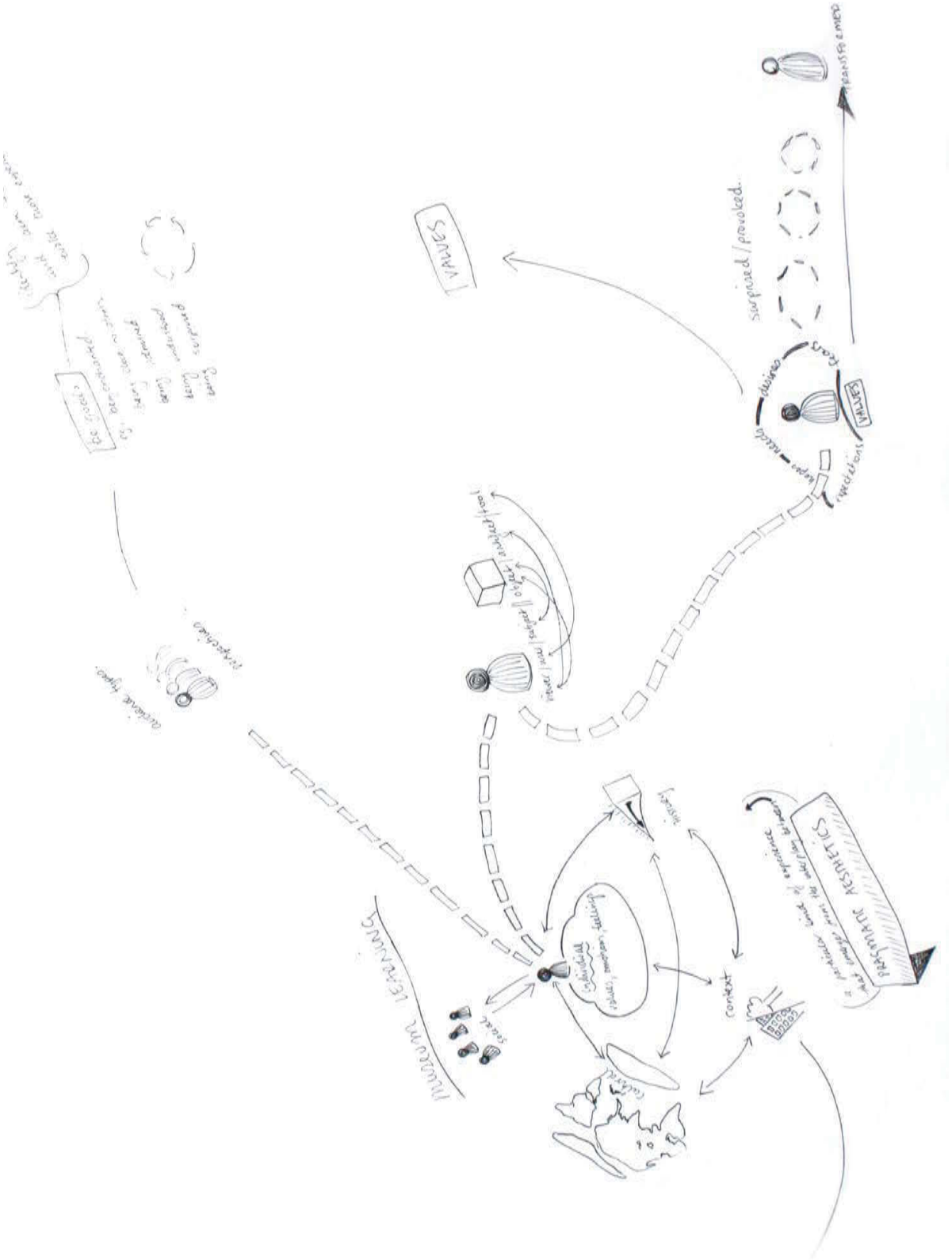

Figure 51: Mapping Process
Chloe Walker 2011

Figure 52: Mapping Process
Chloe Walker 2011

2 Contextual investigation

In addition to this secondary research, I determined that I needed first hand experiences of a range of educational and entertainment arenas beyond my current knowledge set. Firstly I decided to explore the types of relationships contemporary art galleries in New York City were constructing with their audiences; and then, in contrast to that I decided to explore what an "imagineered" experience at Disney World, Florida would be like. After those, I went to NASA to observe how location based education could be infused with entertainment; and finally to London, Paris and Amsterdam to experience mobile museum tours from a European perspective. These experiences were all very different and all employed unique techniques for engaging audiences, guests, visitors and users.

I spent a few hours each month for 3 years (2007-2010) attending exhibition openings at small galleries in New York City. I found that small Art Galleries in New York have very social relationships with their audiences. Gallery strips launch new shows concurrently so it's not uncommon for people to skip between shows on a single night in certain districts like Chelsea or the Lower East Side. These concurrencies are often framed within a "festival" with an official map showing participating galleries across streets, down alleys or up elevators. Most people at these shows circumnavigate the show, visually consume the messages and aesthetic sensations to the art then return to friends to sip wine or beer and discuss. Even if you go alone you are surrounded by lots of people and within earshot of conversations. These experiences are inherently social and it is that element that augments the art to add the most value to the experience.

In stark contrast, my 2007 Disney World experience was very different. The entire theme park complex is so large that you can only experience one or maybe two of the 5 parks in a single day. Before even entering a particular park there's planning involved. Which, along with the money you've spent to visit, can turn the experience into a game of challenge between space and time. How much can you see and experience within a day? My Disney world experience began at the hotel, the 'yacht club' resort. Ropes, knots, blue and white stripes, boardwalks, piers and moored boats defined the boundary of the "Yacht club" as different to the adjacent "Beach Club' resort which exchanged the boardwalk for beach, ropes for towels, piers for swimming pools and boats for floating beds. The fantasy had begun and was completely immersive. After a boat ride from the resort to one of the parks I began my adventure. Once inside, the fantasy was notched up a level as you are surrounded by completely mad-made and meticulously architectured buildings, statues, roads and gardens devoted to the park's theme. Once the initial amazement wears off, the game begins, and the sound of screams and towers of undulating trains weaving their way across the man-made lake adjacent mountains of steel, wood, paint and rock, beckon you onward. What to do first? How does it work? The map helps you identify your checklist of major rides within each park and helps you evaluate the most direct paths to them. From them on the experience is completely designed to account for every potential user scenario. If you're active and focused on the rides you can line up and wait for about 30 minutes to board a ride or you can replace the line with a time specified "fast pass", take control and feel clever by jumping to the front of the line in about an hour. Either way you are satisfied. Even if you wait in a line, it's entertaining, as you begin to learn, you are already on the ride. The line builds anticipation and excitement for what lies ahead, introduces a narrative and progresses you through "levels" even before you enter the ride.

Alternately if you want to relax and take care of the children, there's plenty of space to simply sit and remain entertained by dancing water fountains or characters popping by to say hello. The rides themselves are amazing spans of pure adrenaline and up until this point in my life I had never experienced something so catered to continual sensory, emotional and narrative stimulation and immersion.

Although the socially mediated niche art galleries of New York City and the hyper-stimulating, immersive theme parks in America can teach museums about user motivation and engagement it would be wrong to simply transform museums into either of these and devalue their unique value proposition. Museums are more focused on teaching people how to learn through an appreciation of material culture than delivering simply thrilling experiences. Museums allow people a unique connection to the future through the eyes of the past and this value should not be lost, but instead, enhanced.

In order to continue my exploration into comparative museum experiences, I decided to look at a range of different contextual and cultural approaches. The first place I visited was NASA in 2007. I came to NASA with an awareness that the place itself was an object of worship, synonymous with technological advancement and Space exploration and I was surprised to find that the experience itself seemed trapped in the 80s. This was perhaps a wise decision to focus all financial support since the 80s on research and development rather than the maintenance of a "Symbol". But overall the experience was underwhelming, compared to the nearby Disney World. The educational arm at NASA most likely suffered the budgetary cuts experienced by some museums. It reinforced the my suspicion that museums could benefit from rich immersive learning experiences that don't require the costly fit-outs, staffing or services.

The next set of places I visited were the Louvre in Paris, the Rijksmuseum in Amsterdam and the British Museum in London. My main focus was to experience their mobile tours. In 2008 the Louvre offered a multimedia audio tour that gently lead you from room to room as it pointed out objects of significance. It took you on a specific route through the masterpieces within a section of the museum. It was calming, even while in swarms of people, which was lovely, but still I felt superficial, probably because it was geared to first time visitors like myself. In 2008 when I visited the British Museum and Rijksmuseum the only available tours were traditional audio tours using number entry systems, without structured sequencing. These experiences are interesting but perpetually shallow. Especially since up until then the potential for museum tours had headed in interesting directions with gaming and narrative potentials.

All of these experiences led me to the decision that my research would focus on the development of a approach and design of digital, mobile, museum learning applications, that could enable individuals to build deep and emotionally significant relationships with objects, museums and other people.

3 Design of the insights kits

The participants were asked to firstly select either one of three personalised insights kits. The colors were red and blue, black and purple or orange and yellow.

The following instructions were on the front and back of the brochure:

> The enclosed items are the pieces of your insights kit. You'll find suggestions for how to use each one inside. They're empty and ready for you. This kit is a research tool to help me (the designer) get to know you (the co-designer/user) better. Sharing your thoughts, feelings, insights, style, expressions and ideas in this exercise will make it easier for me to design for you and easier for you contribute to the design process. Enjoy!

Figure 53 & 54 Insights Kit
Chloe Walker 2011

> Please use this Box to store and collect the material for this exercise. Feel free to use it as a canvas if you want to express yourself. Please send it back to me once your activities are over so it can inform the design process. Thank You!

To make the kits feel valuable and personal I hand made each item and created pockets within archival boxes. I applied unique color coding and made places for them to print their name.

It was imperative that the kit didn't overwhelm the participants but instead gave them a sense of accomplishment. To this end I limited the amount of pages within each book and clarified that they only contribute quantities they felt comfortable with.

Instruction brochure

Before sending the kits across to Australia I tested the instructions out on 4 colleagues and with their input ensured a good balance between clarity and flexibility. This change included color coding; grouping into easily identified museum and private activities; and writing a summary statement that appeared next to each item.

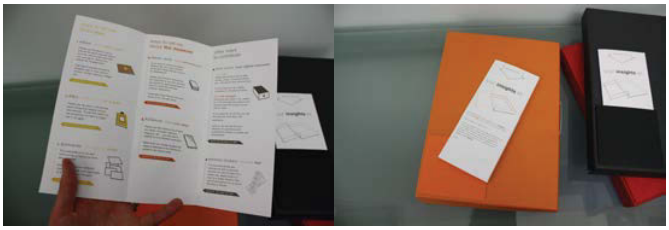

Figure 55 & 56 Insights Kit
Chloe Walker 2011

Album - what's your story?

Figure 57 & 58 Insights Kit
Chloe Walker 2011

The way someone tells a story reveals their perspectives on thought and action, what's valuable to them and what it means to them to be human. They are potentially a deeply personal and emotionally rich way of sharing what's meaningful in their lives. It is for this reason that I chose to include an 'album" in the kit. The album was intended as a space for each person to express themselves with visual or verbal languages. As the first of the "personal" items in the kit, the following statement explained it's purpose:

> "Please use this album to show and tell me about yourself; about your life; who you are and what you care about. Simply put, please tell me your story. Feel free to express yourself in whatever way is most natural--photos, writing, drawing, collage, etc...."

Diary - what do you do and feel?

Figure 59 & 60 Insights Kit
Chloe Walker 2011

The diary was the next personal item in the kit. I included a little insert on which they could write their name. The diary was intended to be a place for capturing the daily experiences and feelings of each participant. I wanted to know what their week was like, how they got around town, what they did in their spare time, how they felt about waiting in the line for the bus, who they spent time with, etc... Basically, snippets from a week in the life of each participant. The instructions were as follows:

> "Please use the diary to tell stories about things that happen during this exercise. Things that make you feel something you think is important or of value."

Postcards - what do you think?

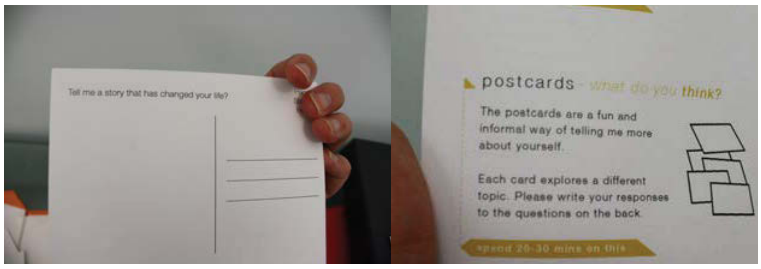

Figure 61 & 62 Insights Kit
Chloe Walker 2011

The postcards were the most lighthearted of the personal pieces in the kit. There was a limited space for writing and a short question top left on each. Each question targeted an area of my research focus and was intended to capture participant's ideas or opinions on each topic. The eight questions and *topics* were as follows in no particular order:

> Please tell me a piece of advice or insight that has been important to you. *(Meaning)*
> What role do art and design play in your life? *(Aesthetics, form & function)*
> Tell me a story that has changed your life. *(Personal Narratives)*
> Tell me about your favorite device. *(Technology)*
> How do you learn and what are your most valuable skills? *(Learning & Flow)*
> What are your favorite games and why do you love them? *(Games & Play)*
> What do you do simply for it's own sake? *(Flow)*
> What's the role of Museums in your life? *(Museums)*

On the backs of the postcards I printed my research maps (detailed in chapter ?) for each topic in case they were inspiring.

Theme cards - what interests you?

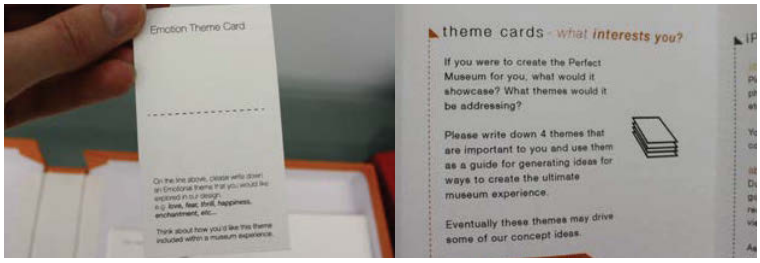

Figure 63 & 64 Insights Kit
Chloe Walker 2011

The theme cards were the first of the Museum focused items. These themes were intended to be starting points from which to base initial conceptual discussions upon. They became very important since they also acted as broader lenses through which to see the additional data from other items.

iPod Touch - your digital moments.

Figure 65 & 66 Insights Kit
Chloe Walker 2011

There were numerous reasons for using the iPod touch as a recording device within the museum:
I wanted to experience the museum through their senses. I wanted to see what recording mode they gravitated towards or felt comfortable with, for example, video, audio or photos. How they felt about using the device as they moved within the space.
I wanted to see what type of museum visitor they were (see chapter ?). Plus what subjects and exhibit types drew their attention, whether they were hands-on or hands-off, passive or actively engaged with the exhibits. What their opinions on the museum experience were for example what they liked and what they didn't like. And finally what they thought could be done to improve it.

Emotion stickers - how you feel.

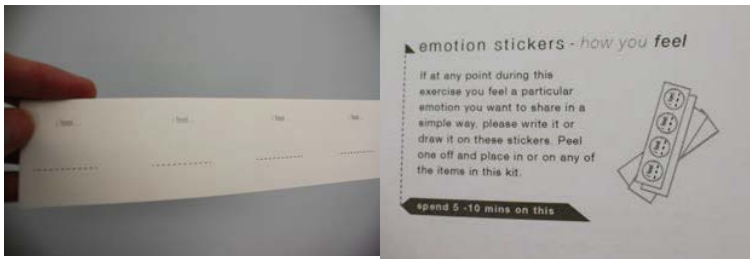

Figure 67 & 68 Insights Kit
Chloe Walker 2011

The emotion stickers were meant to be used in any possible way as a quick expression of an emotion. They could have been stuck on anything from the folder, through the books, to street signs and walls you'd take a photos of. The instruction read:

> If at any point during this exercise you feel a particular emotion you want to share in a simple way, please write it or draw it on these stickers. Peel one off and place in or on any of the items in this kit.

They were focused on making it easy and not to invasive to express how you felt.

4 Design Influences

4.1 Horizon (1999)

I first explored ideas of emotional interfaces in 1999 in my Undergraduate Honors year thesis work "horizon".

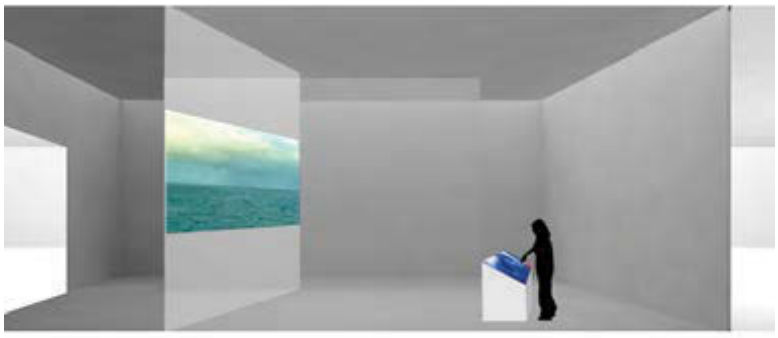

Figure. 69 Chloe Walker 1999
Horizon
Interactive Installation

The work explored numerous themes: personal vs social space; emotion as a narrative thread; synesthesia and the abstract descriptions of sensory blurring; the importance of the journey over the outcome; and how through chance and memory everything is interconnected.

For the theme of private vs public, the distinction was made by whether you were the person in control of the interface, someone close to that person or someone elsewhere within the room. Interacting with the interface was a powerful, active, engaged experience and watching this interaction and the audio/visual projection as an audience member was interesting and intriguing. The interactive installation was set up within a large room at the University of Technology, Sydney during the graduation exhibition (1999) and remained there for a week. The presentation of two spaces—public and private—encouraged multiple layers of meaning and understanding to emerge.

The realm of the personal space was not specified, but it was defined by the individual controlling the installation. Sometimes they sat all alone within the room; other times a friend sat next to them; or, a group of people crowded around and chatted with them throughout their journey. In this way the boundaries between public and private space were in flux.

The intimate level of the experience was designed to be visceral, abstract and a reflection of the private, sensual and emotional parts of our mind. Each interface was either completely abstract or partly abstract—containing a mixture of blues, yellows or reds with one predominant color. The predominant color defined the screen as one of 3 emotional states: happiness, sadness and anger. The experience was designed to allow people to moved from one emotional space to another or to stay within a single emotional journey.

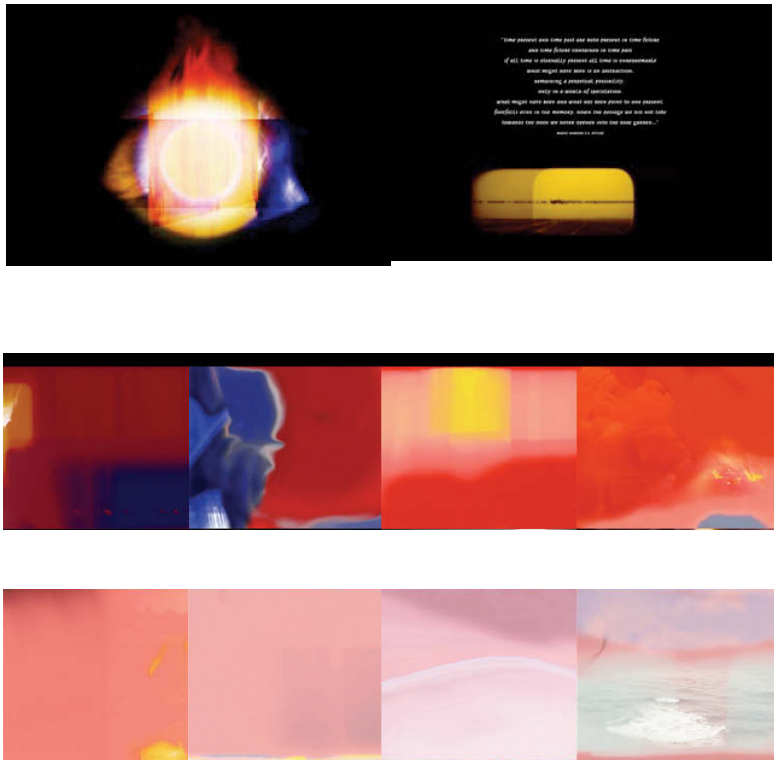

Fig. 70, 71, 72, Chloe Walker 1999
Horizon:
Personal space—Anger/red/fire/car Journey
Interactive Installation

The interface was designed to engage participants in an aesthetic and emotional decision making process. To force a shift away from any preconceptions and into a state of presence and intuition. There were no menus or lists of links, there was only the abstract interface with hotspots and audio cues. Individuals had to scrub the screen to find the links and whether they chose to click on a red, blue or yellow area of each abstract interface, was determined by whether they liked that color or the associated sound. This intentional omission and lack of a hierarchical taxonomy forced the journey to be aesthetic, emotional and viscerally motivated, and in turn to draw distinction from the majority of task or goal focused computer interface designs.

The social layer of the experience was that of the audience member. The audience watched the individual user and/or the screen or simply listened to the audio. The content designed for the audience was tied to a set of themes. Each emotional space was tied to an element and a form of transportation: happiness was air and a bus; sadness was water and a train; and anger was fire and a car. Video montages were associated with each interface and projected onto a large partly transparent screen, between the interface and the door. The sound was either an environmental sound (e.g. water) or a piece of classical music.

Figure . 73, 74, 75, 76 Chloe Walker 1999
Horizon: Public Space
Interactive Installation

As the user moved from the beginning to the end of their journey they moved from dark to light imagery. Symbolically this was meant to represent the progression from the depth of an emotion to a place of transformation and a reflection on transience and interconnectedness of everything.

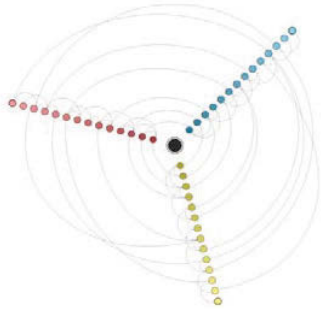

Figure 77. Chloe Walker 1999
Horizon
Narrative structure
Interactive Installation

There was no back button. Like life, you simply continued forward, towards the unknown, towards a blurred horizon. As Russell said about emotion:

> There is little convergence on an answer and therefore little agreement on where emotion stops and its causes and consequences begin (another perennial question). (Russell 2003)

During the week, people came and went and of those I overheard, some people said that they liked how relaxing it was and others how they liked to play it as a game or an instrument.

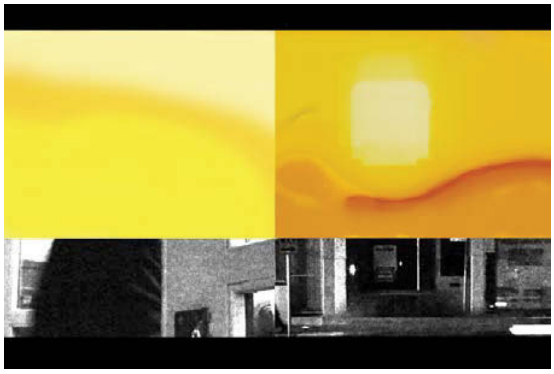

Figure: 78, 79 Chloe Walker 1999
Horizon
Yellow (Happiness) & Blue (Sadness) interface and video
Interactive Installation

Through the development of this work I became aware of the potentials for experimental interactive interfaces focused on engaging the sensory and emotional levels of experiences.

This work was the first in a direction that I'm continuing within this research, but when I designed this work, it was more of an art installation than a design piece. Since then I've realised that although I tried to make the work neutral and many of the decisions were affected by chance (abstract landscapes created with a random camera effect and footage time determined by throws of the i-ching), the work was essentially created for myself. This research will aim to combine the depth and ambiguities of an art project with the sensibilities that develop from the designer client relationship.

Within this research I'm aiming to extend many of the themes from Horizon, but instead of designing for myself I will design for others. Not a client, as it often is in my professional practice, but for an individual user. I want the final product to contain knowledge of our interpersonal process. For my part I aim to include some of the previously noted thematic and subjective influences along with a range of theoretical influences; and for their part I will design each work to use personally significant symbols or ideas in order to develop a deeper engagement and richer level of understanding and learning from the experience.

4.2 Design influences

Blossom by Jayne Wallace

Figure 80, Blossom
Jayne Wallace, 2008

I've been inspired by Jayne Wallace's phd research and digital jewelry designs for a number of reasons. Firstly by the emotional richness she was able to embed into her design concepts and secondly by the method she used to achieve the emotional richness. Of particular relevance is her digital jewelry design, Blossom (2007). Blossom explores the potentials for people to form personally, emotionally significant relationships with digital jewelry. Jayne Wallace designed blossom for a woman called Ana and blended objects and materials that were meaningful to Ana with a digitally enriched narrative to create a work that resonated for Ana on many levels. Ana lived in he United Kingdom but longed for her childhood in Greece. Blossom captured Ana's sentimentality in form of a flower with stamp petals and a twig branch, that opened only once when it sensed rain on the beach in Greece. By touching the visceral, behavioral and reflective levels of experience Jayne Wallace created a deeply, emotionally significant experience for Ana. Conceptually, she challenged perceptions that the digital addition to jewelry would dilute the emotional significance of it. I began to ask myself how if I could create a similarly meaningful relationship with museum objects via a mobile device.

One difference between Jayne Wallace's process and my process is that for her work the meaning was embedded more powerfully in the aesthetic and narrative of the object whereas in my process the majority of the transferred meaning came through in the ideation as this defined the most powerful connection to people's "why?" goals.

In addition she designed based on cultural probes only. I wanted to take the dialogical aspect further and develop an ongoing relationship with my participants in order to understand them more holistically. I also felt that the care that resulted from the process was essential to my motivation within my process.

I modified her approach to suit the remote nature of my research; to more effectively address my research topic and question; and to allow me greater involvement with my participants in the ideation, conceptualisation and visualisation processes.

WeARMoMA

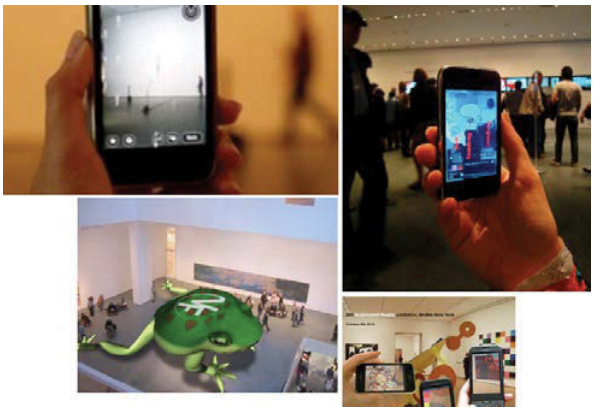

Figure 81. WeARMoMA
Misc. Artists, 2010

WeARMoMA has been influential to this research in that it explores the potentials for digital objects to compete with physical objects for status. This work was a rogue exhibition by online digital artists that was placed into New York's Museum of Modern Art via people's mobile phones. They rejected the conventions of curatorial control and displayed Augmented reality art among million dollar pieces. What this work displays is that the thrill of defiance combined with a philosophical question of "what is art?" can influence the perceived value of the digital art in a positive way. The exclusivity—in that not everyone at the museum was privy to the rogue exhibition—also looked at perceptions of value through limited access as well as giving those aware of it a sense of co-ownership over the works.

American Natural History Museum

This work is influential on my research as it is one of the most contemporary releases of a museum way-finding application. It uses the combination of wifi and rfid tagging to locate visitors within in rooms of the museum, and as a result gives clear directions to other places of interest. With past museum research revealing that 1 in 5 people approach a guard to ask for directions, this is a revolution for giving people a sense of control and empowerment within the museum.

Figure 82. American Natural History Museum app, 2010

PhillyHistory & UAR

Figure 83. Philly History
Philadelphia Museum, 2010

PhiliHistory is an Augmented reality initiative from the Philadelphia Museum, USA that places its collection of local archives within the physical space. It is based on the Augmented reality browser Layar and it shows archival photos of locations on top if the existing physical buildings or sites. It's interesting because it aims to take the museum's collection out of the museum and into the streets where people can have a connection with the city's history in a different way.

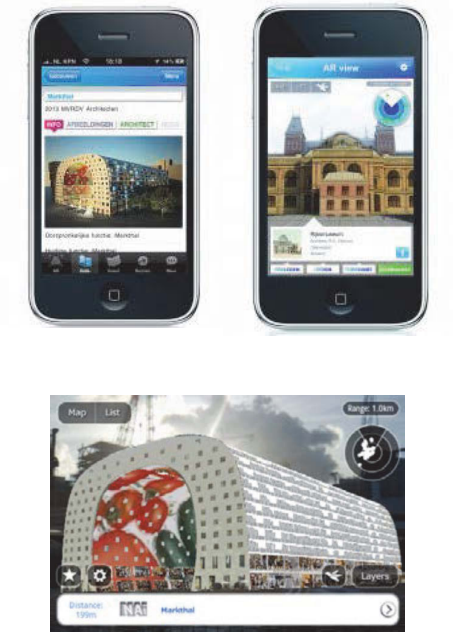

Figure 84. Urban Augmented Reality
Netherlands Architectural Institute, 2010

UAR (Urban Augmented Reality) is a similar initiative by the Netherlands Architectural Institute that places rendered 3D models within the urban environment. With this application you can view either the past, or the future overlaid on the real environment. What's interesting about this is that it presents the Netherlands Architectural institute as a knowledge center. It gives the knowledge more gravity and allows the institute's value to extend beyond it's walls and into people's lives.

4.3 Emotionally reactive media

Because emotions are so elusive, ambiguous and expressed in many different ways—consciously through language, physical movement, facial expression and gesture; and unconsciously through bio-physical responses like sweating or heart rate increases—it's only through reading the complex combination of these expressions that we can even attempt to label a particular emotion.

Through the following examples we will investigate the myriad different ways designers have tried to understand the complexity of emotion in relation to technology. Firstly we'll look at works that are designed to react to either conscious or unconscious emotional expression and then we'll explore works that are designed to induce particular emotional states.

Reading bio-signals

Environments present us with multi-modal sensory stimuli that elicit endless types and degrees of emotional responses. The following example—Bio-Mapping by Christian Nold from London's RCA interaction design department—has experimented with capturing and visualizing the emotional experience of people walking around a neighborhood. The work captures different levels of felt arousal (hi to low) and plots the vacillations across a physical landscape.

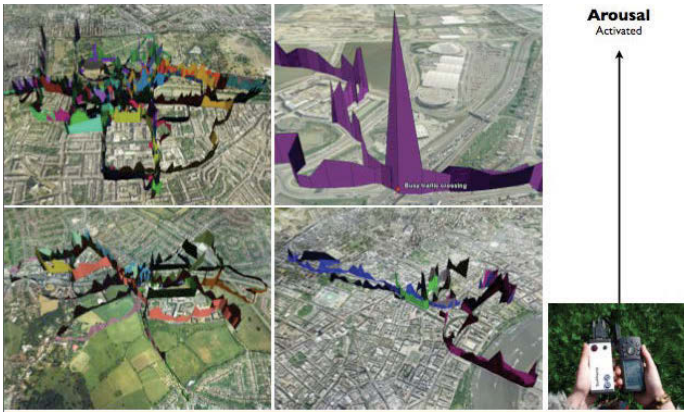

figure 85. Bio-Mapping
Christian Nold 2006

He combined the technologies of GPS and GSR to overlay these biomaps as graphs with peaks and troughs over Google Earth. His visualizations revealed that certain intersections and areas of these towns or neighborhoods displayed higher levels of arousal for people than others. He hypothesized that these levels of arousal were displays of stress. The assessment was made as an example the traffic is loud and aggressive, or a lane is the known site of a murder. What's interesting about this is that it may start to tell us more about our perceptions of objects in space. It is however largely speculative in it's assessment of emotion. It seems to only measure levels of arousal but not what the valence is.

Bio-mapping among other designs reflects the trend in research into human emotions and computers of focusing on physiological information eg. blood pressure, skin conductivity (also referred to as galvanic skin response) and heart rate. The Emotion mouse is another example of this:

> "The emotion-mouse registers your heart rate, body temperature, general somatic activity and galvanic skin response. By doing this it can discriminate between six emotions."

As noble as these efforts are, they don't allow the individual to express their emotions, verbally, gesturally, etc. because either only holding a mouse and applying a set of gestural parameters to it or being assessed on one plane only.

Reading Emotional Expression

In the paper ***"Touch Me, Hit Me and I Know How You Feel: A Design Approach to Emotionally Rich Interaction"*** the authors suggest that the object needs to be responsive to an expression of emotion and not simply physiological readings. They propose a 3 step process for evaluating the appropriate emotional connections between user and object.

1. What are the relevant emotional aspects for a context for experience?
    a. What sources of information on these aspects does the product have at its disposal
    b. How can the product get hold of this information?
    c. How can the product communicate to a person that it received this information?
2. How should the product adapt its behavior to the person on the basis of this information?"

In the shift from bio-metrics to self-expression, they're trying to create products that engage in an expressive conversation with their users. The difficulty lies in finding an appropriate reaction to an emotionally charged expression. eg. stroking, slapping, flicking. and the insight lies in the creation of a set of interaction parameters based on physical, emotional expression.

> "The essence of our approach is that a product not only elicits emotionally expressive actions, but that the feedback is inextricably linked to these actions."

By defining that the mode of interaction dictates the product/interfaces emotional reaction they're essentially mapping basic non-verbal human communication. The complexity arises in stating that the product isn't trying to alter the emotions, but simply respond to them, when there is no way that the user react and not be changed by the experience.

The design ***Key Table*** by Bill Gaver (et al. 2002) explored ideas around gestural, emotional communication.

Figure 86. Key Table
Bill Gaver 2003

The table had a pressure sensitive surface, that could distinguish difference between someone gently placing keys down and throwing them down. The *Key Table* assumed that the more

expressive "throwing" gesture expressed anger and responded by tilting the picture above it at an angle—warning others of that persons mood.

The Key table is a playful attempt at reading emotions, but it is really only reading the arousal and asserting a valence to it. For a design to reflect emotion it will need to combine both Valence and Arousal.

Creating Emotional embodiment

Members of the affective computing group Alea Teeters, Rosalind W. Picard and Seth Raphael worked on a project called *Emotion Bottles*. In this project they're exploring appropriate interfaces for accessing emotions, layering and the:

> "interaction between conflicting emotions, and the meaning of transition between clear emotional states as a person empathizes with or projects their feelings onto the bottles" (Teeters, Picard, Raphael 2005)

Each bottle contained an extreme emotional state and represented our ability to "bottle-up" emotions within ourselves. This user scenario illustrated the goals of the project...

> "Two people walk into the room mute. They look at each other and down at the bottles in between them. One person picks up the angry bottle, shakes it real hard, and releases the cap which flies across the room on a string, followed by a mad sequence of intensely angry words, nonsensical but intentional. As they fade, the person gives the bottle another shake that results in a quick, short outburst. The second person picks up the depressed/submissive bottle and pulls up the spring loaded cap, letting out a smoky string of defuse words, quietly stating and fading into silence. She cocks the cap to the side and pours the bottle out, letting out a stream of flowing sadness, punctuated by sobs of intensity, and falling to the floor in self pity. The first person takes the sad bottle and shakes it into the stream of the angry bottle, resulting in yelping sadness and sad words purged by angry overlays. The second person takes the happy bottle, closes the angry bottle, and lies the sad and happy bottles side by side, releasing the lids. Out comes a bubbling stream of mixed emotions and apologies, slowing after the initial flow. The first person again takes the angry bottle and places it next to the other two, opening its lid as well. The result is neutral speech, spiced by words of emotion but with low intensity. A relaxed, conversation and occasionally a friendly argument. The second person places the bottles upright and closes them one by one - angry, happy, sad - and the two people walk out of the room in silence. "

This exploration and others like is raise interesting questions about the success of embodying emotions within responsive media. Can you trigger an empathetic emotional response without the human element? In this case the human element was the spoken word and the "meaning"—albeit ambiguous—was contained within the verbal expression of words and tones. The disembodiment is not dissimilar to that of the telephone, but without a person that you know on the line or a degree of empathy for the stranger on the line it's very easy to simply hang up without explanation or consideration.

In contrast *ScreamBody* (Dobson 2004) was designed is an individualised, portable container for a scream. If a user needed to scream and it was an inappropriate situation, ScreamBody would essentially silence the user's scream and record it for cathartic playback at a later point. This design explores some very interesting questions around the socialization of emotions but it does place the screamer in a strange position by having them carry around a strange shaped container device. In terms of empathetic connection, because the scream and the screamer are intrinsically linked the potential for a deeper and more meaningful connection is possible.

Figure 87. ScreamBody
Kelly Dobson 1998-2004

Constructing Emotional states

Similarly the physical space can be designed to evoke particular emotional and cognitive states. In 2004 Waterworth Waterworth and Riva developed a 3 layers model of presence within a museum. *Proto-presence* is our sensory orientation towards or away from an environment, *Core-Presence* is our perception and selective attention through cognitive binding and temporal coherence; and *Extended-presence* is the high thought of memory, anticipation of the future and the integration of memories or past experiences, learned ideas, beliefs, skills and hopes for the future. They used the Exploratorium in San Francisco, to develop a work with three emotionally charged rooms: Paridiso (calm); Pergatory (neutral); and Inferno (anxiety) and they found that the Inferno room (anxiety) to lead to a greater level of presence, whereas the calm room Paradiso lead to marginal daydreaming. Some explanation for this may lie in the base psychology of survival and self-preservation. When there's danger a more acute awareness of the present is much more important.

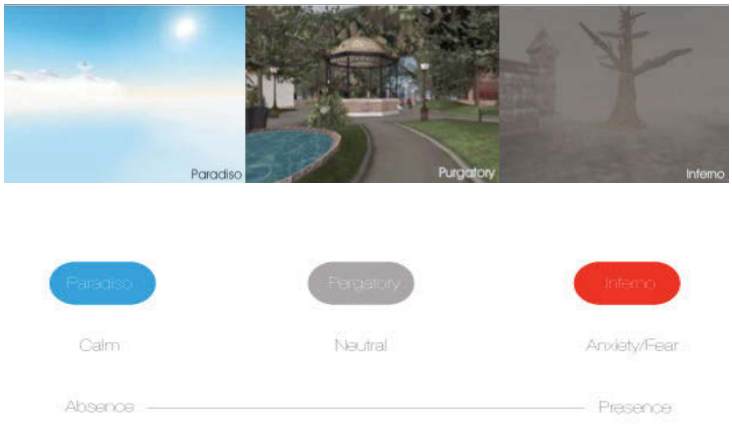

Figure 88 : Waterworth Waterworth and Riva 2004
Exploratorium
Interactive Installation

Train by Brenda Braithwaite explores the emotionally rich potentials for game design to use allegory to teach empathy. She designed the game to teach her daughter about the holocaust. She intentionally obfuscated any initial references to the holocaust, but instead structured the game to build security and attachment before revealing the horror to come.

> "...its emotional power shifts from the epiphany of its ending to the individual gestures that construct its play session -- gestures (pushing, shaking, that must necessarily be enacted in order to reach that finale." Ian Bogost

Figure 89. *Train*
Brenda Braithwaite 2008

Psychological tools have been used in the film industry for decades but they're only now being explored within the interaction design community. Stephen Anderson (2010), a User experience consultant, has developed a set of 52 *Mental Note* cards aimed to inspire interaction design brainstorming and detailed design inventiveness. The cards are reference psychology and are designed to be used to help designers construct specific emotional experiences and motivations. Here are a list of the ones most relevant to experience: *Status, Story, Surprise, Familiarity bias, Proximity, Peak-end rule, Self-expression, Sequencing, Serial position effect, Autonomy, Delighters, Chunking, Appropriate challenges, Feedback loops, Variable rewards, Limited duration, Social proof, Scarcity, Competition, Pattern recognition, Limited access, Humor, Rewards, Achievements, Shaping, Limited choice, Framing, Curiosity*. These specific psychological tricks will definitely construct desired results if used effectively, but they will only ever be shallow and transitory if not connected to deeper personal significance and meaning. It is also important to note that they must be used responsibly and not simply to excite people into buying something nor guilt them into donating money. This research acknowledges that these tools are effective but must only be used if the motivations are ethically sound.

Appendix C: Documentation for research

Transcripts of Interviews with Lexi

Lexi & *Chloe* Discussion; 09 May 2011; 8:15-9:34am NYC; 10:15-11:34pm Sydney.

1. WAYFINDING >

<lexi>

"Way finding in museums is usually related to service finding. So they put toilets and cafeterias, and other sort of services, at the same level or on the same layer as the rooms and exhibitions. So in the end you don't really know what you're looking or and instead you find the toilets. It' s using a language that's not appropriate within the space. [...] yeah it's a complete different language. When i go up to the toilets, I know exactly what to look for: the boy and the girl, you know. Or if i'm looking for an ATM or anything, I look for certain icons and that's not just because we're designers, it's because it's a universal language. But if you look for, um, nature or you're looking for historical artfacts, that you have no Idea what they are about. How do you look for something like that. And as a designer, how do you address that language thing, you know? And on the other hand without killing the surprise factor. When navigating around you do want to be surprised. but you still want some certainly. you want to make sure that you don't end up in the garbage dump"

2. an open invitation for discovery

<lexi>

"In the space you provide hints of what you may or may not find. You provide hints on how to access certain spaces as well. So if you have an open plan, your body experiences will be completely different to an alley or a narrow space... you know? Your predisposition will be different, so the indications will be different and what you discover is especially different. if there's an open space with absolutely

nothing I don't think that you're gonna just cross the space. I'll probably go around the sides of the space—it'd be intimidating, you know? What's inviting and what's intimidating within the space depends on what you're inviting that person for.[...]

why did we unwrap the mummy we were not supposed to.. [...] That'd be fun, really awesome if you could unwrap a mummy![...] Augmented reality "

3. "fun here", "Surprise", "awesome" ,"try this", "why not this", "Go there for some really cool stuff", "Mum, Dad: Here!" = a conversation

<lexi>

"how people move around the museum, this is something we have to listen to. "mum, come here!", this is something you actually hear in a museum right? If I'm in a family and I'm listening with my kids an one of them goes "mum come look at this! I'd definitely go, maybe if the sign reads exactly that I'd probably go, you know?

Even if you go with a family of friends, you all have a different timing of what you. And I notice that, I've seen it myself in my own research there's a lot of pushing and pulling during the visit, there area a lot of interruptions of the visit. Some people just enjoy looking at things, observing of analyzing, or thinking, or taking their time, so even when it's a group experience, it's the sum of individual experiences. ["you only live within your mind"] but you do want to share it here and there.

<chloe> [maybe the application can help you have a social experience while you're by yourself]

yes, yes, definitely.”

4. Small labels = engaging delivery of knowledge

<lexi>

“yeah, they’re really boring, you’re reading all the time. You’re reading at school, you’re reading at work, reading here, there... Going to a museum to keep on reading is the least thing you want to do, um... and when labels are that small that doesn’t help. [how could a digital device improve this?] um... not really. that remains a mystery to me, defining how much information we want to disclose. Do we want to be a big encyclopedia or do we just, you know, want to be a click, a click on peoples minds and let the rest develop. people keep going to museums again and again and revisiting the exhibitions. people don’t leave a museum with 100% of the information in their head. They always leave room for some data, they always have some sort of reflection after the visit. They keep coming back, I mean of all the people I interviewed this month or last month, none of them had been there for the very first time.

So that says something you know, that means that they keep coming back. So there’s no need for overloading their heads with information. If they want more—were in the era of the internet—if they want more they will find that more. So to what extent do we want to fill their minds, and to what extent to we just want to generate that curiosity? [what could an app do to make these types of experiences better]. If we just let them know that this is just the beginning, I think people can catch up their own rhythm, you know what I mean? This is like the previews of the movie. People know what they’re going to find and if they want to see the whole thing, they will go for it.

This is like navigating basically on a website. you don’t do everything on the homepage, you just tell people what they’re gonna find.

Museums start becoming open libraries, and what's the limit there? it's not our duty to explore that part—top what extent are museums becoming like the new wikipedia." During this exercise, and being a real post-it person, I kept thinking of ways you could remember, like if you're exploring something it would be interesting to know more about this, but how do I remember that? Will I remember? You know how you sometimes are in the street and you see something and you think, oh i should write that down, but you think "no I will remember", but you don't. When you get home you go, oh shit what was that? what was that? I should have written it down and you miss a lot of things. So maybe this app can give you the opportunity to give you, to save your preferences, or save, or send to yourself hints of things you thought of while moving around the museum,like a to-do list, a checklist. So this device I go through with you, this wristwatch, I don't know, will be a hint while you get home "oh remember that at the museum, remember how much you liked this and that" and you go "oh yeah, yeah, I'll check that" you know, um, it could be a link to the museum website like we were talking before, xyz information and the rest is saved for later.

how can we allow people to access that information later on. [...] build your own experience. During and afterwards. *Your experience doesn't stop at the door, your experience keeps going. [...] I think it allows people to continue with a dialogue outside the museum. in a family group , a friend group or a school group, sometimes these conversations come up and people can say... "oooh look I've found that, look at this, I found this, but couldn't find that" It generates a conversation outside of the museum as well. It prolongs the experience [...] and you can say "aaah you missed that, oh me too, we should definitely go again"*

You know how people are very visual in general. I'd really enjoy something that takes me back to the place after the visit.

"oooh imagine gps-ing your pathway through the museum" generating a layer every time you get there, the tracking system tells you exactly where you went.

5. Immersion

[what could we design to address this theme?]
<lexi>

"I think it could be... going back to what we just said about mapping the movement and some sort of temperature of what you like the most...umm.. especially with the belonging header. I think immersion and belonging... I find it really hard to put them in separate theme cards, 'cause I thought they were so, so strongly linked...umm...because you belong into a space, but the belonging is not just a spacial thing. Belonging's actually committing, actually engaging in an emotional way and a spacial way. So that's why I find it so hard to put in different cards. and it depends on your level of immersion at the same time. **You don't belong unless you are immersed.** *and there's no immersion without belonging. [...] Purpose is a great way to say it [...] Because you're part of it. [do you think that people could not feel immersed of belonging in a museum] Oh yes! I see it all the time. People that don't think that they can do things. Or people don't know to what extent they can interact with things. But definitely, definitely effects the way they feel part of it or not. you can see that in their body language. You see people that barely ever take their hands off the pockets...or you can see people walking around with their hands together in their backs or bottoms You can see people that won't let go of a kid...you know? it's body language that tells you whether the person feels like home or like a complete stranger. [what could we use the mobile phone for to encourage immersion and belonging?] well think of it like this way... remember at the powerhouse there's this panel in which the silhouette of hands are drawn on the panel, and ummm.. and you can put your hands there and you can see the connectivity of electricity... I actually made a video of it when I told you on the ipod that's one of the things that I remember doing with my colleagues when I visited. yep, so that being said, if you have a hand that's drawn there, that's for people to put in there. um... i'm not saying that you should have a hint or a silhouette of a mobile device everywhere, so people put the device. I'm just saying*

that it's just little indicators that will tell you what you can or cannot touch, whether you can or cannot climb. There's a lot of, still a lot of showcases... and cabinets and I think that's wrong. Even um... even in the development of new exhibitions they insist on doing cabinets or showcases or tables, or it's little physical exploration of other dimensions of the space. the climbing, jumping, pushing, pulling, umm—I think there's a lot that can be done in terms of a journey, within the space. Um and if there's going to be a device that helps you through the navigation of this space, the device has to be called, has to be drawn into that movement. It has to be part of it. I feel with handling this thing—with me all the time—I felt limited. I kept thinking and I actually mentioned it, what about a wristband or something, something that you can still carry with you, but don't limit your movements: in terms of hands; or in terms of jumping; in terms of moving...um...We're so into hand held devices, it's such a strong concept, that we assume that it has to be handheld. I think we can do much better than that. [...]

<chloe> [it definitely raises and interesting point around how you engage with that interface, though if it's, for the sake of like, kind of practicality. if it' on a phone right, that's fine, but perhaps the phone does adhere to a wristband, that you, so you can have it just casually placed...hands, you can leave your hands free as you're moving around the space, but then when you need it or when something happens maybe it vibrates, it vibrates to tell you you need to pay attention to it, and so you can suddenly find] there you go *[some information on it, or maybe, maybe even like, like it tells you when there's something for you to access, and it tells you how to get there, and maybe if it's something that's inside a case, perhaps you can put the phone up against the case, and, and you can, i don't know, touch the phone and it will be almost like touching the thing in the case, maybe it vibrates a you touch it, or maybe it squeaks or something, ahha... I don't know, but like, so maybe there's]* I love that *[maybe there's a way to have that tactile experience, like through the conduit of the phone, even 'cause things are always going to be in cases]* yeah that's true... well hopefully not *[the interim, for the interim I suppose. yeah well that's very interesting, that's cool i suppose that there's this notio that it can, it can ummm, not, not inhibit, shouldn't inhibit your experience] hmm yep[I mean maybe also you could wear it around your neck or something, maybe it displays something about you, haha,] yeah yeah [so people can see that... hehe...]* and again belonging *[yeah, feeling like you belong in some way].*

6. *Culture*

<lexi>

"more than other cultures as what you are from and what you have and stuff, I thought of it as um as a common sense thing.. of respecting each other's times and pays and interests and ways of exploration.. umm... again what we're talking about, even when you visit as a group, you're still individuals, you visit together to have a common purpose, but with individual ways of exploration... and usually museums —and this is just a physical constraint probably—don't take into consideration how these different personality if you want, converge in front of an exhibit and how to avoid that confrontation. Especially when I comes to interactive stuff, interactive are not yet designed in, in um, in a community way, they're designed for an individual experience so, you know somehow that saying goes, something like...my freedom ends when your freedom begins.... or something like that.. um, that this is my space...umm... right and you have a space of your own, that at some point your space and my space will be the same, how do we engage in a respectful way. How do we both, or the three of us or the four of us, and sometimes 15 of us; experience this space together, still respecting each other. [yeah, I mean yeah, it's definitely something I think that is a really good point because it can often be a, you know, a challenge of social interactions in a museum, like how..] yes , yep *[not only how, questions around how you're meant to behave in the space but how do you behave around other people? Do you respect them doing their thing in front of it and stand back, or do you come up and join them and ask them a question or you know?]* well that's why i have been researching in my own project how the interaction happens and how open people are to this social interaction through the technology there they have. *[yeah right, yeah] and I've seen that interaction a lot.*

The whole concept of time and space and sharing, understanding and engaging starts here with the perception of it, ummm, I'm more interested in this book, living with complexity by Don Norman. I find Don Norman interesting and fascinating sometimes i wish I was right in front of him, cause i read it and have discussions with him when i read, he's a really interesting guy, it's like, aaah I really want to have a cup of coffee with this guy... and I love how he blames designers for everything, I love it, and he's not a designer.

7. *Your time, my time*

<lexi>

"We don't go to museums to find out about the latest thing, we go to find out about the past. if we want the present we'll just turn on the tv, we'll go to cnn, or we'll go to a geek website or something.... we go to museums because we want to discover where we come from, here at this very moment, we go to museums because we want to acknowledge our present through the experiences of who made that possible... i think that's a general understanding of people in terms of museums. it's not just the curiosity of it, it is acknowledging the work of others, it's acknowledging the effort of others, it's acknowledging that somebody tried something that ended up being what you're doing now. *[yeah right, and it's. yeah i mean it does tie back to all your,yeah that awareness,* that awareness of being part of the continuum *] yes [that awareness in itself gives you that sense of belonging and respect, and then if it's done well, obviously immersion] yes,* they're all super related.

Alice & *Chloe*
Discussion; 16 May 2011; 8:00-9:34pm NYC; 17 May 10:15-11:34am Sydney.

1. Relationship with the Powerhouse

"

I've got a long term relationship with the powerhouse. I remember going to it as a kid and have great experiences, since childhood and of course some of my work's there and I did some work experience in the conservation lab, so I really love the place. It just seems to be running down a little bit at the moment, a but underfunded, that sort of thing.

[Yeah It's sad isn't it...aaah. Well we're going to try and change that now aren't we.] yeah! *[put it back on the user. It could basically be an empty building]* yeah, a maze *[full of augmented reality objects]* projections and holograms. *[So I guess It was an interesting perspective to get on the museum 'cause i hadn't been here in a while and I wasn't really, I mean I've been away so long, I wasn't sure what state it was in, cause I know we've gone through funding humps you know peaks and troughs and stuff like that, you know, so it's interesting to see it through your eyes... and I love your work, it looked amazing, your design. that's so cool! And are you doing stuff like that still?]* I'm trying to get back into it. I've pretty much spent the last decade teaching and researching and that sort of thing. So I'm trying to get back into design, starting up a small business and that wort of thing. But it's only at the business plan stage...so. *[great....and so, that's so cool. I'll have to buy your stuff when it's out]* I'll let you know [if you need a website....haha.. um...yeah cool.]

[and then you had some thoughts about the experience, like the layout and the wayfinding, you found it was an issue, you don't know where you are and you can't find anything, and you're trying to get to the ecologic exhibit and it's like "where?" down here, around the corner, through some maze, and then.. And I loved that video you took that was just your feet walking around, that was really cool! hahaha]

I like textures and surfaces, and i like the variation, it helps you find your way and that's sort of why I did that. Because it's how the track was lighted or how complicated the path was to get from where you wanted to start from to where you wanted to go to...so. *[yeah right...so you're very interested in the abstracted visual*

language?] yeah *[yeah cool, I really loved that 'cause I um, it made me feel a lot like I was there but it was mysterious, so I thought that was a nice element to it… it was like, oooh where am I now. Oh that's cool, I wonder where I could be… It was really nice. I loved it. And um, you sid that it's a shame that some of the exhibits are old, and not fresh. Like the exhibit in innovations in engineering, that was very current but not connected in any way to the other stuff that is actually related to the same issue, idea or theme. which is a bit of a shame hey? so maybe we could try to fix that problem.]*
One of the great things about the powerhouse is that they do have an awesome collection of stuff and they do put really old things on display, and I love that about the powerhouse, but it's trying to keep things in rotation and bring in ne things and make it more current and tie it all together in a cohesive manner rather than just have captions of information here and a disconnected one over there, and not really interacting at all. [yeah right…. so that funny that you say that, 'cause that's something that I've been really thinking about and it's just that there's an opportunity to make the connections between things more meaningful] mmm [maybe through a device of some sorts] yeah *[and you said as well that the peripherals really effect your experience, not just the exhibits but the little kind of rests in between, the hurry, hurry, slowly, slowly, rests in the pacing. it's almost the dramaturgy of it really, it's really intense then you slow down…]* yeah *it sort of gives you an opportunity to find the things you're really interested in and then even if yo just want to sit in the space and find inspiration and let something come to you in a while. then, it sort of helps to have a nice space around that you could not rush yourself. [there's the potential for the reflective moments as well. where you kind of make sense of the experience and sort of take it in and watch people.]*

I think they do playing well, like for younger kids, they do playing well at the powerhouse. But in terms of setting up spaces for older people to chill out a little bit it's sort of not so catered for. [ok that's interesting, it's yeah, because it's you know, it can be exhausting going to a museum, and it's often the case of people getting overwhelmed by it and then feeling guilty 'cause they couldn't see everything. I's crazy.] It's huge, and it's a place that you want to be able to go back to and not feel terribly rushed to get through and you want to be able to get to something that's not too expensive hopefully, so...you know just to make an event out of it...

2. Connectivity

[yeah I completely agree…. yeah cool. Um…. from the theme cards you said that connectivity was an important theme potentially…. you mentioned that as your space theme card and so ' can you go into a bit more detail about how you cold imaging that playing out and what you imagine that, what we could design to enhance that theme?]
hmm... I think with connectivity with people's past experiences, how that influences with their interaction with future experiences and also how people connect with other people in their environment and other objects in their environment and the spaces themselves. So for me it's sort of an overarching, more holistic idea of sort

of how we're working in the space and I guess it goes into that whole actor network theory... umm idea... of um, even inanimate objects being actors within the space. But very much so, sort of connectivity between the actor and the object within the space and the space positions them for people to come in and engage with them. For example the ecologic exhibition and then the sort of, I can't remember what it was, the eco-surfboard, or eco-engine that was up in the innovations exhibition and them not being connected at all...that you'd have to go down 2, 3 flights of stairs to get to the ecologic exhibition, which is not very well signposted at all. And you wouldn't know that it was down there, assuming it was down there. um so that's a sort of dis-connectivity or disconnectedness that I sort of see in this particular instance... that i mean how do you get over it if you don't know that those 2 things are there and they're related. [yeah... right... yeah so maybe we could come up with something that allows you to visualise or allows you to navigate things that are more connected.] *yeah* [or maybe, maybe eve if you don't want a directed experience you could have something where starts to build connections as you're experiencing what you might just stumble upon, so you can understand the connection.] *Um...a few years ago i, for the Sydney bike festival, I think it was the Sydney bike festival, or it might have been the Sydney festival. There was a little program called Writers Spoke and you could hire a bicycle and ride around Sydney and attached to the front of the bike was a gps and a recording device of sorts, and they had made this little program where you'd ride around to various spots in the city and you'd pinpoint yourself and leave a little message there. And it goes into this network and then other people can listen to this message that you've left at this point. It's kind of like hunting for other people and different types of messages that they've left and it was a really nice little experience and I think that they got a lot of people riding around sydney that otherwise wouldn't have.* [so it's a little bit of a game] *yeah, it's a little bit of a game and It's sort of connecting these ideas to, one idea to another...And I know in the powerhouse they've got this massive collection and sometimes they put things on display or not ... but just from talking with you now, I was thinking of, you know if you had a device, so if you look at the innovation exhibition and you sort of scan in the little code that it's got it says, oh, there's a related exhibition and downstairs, and that way tells you a bit more about the Ecologic or something in the ecologic exhibition,another artifact maybe that relates to it... and this might get over the connectivity issue.* [yeah] *um...and it's kind of like a treasure hunt as well, so it's a little bit fun and you don't have to have 2 related objects sitting next to each other to sort of get over that issue and it allows people to choose whether or not they want to sort of explore a bit further to whether it's just a passing thing that they find interesting. Whether there's something they can come back to another day* [yeah, right, so you can almost build like a personal record that sort of stays with you, growing and expanding with you] *I hadn't thought about that but yeah* [that could be kinda cool, yeah... would you want it to have any kind of gamification in it at all? Would it be fun for example if, so say you scanned that innovation piece and it said "oh down in ecologic there's another piece that's very connected to this. and um... get there in 5 mins and you get points" or something... do you want that to it or does that trivialize it?] *I don't know,*

see there are people that go to exhibitions, I'm being very [um general... yeah] umm... some people want to explore, but some people go with a, um, purpose. If I was going there with a purpose I wouldn't want to play games, i'd kind of want to know, oh this is connected to that, it's very much about finding the information that I need within a certain period of time. but then again there's that sort of playfulness that's sort of like, well ok I know that this thing is down there an maybe I'll go down and find it sort of in sort of the next hour of so or I'll just keep wandering around, I don't know. I don't know if the time limit is such a um pressing thing, i don't know, it could be, It depends on.. [I mean for you, 'cause um.. you're essentially the client in this interaction and you may want to design something for someone else, because you're a designer, um and I know that I would find that hard to break out of... I'd be like no not just me... haha... what about other people?? Well this is actually for you, so it's more about what you would like. What would excite you?]
i don't think yeah, the time limit is not so important... I kind of like the idea of... I've got some friends into the concept of caching... i don't know if you've heard of caching? [aaahha..] it's where you sort of get a little object, you bury it somewhere, or you hide it somewhere and this is an international thing so you ah...they tend to be a little sort of logos or um chips that people make up with their group logo or something like this (people do it in teams). And you go around collecting and moving these little things. I think the aim is to collect and it's all about the treasure hunt and how sort of for moving pieces around the world. You can pick up something from the queen victoria building sort of sitting on the statue and you can fly over to new york and leave it at the base of the statue of liberty or something like that. And it's just that aaah, umm I guess larger... being involved with people that you are not necessarily ever going to meet, it's this abstract community sort of idea. I'm kind of getting off the point here...[no no no.. there are some interesting ideas there. in that there's this notion that, i mean you mention community quite a bit] mmm [and the ideas of... I think I had it on the next slide actually, about swapping stuff and sharing stuff and caring for people as well as things. um and so um this resonates with me as well in terms of what you're saying it's—I mean it's playful, but it's a way of connecting.] mmm [and it'a a way of staying connected, I mean is this something that you're really into or that you want to get into or] I haven't done it and I'm quite time poor [yeah right... haha..] so [hahaha I can relate] um yeah at this point in time I think I can so without that other thing i my list. I love the concept and i think it sounds like a lot of fun and I know that my friends go off and for days and they're sort of going on these hunts and it's sort of... yeah it's like treasure hunts for adults. [yeah It's really cute, I really like it.haha... I mean you could do something like that through sort of virtual artifacts I suppose] yep [like you know, as you were saying with the little messages biking around, well maybe it's, maybe you're sharing a museum experience with someone who's at a museum somewhere else in the world and wherever they are they could collect something or add something to the virtual space] that's interesting [yeah you know how the situationists used to kind of use a map of one place to navigate another place. It could be a similar kind of thing so you could feel that you're so maybe someone's in the Met and you're in the ecologic exhibit and that maps to the ancient egyptian room in the met, and they leave a

little piece there for you to pick up.] yeah that's really interesting. I like that sort of international aspect to it as well. It's umm, yeah. *[yeah so that's kind of interesting, that there could be a connection. Because the museum, I mean it's not a sterile single culture reflection, it's a reflection on humanity and civilization and time and space and everything, so it's not like it's irrelevant.]* no, definitely not. *[oh cool, I quite like that Idea. I mean what do you think. If you could imagine anything, to really suit you and your needs? I mean maybe you're time poor. Umm, in a situation at the moment, maybe it's suiting that? maybe it's about really short bursts at a museum, well i know you have to pay so that's not, that's a barrier there. Umm, what would you, i mean you mentioned something about, you mentioned you could buy the sustainable clothing from the exhibit while you're in the museum, is there really anything really, really top of mind, that you'd like?]* yeah it's um... i think that getting that connection as well to the outside world is a good thing. It's going to be limited by the exhibits that are on as well I mean if you've got something really old, you could have a link to the historic houses or something like that. I think it's tricky i think if you're maybe displaying products that are currently in the marketplace, people want to know where they can get them from, I mean I've had a few emails about the pants that I've got in the exhibit. *[haha, cool]* that aaah, the tricky thing is that sort of , which retailer do you go with and do you stock everything in the museum shop and should you really be, should that be the point that you're trying to pursue with the external connections and all that sort of thing. I think it might umm.. get a bit messy and need another level of management to really deal with that kind of connection. But umm...perhaps if the external people who are interested in, say retailers or magazines, or predominantly retailers who are interested in various things being in the exhibition, perhaps if they could take charge to create something like a blog or a framework that gets set up on the internet and people could just post to it so it's very democratic and that doesn't really require a lot of policing besides basic security and making sure people don't spam it, that might be a way to get around that. And you could see what's current and who's stocking what, and if they've run out of stock, or if they're not going to make any more of this or if they are sort of upgrading to the next option then they can post things up there, and then it's not the focus of the museum to actually take care of it, and they kind of provide the community space for people to explore the concepts of the exhibition a bit further outside. But ah, yeah the museum doesn't have to actually take care of it themselves. *[So do you think that would be a really valuable feature? umm if we were to create something tied to al these community concepts, and sharing, the notion of sharing, and remote spaces and global kind of relationships, is that kind of a I suppose, e-commerce side, because then it's really about putting money where your mouth is, or do you think it's not as important for you?]* I think it is important because I mean there's a lot of books that I know of that would be really good if people are going to the ecologic exhibition, if they could be interested in getting their hands on them and the powerhouse museum can't stock them all. um, it's just that sort of that getting inspiration from an exhibition and then being able to explore that concept further once you get outside of the exhibition, so that you, so that that experience doesn't sort of stop there. And there's nothing wrong with it stopping

there if you just want to go in and think about something. But for me, going to an exhibition, often times I want to, go via the gift shop afterwards and see what' they've got there. Sometimes I find that almost as curious as some of the exhibits they have in museums and art galleries. [cause it's a curated set as well isn't it?] *yeah, it is absolutely, and the little piece, the little momento that you can take away that away to remind you of what you've seen here, whether it's a book or a book mark or something that's a little bit quirky or made in a very, umm.. sort of playful way, to remind you of something that you felt in that exhibition* [yeah that's really lovely, because even if you go by yourself and um… i forgot to mention to you that what i'm designing is for you and well it may have something to do, well definitely like conceptually to do with community but it's probably for the kind of individual type of experience] *ok* [um… i mean it could, if you really want it to be about going with someone else that's fine we can make it work that way, but I guess it's a little simpler in a way to make it just about the single experience, cause you can always expand out to the partnership experience from there, but then it's this notion that if you are going by yourself and you're wanting to share it with someone in some way, then like you've got the gift shop with things you can get for your family, or the postcards you can send to someone, or whatever it might be, there's something really nice about, and a limited take away as well. Not like you take everything and give everything to everyone, then that feels like in a away like an irresponsible lesson, but just to take just one thing with you or something like that or sort of to preserve the ummm special qualities of, and I guess the power of each object in one way.] *And it's kind of an external thing in a way sort of either receiving, you're being given by the exhibition or by the curator, that you're purchasing in the shop, you can take sort of photos in some of the exhibitions, and it means that you kind of can't, to buy a little bit more when you get to the shop, well at least in my case that's what I've found, well you can do drawings and al that but if you're time poor sometimes that's not really an option, then i take photos which is what I typically do if I'm allowed to and if not then i try and find sort of a postcard of something that is my favorite thing in the exhibition, but I don't sort of send it away, I just hoard them, hahaha* [hahahaa and put them on your wall] *little boxes where nobody else can find them* [to stay forever hahaha…] *that's right* [oh that's great! haha] *hahahah* [oh I just got thinking then that it could be so lovely to have, you know I mean, we could have this community sharing aspect while you're at the museum, but the takeway could be almost that you, you know, it's like you're favoriting a particular object and then you get the privilege to follow the experience of that object through the other people that might be sharing it or commenting on it or visiting it, you get to see activity, um…like the life and times of …this object] *that sounds, yeah, absolutely, the way that people use it, that's a lovely idea* [yeah right, cool. I mean, anything else coming to mind like what we could do?] *ummm…yeah, when you were talking about that, something popped into my head, ummm, there's that, there's the, I can't remember exactly what it's called, but it's like a free library concept where you've got traveling books and you stick a little sticker in the front of the books and you leave it somewhere after you've read it and somebody else picks it up and then they read it and they leave it somewhere and somebody else picks it up and they sort of … so you've got these books that pop up at a bus stop or a*

dentist office and you can take it with you. ummmm... so maybe something like that, if were looking at artifacts in particular and we don't necessarily need to. ummmm... sort of a way of thinking about the actual physical object and how it might pass from hand to hand, and, i guess it ties into that caching idea as well that umm...

i think that the strongest idea, if we're looking a concept that is quite easily regulated by the museum and updated by the museum, that um is like the headphones you take around with you if you're looking at an art exhibition ummm so that the museum can update it as they need to and you take it around and maybe it's got a virtual presence as well after you've had this trip you log onto the little console or whatever maybe you've even got an app... well not everybody's got iphones so, ummm... so you've got this program you log into, you go through your experiences, you've chased your various sort of favorite items in there, you've got potential external links to where you might be able to source something or find a publication that you're interested in or connect to an online community that looks specifically at this particular thing.. Sort of then as you give the little console back at the entrance desk then you can go home and sort of go to work and go online and look through your little collection if you see what you'd like to do next.... but then, that's the sort of, I don't know if that's as prescriptive as you want to go with this or whether you want to have a bit more fun with it or whether you want to get a sort of experience on it or a couple of other models or this may be something that comes to mind that is highly do-able, um...i guess with all the, particularly with all the app development and interactions with museums. That sort of infrastructure seems pretty much up and ready to go.

3.Sustainability & Conservation

[if we were to go pie in the sky tough, ummm, obviously reality kicks in at some point, but if we were to go pie in the sky, of the ideas that we've mentioned so far, what would be your favorite, or a combination of a few.... I mean what you just mentioned is a realistic view of what could operate... but imagine you have your own device you and you can do anything you want with it, what, how could you imagine that being extended further, past reality..? haha] ummm, i think it would be lovely to have a space near that exhibition, where you could take things like books, like one or 2 books, like obviously not all of the bad books that you're trying to get rid of, from your collection but vinnies wont take them, *[hahah]* like a few books that you really enjoy and you don't need them

on your shelf anymore and you want to leave them for somebody else to sort of take any enjoy as well, so aaaah.. options for those sort of experiences, ummm, and maybe that tracking those sort of things could be incorporated into this device, so say you're picking up a book, you take a photo of it and it goes onto your particular profile page or whatever, or onto your list and you can sort of post it up onto the powerhouse community page so people can see who's got their book and where it's traveling and that sort of thing... i mean it would be hard to do with other items, like clothing, you need a clothes swap to do, i mean it's a very situated event it would be hard to do. [that's so lovely i love that idea that the whole idea and philosophy the community and sharing in the community is extended into the physical realm from the untouchable physical realm into the totally tangible own-able physical realm, i think that's really lovely] Something else that.. sorry [i think...sorry, you go on..] no you [it's just that I think it's a really lovely idea that could be taken in lots of directions] Something that could be messier, but that could be very valuable for sustainability at least, ummm sort of exploring an aspect of that is sort of having like seedlings available, like your seed saver stall there, so people can find out how to grow their own herbs and have a mini garden and all that kind of thing, because food miles is a really big issue in terms of sustainability and umm trying to get people to grow their own and go into community gardens if they don't have their own garden space, even having, i've got a little apartment, like I've got a sunroom out the back of our place and I've got 2 big herb pot planters and herbs flying out the sides of them... aaah... doing the little things to show people exactly what they can do to um be a bit more sustainable in their every day lives, and of course i'm specifically talking about this exhibition with that, but that physical ummmm sort of empathy and how it relates to your every day can be brought into another, concepts like say if you had an exhibition on travel and ummm space travel, maybe it could relate it in some way...but ummmm... [well that's kind of interesting and got me thinking of an idea and maybe partnering with some kind of company that sells carbon credits or something, and you know that knowledge is the commodity of the new era, so maybe there's a notion that you can, as you learn, learning about ideas to do with sustainability, buy you carbon credits] that's an interesting idea [so you can almost like, go to the museum, and the more you learn about these issues, and contribute that knowledge it gets you, well this company will match it.] mmmm [there's just something about it] well that could be an interesting way sort of partnering the exhibition and even the museum, to and even I guess a more tangible way i guess, that might also help with funding or sort of getting the museum itself a bit upgraded or at least more energy put into it to bring in exhibitions and the actual presence of the space up to speed a bit... [yeah right, it could like tied to your idea, you know your idea, well a paralleling of the notion of going into the space and sharing and becoming part of a virtual community in your learning and then going outside that and having that realised by you being given a book on a subject that you were interested in the museum. There could be a similar relationship with you going into the museum and learning about this stuff and you putting it into action somehow, like... then you do, you buy some seeds, you do something as well. and that can be like you can get extra credits by doing all this great stuff, you know. like offsetting all your carbon.]

yeah it could also be an interesting thing to tie into the green energy... well at the moment I'm looking at various plans 'cause I've moved into a place where I'm trying to get as much green energy on my plan as possible and it's quite expensive to get that change done... and so maybe those industry partnerships, they could do special deals. Again it starts to maybe a level of complexity that the museum staff can't actually deal with themselves, I don't think, their time, but perhaps a third party greenox or greendrinks, a non product specific, well non-business specific entity could sort of step in as a middle person and manage that. *[yeah, completely! That'd be really interesting... woooo i like this this is great! and what was like.. you write down lots of museum experiences, like we go we sort of focus away from ideological perspectives and more on experiential perspectives]* *uhuh*

4.Museum Experiences

[You mentioned a lot of museums that you really loved, that contained your favorite experiences, what was it about them, i mean, say, I guess both tactically, how can you imagine an application on an ipod touch or iphone, or an android device, how could you imagine an application helping to stimulate a similar type or experience for you within the powerhouse?] *I think with those, hmmm, that's tricky, with those experiences so with the australian museum, or the british museum in particular. The British museum i'd gone to once, and it was one of the things I really wanted to do when I was last in London, umm, I sort of went through like a hellcat with a tail on fire,* *[ticking stuff off, hahah]* *yeah just trying to get through and see as much as I could, I took photos like a madman. Umm, the quality of experience wasn't so great* *[but frenzy's fun]* *yeah, but it was just getting there, it's an amazing space, like the atrium and the light, just an incredible building, and I guess the australia museum has that similar old historic awe, that the British museum has but on a much smaller scale. yeah, very antipodean. So the powerhouses a much different space, but in terms of the actual exhibitions, ummm I guess the australian museum is a bit more awesome because of the stuff it's putting on display, so it's got dinosaurs, it's got taxidermy, it's got gems, these are things that aren't necessarily man made, obviously man's had a process in displaying them, but they're curiosities of the natural world. There's something that I find awesome in that.*

but I mean the powerhouse, I love their collection in a different way, but it's all about manmade about what man can do, about how man changes things, mankind I should say rather, so it's a very, I guess the australian museum's a bit more humbling, but the powerhouse museum's tend to make me a bit more egged on, this has been done, i could do this a bit better, *[ok, ok]* *yeah so it's a different kind of, I have a different emotional reaction, a different emotional reaction to them. I think that sort of influences my expectations, I've got higher expectations for the Powerhouse museum. I mean the Australian museum's this sort of sandstone, it's*

been there for ages, it's rock, it's there and you go wow there's all this natural stuff, but the Powerhouse museum is very much about I want to see old stuff, I want to see where we've come from but I also want to see where people think that we're going to and I want it to be good. [yeah,ok, so there wouldn't, I mean, would it be valuable at all or would it be trying to combine two things onto sort of square peg round hole, if you were to try and create the same level of awe through some augmentation of storytelling that may not currently of be as kind of deep as, I mean you go to the natural history museum with a life of understanding, the magnitude of how far we've gone from way back, you know dinosaur time up to now, whereas the Powerhouse, it's you know it's a shorter timeframe, but still the stories are quite amazing, but they're just not told very effectively.] yeah, i think you've got a real point there, I mean the display paragraph that most objects have in the powerhouse is very small, I mean I remember when I was writing the display paragraph on mine, I mean the project was so complex, how can you get a 5000 word essay down to 200 words, I mean you have to do it for certain reasons, but you just don't quite get all the significant complexities that people kind of want when you get an object like that, i mean with al that stuff in the powerhouse, not only do you have it on display but there's all this history of the curators and the conservators taking care of it and the detail that's gone into it, I mean that sort of history behind the objects is very curious as well so just thinking back to when I was doing work experience in the textile conservation lab there were these massive folders of each artifact, showing where it had been cleaned, the different fibers that had been matched, the different dyes that had been used, and 1700 silk from japan, and there's all this really rich detail, that you don't get to sort of see or experience, and there's a lot of people that might not want to know that, but I want to know that sort of detail and I want to see that richer connection, what these different artifacts have gone through throughout their lives, not just when they were being used by people which sort of stays with then but how they're been damaged or worn out in certain places, to when they get to their actual place in the museum and then the conservator has to look at them and think maybe I have to deal with this delicately and clean it up a bit otherwise it's going to wear out even more and fall to pieces a lot sooner that we actually want it to. So I just like that back of stage [back of house] information, just [kind of the insiders guide]. Yeah, just to show you how amazing some of these objects are and show you how much they're traveled through to get to you, and presented so nicely in subdued light and they're on a purpose built sort of bust [yeah it's funny because it's in a museum it's so, and yeah it's such a funny thing too because some of the objects on display are quite practical, like real world objects and then to see them disconnected so much] yeah [from their usefulness, you know it's so, you know it's that whole art theory debate about the white wall and you know, the rarefaction of objects just through the display of them] yeah [in a certain way, yeah so it's like that must be, yeah that'd be great, if we can somehow come up with a way to make to give you a connection with it, to make you feel the life of this object as if it had the same level of awe that we brig to a lot of these other objects that are more, much more kind of potent] yeah, that'd be great [alll right!] let's do it [let's do it… ok, so I mean that does come down to, there's definitely a level of practicality that I'm not going to be

addressing so much in these projects because it's important to aim towards the future] yeah *[and maybe because it might not be able to be done now does not mean that it's not worthwhile putting some energy into it, some energy and get some funding for it and make it actually happen in the future— so we can kind of push some of these ideas a bit]* ok *[...and of course a lot of man hours could go into telling those stories, but maybe a clever way of...*
i saw a website, it was an art video website so it was basically um, you know a whole lot of discussions presentations, talks by artists or people running museums, that sort of thing, it was quite wonderful actually because as they went through the discussion on the right side there was a scrolling panel that contained a whole lot of different points and an image and a point, and the image was just an image that was grabbed from the web, that had been tagged as an appropriate image to display in connection with this point that the person was saying right now... you know... so as you went through there was all these different references so easy to find out more about this particular point, it was orchestrated in a way that was.. and dynamically done too, and it wouldn't have required a lot of effort to tag this out there on the web or just trawl to connect it in. um.. it was just a great way of complimenting a story that's being told.so technically this would be a way to do it, but yeah it was very interesting.]

5. Virtuality

I know that this is, not necessarily realistic for the timeframe that you've got for this particular project but just thinking about those folders from the conservation lab I know that the powerhouse museum has got published all of the items that they have sort of publicly available so, the public can see all the details of the conversation and that technically if they wanted to, you can take stuff in there if you need to have it conserved and it's just your personal item [ok] and i was just thinking of, umm, if those files could be digitized, the photos they're taking are on digital camera anyway, sort of to have a digital sort of file of all that stuff and have it cached away and if there's a program to have it bring up bits and pieces if you want to see what else is in the powerhouse exhibition would be a really lovely thing to do, i know it's just a bit more pie in the sky. [i don't know, are you talking about visualizing the collection virtually as well as physically within the museum?] yeah, so having that physical cache having to see the.... [I'm just trying to find something 'cause there's a cool example of i put a presentation together a while back sorry about this, it's a pretty big presentation so it's a lot bigger than what you can see, let me try to find the page i'm after, and I don't want to bore you with all the, or like spoil anything that might be coming up by showing you some of this stuff, but there was a work, only recently in the MOMA and it was an augmented reality piece and what it was, was that they got all these digital artists from around to the world to submit their works um into this rogue exhibition that was taking place in the moma, so ummm you can see so basically this is an augmented reality exhibit

and this frog was geo-located in that spot in the foyer in the moma. So you could walk around the moma and see all the official exhibits and at the same time see all these guerilla exhibits] **wow** *[in there too so it's totally doable, itwas done lat october, so that could be something that's quite interesting. If you're interested in the breadth, exposing the breadth of the museum in the museum context then that could be one way to do it]* **that's really interesting.** *[ok, i don't want to lead you down a path so, but you suggested it so it's obviously like something that's relevant]* **yeah, that's sort of a very curious way of utilizing a lot of space in the museum i guess, it has lots of potential particularly for way finding I think.** *[to show directions or some kind of cues in the augmented space]* **Even even presenting information in an interesting way in that virtual path.** *[Absolutely, like you can do a lot with it, I mean it's a little clunky in terms of the locating, i mean it's not too bad, i'll pull it back up still I don't think yo can see, but sometimes the work would be half way through the floor and not totally be in the right spot.]* **I kind of like that though, like when I go and see a band, I like to see bands that aren't too polished. they've not like been around forever and are a bit clunky and make mistakes, i like that. [a bit real hey] a little bit raw a little bit off center it' not perfect.** *[human]* **yeah, a little bit odd.** *[yeah, more curious, ok well there's something interesting there, would that be something that's user controlled, or popularity, or would it be a time based thing or would it be purely curated or would you define what yo see based on your interest or a theme yo might want to see]* **that's a tough one, I want it all, haha.** *[haha, can I have it all?]* **every color umm** *[Chloe you left out maroon, haha]* **Well maybe i don't know how complex it is to put it together, but different** *[I don't have time to actually build this now, but I do need to know to build it or that it can be done, but ummm this research is as much about the process of getting to the outcome as it is about the design, but i'm not going to be able to actually build something if it's too difficult to do in the time, but it's ok to actually test it out as a concept.]*

Well can I give you an ideal and you can sort of pare it back. [yeah of course] **Ideally i think the wayfinding would be, there would be a template or a model that the museum offers in a way, and within that you can actually read information in it on your way to finding an exhibition or to finding that particular object, there might be a bit of trivia in there so you can learn something on the way, not necessarily, but, on the other side of that having those big objects or virtual objects inhabiting the virtual space of that sort of physical environment like the big frog in moma. Having that as being something the user can interact with sort of move around or change color or dissect so, or sort of crawl inside, so if you're standing in the middle of the virtual frog and you look up you can see it's beating heart, cause you could be just standing in the frog..** *[Let's do it, I love it!! that's incredible, I love it, so there could be like a way to see a virtual version of the static thing to see how it's working]* **and that's just like really** *[i love it, i think it's fantastic, let's do it. it's wonderful. I think it may be like 5 years away, but as a concept i think that's great]* **it'd be a bit awkward if kind of stand at the back of the frog and you're looking up and you end up in the bowels** *[that's a bit gross, yeah you know that's the thing. Because the museum is such a unique opportunity, it's a unique learning opportunity that you don't get to be in the vast spaces surrounded by*

objects and other people in a particular mindset, it would be perfect for that, I mean it's a learning place, where you go to learn i think that's cool i think it's amazing. Yeah cool, cool, so I'm going to transcribe this, and make a list and we can revise the concepts].