

Back to the drawing board?

Exploring process drawing and
pathways to drawing participation in
Higher Education for graphic design students.

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I dedicate this thesis to
my late husband, Peter Saunders and
my late mother Jennifer Lane,
who always believed in me.

Special thanks
to my father who passed on a love of drawing
and my two daughters,
Avril Saunders and Lena Peel,
who supported me throughout the difficult years.

DECLARATION

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Signed:

A solid black rectangular box used to redact the signature of the author.

Date: December 2021

Janet Saunders

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ABSTRACT

***Back to the drawing board?* Exploring process drawing and pathways to drawing participation in Higher Education for graphic design students.**

“I can’t draw”. “I don’t draw.”

While facilitating my first brainstorming session with undergraduate *Visual Communication, Design* students at Western Sydney University (WSU), I was struck by the absence of any drawing activity in the classroom.

Technological innovations have significantly reduced the role of drawing in the design process since the mid-eighties; however, research confirms sketching, or indeed any form of hand-eye coordination provides valuable cognitive and communication functions in the creative process. The ambiguous nature of a freehand sketch allows for creative interpretation, encourages ‘fluency’ and iteration, and provides a ‘thinking trail’ for evaluation. The physical act of drawing can also aid concentration and memory. Many professional designers recognise process drawing as a vital ingredient in their creative thinking processes and those of new graduates. Through a literature review and reflection on my creative practices, this thesis identifies the benefits of process drawing to think, create, communicate and collaborate in the design process.

So, if drawing is so useful, why don’t design students use rough sketches and thumbnails in the classroom? Through a practice-led enquiry, I reflect on observations made as both “insider” and “outsider” within my communities of practice. As a professional design practitioner, visual artist, teacher and researcher, I investigate the role and value of process drawing in the twenty-first-century classroom. The attitudes, behaviours and ‘designerly’ practices of WSU design students are explored through a multiple-choice *Why draw?* questionnaire conducted over six years. The interviews and group discussions with final-year, high achieving WSU design students help clarify the creative thinking practices of these participants and identify possible barriers to wider drawing participation. The observations, interpretation of the literature and questionnaire and interview findings underpin the studio exploration into possible pathways to foster drawing participation in the classroom.

A *Speed Squiggling* activity was designed to demonstrate the value of drawing and to encourage divergent thinking, iteration, creative flow, and design thinking skills. A *Pre-and Post-Why draw?* questionnaire was collected from second-year WSU Design students before and after the *Speed Squiggling* trial. An analysis of students’ written and visual responses explores the effectiveness of this kind of drawing activity to encourage and foster drawing participation. *Back to the drawing board?* adds to the critical discourse in drawing research and design education that argues process drawing has an important role to play in the

twenty-first century classroom and should continue to be clarified, demonstrated and encouraged in design education.

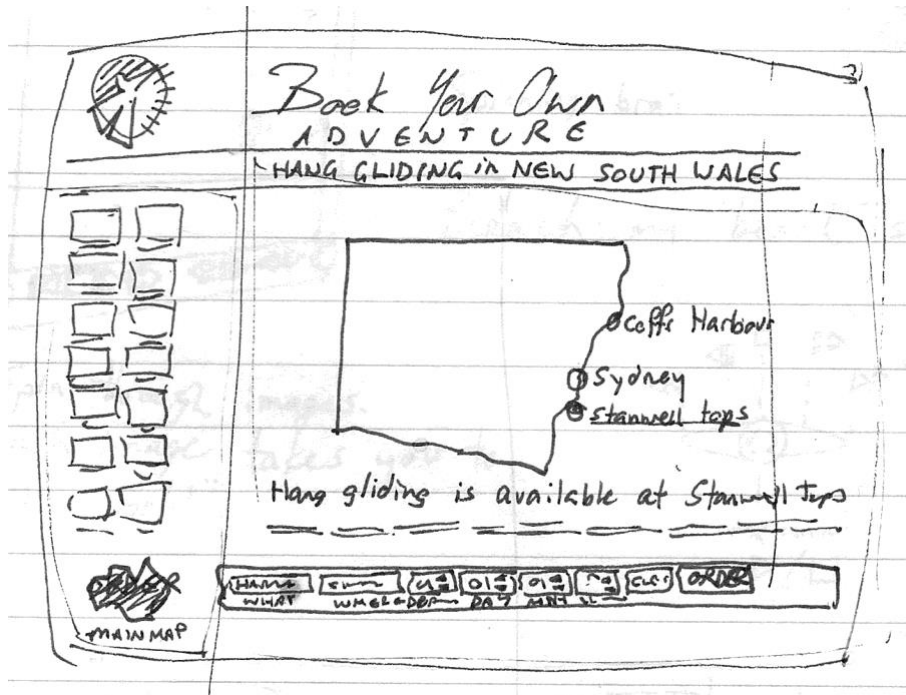


Image 1: Thumbnail drawn with client, Eye Cue Communications, 1990.

It is evident that designers adapt drawing to whatever task or project they are working on at any given time and it is equally clear that designers' drawing practices have adapted to the massive changes in industrial practice occurring over the years (Schenk, 2016, p. 212).

PREFACE

Drawing and me

Throughout nearly three decades of my career as a graphic designer, I experienced first-hand many of the technological changes that transformed the graphic design industry in Australia and overseas. Computers replaced layout artists, reprographic operators and typesetters. Later, the internet, social media platforms, and touch screen technologies changed the landscape yet again. As a result, there were significant changes to the roles of graphic designers, workflow and production processes. During this time, I had not been conscious of a significant change in the way I used drawing in my design practice. When I look back through old job folders and archival material that remained from twelve years running a small graphic design company, there is evidence of a gradual shift in my drawing practices in response to technological changes, reduced budgets and client expectations.

Despite these changes, I did retain some process drawing in the concept development stages of a design project. I still instinctively reached for a pen and paper to explain or work out specific design problems. When teaching undergraduate design students, I encourage mind-maps to plan and define assessment briefs; thumbnails to explain layout, composition, navigation and demonstrate the value of iteration; and storyboards to explain story flow, camera position, lighting and framing. Perhaps this is a result of pre-computer tuition acquired at Sydney College of the Arts in the early 1980s? I discovered the changing relationship I had with drawing was not dissimilar to the experiences of participants in the longitudinal study conducted by the UK-based researcher, Pam Schenk. Schenk (2016) interviewed and collected process material from a group of graphic designers during the same 25-year period as my design career. There are many parallels and similarities to my experiences in the way these participants used drawing to think, create and communicate.

The creative processes, for both my image making and professional design practices, use freehand sketches in the initial stages. I use both paper and pencils or a tablet and stylus. I don't regularly use a sketchbook, but my thinking processes commonly incorporate thumbnails, rough pencil sketches, and drawings on overlays. I also cut and paste drawings and photographs within Photoshop and other image manipulation apps on my iPad. Early in Schenk's (2016) study many of the designers interviewed kept a sketchbook and notebook, "both as a means of developing background knowledge and as a repository for recollections of inspiration" (p. 57). In my pre-computer days, I found inspiration in design books, annuals and magazines.

In the first two decades of my career, I spent considerable time adapting and responding to new technologies and new ways of working: the use of drawing varied depending on the design task. Time was money, so I used the most appropriate methods and tools that were both efficient and low cost. My

memories of the way I used process drawing are similar to the participants in Schenk's (2016) study, who noted a gradual combination of hand and digital methods in their design practices. "Much as designers maintained the importance of pencil and paper, they also appreciated the growing range of digital tools at their disposal and chose them carefully according to their requirements" (p. 165).



Image 2: Studio equipment of the 1980s.

tracing paper carefully stacked next to boxes of rub-down lettering. Each sheet of Letraset cost more money than I made in an hour (see Image 2). The Pantone markers stood proudly on the shelf next to my irreplaceable Pantone swatch book, stock photo catalogues and reference book collection. The smells of spray adhesive and fixative mixed with those of acetone, spirit markers and all night coffee. I felt ultimately at home working in this kind of studio environment. Drawing was central to many of the design tasks I was employed to do. However, within two years of graduating from Sydney College of the Arts (SCA) this all changed.



Image 3: Macintosh SE (1988) & external disc drives used in the 1980s & 1990s.

In Sydney during the mid-eighties, I began my career sitting at a drafting table with an adjustable T-square, holding a blue clutch pencil in one hand and a sliding 'em' ruler in the other. My tray was full of lead pencils, scalpels, rotary pens, and a complete compass set which held my favourite ruling pen. In the draws below were two airbrushes and piles of partially cut Frisket film held down by a box of Windsor and Newton gouache and bottles of ink. My yellow airbrush compressor was held together with black gaffer tape and lay waiting for the next illustration job. The metal map-draw in the reprographics room held large pads of Bank, Bond, Canson and thick

Almost all this equipment, plus my typography 'markup', and 'rub-down' skills, were replaced by a little Macintosh SE with a screen the size of a large postcard (see Image 3). The new *MacWrite* and *MacDraw* software programs allowed me to begin freelancing from home, so my husband and I moved out of the city and started a family. Working from home in the late 1980s was a relatively new concept. There were

still plenty of visits to the city to meet with clients, collect four colour film separations and check proofs. At these meetings we would quickly sketch possible ideas to clarify briefs, or draw changes on proofs at the printer.

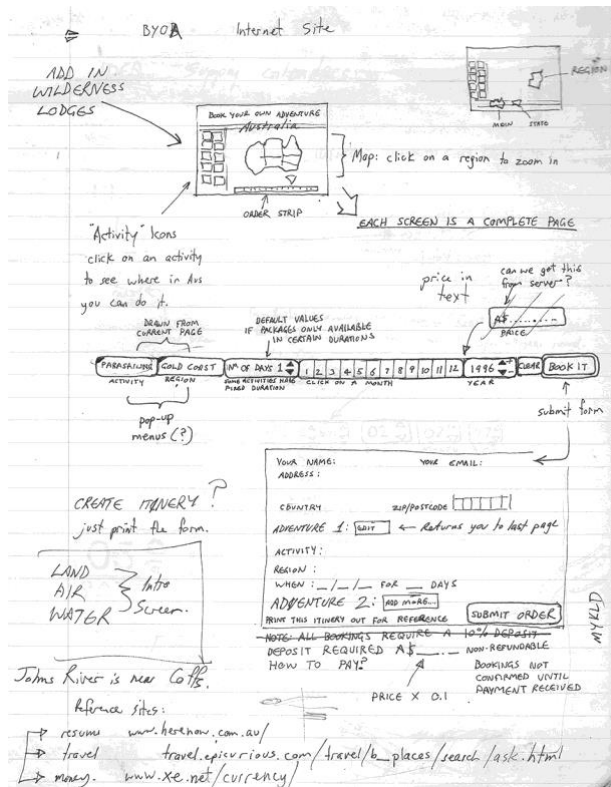


Image 4: Working sketch drawn with client, Eye Cue Communications, 1990.

Sketching ideas alongside clients was not practised universally. Schenk's (2016) study revealed that "almost all the graphic designers interviewed expressed a considerable reluctance to draw in front of new clients, in particular, it was felt that this could make design look easy and therefore not good value for money" (p. 58). Peter and I continued to sketch while consulting with clients, as it was a quick way to define a brief (see Image 1 and 4).

During this period of rapid change, Schenk (2016) broadly identified three groups of design professionals. One group was comprised of "the enthusiasts" who readily explored and revealed in all aspects of the new technology. Another group were designers who had already been in the graphic design industry for a number of years.

These "experienced adopters" gradually acknowledge the advantages of the digital technology. The final group, the "avoiders" were concerned with the negative effects of computers. As a result, the 1980s gave way to a much greater range of individual forms of practice" (p. 97). My husband was an "enthusiast" while I fit into the "experienced adopter" category. We became "digital immigrants" overnight (Prensky, 2001).

The 1990s arrived, along with the "recession we had to have" (Australian Prime Minister Paul Keating, 1990). My husband, who was working for a large architectural firm in Sydney, became unemployed along with 10.8% of the population. To keep up with the 18% interest rate on our new mortgage, he joined my freelance business, and we became a Desktop Publishing company called Eye Cue Communications. Unfortunately, we were not the only ones to make this transition. Instant Printers and desktop 'cowboys', with no previous design training, emerged on the scene. Some clients invested in their own high-resolution printers and employed in-house designers, no longer needing our services. Our company replaced an old dot matrix printer with a black and white laser printer, which significantly reduced the number of Pantone marker renderings I drew. The number of clients on our books shrunk although we

did manage to hold onto our bread-and-butter clients. The budgets and timelines became smaller, and our clients' expectations grew larger. Computers provided "more bang for your buck!" which was the catch cry of the 1990s. Our small business survived the transition by providing custom-made illustrations, photography and multi-slide presentations, as well as desktop publishing services, but there were many changes yet to come.

The first time I stopped to question my approach and consider the role and value of drawing in the creative process was in the early 1990s. I was asked by a former colleague to come up with a few rough brand concepts for a small cultural museum in Sydney. I was overloaded with projects at the time, and the budget was low. The client wanted a symbol to accompany their name. I had recently acquired Freehand for my Mac SE, which replaced the MacDraw program I had been using with my tiny Macintosh computer. I quickly produced a few variations using this vector software. While these were received well by my former colleague, she was concerned that they looked too finished and would be rejected immediately or accepted without further development. She asked me to render them as a rough pencil sketch to show the client. This incident was the first time I remember considering the inherent qualities of a pencil drawing that allowed for multiple interpretations. Schenk (2016) observed that designers during this period noted: "essential qualities of an image could be quickly explored through drawing on paper, while the detail could then be resolved more slowly and carefully on the computer" (p. 100).

By the mid-nineties, my husband had developed an interest in 3D visualisations and interactive software. He discovered the video game called Myst and decided to teach himself how to use Hypercard and Director. This hobby led our little company into the emerging world of interactive multimedia. To understand and learn these new technologies, I began a *Masters in Digital Design* at my local university, which was known then as the University of Western Sydney. Our business moved into larger premises, and we employed another designer and photographer. For a brief period, our company thrived, and we invested a significant amount of money in the next generation of technology, awaiting the spread of the World Wide Web.



Image 5: Reference material used during the 1980s.

The internet rapidly became broader and faster, and our competitors became global. The search engines had improved, allowing online illustration and photography libraries to provide a cheaper, viable alternative to the creation of customised images. Internet searches quickly replaced the illustration reference books and type manuals (see Image 5). Schenk (2016) also notes "The ability to scan found material and transfer the digital information onto a personal computer

was a revelation for many designers exploring the new technology" (p. 102). Although computers and the internet provided an exciting new platform, the work our company produced during this transition period was less exciting. I spent a lot of my productive time learning and keeping up with new software programs as they continuously improved their capabilities and functionalities. Eventually, the Adobe Suite took the market share, and Print Shops finally invested in large format digital printers and replaced their PCs with Macs.

However, by the late 1990s, our company had moved away from print-based projects and concentrated on producing customised websites and online resources. Like many other graphic designers during this time, to reduce outgoings I took on additional roles and became a writer, animator, and video editor. I even acquired some necessary programming skills and dabbled in Flash ActionScript. My partner and I taught graphic software classes part-time at Western Sydney University to keep some regular money coming in. I still worked as an illustrator and began producing simple time-based animations in *Flash*, drawing directly into the program using a Wacom tablet. I also kept up my image making practice and attended a weekly life-drawing group.

It wasn't until 2009 when I took on the role as an instructional designer for a new multimedia company that I questioned the role and value of drawing again. I was producing storyboards for a series of animated sequences explaining the standard operating procedures for railway security guards. I chose to use a computer-generated wireframe approach rather than a freehand drawn approach. It was not the first time I had produced a storyboard and rough visuals in this way, but it was the first time that I used a wireframe approach to brief another illustrator other than myself.

I had created some freehand sketches that were used to scope out the format and story of the training resources with the client. At the time, I thought it would be quicker and easier to redraw these simple wireframe Images directly into the vector animation program Flash, rather than redraw the storyboard using freehand sketches. The client was happy with this approach, but the illustrator was not. He complained that the wireframes looked too finished. I had already indicated an illustration style to the client, and this had restricted his creative input. On reflection, he was right. This incident forced me to think about the importance of freehand drawing. Where and when is it appropriate to use? The computer gave the impression of saving time, however, as one of Schenk's (2016) interviewees commented: "designing on-screen did not necessarily lead to efficiency as designers could still spend hours because of the range of different choices made available by the software employed" (p. 108).

A new century was rapidly approaching. My husband and I survived the 'millennium bug', but we were both overworked, thinly spread, and unable to compete with the larger, emerging multimedia companies – so we disbanded the company. During this same time, Schenk's (2016) interviewees also noted "clients expected faster turnaround and would greatly underestimate the time needed for the thorough development of the design solution" (p. 112). Our little company also had issues with clients who knew that revisions were easier to do and thus expected late changes would be cheap or free. We retreated from working directly with clients. My husband took on a web manager role in the large Australian science research institution, CSIRO. A few years earlier, I had taken on an interface design role with a new multimedia company aligned to the University of Western Sydney, Centre for Design Research and Education. CADRE specialised in immersive interactive educational resources. I no longer thought of myself as a graphic designer. I had become a visual communicator.

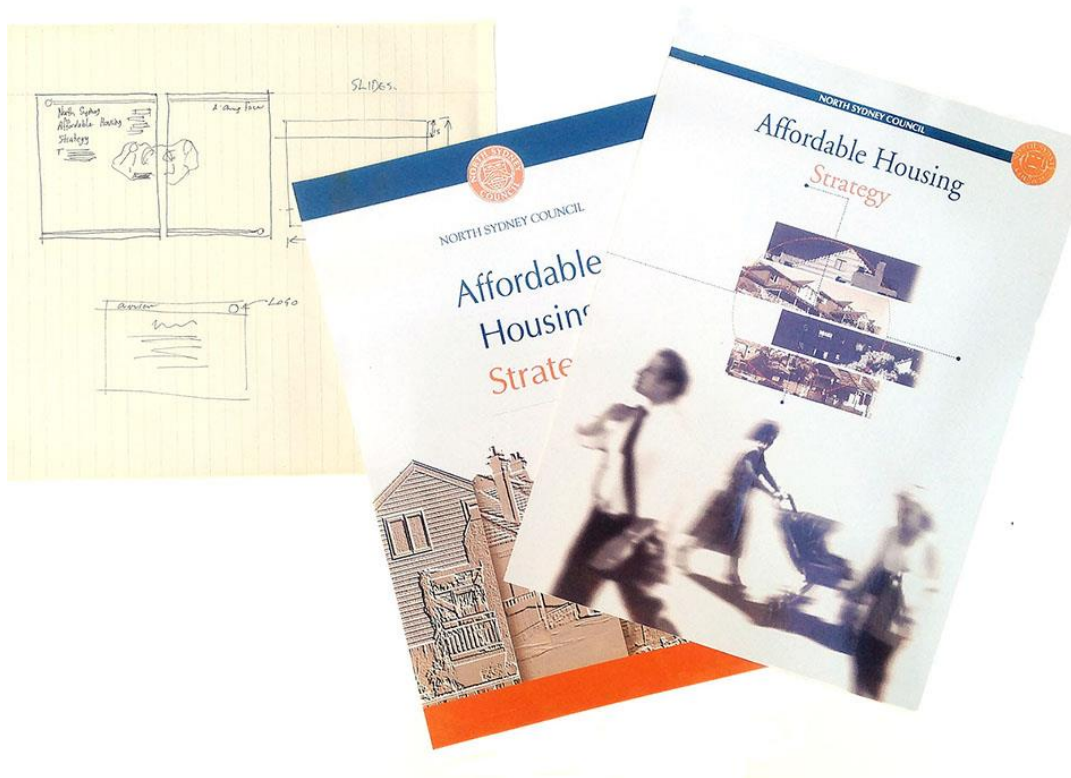


Image 6: Thumbnail & digital draft printouts, Eye Cue Communications, 2000.

The first decade of the new millennium rolled out and so did the smartphones and tablets, bringing with them the ever-growing potential of social media, video and data visualisation. For a decade, I worked closely with subject matter content experts designing and producing interactive learning objects and online resources for educational institutions and corporate clients (mainly in the US). We continued to produce print work for established clients who were keen to showcase the new digital aesthetics made possible using filters in Photoshop and Illustrator. As some of these early effects were difficult for clients to visualise we often provided digital draft printouts, however I always began the ideation process using a thumbnail to establish the concept and composition (see Image 6).

I was continually upgrading my digital skills to keep up with the ever-changing platforms and modes of delivery. My drawing practice had reduced in scale to thumbnails, storyboards and rough concept sketches. Schenk's (2016) study also found that specific elements of layouts such as grid, logo and letterform design would often still begin with a sketch. During the 1990s it was often easier to use a drawing to work through three-dimensional structures, rather than using a more sophisticated digital modelling system. One of Schenk's interviewees commented, "designing on-screen did not necessarily lead to efficiency as designers could still spend hours because of the range of different choices made available by the software employed" (p. 108). Schenk (2016) adds, "even in the digital age paper based drawing still forms an important part of a designer's range of tools" (p. 209).

When I left the graphic design industry in 2010, I began teaching undergraduate design students and returned to my studio and image making practice. While I was re-establishing my life-long friendship with drawing, I began an investigation of drawing techniques that might fill the gaps I had observed during tutorial brainstorming sessions. This thesis follows an investigation into some students' creative thinking practices at Western Sydney University (WSU) enrolled in the *Visual Communications, Design School* where I began my teaching career. Alongside this study I explored mark-making techniques that required minimal instruction and observation drawing skills, like doodling, continuous line, tracing and projection activities like 'squiggling'. Quick drawing activities were designed and trialed with various groups in search of pathways to encourage and foster drawing participation for drawers and non-drawers.

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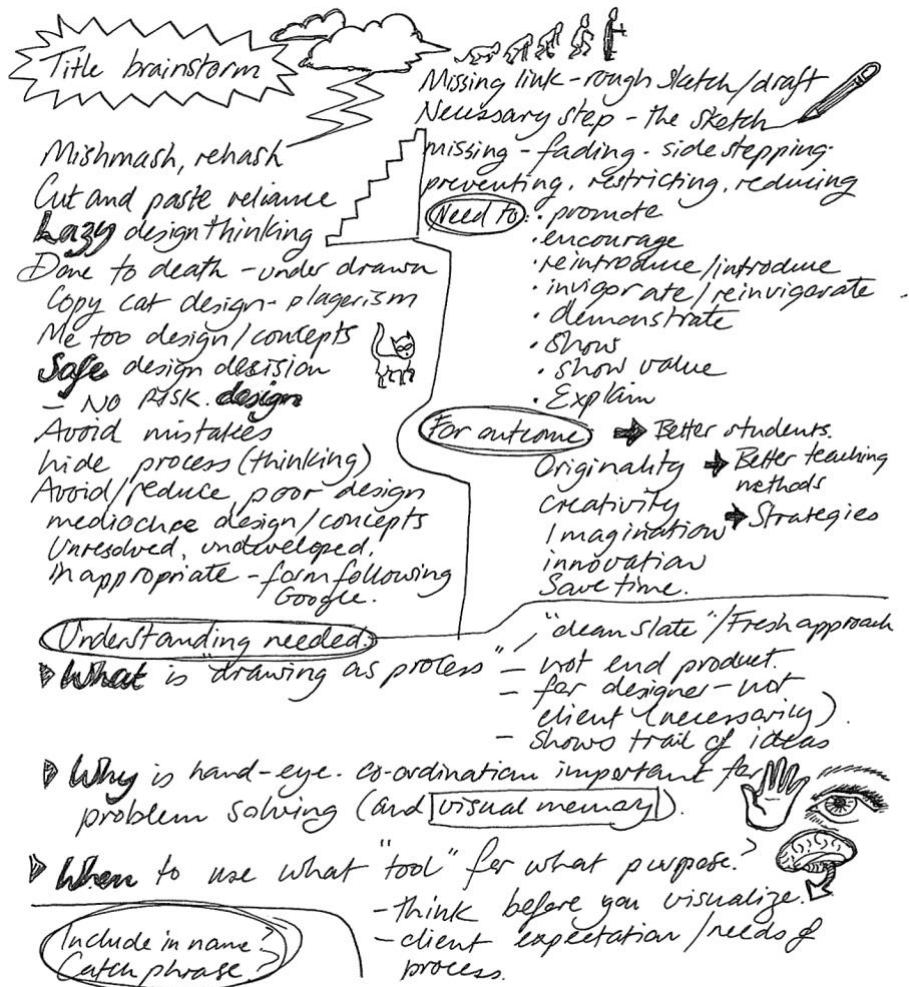


Image 7: Thesis title brainstorm notes, first journal, 2010.

The sketches, done for eyes and directed by them, make some of the design plans visible. They not only supply the designer with tangible images of what his or her mind is trying out in the dimness of its own freedom, but they also permit the observer or theorist to catch a few stop-motion glimpses of the flow of creation (Arnheim, 1993, p. 19).

1 Introduction

1.1 Overview

Sketching, drawing, or indeed any form of hand-eye coordination provides valuable cognitive and communication functions in the creative process. Drawing makes internal thoughts visible, which in turn promotes creative thinking, increases concentration and leaves a thinking trail for future evaluation. A sketch can be both study and masterpiece. This duality often leads to misconceptions, diverting attention away from the many benefits of drawing as a creative thinking tool. Indeed ‘nailing’ a definition of drawing rarely attracts consensus views. "Instead it invites frustration or obsession in attempting to clarify something which is slippery and irresolute in its fluid status as performative act and idea; as sign, and symbol and signifier; as conceptual diagram as well as medium and process and technique, with many uses, manifestations and applications" (Petherbridge, 2008, cited in *Writing on Drawing*, Garner, 2012, p. 27). Different forms of drawing have traditionally supported “designerly ways of knowing” (Cross, 2001). John Berger (2005) defines these kinds of working or process drawings as those “which study and question the visible, those who put down and communicate ideas, and those done from memory” (p. 46). His definition of drawing is one of discovery. Despite a long association with drawing, misconceptions about what drawing ‘is’ and what drawing can ‘do’ are still prevalent across creative industries and education.

This thesis explores the many enduring, unique benefits of process drawing in the creative thinking practices of undergraduate *Visual Communication, Design* students at Western Sydney University (WSU). The related study supports the continuation of specific drawing practices underpinned by creativity, design thinking and experiential learning theories. Students' drawing practices and attitudes to drawing are explored through classroom observations, questionnaires and interviews. These findings are combined with insights gained from my graphic design, image making, teaching and research practices. Analyses of the data contribute to an understanding of the role and value of drawing in the creative process. In response to these findings, pathways to drawing participation are investigated through the trial of a quick drawing activity designed to demonstrate the benefits of drawing to the novice designer and to encourage drawing participation in the classroom.

The thesis title, *Back to the drawing board?* deliberately questions and provokes the old argument that calls for the resurrection of traditional drawing tuition in design schools. However, the intention is not to suggest a return to the 'bad old days' of pre-computer tuition but to clarify the unique qualities and

benefits of 'process drawing' while finding ways to encourage and foster drawing participation in the twenty-first-century classroom.

1.1.1 Why Draw?

Humankind has been discovering and making sense of the world through drawing for over 70,000 years. The earliest examples of purposeful mark making were made on 73,000-year-old silcrete flakes found in the Blombos Cave in South Africa. (Henshilwood, d'Errico, & Watts, 2009, p. 27). Henshilwood et al (2009) also note that carved (or scratched) on these stones are superimposed sets of parallel lines which appear to be "remnants of a complex design" (p. 35). The original intention of these first known patterns is debatable; however, someone with intention, visualised and planned to make those marks. Perhaps to express, remember, communicate, or design something. Ever since, drawing as a tool has been developing throughout every civilisation. In the West, our modern understanding of 'sketching out' for invention, inspiration and innovation is derived from European art practices of the Renaissance period, which is on a continuum of drawing practices that date back to classical antiquity (Petherbridge, 2010, p. 28).

This thesis is predominantly focused on the role and value of drawing in the creative processes of visual communicators working within the field of graphic design. During the late nineteenth and early twentieth century, communication theory and semiotics shifted the role of the graphic designer from image-maker to the interpreter of messages. We saw design "grow from a trade activity to a segmented profession, to a field for technical research" (Buchanan, 1992, p. 5). The technological changes of the late twentieth century caused a re-think of the linguistic approach of communication theory and semiotics. Buchanan (1992) notes that visual communication was regarded as "persuasive argumentation". "Every designer's sketch, blueprint, flow chart, graph, three-dimensional model, or other product proposal is an example of such argumentation" (p. 20). Design and creative thinking activities evolved alongside the development of computers, software and the World Wide Web. Many designers, including myself, adapted their ideation practices to stay in step with technology (see Preface). However, the development of cheap, useful, digital drawing devices has been relatively slow, contributing to an interruption in the drawing continuum for a generation of designers.

However, research confirms that drawing or sketching provide unique benefits in the creative process that are still relevant today. "While freehand line drawings may not have the same importance in current virtual design studios the support of incompleteness, ambiguity and shared meaning in solution-focused and problem-focused thinking remains essential" (Garner, 2003, p.1). The indeterminate nature of sketching can also help avoid the early crystallisation of ideas (Goel, 1992) and provide opportunities for "divergent-production" necessary for invention and innovation (Guildford, 1967). Drawing makes internal thoughts visible and helps in the restructuring and combining stages of visual problem-solving (Goel,

1991; Verstijnen, Hennessey, van Leeuwen and Hamel, 1998; Menezes and Lawson, 2006). Even simple scribbling and doodling activities can boost memory retention (Kessell and Tversky, 2006; Andrade, 2010; Wammes, Meade and Fernandes, 2016) and help designers 'see it' and 'store it', reducing the load on the cognitive processes needed to design (Tversky, 1997, 2001; Bilda, Gero and Purcell, 2006).

Drawing is also an efficient formatting and compositional tool, facilitating problem identification early in the design thinking process (Buchanan, 1992). Self-generated sketches as opposed to representations made from alterations to existing models or templates can direct attention and communicate vital information in the design process to clients, design teams and stakeholders (Buxton, 2007; Goldschmidt, 2009; Kirsh, 2014; Schenk, 2016). Sketching can save time, energy and money. Hand-drawn diagrams, pictorial and symbolic representations can abstract information and provide spatial displays where mental operations can be performed (Larkin and Simmon, 1987; Arnheim, 1993; Suwa and Tversky, 2002; Farthing, 2013). Simple hand-drawn lines, dots, arrows, and other symbolic conventions can be used to indicate time and movement. Crossing out, making mistakes and finding visual connections with a pencil or stylus can leave a visible thinking trail which provides valuable insights into the creative process for designers, students and teachers, making drawing a valuable communication and collaboration tool in the creative thinking process.

From a teaching and learning perspective, process drawing provides unique opportunities for assessment clarification, classroom ideation, facilitation, collaboration, communication and meaningful feedback (Schenk, 2016; Casakin and Goldschmidt, 1999; Betts, 2011; Mignone and Blaiklock, 2019). Even the act of drawing can aid concentration, memory retention and boost learning capacity (Kessell and Tversky's, 2006; Andrade, 2010; Wammes, Meade and Fernandes, 2016). Drawing can be used to scope the problem and interrogate what is in the imagination, or what Eugene Ferguson (1992) referred to as, the "mind's eye". Thinking through an ill-defined problem using a rough sketch can encourage original thinking, avoid "design fixation" (Jansson and Smith, 1991), and deter plagiarism. *Back to the drawing board?* through a review of the literature and the creative thinking practices of WSU design students, identifies seven good reasons for novice graphic designers to incorporate some form of drawing in their creative thinking practices (see Chapter 3: Benefits of drawing).

1.1.2 Impetus

"I can't draw". "I don't draw."

My teaching observations reveal that many *Visual Communication, Design* students at Western Sydney University (WSU) do not naturally pick up a pencil to think, create or communicate as part of their creative processes in the classroom. During my first brainstorming session with first-year students, I experienced a disconnection between my approach to a creative thinking task, and that of my students. I

was inexperienced at teaching, fresh from the design industry. As I walked around the classroom, I checked that each group understood the assessment brief and were 'on the same page'. However, I noticed that there were no 'pages'. There were very few pens, pencils or styluses. Some students attempted to verbalise what they were thinking, describing what they imagined or saw in their mind's eye. Some wrote lists of keywords in their notebooks or on their smartphone, and some retreated into their computer screens looking for inspiration on Pinterest, Behance, Instagram or other digital image repositories. To encourage individuals to generate and discuss their ideas within their group, I provided sheets of A3 paper and coloured markers so they could visualise their thoughts quickly. The 'good drawers' took the visualisation lead while others just looked on. While collaborative activity increased, I observed that some students were not comfortable drawing in front of others. The general lack of sketching activity during these sessions may have gone unnoticed had it not been for the accompanying lack of engagement, idea generation and conversation in the classroom.

As I moved from one group to the next during this first brainstorming session, I observed how challenging it was for me to discuss concepts without sketching. Why aren't these students compelled to pick up a pencil or a stylus, to think through their ideas? Perhaps my reliance on sketching is a product of my pre-computer training and other generational factors? A reflection on my changing relationship with drawing acknowledges the enduring benefits of different types of drawing to my design, image making, teaching and research practices (see Preface). The *Back to the drawing board?* study began with a desire to encourage reluctant drawers to engage in process drawing activities in the classroom. However, before I could suggest a return to the drawing board, a deeper understanding of these students' current creative thinking practices and possible barriers to drawing participation was needed.

1.1.3 Back to the drawing board?

Design educators have been adapting to changing technologies, curricula, and industry needs, for decades across all creative industries. This thesis considers and evaluates the critical, ongoing role of drawing to design education while exploring strategies to overcome barriers to drawing participation within a continually changing educational environment. Commentary from design industry leaders also reveals that having the ability to manipulate ideas quickly through sketching is often valued as part of their design practices and those of new employees and contractors. While some students find alternative ideation methods, it is clear from classroom observations that some drawing activities have survived the technological revolution and continue to support students' creative thinking practices.

Drawing tools, devices and digital collaboration methods are continuously developing and will one day replace the humble pencil in the virtual classroom environment. However, access to tablets, iPads, stylus and high-end software was out of reach for many design students at WSU at the time of this study. Bill

Buxton (2007), computer scientist, designer and human-computer interaction researcher at Microsoft, observed that while we wait for technology to become accessible for all, "we need to be vigilant that we don't inadvertently drop important and proven aspects of the design process along the way, just because they are not well supported by the tools that exist today" (p. 183). The drawing board may have changed but the unique benefits of sketching are still an integral part of the design process, especially in the early conceptualization and scoping stages of a design project (see Chapter 3: Benefits of drawing).

Minimal drawing skills are needed to harness the value of process drawing; however, twenty-first-century students have come through a school system having engaged in significantly less hand-eye coordination activities than their parents and teachers due to increased screen-based activities. Despite reduced pencil or pen use my initial classroom observations confirm that most students have enough drawing ability to engage in some form of collaborative drawing activity. What they appear to lack is an understanding of the value of drawing and making, motivation, confidence and time to practice. The drawing board in the physical and virtual classroom is still evolving but drawing still contributes to creative outcomes while providing additional benefits to the learning and teaching experience and should not be overlooked or discarded.

1.2 Evolving methodology

So, if drawing is so 'handy', why don't design students use rough sketches and thumbnails in the classroom? The unfolding questions of the enquiry shaped and informed the chosen methodology and methods which evolved over six years of the study from 2013 to 2018 in parallel with my teaching and research practices. "Purpose fit methods" (Jick, 1979) were used to explore the benefits, practices and possible pathways to drawing of first, second and fourth-year *Visual Communications, Design* students at WSU. At the beginning of the study, my ontological and epistemological framework took on a quasi-scientific appearance. This approach was possibly shaped by my past experiences working alongside scientists creating online learning resources in the 1990s. I had naïvely attempted to employ a deductive approach, looking for ways to isolate variables and uncover the 'truth' about how students used or didn't use drawing in their processes. Further research revealed alternative approaches. Nigel Cross (1999) articulates my revelation well; "We (design researchers) have come to realize that we do not have to turn design into an imitation of science, nor do we have to treat design as a mysterious, ineffable art" (p. 7). Cross advised that a theoretical deliberation and reflection on the nature of design ability is needed alongside considerations of how people learn to design and how this development can be nurtured in design education (p. 5). He proposes a taxonomy of design research which includes a "design epistemology" defined as "the study of designerly ways of knowing". He also describes "design praxeology" as being "the study of the practice and processes of design" (Cross, 1999, p. 6).

I chose to incorporate design praxeology, with a focus on process drawing. This growing, complex field of study spans many creative industries and educational settings. Within this vast field, *Back to the drawing board?* focuses on the role and value of drawing in the graphic design and visual communications spaces within an Australian educational setting. During the twentieth century, drawing research, as a topic of enquiry, gained traction across academic fields including neuroscience and cognitive psychology. Improved imaging technologies also contributed to the growing interest in drawing as a creative thinking, learning, and research tool. Studies using drawing as a research method of practice needed clarification and a classification of drawing types and their functionalities that could be recognised across creative disciplines, including visual arts, graphic design, architecture and engineering. This need gave rise to comprehensive drawing taxonomies that continue to evolve as the field of drawing research expands.

The growing global academic interest in drawing as a design thinking research tool, in the early 2000s led to the establishment of several UK based drawing research networks. These groups include *The Campaign for Drawing*, established in 2001. This group continues John Ruskin's (2004) philosophy and legacy, developed during the late 1800s: it promotes the power of drawing for everyone through *The Big Draw* global events and festivals (<https://thebigdraw.org>). In 2013, I attended the *Big Draw* in Newcastle, Australia, which celebrated drawing through exhibitions, drawing collaborations and workshops. The *International Drawing Research Network* (DRN) was also established in 2001 at Loughborough University as part of *The Big Draw*. These groups aim to improve drawing knowledge and raise the profile of drawing and drawing research through a discussion network and online journal, TRACEY UK.

"TRACEY's aim is to stimulate, host and publish diverse perspectives on drawing and visualization to/for a community of researchers, practitioners, educators and students. We advocate the value of drawing and visualisation in professional and educational contexts" (<https://www.lboro.ac.uk/research/tracey/about>).

During 2011, Angela Brew, Michelle Fava and Andrea Kantrowitz, collectively known as *123 Draw*, founded *Thinking Through Drawing* (*TtD*). In 2018 this collective grew into *12345 Draw*, which continues to promote drawing to a diverse global audience. In 2011, *TtD* had six symposiums, including the *Practice into knowledge* (and subsequent *Drawing Connections* paper) and *2B Drawing Changes* in 2020. The discussions and publications of the international drawing research networks and groups focus on drawing practices. Their events and publications inspired the initial inquiry into my drawing practices and those of my students, which led to this pedagogical study in and around classroom creative thinking practices.

Back to the drawing board? adopts a "reflection-on-action" and "reflection-in-action" methodology (Schön, 1983). Throughout the study, I observed and took notice of actions within my practices as a professional graphic designer, teacher, researcher and image-maker. I looked for ways to make sense of the seen and unseen creative processes, practices and attitudes to drawing of my students. In this context, *Back to the*

drawing board? could be described as practice-led research. Donald Schön (1983) describes *practice* for the professional as "the development of a repertoire of expectations, images, and techniques". These are often stable or known to the practitioner. "This knowing-in-practice becomes increasingly tacit, spontaneous, and automatic, thereby conferring upon the practitioner and his clients the benefits of specialization" (p. 60).

The philosopher, Martin Heidegger (2010) also recognised that "observation is a kind of taking care just as primordially as action has its own kind of seeing" (p. 2018). As a practitioner, I engaged in drawing while designing activities to encourage drawing in the classroom. This kind of reflecting while doing is not a foreign practice to designers. It is part of the fluid nature of the design process itself. Design problems are by their nature "ill-defined" (Cross, 2011, p. 43) and unique to each new situation. Designers need to remain sensitive to the needs of the message, audience and client while remaining flexible and able to respond to change 'on the fly'. In this sense design thinking is reflection-in-action and can occur in seconds during and after each action or at stages throughout a design project. The reflective practitioner must also engage in a reflexive process that interrogates the layers of political, cultural and social influences on the study, its participants and themselves (Crouch and Pearce, 2012). *Back to the drawing board?* is conscious to avoid preconceived ideas and possible bias that accompany this kind of 'insider' research (Chavez, 2008). As an insider, I took steps to guard against bias, which included "careful attention to feedback from participants, initial evaluation of data, triangulation in the methods of gathering data and an awareness of the issues represented in the project" (Costley, Elliott, Gibbs 2010, p. 7). The triangulation of methods has been woven into the thesis narrative. It includes comparisons between observations, responses, interpretations, and visual analyses of outcomes.

1.2.1 Participants

The participants of *Back to the drawing board?* were enrolled in the *Visual Communications, Design* course at Western Sydney University (WSU) between 2013 & 2019. During this time 44.07% of domestic WSU students were the first in their families to attend university. WSU students come from diverse cultural backgrounds in and around the Western Sydney region, from more than 171 countries, including indigenous residents (Scott, Shah, Grebennikov, Singh, 2008 and 2019).

Some WSU students suffer from "imposter syndrome" or "imposter phenomena" first identified in a 1978 publication by the US psychologists, Dr Pauline Clance and Dr Suzanne Imes. They noted that "certain early family dynamics and later introjection of societal sex-role stereotyping appear to contribute significantly to the development of the impostor phenomenon" (p. 1). This manifests in many ways across all genders at WSU. Some students strive to meet high family expectations and some suffer from identity issues and a fear of failure. In addition, many WSU students attend university straight from school and

have not experienced other learning environments. Although there are many students who could be described as independent thinkers, first-year students often behave and operate in ways that served them well at school. Some need significant support and/or constant praise in the pursuit of high grades. The significance of students' prior training and learning culture is expanded upon throughout the thesis and has influenced the type of in-class drawing activities that were explored as part of this study.

The *Visual Communications, Design* course at WSU is continually evolving in response to industry needs and the changing trans-disciplinary landscape of graphic design education. Robert Harland (2011) clearly describes a shift away from traditional divisions of typography, illustration, photography and print during the early 1990s in many design schools (p. 21). He suggests an alternative depiction of graphic design as “unified thinking and doing an activity that involves idea generation, image creation, word interpretation, and media realization, for industry, commerce, culture, and society. Communication, with its theories, models, methods, and practices, is also recognized as central to the process of making meaningful representation” (p. 22). The WSU *Visual Communications, Design* course has also moved away from traditional divisions. First-year Units include *Web and Time; Image Design* (which amalgamated illustration and photography); *Visual Storytelling; Design Histories and Futures*; and a two-hour studio based Unit that incorporates graphic design principles and applications. The changes to the graphic design industry and Visual Communication course structures have attracted an eclectic group of students with different interests and backgrounds, varied understandings, attributes, skills and prior training.

In this thesis, I refer to the *Visual Communication, Design* students involved in the study as 'participants' or 'students' rather than; Visual Communication, Design students, which is wordy; or Graphic Design students, which is a term with which many students don't identify. When the terms design and designing are used in this study, they refer to the functions of visual communicators and graphic designers rather than the design activities of other design disciplines such as interior, industrial, fashion, architectural, landscape, gaming and service design. More detailed information about the participants and the educational environment is included in Chapter 2: Methodology.

1.3 Underpinning theories

The direction, and methodology of *Back to the drawing board?* have been informed by theories of creativity, design thinking, visual perception and experiential learning found in the literature. These theories underpin critical assumptions made about how students think, create, learn, design, and communicate. They resonate with my experiences as a designer, teacher and learner, and match observations and comments gained from the participants of *Back to the drawing board?* The critical assumptions of the study include the conviction that everyone has the capacity to think creatively and learn to draw 'well enough' to harness the cognitive and communication benefits of drawing. As Betty

Edwards (2012), the author of *Drawing on the Right Side of the Brain* (first published in 1979) observed, “drawing is a skill that can be learned by every normal person with average eyesight and average eye-hand coordination” (p 3). Specific aspects related to visual perception theory and Gestalt principles are included alongside applications discussed in Chapter 6: Speed Squiggling.

1.3.1 Creativity

Designing and design education are characterised by creativity. Designers strive to be creative and produce novel, surprising, memorable, high impact and high-quality outcomes that change hearts, minds and behaviours. Ken Robinson (2011), worked as an international education and the arts advisor and championed the significance of creativity in education and the positive effects of creative thinking for the economy.

It's often thought that creative people are either born creative or not, just as they may have blue or brown eyes, and there is not much they can do about it. The fact is, there is a lot you can do to help people become more creative. If someone tells you they cannot read or write, you don't assume that they are not capable of reading and writing, but that they haven't been taught how. It is the same with creativity (Robinson, 2011, p. 4).

Creative thinking can be learned; however, many students need to be convinced of this fact. In 2019 a mature-age student who had elected to take the *Visual Storytelling* Unit at WSU came to see me before her first tutorial. She was concerned that her ability to perform well in the Unit would be adversely affected because she "didn't have a creative bone in her body". My response echoed Edwards and Robinson's conviction that everyone has the potential to learn how to think creatively. Tom Kelley and David Kelley (founder of the global design company, IDEO), (2012) also agree with this pragmatic approach to teaching creative thinking with their students at the Hasso-Plattner Institute of Design at Stanford (d.school). The Kelley's developed strategies to help students overcome the "four fears that hold most of us back" (p. 115). They provide pathways to creative thinking through activities that often included some form of process drawing. They too believe "creativity is something you practice, not a special 'faculty' you were born with" (Kelley and Kelley, 2012, p. 116).

The field of Creativity Research stretches back to the 1930s and experienced many shifting paradigms during the early twentieth century influenced by theories of 'genius', 'intelligence', and the development of creative thinking processes. Creativity research today is experiencing another paradigm shift emerging from the disciplines of neuroscience and cognitive psychology. Recent discoveries in neuroscience reveal the brain's incredible ability to recall, remix, respond and change to subtle stimuli consciously and unconsciously. The psychiatrist and psychoanalyst, Norman Doidge (2007) explains how human thought is sophisticated and flexible; "the brain is neuroplastic and can change its own structure and function

through thought and activity" (p. 5). The implications of neuroplasticity theory on creative thinking and learning are immense and go beyond the limitations of this thesis; however, an exploration of these theories that relate to finding pathways to drawing participation are included in Chapter 5: Pathways to drawing.

Creativity theories differ across domains; however, Mark Runco and Garrett Jaeger (2012) provide a general bipartite 'standard' definition: "Creativity requires both originality and effectiveness" (p. 92). A creative outcome is often labelled novel, unique or original. However, originality is vital for creativity but is not sufficient on its own. "A random process may produce 'original' ideas, but they also need to be useful, fit or appropriate (effective) to be considered 'creative' and of value" (p. 92). Margaret Boden (1998) also notes that random combinations conducive to creative ideas do not occur within a conceptual space devoid of existing styles, conventions, and rules. Creativity requires "daring explorations" of the chosen conceptual space, "At the limit, when the space is not just explored but transformed, ideas arise that were previously impossible" (p. 270). Artificial intelligence (AI) can generate endless 'original' design solutions through the random application of rules and stylistic conventions, but this form of "combinational creativity" still requires human judgment of its relevance. It is possible for evolutionary programs to transform themselves and evaluate newly transformed ideas "but only if the programmer has provided clear criteria for selection" (Boden, 2016, p. 70).

In 2017, while viewing designer Ross Lovegrove's *Convergences* exhibition at the Pompidou Centre in Paris, I strayed into the neighbouring show, *Imprimer le Monde* featuring the work of a collection of young artists, designers, and architects. I moved from Lovegrove's award-winning designs, which combine technology, material science and intelligent organic forms, to the 3D printed objects and prototypes produced by these young designers. Both exhibitions emphasized the intricate organic patterns, shapes and surfaces made possible through generative software and 3D technologies. While many of the young designer's objects looked very different from anything I had seen before, I was struck by the homogenous appearance of the exhibits. Although Lovegrove had harnessed similar technologies, his designs reflect the hand and eye of the maker, not the possibilities of the available software. The organic origins of Lovegrove's thoughts can be seen clearly in his sketchbook explorations. While it could be argued by some researchers, that AI can "sometimes match, or even exceed, human standards in some small corner of science or art" (Boden, 2016, p. 72), matching human creativity remains elusive. AI lacks a body with sensitivities, frailties, memories and aspirations. "Machines are unlikely ever to be capable of the nuances and search for salience that humans, including young children, can infuse into their artworks, let alone well-trained, mature artists whose work, whether consciously or not, is imbued with human life deeply lived" (Simmons, 2019, p. 17). The exploration of creativity through the development of AI is a vast area of research and is beyond the scope of this thesis, however, it is essential to note that AI has elevated, not

diminished, the value of creative thinking and drawing in the design process highlighting the value of iteration, divergent thinking and critical human centered evaluations.

The psychologist, Joy Paul Guilford (1967) acknowledges the abilities most relevant for creative thinking are "divergent-production" and "transformation" (p. 8). He notes the characteristics of divergent thinking (and thus creative thinking) include fluency, flexibility, originality and elaboration. Creative ideas can sometimes appear to come from nowhere. Still, research suggests that environments that encourage play provide opportunities for random thoughts, spontaneous discussions, and 'accidents' that lead to invention and innovation. The cognitive scientist, David Kirsh (2014) reminds us that chance plays an important role in the creative thinking process. "It can be used to thwart bias, overcome the drive to imitate past solutions, and stimulate new ideas" (p. 5). Playing with random marks, scribbling and doodling can promote creative thinking with the added benefit of making those thoughts visible for later reflection and reimagining.

Understanding and experiencing the creative process is a vital part of design education; however, Charlotte Sjödel (2011) proposes that our understanding of the creative process is 'impoverished';

Many existing models of the creative process are also biased toward regarding the generation of ideas as the essential engine of creativity; the elaboration of ideas is under emphasized and undervalued. In other words, even the best-developed current psychological models of the creative process perpetuate the cliché of creativity as a light bulb turning on (p. 55).

Many designers strive to achieve a highly focused mental state conducive to idea generation and productivity, often referred to as 'being in the zone'. Indeed, the psychologist, Graham Wallas (1926) observed: "a slight degree of dissociation may be useful, or at least harmless, for the purpose of certain kinds of creative thought" (p. 234). The psychologist Mihal Csikszentmihalyi (1990) referred to this unconscious state as "flow" (p. 9). Creative flow can be gained through many different expressive acts; however, drawing encourages a cyclical creative process that moves away from the notion of one great idea. Kirsh (2014) agrees noting that; "The more defocused a subject's attention, the more widely dispersed are the connections they will make and the more low frequency are the associations they will find. It's like accumulating many little aha's each time a new way of seeing occurs" (p.12).

Most designers gain great satisfaction from finding new ways of expressing and communicating ideas. They enjoy being recognized by their peers as a 'creative thinker'. Professionals, teachers and experts often base their opinions about who, and what is creative from cognitive studies, personal experiences and current trends. Runco and Chand (1995) emphasize the influence of prior knowledge, memory, classification, evaluation and analytical skills on an individual's ability to engage in creative tasks such as problem identification and problem-solving. Among these early twentieth-century psychologists, Graham

Walla (1927) developed experiments to measure the behaviours and attitudes needed for creative discovery. Creative thinking tests evaluate "preparation, incubation, illumination, and elaboration skills" (Guildford, 1967, p. 5). The *Purdue creativity test*, developed at Purdue University, is one example (1960, p. 255). This test inspired the development of Guildford's *Alternative Uses Task* (1967). A common incarnation of this task is the "How many uses can you find for a paper clip?" activity. I remember doing this assignment in my first year at design school in the early 1980s. It is still used to demonstrate the value of divergent thinking in the creative process across many disciplines (Robinson, 2011, p. 264).

While some cognitive studies recognize the significant ingredients for creative thinking, the recipe for creative outcomes is complicated and relies on the subjective evaluation and insights of both participant, researcher and experts. Therefore, judging creative outcomes is inherently subjective and often contentious. Even when people agree, something is 'creative', "it may be difficult to identify those aspects of the context which justify the human's interpretation" (Boden, 2016, p. 64). For this reason, design education provides structures aimed at measuring creative input and output, which include relevance and effectiveness criteria, thus acknowledging that creativity requires both originality and effectiveness.

1.3.2 Design thinking theory

A distinction can be made between creative thinking and design thinking. Creative thinking is crucial in the design thinking process; however, a person can think creatively without proposing a design solution. Tim Brown (2009) suggests it is “in the divergent mode that we most need playfulness. Perhaps in convergent mode we need to be more serious. And so being able to move between those modes is really quite important” (TED transcript). Creative thinking applied to design it is not just an original idea; it is transformative. “It (design) has an effect on the world, both the man-made world and the natural world” (Crouch and Pearce, 2011, p. 7). Creative thinking and design thinking are part of the process of finding a solution. The term *design thinking* in this study relates to the non-linear process of problem seeking, defining, solving and applying solutions to an ill-defined, human-centred design problem (Buchanan, 1992; Cross, 2011). Nigel Cross (2011) observes that design thinking is something inherent within the human cognition; it is a crucial part of what makes us human. “Anything that isn't a simple, untouched piece of nature has been designed by someone” (p. 8). *Back to the drawing board?* recognizes that analyzing the relationship between “materials, ideas and systems” (Crouch and Pearce, 2012, p. 8) is vital for understanding the students' design processes and the role of drawing in their practices.

Design thinking was the subject of intense interest during the 1960s when the mathematician, designer, and former teacher, Horst Rittel formulated the “wicked” problem. Rittel argued that most problems addressed by designers were wicked in that they were complex, evolving, and “indeterminate” and therefore require creative, flexible and strategic thinking (Buchanan, 1992, p. 1). The situations and problems that require design thinking are decided within a political, cultural and social context (Crouch and Pearce, 2012). Designers (and researchers) also think and act within a social realm. The prior knowledge, experiences, cultures, prejudices, and belief systems of a design team influence the design thinking process and outcomes. Most design teams have written or unwritten rules or models of engagement based on the discipline's culture.

The design thinking models, promoted at WSU, cycle through scoping, generation and evaluation stages in messy, non-linear trajectories. Design thinking models typically involve divergent and convergent steps including, problem finding, problem defining, ideation, testing and evaluating. The Stanford d.school suggests a five-stage model: “empathize, define, ideate, prototype, test and assess” (<https://empathizeit.com/design-thinking-models-stanford-d-school>). Design thinking models attempt to simplify a complex, often unconscious, cyclical process. When introducing ideation or brainstorming theory and activities, I often show, *The Design Squiggle* developed by the design strategist, Damien Newman (2010). This doodle begins as a messy, noisy, uncertain scribble, which eventually finds its way through insights into a straight line that represents clarity or design. Assessment tasks often attempt to

model steps in the design process to encourage students to consider the brief, audience and message before focusing on aesthetics and style or finding readymade solutions.

Ideas or conjectures that focus on a solution (solution conjecture) is not an uncommon strategy for graphic designers and can be adequate for many design problems and tasks. Skilled designers rely on past visual experience, known precedents and the application of analogical reasoning when making conjectures or visualizing solutions (Menezes and Lawson, 2006). Early conjecture can save time but can also risk the crystalizing of inappropriate, ill-fitting design solutions. Nigel Cross (1982) argues that designers commonly use conjecture to contain the problem within manageable bounds. Designers “seek, or impose a 'primary generator,' which both defines the limits of the problem and suggests the nature of its possible solution" (p. 6). Different types of process drawing can enhance and provide a fluid interpretation or conjecture, whether it references found imagery or emulates what is in the mind's eye. To avoid reliance on style, rather than the message, designers engage in ideation activities to generate novel, unexpected thinking, which often includes some form of sketching.

Brainstorming is an idea-generating activity that can be anonymous, freeform, directed, or guided, and typically includes the spontaneous sharing of solutions to practical problems, through language and visualizations. Brainstorming theory is based on cognitive studies that suggest deferring judgment, and exhausting ideas in the early stages of the design thinking process can generate novel, surprising and unexpected outcomes (McKim, 1980). Brainstorming was first introduced into the corporate setting by Alex Osbourne in 1957 and is still encouraged across design, business and educational settings, including Stanford d.school (Kelley and Kelley, 2012). Traditional brainstorming techniques involve a group of people who participate in "active dialogue and interaction by verbally sharing their ideas one at a time. It helps stimulate the production of a large quantity of ideas, ruling out criticism, freewheeling, and combining ideas throughout the sessions" (Al-Samarraie and Hurmuzan, 2018, p. 79). Other brainstorming techniques call on group members to generate ideas individually without communicating with other members, thus allowing participants to perform specific roles in the design thinking process before coming together. Online discussions and social media platforms are also used in the early ideation and problem identification stage of projects. Drawing in the classroom can facilitate the brainstorming process and ideation activities as they allow students to have a circular conversation with peers, teachers and themselves, thereby encouraging original thinking.

Al-Samarraie and Hurmuzan (2018) evaluated forty-two well-grounded brainstorming studies and discovered that rules and guidelines varied considerably across different University disciplines. They categorized the effectiveness of varying brainstorming approaches concerning the purpose of use, opportunities, challenges, and proposed solutions (p. 80). Brainstorming sessions are included in most WSU Units and incorporate face-to-face discussions, mind-mapping, individual and group sketching

activities and online discussion groups. Many students appear to find value in these activities. However Cross (2011), warns of the tendency for participants to rely on personal knowledge, rather than public and more formalized knowledge sources. "Brainstorming without reflection or evaluation can create misunderstanding" (p. 213). Letting ideas "flow" without conscious and subconscious evaluation is also difficult to achieve and unrealistic because we have to continually remind ourselves not to exclude any ideas until we have considered all possibilities (Runco and Chad, 1995, p. 21). *Back to the drawing board?* considers the effectiveness of different brainstorming techniques in the development of drawing activities designed to stimulate idea generation in the classroom (see Chapter 5: Pathways to drawing).

Idea generation is only one aspect of design thinking. Ken Baynes (2010), following on from Cross (2001) also describes the activities that designers use in the design process as "designerly". Process drawing or sketching out can be included at every stage of the design process; "when talking about a design proposal, presenting 'it', persuading others to believe and act on 'it'. Simulating and expressing its proposed performance and communicating plans and specifications to make, promote and test 'it'" (p. 12). Moving back and forth within the creative space and mulling over possibilities and strategies is a necessary part of the problem-finding and problem-solving processes. David Jansson and Steven Smith (1991) describe the character of conceptual design as a discovery process where designers visit many points in both concept space and configuration space to reveal more about the problem and potential solutions, "thus discovering new aspects of the problem" (p. 3). The many benefits of drawing in the design thinking process are investigated further in Chapter 3: Benefits of drawing).

1.3.3 Experiential learning theory

Experiential learning theory underpins critical assumptions made about how students think, create, learn, design, and communicate. The psychologist David Kolb (2014) explains that experiential learning plays a central role in the learning process and "can be differentiated from rationalist and other cognitive theories of learning that tend to give primary emphasis to acquisition, manipulation, and recall of abstract symbols, and from behavioral learning theories that deny any role for consciousness and subjective experience in the learning process" (p. 31). Kolb built upon the learning theories of Lewin and Dewey, creating models that aim to explain how individuals learn and become empowered to "trust their own experience and gain mastery over their own learning" (p. 53). Experiential learning is not about forcing students to think in a specific way, but more about introducing and integrating known creative thinking methodologies into a student's design process in a way that feels 'true' and is 'handy'. "As human beings, all we have is our experience, and all knowledge begins in our experience, and the way in which we know something is true is that it comes back and proves true in our experience" (Kolb, 2012, Hay Group Global video).

Experiential learning theory also acknowledges that experience and "practical knowing" (Coghlan and Brannick, 2005) is reassessed continuously. "Ideas are not fixed, and immutable elements of thought but

are formed and re-formed through experience" (Kolb, 2014, p. 37). Learning is a continuous process grounded in experience. Creative thinking and design thinking rely heavily on experience, action and reflection on that action.

Providing an environment where new experiences can be introduced and tried is vital to the success of experiential learning practices. Learning through successfully 'doing' can overcome prior habits, prejudice, and fears that can negatively impact, and therefore determine, the strategies and approaches that the learner chooses in their practices. However, habits and misconceptions can be hard to break. Kolb (2014) suggests that "truth is not manifest in experience; it must be inferred by a process of learning that questions preconceptions of direct experience, tempers the vividness and emotion of experience with critical reflection, and extracts the correct lessons from the consequences of action" (p. xxi). Extracting the 'correct lessons' requires guidance and self-efficacy. Experiences can provide positive motivation and "the focal point for learning, giving life, texture, and subjective personal meaning to abstract concepts and at the same time providing a concrete, publicly shared reference point for testing the implications and validity of ideas created during the learning process" (Kolb, 2014, p. 32). *Back to the drawing board?* aims to provide pathways for students to experience the value of drawing through trying out different drawing activities for different creative and design thinking tasks.

The *Visual Communications, Design* curriculum at WSU includes an experiential learning model that incorporates cycles of interaction between the individual and their environment. Design thinking and design skills are acquired through the integration of practical design projects with applied theory. Experience, doing and reflecting on the doing are embedded in the course content and design of assessment tasks. How students learn the process of designing is through the demonstration and modelling of different creative thinking and design thinking activities combined with their personal experience and their practical knowledge and learned preferences. Ultimately, over four years through trial and error these design students decide what works for them. In their final year, students engage in a studio simulated program (Unit) called the *Rabbit Hole*. Here they work collaboratively on different projects with real budgets, deadlines and clients. Students develop "higher-level functions such as applied research, professional communication, project management, presentation and interpersonal skills" (Edwards-Vandenhoeck and Sandbach, 2014, p. 5). The design learning framework cycles through scoping, generating and evaluating phases with making central to the learning experience.

Back to the drawing board? investigates and considers the role of doing, making and experiential learning in my creative thinking practices and those of WSU design students. Observations and accounts of concrete experiences using drawing in the creative process (including the trial of quick in-class drawing activities) add to the knowledge of how process drawing is understood, used and experienced in the creative practices of the participants of the study.

1.4 Drawing defined

The artist, writer and curator, Deanna Petherbridge (2008) acknowledges drawing definitions are often slippery, irresolute and contentious (cited from *Writing on Drawing*, Garner, 2012, p. 27). I recently experienced some contention while attending an exhibition entitled "*Drawing*" in my local area in 2017. One of the contemporary artists defended the group's right to label any visual act as 'drawing' in the opening address. While I understood the definition of drawing within the context of each artists' intention, I wondered if removing all boundaries in the definition was useful in the promotion of drawing as a unique expression.

Ben Jonson (2002) agrees the definition of drawing should avoid a prescriptive or formulaic approach but adds that "it may be worthwhile to try to clarify and locate the sketch in the design process from both an experiential and theoretical knowledge base" (p. 247). He poetically positions the duality of a sketch as being "at the very heart of creation, bridging daydreaming and calculation" (p. 250). Steve Garner (1999) notes that sketches display characteristics that make them valuable to the artist, designer and viewer providing "a blend of serendipity, skill, speed, economy, pleasure, pain, anger and humour can often produce a sketch of more interest to people than the finished product whether that be a building, a domestic product, a piece of sculpture or a painting..." (p. 100)

Contemporary art and design domains have embraced broader definitions of drawing practices as design industries evolve in response to technological, political and social changes. In 2012, Garner called for "a critical discourse" in drawing research. He expands on Berger's definition of drawing as "discovery", stating that drawing today is characterised by "diversity" – diversity of interpretation, application and interrogation (p. 13). Some drawing researchers "inquire into specific practices, such as observational drawing, while others take a broader view of drawing, considering gesture, performative forms of drawing, or drawing as visual thinking and situated cognition" (Brew, Fava, and Kantrowitz, 2011, p. 8). *The Drawing research network* (DRN) and *TtD* group explore a broad spectrum of drawing practices through practice-based and traditional research methods. The following definitions and taxonomies have grown from this diverse interest in drawing research and are referenced throughout this thesis.

1.4.1 Process drawing

Seymour Simmons (2019) identified five paradigms of drawing instruction that address distinct but interrelated facets of drawing with applications across the arts and creative disciplines. They include: drawing as design; drawing as seeing; drawing as experience and experiment; drawing as expression, and drawing as a visual language (p. 16). Buxton (2007), suggests the rich ecology of drawings and rendering types could be categorized by intent. "What is the purpose of the drawing? Why was it made?" (p. 121). He suggests there are five types of rendering; Sketch; Memory Drawing; Presentation Drawing; Technical

Drawing; Description Drawing. Buxton also notes that "explicitly pointing out these categories will hopefully help prompt you [the designer] to always question if you are using the most appropriate rendering style for the purpose at hand" (p. 121).

Back to the drawing board? focuses on a precise range of drawing types, which I refer to as process drawing. In this study, the term process drawing is interchangeable with 'ideation drawing', 'speed drawing', 'rough sketching', and 'first thought drawing'. Renaissance artists adopted the old Italian name *pensieri*, meaning 'thoughts', to describe their first thought sketches. Petherbridge (2010) observes that the "descriptions of the sketch in different periods have remained amazingly consistent, with the current and familiar terms of speedy, exploratory, spontaneous, abbreviated, unfinished, indeterminate, fiery, contingent and disordered well-grounded in historical art discourse" (p. 26). Gabriela Goldschmidt (1991) puts the early sketches that architects make into a select category: study sketches. "These sketches, often scribbled on lightweight, transparent tracing paper, are usually made very fast and are sometimes so idiosyncratic that they are only comprehensible to their maker." (p. 123). She adds its purpose is to test and verify a concept through a communicable representation (p. 130). Different process drawing types and activities used by WSU design students include scribbles, doodles, mind maps, rough sketches, thumbnails, storyboards and hand-drawn diagrams. Text and other types of graphic representations are also used in conjunction with these drawing types and can therefore, be labelled in different ways.

1.4.2 Drawing taxonomies

Back to the drawing board? draws from several existing taxonomies to discuss and identify different types of process drawing and their functions and contribution to creative thinking. The taxonomies of Xenia Danos and Dr Eddie Norman (2009), Stephen Farthing (2013), Jonathan Fish (1996) and Pam Schenk (2016) provide an overview of the different attributes assigned to process drawing types and their functionalities within the broader disciplines of visual arts, graphic design, and architecture. Process material collected as part of assessment tasks suggests that many students annotate their notes and drawings, create storyboards and hand-drawn flow diagrams. Mind mapping is popular with both teachers and students at WSU. It typically uses phrases, words, symbols and pictures to generate concepts and thoughts, arrange, connect and compile idea fragments into conceptual fields. Students also use other forms of graphicacy listed in the following taxonomies such as hand-drawn charts, graphs, symbols and maps. Across the following four taxonomies, some process drawing types and functions crossover, and some definitions differ across disciplines.

Danos and Norman's (2009) *Taxonomy for Graphicacy* argues the importance of a shared visual literacy "in a world where information is often technical and time is often short, visual images potentially offer a direct, fast, effective and efficient way of communicating" (p. 69). They proposed a new taxonomy

building upon Edward Fry's taxonomy produced in the 1980s. It was developed as a research tool to map graphicacy and support the measurement of skills and abilities needed to communicate through images. Danos and Norman (2009) refer to different types of drawings that serve educational purposes (referencing booklets published by the *Campaign for Drawing*, series 2001-2007). They include analytical and annotated drawings, bird's eye view, cartoons, computer-generated images, design drawings, diagrams, doodles, elevations, exploded views, gestural drawings, narrative drawings, maps, observational drawings, plans, projections, schematic drawings, scribbles, sequence drawings, serial vision studies (including sketches), speed drawings, storyboards, and technical drawings (p. 77). The spider diagram example (p. 80) resembles the mind maps produced as part of WSU in-class ideation sessions.

Farthing (2013) set out to represent the diverse terrain of two-dimensional representations (drawings) using a creative approach of "pictorial deliberations". His pictorial diagram drawn in pen and ink visualises three frequently cross-fertilising kingdoms: writing, notation and drawing. Process drawing types such as scribbling and free-of-form mark-making rise from the Kingdom of Drawing having travelled through pictorial, "Improvised", "Estimated" and "Freehand" junctions to arrive at the "sketching genus". Sketched diagrams like mind maps and pictorial flowcharts comfortably rise from the Notation Kingdom and flow through "conceptual", "systematic", and "measured" junctions, breaking away at "freehand" to join free-of-form marks in the sketching genus (p. 427). Farthing's representations cleverly show how the definitions and terms overlap and intersect and illustrate the multiple forms of drawing available to the designer.

In her latest comprehensive taxonomy of drawing, Schenk (2016) identifies four different sketch types: "observational, analytical, private and digital" and links the drawing attributes, functions and tasks with specific terms. She aligns the drawing task to a succinct term that sits within stages of the design thinking and production process: preparation and inspiration; briefing and ideation; development and synthesis; presentation and evaluation; and commissioning and specification (p. 176-177). The terms and descriptions Schenk uses resonate with my graphic design industry background. It is interesting to note that some of these terms are rooted in almost obsolescent, designerly practices like "letter rendering" and "impositions"; however, students still refer to these terms. The use of some out dated words may reflect the continuation of some terms in the secondary school visual art and graphic design programs.

Fish (1996) identifies three distinct kinds of sketches, those that "represent two-dimensional views of real or imagined objects"; those "used for imagining something else"; and those which possess specific "privileged attributes of untidy indeterminacy" (p. 16). A sketch could be an unconscious scribble or doodle, a rendering of what one observes or imagines, or a drawing rehearsal or an under-drawing produced in the development of an outcome. In this sense, a sketch could be generated by hand or on the computer. The term *sketch* is complex and vague and the media and functionality employed may vary across design disciplines. However, different definitions of the word sketch or sketching always include

aspects of speed and fidelity. Fish (1996) acknowledges the problem of defining the term sketch observing “the very fact that a word is hard to define suggests that it refers to something poorly understood and stimulates thought about the nature of the object or concept to which it refers” (p. 23). For some WSU students, a sketch can describe their final drawings that use a 'sketchy' hand-drawn illustration style as well as ‘first-thought’ drawings. Some students describe all their working drawings created in the development of an assessment task as sketches. Many express an inability to sketch, referring to their lack of observational drawing skills rather than their ability to roughly sketch what is in their mind's eye.

1.4.3 Process drawing examples

During the development of this thesis, I used process drawing extensively. The following examples represent a cross-section of different drawing types produced while writing my PhD proposal. These examples and functions can be referenced alongside students' process drawing examples discussed in Chapter 4: Practices and barriers to drawing.

The first example is a hand-drawn mind-map from the second page of my first sketchbook (see Image 8). Before I began writing the thesis, mind-mapping helped define the issue, guide the literature review and facilitate discussions with my supervisor. Mind-mapping is a common ideation technique used by many students and incorporated into some assessment tasks at WSU. In this diagram, I began organising my thoughts around what, I believed at the time, was the main reason why students were reluctant to draw in front of others, i.e. lack of design thinking skills. I included comments received from students during my first-semester teaching; “I can't draw”, “It's a waste of time”, “It's quicker on the computer”, and “I didn't do art at school”.



Image 8: Mind-map redrawn, second page, first sketchbook, 2010.

While exploring the thesis questions, these drawings helped clarify my thoughts and find a direction. They provided additional value throughout the study as I revisited ideas with renewed understanding as the thesis argument developed. I had not yet thought about how students were generating and developing their designs outside the classroom. I hadn't considered that there might be some design procedures and briefs that might benefit from drawing activities more than others. It is also interesting to note that this

first mind-map was redrawn from a previous sketch made on the first page of my brand-new sketchbook. Sadly, this first sketch was ripped out, destroying the evidence of my first thoughts and a messy mind. Possibly I feared the judgment of my drawing and writing skills. Perhaps it was full of spelling mistakes. This sketch exposed my fear of judgment that many students share when showing their sketches in class.

Some of my first visualisations began as doodles or first thought sketches. These drawings were drawn subconsciously, playing around with metaphors and fun ideas about drawing itself. Image 9 is an example

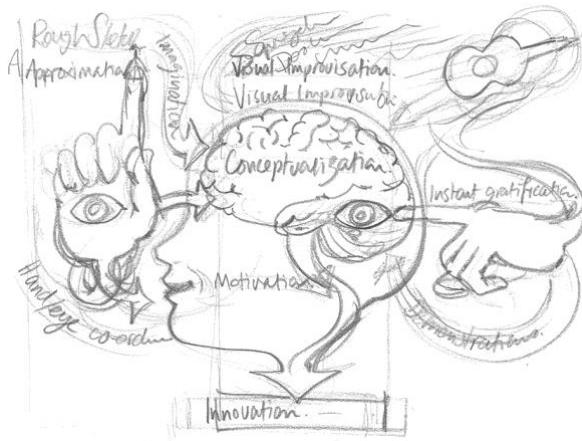


Image 9: First-thought sketch exploring hand, eye and brain visualisations, 2012.

of a drawing that began as a doodle, was transformed and drawn over with a second thought sketch, traced and developed as an under-drawing, which was later scanned and redrawn. This quaint sketch was done while contemplating the unique qualities of drawing, making the connection between hand, eyes and the mind after reading Edward's *Drawing on the Right Side of the Brain* (1997) and related discussions.

When refining the thesis storyline and structure, I returned to a pictorial approach: this decision was instigated by Michelle Fava, one of the founders of the *Thinking Through Drawing Research Network*. During a visit to Cambridge in 2017, Fava demonstrated her “one card, one concept” approach using visual analogies and metaphors. I was instructed to draw pictures representing keywords, concepts or metaphors, then verbalise these ideas while making changes and clarifying the drawings (see Image 10). I recall being tentative and self-conscious during this session and reflecting on how my students might feel when asked to draw in the classroom.

of a drawing that began as a doodle, was transformed and drawn over with a second thought sketch, traced and developed as an under-drawing, which was later scanned and redrawn. This quaint sketch was done while contemplating the unique qualities of drawing, making the connection between hand, eyes and the mind after reading Edward's *Drawing on the Right Side of the Brain* (1997) and related discussions.



Image 10: Drawing analogies and metaphors workshop with Michelle Fava, Cambridge, 2017.

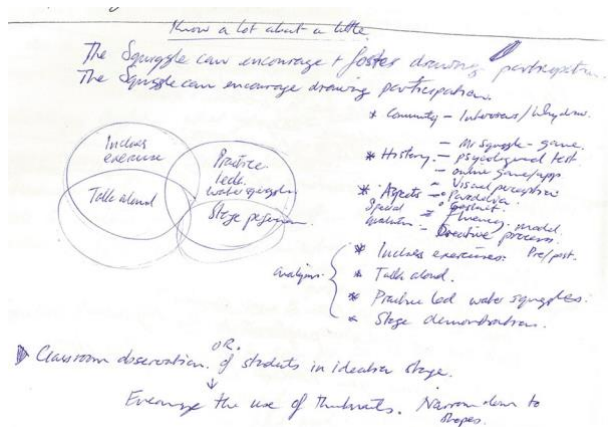


Image 11: Notes from Silverman's workshop, WSU Qualitative Research Conference, 2016.

Image 11 is a typical example of the kind of hand written notes I produced during the conceptual stages of the study. Note-taking is encouraged during WSU tutorials and pencils and paper are always provided in my classrooms. However, I have noted a significant change in students' note-taking behaviour since I began teaching in 2010. If prompted to take notes, students prefer to take a photograph of a projected slide or white board scribbles with their phone or iPad instead of writing the

information down themselves. One student explained that this was to save time and retain all her information in one location. Reflecting back on these notes I see fragments of diagrams, scribbles and other hand drawn elements that highlighted and connected ideas on the page. These private sketches assisted my creative thinking, comprehension and memory in the early stages of research for *Back to the drawing board?*.

Using thumbnails to plan and compose is still a common designerly thinking activity used by designers. Midway through the thesis planning I produced quick thumbnails, which helped plan the structure and storyline of the thesis. I approached this task like a graphic designer preparing a publication. These thumbnails provided a detailed breakdown of the proposed thesis content, structure and storyline (see Image 12). I was able to view the whole thesis in one eye span, which allowed for meaningful conversations to occur with my supervisors. Revisions, additions and connections were made using post-it

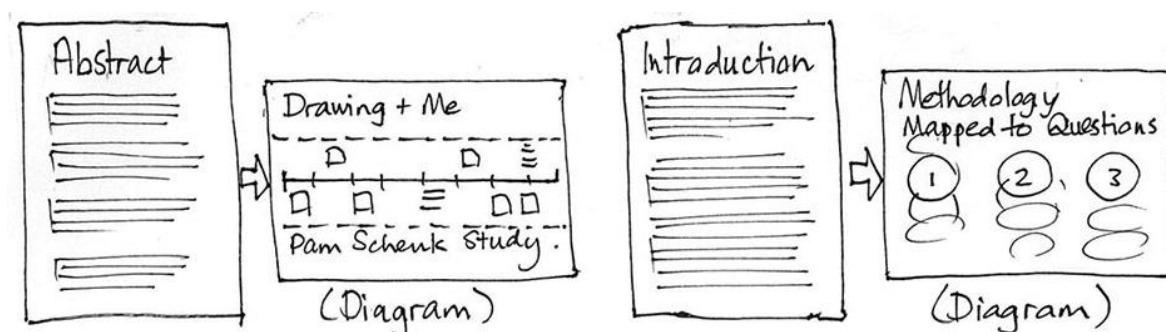


Image 12: Thesis content and structure thumbnails, 2018.

notes. This structure was used to create headings and subheadings in the thesis Word document and content analysis program, Nvivo. The components and connections within each chapter were also mapped. These sketched diagrams provided the framework that was updated as the thesis developed. Examples of these working sketches are included at the beginning of each chapter of *Back to the drawing board?* (see Images 14, 20, 21, 41, and 54). For more information and examples of process drawing types

and their role in the creative thinking processes of students, see Chapter 4: Practices and barriers to drawing.

1.4.4 Media and technique

At the beginning of *Back to the drawing board?* all first-year WSU design students were given a free iPad on enrollment in 2011 and 2012. Visual Communication Design teachers were also given the same version of iPad. Initially, the study embraced the possibilities of this new technology and considered ways to incorporate the impact that iPads had on drawing participation in the classroom. At the time, few published research studies were comparing sketching on an iPad with traditional pencil and paper methods. In 2013, I set out to explore the benefits of drawing using the iPad through my life drawing practice. I trialled the following sketch app, Brushes, inspired by David Hockney's drawing recordings at the *Fleurs Fraiches* Paris exhibition in 2010. I also played with Paper53 which was the free sketch app recommended to WSU first-year students on receipt of their iPad. I used the vector app SketchBook Pro extensively as this could be imported into Adobe Illustrator. The sketch app Procreate was also used consistently for illustration projects. Procreate had the best recording feature during these early days. I also trialled drawing with my finger, a Wacom Bamboo stylus, a Pogo stylus and iPad Pencil. The account of my first experiences drawing on the iPad revealed some frustration.



Image 13: Wacom tablet, 2010 and first iPad and Bamboo stylus 2012.

It is important to note that up until the start of this study, I had drawn exclusively using a large Wacom tablet and stylus (see Image 13). I had become accustomed to using Command-z, incorporating collage elements and using filters as part of my digital drawing practice. Despite my experience using a stylus, I discovered some negative aspects to sketching on the iPad. These were related to the small A5 screen size; difficulties with the sensitivity of the interface that changed when I rested my hand on the screen, and an annoying lag time, which

Hockney (2010) refers to as the computer "playing catch-up" (p. 3). I too found that the iPad could not keep up with the speed of my drawing. My first iPad had memory, saving and battery issues. It did not take me long to overcome these fundamental issues, but I was keen not to add to the barriers and frustrations that students already experienced in the classroom when asked to draw. So, the study moved away from using the iPad to explore students' practices.

To determine if design students employed their free iPads for drawing activities, I included a question probing iPad sketch app used in the first *Why draw?* questionnaire. Results revealed that despite the large numbers of students with iPads, most students did not use them for sketching or drawing purposes. Results from the next years *Why draw?* questionnaire revealed a minimal increase. Students did not seem to find the iPad a handy device for sketching up ideas in class. The use of iPads in the first-year *Visual Storytelling* tutorials had only become visible in 2018 and 2019. The students who use their iPads to draw, identify themselves as illustrators and regularly engage in digital drawing activities.

Subsequent studies reinforced my decision to stick with paper and pencils. Elizabeth Becker (2016), studied the effectiveness of graphic design students' use of iPads for sketching activities at the University of North Dakota. She aimed to discover the impact of using a sketch app on the idea generation process. Becker's first significant finding was that participants preferred sketching utilizing paper and pencil to drawing on the iPads (p.105).

Nine of the ten study participants indicated that after experiencing sketching on the *iPads* they still preferred to sketch using paper and pencil. 'It just doesn't compare', one participant said.

Another stated that the iPad still 'felt' like a computer, which made her want to sketch on paper first. In contrast, another participant called the iPad a gadget and explained, 'a gadget is not like paper. So it, like, limits your freedom' (Becker, 2016, p. 89).

Nicos Souleles (2017) investigated the usefulness of iPads to students studying Art and Design at the Cyprus University of Technology in Limassol, Department of Multimedia and Graphic Arts. Open-ended interview questions probed students' experiences using the Adobe Ideas app in place of paper and pencils for a conceptual learning task. He concludes listing the advantages and disadvantages of each. Students noted the benefits to using the iPad were; more options/functions, easy to develop ideas; portability; easy to use; easy dealing with colours; entertaining to use; and familiarity/previous knowledge (p. 7). The disadvantages of using the iPad were; time required to learn the tablet; not easy to sketch; lack of familiarity/no previous knowledge; and the iPad is expensive. The students identified disadvantages of traditional tools but on balance Souleles's study found unique advantages and arguments for the coexistence of both tools; however, he also notes that students' preference was dependent on the circumstances, constraints, previous skills and knowledge of individual (p. 11).

When I began the *Back to the drawing board?* study, significant distinctions could be made between drawing on paper and drawing on a digital device. Recent technological improvements have removed many of these differences. During this research, access to adequate digital sketching tools for all students was not possible. However, it is proposed that the act of thinking through your hand to make meaningful marks have similar functions whether you draw using a finger in the sand or a finger on a device. *Back to the drawing board?* chose to use traditional pencil and paper for all classroom trials to avoid technology

hurdles or barriers to drawing participation. Using paper and pencils would maintain equity amongst students and consistency in research results. In the context of this study, whether students chose to use a digital device or traditional materials is almost irrelevant to the argument that process drawing has a role to play in the creative thinking processes of novice designers.

1.6 Thesis structure

The content and structure of *Back to the drawing board?* has evolved as the study has grown, reflecting the development of the argument and possible pathways to drawing participation in the classroom.

Chapter 1: Introduction

Chapter 1 introduces and frames the thesis argument proposing that process drawing activities are still relevant in the creative thinking processes of novice designers and should therefore continue to be fostered and encouraged in design education and the classroom environment. The introduction includes summaries of the supporting literature, theories, and definitions that underpin the questions, chosen methodology and support the thesis argument.

Chapter 2: Methodology

Chapter 2 outlines the methodology and methods rationale, which evolved as the questions of the study arose. This includes an explanation of the adopted "reflection-on-action" and "reflection-in-action" approach (Schön, 1983) and discussion of the impacts of "insider" research. The chosen methods include a *Why draw?* questionnaire and interview questions designed to investigate the prior training, practices and attitudes to drawing of WSU design students. A triangulation of the observations, responses and process material (which led to the practice-led investigations) is outlined alongside the rationale and design of classroom drawing activities.

Chapter 3: Benefits of drawing

Chapter 3 includes a cross-disciplinary review of research studies into the role and value of drawing to creative thinking, design thinking and design education. The benefits of drawing are considered alongside observations made in my creative, teaching and research practices. The drawing research literature supports many good reasons for designers to include some form of process drawing in their creative thinking toolbox. The enduring value of drawing supports the development of classroom drawing activities.

Chapter 4: Practices and barriers to drawing

Chapter 4 explores the drawing practices and attitudes of *Visual Communication, Design* students at WSU. The results from first-year design students' *Why draw?* questionnaires are analysed alongside final-year interview and group discussion responses and examples of their design process material. An analysis of data outcomes and insights gained from responses shed light on the practices and barriers to drawing participation experienced by many students. These findings are considered alongside a continuous reflection of my teaching practices in the classroom and inform the design of classroom drawing activities.

Chapter 5: Pathways to drawing

Chapter 5 explores possible pathways to drawing through drawing itself. Accessible drawing techniques and strategies are explored including doodling, continuous line drawing, tracing and projection activities like squiggling. The insights and findings of these experiments influenced the creation of accessible, quick drawing activities designed to encourage and foster drawing participation during a one-hour tutorial.

Chapter 6: *Speed Squiggling*

Chapter 6 discusses the trial and analysis findings of the experiential drawing activity, *Speed Squiggling*. This activity was designed to align with the *Researching the Visual* Unit objectives and students' designerly practices. The activity was trialled with second-year WSU design students in 2018. An interpretation of the responses to a *Pre-and Post Why Draw?* questionnaire was considered alongside a visual analysis of the students' visual responses to the squiggles. An evaluation and recommendation for future developments of the speed squiggling activity is also included in this chapter.

Chapter 7: Conclusion

This final Chapter 7 summarises the seven good reasons for novice designers to use process drawing in their creative practices. The insights and findings from observations and interpretations of student responses are also summarised alongside recommendations for strategies to encourage process drawing participation in the WSU *Visual Communication, Design* classroom environment. Future considerations and implications of the study's findings are also discussed in the broader context of Graphic Design Education.

1.8 Conclusion

Back to the drawing board? argues that process drawing should continue to be clarified, demonstrated and encouraged in design schools. The study itself demonstrates the benefits of “thinking about drawing and thinking *through* drawing” (Garner, 2012, p. 16). The methodology and methods were chosen to respond to questions about students' creative thinking practices and attitudes to the use of drawing as part of their design processes. Questionnaire and interview responses directed the study towards finding a way to encourage and foster drawing participation in the classroom. Drawing research literature, taxonomies, creativity theories, design thinking principles and experiential learning theories underpin the relevance of this aim.

The thesis structure weaves personal narratives, reflections and observations throughout the text and includes data visualisations and process drawing examples where needed. The thesis narrative begins at the drawing board with a reflection of my changing relationship with drawing and my professional design practice. It then considers the changing drawing board ‘space’ and relevance to students' creative thinking practices before moving back to a physical drawing-board to explore accessible pathways to drawing participation *through* drawing. Throughout the study, students are encouraged to experience the benefits of drawing through quick classroom drawing activities. The research concludes with an evaluation of their experience using drawing in their practices and a visual analysis of the outcomes of the *Speed Squiggling* activity. The thesis begins at the drawing board and ends at the drawing board.

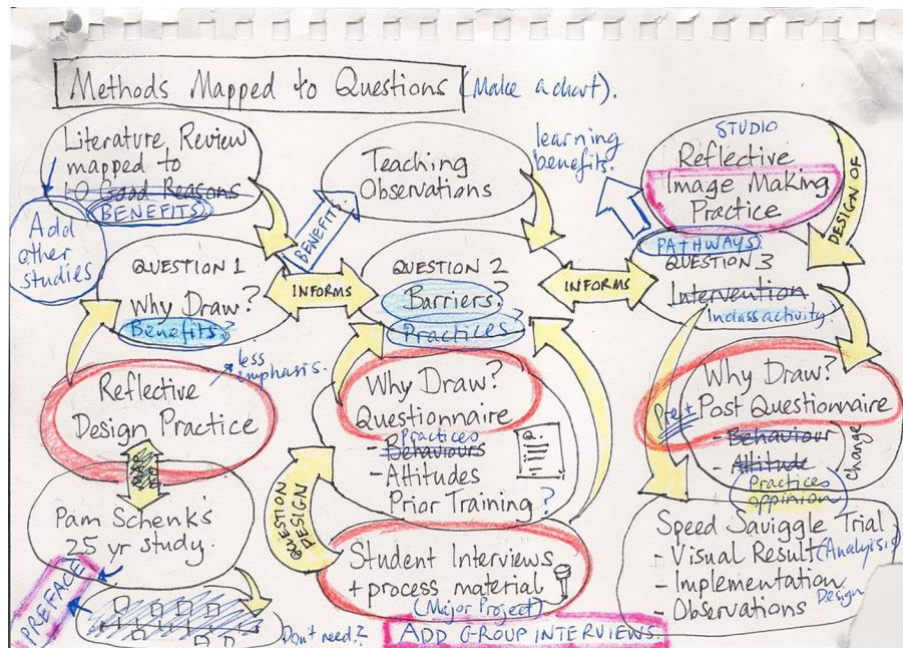


Image 14: Thinking sketch mapping methods to thesis questions, 2018-2020.

When a practitioner reflects in and on his practice, the possible objects of his reflection are as varied as the kinds of phenomena before him and the systems of knowing-in-practice which he brings to them (Schön, 1983, p. 68).

2 Methodology

2.1 Overview

The methodology of *Back to the drawing board?* developed in response to the observations and reflections on actions within my creative practices and those of the Western Sydney University (WSU) *Visual Communication, Design students*. This chapter explains the methods, rationale, design and ethical considerations of the study. The methodological approach evolved as the research questions of the study unfolded. *Back to the drawing board?* is predominantly a practice-based action research study, which revolves around the development and implementation of an activity designed to demonstrate and encourage drawing participation in the classroom. In this sense, it could be described as Classroom-Based Action Research, CBAR (Coghlan and Brydon-Miller, 2014), however, the enquiry also includes an investigation into the role and value of drawing in my creative thinking practices and those of my students, outside the classroom. As an insider, I reflect in and on my actions (Schön, 1983) and experiences. This practical knowing informs how I use drawing as a graphic designer, image-maker, teacher and researcher. Throughout the thesis I compare my experiences with those of my students and current industry practices found within the drawing research literature.

The study uses purpose fit methods to encourage students to reflect on their creative thinking practices through written, verbal and visual responses. Questionnaires probed WSU first-year design students' prior training, creative thinking practices and attitudes to drawing within their practices at home and in the classroom. Classroom practices expand on these findings and investigate graduating fourth-year students' design thinking processes utilised to develop their final Major Project. Classroom drawing activities are explored as part of my image making practice and conducted with WSU students throughout the study. The *Speed Squiggling* activity was trialled in the classroom with 2nd-year WSU design students enrolled in the *Researching the Visual (RtV)* Unit: this experiential activity was accompanied by a *Pre* and *Post-Why draw?* questionnaire, which provided further insights into the pedagogical response. The quantitative and qualitative analysis of these responses combined with the theoretical and practical knowledge gained from reflection in and on these actions, strengthen the thesis argument that supports the continued support of drawing in the twenty-first-century classroom. The inquiry's multiple 'frames' are woven throughout the thesis, providing an informal triangulation of theory, practice, and visual outcomes. The findings and insights through the study's actions highlight the students' current practices, benefits, barriers, and pathways to drawing participation for these WSU design students.

2.2 Methodology rationale

The ontological position of *Back to the drawing board?* is informed by the creative thinking practices, prior experiences and the possible variables that underpin the practices of my students and myself. The design theorist, Anne-Marie Willis (2006), in her case for "ontological designing" proposes that it is impossible to approach the act of interpretation with no prior knowledge. "Pre-understandings are always present, and the interpreter can never absolutely lay all these out in order to put them to one side, as it were, because the interpreter is the totality of his/her understandings" (p. 73). Many factors can influence a person's behaviour, actions and visual outcomes. The nature of the task, instruction, motivation, environment, time of day and sense of self-efficacy can change from one day to the next. *Back to the drawing board?* acknowledges the complexities that surround establishing prior knowledge and the determination of the creative thinking practices of individuals.

For instance, how students approach an ideation activity in a classroom environment depends on many physical, psychological and complex social interactions. Whether students naturally reach for a pencil or stylus or comply with instructions to engage in some form of process drawing in the classroom may be influenced by many factors. These include the instructions and expectations of the task, the teacher's experience and facilitation style, access to materials and devices, the dynamics of the social and learning environment, and the students' and teachers' prior experiences and beliefs. Good or bad childhood memories of drawing can also have a lasting effect on some students' practices and attitudes. Positive experiential and practical 'knowing' can affect a person's ability to engage in process drawing activities with understanding and confidence. The study's subjective epistemological foundation was also informed by the experiences of drawing and using drawing in the creative process – practical knowing.

Back to the drawing board? explores creative thinking practices by reflecting on current process drawing practices and implementing a drawing activity designed to influence the practices and attitudes of the participants. Practitioner-based research is deeply situated, and it accepts that although there are norms of practice, there are also infinite variations. "The capacity to work within these variations, learn from them and subsequently transform them, should be at the heart of the research intent for future practice" (Vaughan, 2017, p. 9). The aim of *Back to the drawing board?* is to understand students' current creative thinking habits and provide strategies and actions that challenge and complement these practices within the classroom environment.

Action Research starts with everyday experience and is concerned with the development of living knowledge, drawing on diverse forms of knowing: not just empirical and rational ways of knowing, including the experiential and tacit, the presentational and aesthetic, the relational and dialogical, the propositional, and the practical (Coglan, 2016, p. 88).

Back to the drawing board? focuses on my, and my students' everyday creative practices and tries out possible pathways to support the use of process drawing in the classroom environment. Carol Costley, Geoffrey Elliot and Paul Gibbs (2010) acknowledge that this kind of insider action research "embraces complexity and can be empowering and innovative, saving time and money by making improvements" (p. 4). This study has the potential to generate discussion and theory in other design education settings and design disciplines.

As previously mentioned, *Back to the drawing board?* incorporates both qualitative and quantitative approaches. Gary Thomas (2017) notes that these two approaches are not in opposition to one another, "rather, they can complement each other" (p. 244). The quantitative data gathered through the multiple-choice questions in the *Why draw?* Questionnaire, aimed to establish the prior training of participants and provide a general picture of drawing in the creative thinking activities of first-year WSU design students (see Image 15). These quantitative results were accompanied by a thematic analysis of responses to the questionnaire's open-ended questions. This tally of everyday creative thinking activities and discussion threads informed the design and implementation of the subsequent interview sessions with students who had recently completed the course.

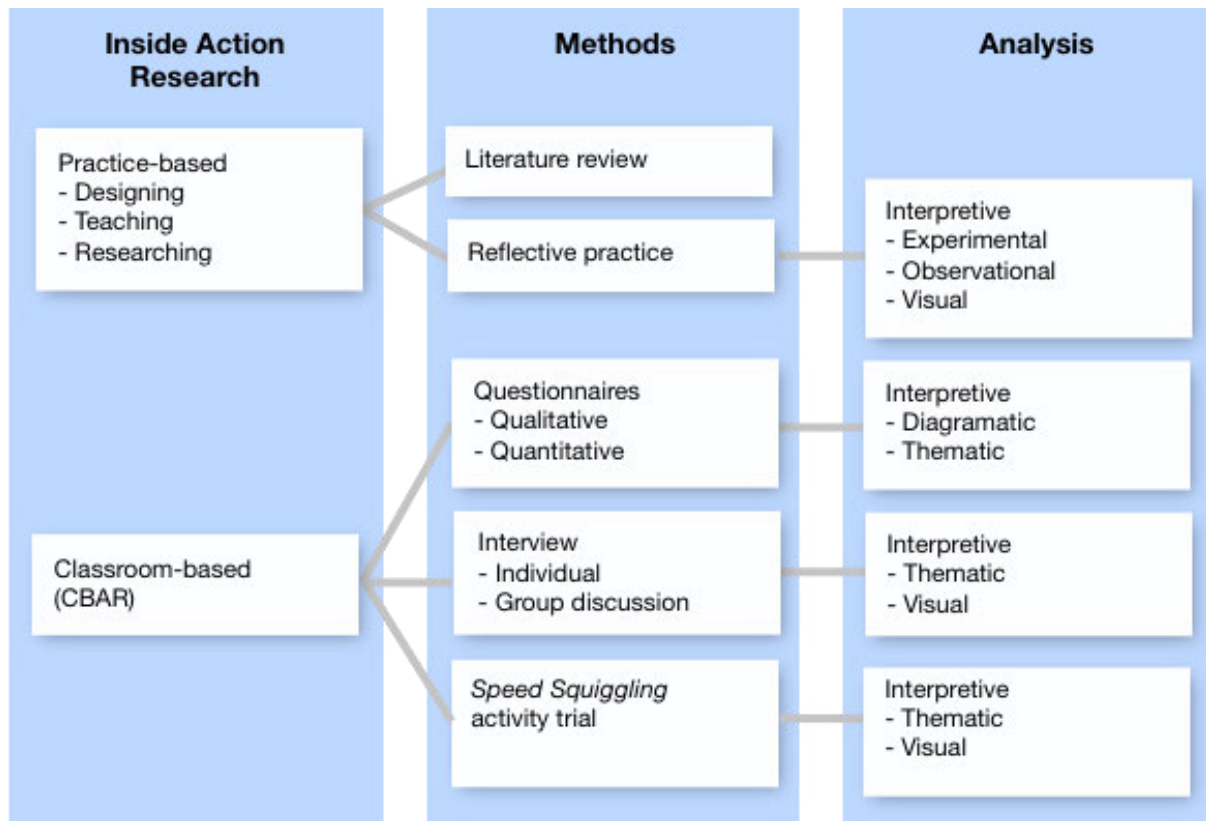
A qualitative approach was used to analyse the rich verbal descriptions gathered during these individual and group discussion sessions. Interviewees were specifically asked to describe their use of process drawing (or lack of drawing) in their creative thinking processes used in the development of their final Major Project assessment task. They shared their opinions about the value of drawing revealing attitudes and possible barriers to drawing participation in the classroom. The analysis of the qualitative and quantitative data derived from the questionnaires and interviews directly influenced the direction of the study and the development of the *Speed Squiggling* activity.

The *Speed Squiggling* activity was informed by the tacit knowledge gained by an exploration of simple doodling activities in my studio. These experiments built upon existing pathways to drawing participation to encourage creative, divergent thinking in the classroom. The *Speed Squiggling* activity was designed to align with the designerly aims and outcomes of the second-year *Researching the Visual Unit* at WSU. The trial began with a variation of the *Why draw?* questionnaire to establish the prior training, practices and attitudes to process drawing of this specific group. A *Post-Why draw?* questionnaire gathered information about the value of the *Speed Squiggling* activity to this cohort. A visual analysis of the outcomes also aimed to demonstrate and provide insights into the benefits of drawing for creative discovery. A comparison of my practices designing, teaching, and researching drawing, with those of my students, strengthens the study's methodological approach and rationale.

Back to the drawing board? does not attempt to map specific process drawing activities to particular design thinking tasks, as each instance of creative thinking is unique. However the study acknowledges the

complex variables of both researcher and participants and the subjective limitations inherent in this kind of insider Action Research. The interpretations and insights gained from observations, conversations and visual outcomes help to build a general picture of the role of drawing in the creative processes of the participants of this study.

2.2.1 Methodology framework



2.3 Action Research approach

Action Research has a long, diverse history, dating back to the early twentieth century. It encompasses the women's movement, Indigenous land rights, green and conservation activism, disease prevention, and professional fields such as education, nursing, medicine and agriculture (Kemmis and McTaggart, 2014, p. 4). Today, Action Research casts a wide net across many disciplines that includes participatory, practitioner-based and practitioner-led studies. David Coghlan and Teresa Brannick (2005) define Action Research as "'practical knowing' which is inclusive of practical, propositional, presentational and experiential knowing" (p. 28). Schön (1983) suggests that spontaneous, intuitive decision-making is "knowing-in-action" and could be replaced with phrases such as "thinking on your feet," "keeping your wits about you," and "learning by doing" (p. 59). Reflection-in-action occurs while you are in the middle of the action, practical knowing or knowing-in-action is "tacit and opens up outcomes that fall into the boundaries of what you have learned to treat as normal" (Coghlan and Brannick, 2005, p. 33). Action research also allows for the fluid interactions, interpretations of findings and reactions to these in the

process of enquiry. Coghlan and Mary Brydon-Miller (2014) note that shifts in thinking can evolve slowly or "there may be an instant insight that there is a better way to do something, an improvement" (p. 676).

The trial of the *Speed Squiggling* drawing activity and other pedagogical components of the research are Classroom-Based Action Research (CBAR). CBAR often consists of a "teacher-designed and managed small-scale investigation" designed to change teaching practices (Coghlan and Brydon-Miller, 2014, p. 103). While the *Speed Squiggling* trial represents an essential component of the study, additional insights gained from multiple perspectives add significantly to the discussion and pedagogical approach. Questions are raised about the specific drawing skills needed to 'get by' and benefit effectively from classroom drawing strategies. Discussions related to curriculum content and learning strategies are beyond the scope of this study; however, the findings contribute to pedagogical discussions related to drawing and drawing tuition in future design education syllabus.

2.4 Practice-based research

Back to the drawing board? incorporates all the advantages, limitations, and challenges that accompany studies performed within one's practice. Practice-based, practice-led, and practitioner research categorisations vary across studies and are therefore tricky to place. Schön (1983) suggests the reflective practitioner "is not dependent on the categories of established theory and technique, but constructs a new theory of the unique case" (p. 68). *Back to the drawing board?* weaves in and out of my practices and those of my students using the creative thinking situations to reflect on and in actions (Schön, 1983). The study aims to combine these different practitioner perspectives while considering the influence and bias inherent in researching one's students within one's place of employment.

As a designer, I am adept at clarifying and reframing problems, searching for novel approaches and new opportunities, designing strategies, meeting deadlines, responding to change, defending my ideas and taking risks. Joyce Yee (2017) notes in *The Researcher Designer/The Designerly Researcher* the importance of her professional design experience on her practice-based design research. "Having a creative and making-based training that embraces uncertainty, uses visual thinking and a 'make-do' attitude brings a very positive contribution to research practice" (p. 162). Yee (2017) also identifies three key benefits of having visualisation skills in the research process; "First, as a reflection and exploration tool; second, as an analysis and knowledge generation tool; third, as a communication, facilitation and discussion tool" (p.160). *Back to the drawing board?* mobilises these three functions while observing and reflecting on my practices and those of my participants whilst developing and designing the *Speed Squiggling* drawing activity.

2.4.1 Insider perspectives

Melanie Greene (2014) defines insider research as "that which is conducted within a social group, organisation or culture of which the researcher is also a member" (p. 1). She notes an increase in auto-ethnographic, insider research projects being conducted within the Canadian education sector to expand doctoral programs (p. 1). "Practitioner-led, participatory designed enquiries are on the rise in Europe, the UK, Scandinavia and Australasia at both masters and doctoral level. This rise can be seen to be both an opportunity and a necessity for design practitioners in the future" (Vaughan 2017, p. 2). There are distinct advantages to studying within one's community of practice. Christina Chavez (2008) lists the benefits of the insider positionality as: "a nuanced perspective for observation, interpretation and representation; an equalised relationship between researcher and participants; the expediency of rapport building; immediate legitimacy in the field; and economy to acclimating to the field" (p. 479). My decision to research and trial drawing activities within my teaching practice began as a practical decision responding to the students' perceived needs.

Costley, Elliott, and Gibbs (2010) note that insider-led research can significantly contribute to work practices. "As an insider, you are in a unique position to study a particular issue in-depth and with special knowledge about that issue" (p. 3). The inside position allows the researcher to make changes and challenge the status quo from an informed perspective. Insiders can understand the subtleties and complexities of the issues because they have in-depth knowledge. An insider brings their unique expertise and experience to the situation, gained through personal experiences, career goals, values, and principles relevant to the research and how the research has been undertaken.

Being an insider also allows the researcher to remain flexible to respond to unknown variables as they are revealed in the study. You cannot know what you don't know; however, the insider's intuitive knowledge allows for flexible responses to new information and findings as they arise. Appropriate content and strategies can be made in and on practices within a known culture. "Situatenedness arises from the interplay between agent (you, the researcher), situation (the particular set of circumstances and your position within it), and context (where, when and background" (Costley, Elliott, and Gibbs, 2010, p. 2). Coghlan and Brannick (2005) state that "one advantage you have as an insider-researcher over an outsider-researcher is that you have valuable knowledge about the cultures and informal structures of your organisation" (p. 61). As a practitioner and insider, I reflected on my participants' "tacit norms" and considered possible bias, judgments, strategies, and theories implicit in specific patterns of their creative thinking behaviour concerning my practices. As a teacher within the classroom environment, I could act upon this insider knowledge and create situations that addressed the findings.

2.4.2 Participants and me

As a University insider I share many similarities with the participants of the study. I was born and raised in the Greater Western Sydney region. I raised my children in the Blue Mountains, which is also part of the WSU catchment area. I am familiar with the history, growth and future aspirations of the region, including the development and building of the University in 1989. I share an understanding of the participants' educational communities having grown-up in the Western suburbs of Sydney. My parents and sisters taught and continue to teach in schools within the WSU catchment area, which has given me an understanding of the past and current challenges some of the more disadvantaged schools face. The small company my husband and I ran for twelve years provided work experience for several WSU students during the late 1990s. As a past WSU Masters and recent PhD candidate, I have a first-hand understanding of the student culture, values and processes of WSU. Indeed, my undergraduate degree from Sydney College of the Arts (SCA), included illustration, photography, graphics, film, typography design history and psychology, and visual perception subjects not unlike the WSU *Visual Communications, Design* course.

Early in the study I transitioned from industry outsider to teacher insider. Sometimes these oscillating perspectives created conflicting expectations and opinions related to design practices and drawing. In my professional capacity as a designer, I worked with several confident young designers who were fluent in the Adobe Suite and often sketched out first thoughts or plans using a Wacom tablet. During the same period, I was tutoring fourth-year *Visual Communication, Design* students. I recall when these fourth-year students were presenting their final year project concepts, it was difficult not to make unfair comparisons between these young professional freelancers and the graphic design undergraduates. Chavez (2008) warns of the dangers of shifting insider and outsider perspectives, noting that the researcher's 'voice' can become confused as they navigate their way through positions of self and other. "For an insider, bias may be overly positive or negligent if the knowledge, culture, and experience she/he shares with participants' manifests as a rose-colored observational lens or blindness to the ordinary" (p. 475). It was not until I began trialling drawing activities in the classroom, observing students' limitations, reluctance, and fears surrounding drawing that I began to appreciate the complexities surrounding students' perspectives within the learning environment.

As a result of these close connections, possible bias and ethical considerations were considered at different stages of the *Back to the drawing board?* study. Costley, Elliott and Gibbs (2010) note; "there are many steps an insider can take to guard against bias in the work, for example careful attention to feedback from participants, initial evaluation of data, triangulation in the methods of gathering data and an awareness of the issues represented in the project" (p. 8). I cultivated a positive rapport and friendly open-door policy with all students, and encouraged critical feedback through informal discussions, often with mature age students who were more forthcoming with their comments, and through formal student feedback

channels. This feedback resulted in many changes to the content, delivery and evaluation of assessment material in the Units I coordinated during the research.

2.4.3 Outside to inside

As an industry outsider coming into the WSU *Visual Communications, Design* course in 2010 afforded many opportunities during the decade that followed. Throughout the study my agenda had changed from being an effective practitioner to supporting future practitioners, helping students develop their design capabilities and becoming 'industry ready'. As an academic and teacher, I lost touch with the day-to-day workings in the graphic design industry in Sydney. I rely on University professional links, discussions with old colleagues, industry conferences, awards, articles and design magazines for my information about the challenges and future direction of creative industries in the twenty-first century. Being both participant and observer has provided me with unique layered perspectives, which profoundly informed my teaching and research approach.

It is essential to acknowledge that outsider research is not immune to external bias and may possess many opposing opinions that affect the study in the same way as insider perspectives. Indeed, pitfalls lie in both positions. For an outsider, the danger is the imposition of the researcher's values, beliefs, and perceptions on the lives of participants. Robert Labaree (2002) agrees that 'insiderness' has many advantages. Still, the researcher must remain alert to the possible "ethical and methodological dilemmas associated with entering the field, positioning and disclosure, shared relationships and disengagement" (p. 97). *Back to the drawing board?* aims to identify possible bias, conflict of interest and traps for an insider. By considering the ethical position, the research addresses these concerns in the reflective conversation. Good insider research practice includes sensitivity and respect for your colleagues, students and communities of practice explaining your research's relevance and value. The research design of *Back to the drawing board?* was carefully considered to ensure questionnaires, interviews and drawing activities provided valuable learning experiences beyond the study's outcomes. Considerations were made around anonymity and confidentiality, and ethical safeguards were positioned to protect students, participants and the data's validity.

The age, gender, cultural background and belief systems of both the researcher and participants of the study also influence the complex perspectives of insider research. Early in the enquiry, I took care to avoid taking sides and make ill-informed judgments based on my previous experiences and prejudices. I reflected on my circumstances and bias influenced by my pre-computer training and the limitations of my experience as a professional designer working in small studios across a relatively small graphic design industry in Sydney, Australia. I had come from an Anglo middle-class artistic family and had entered the graphic design industry during a period of general low unemployment. There was a gender divide that

resulted from lengthy, random working hours that did not suit family life, and the over-representation of men in senior positions, which made it difficult to change the culture. Most design studios of the twenty-first century embrace and welcome diversity and online workspaces. The industry has become global, and the pathways to becoming a graphic designer have broadened. Within this thesis, I acknowledge my early experiences working in Sydney are very different from those of my students (see Preface); however, the continuity of my experiences provides a unique perspective in which to evaluate industry practices.

2.5 Practical knowing

When I became curious about students' lack of drawing in the classroom, I turned my thoughts back on my creative thinking practices and the "knowing" implicit in these actions (Schön, 1983, p. 50). The insights gained through this tacit, practical knowing of what drawing can do, and drawing experience cannot be achieved through theoretical means alone. Schön (1983) highlights the unique awareness that humans' gain from using a tool, probe, stick or perhaps pencil to explore objects. He cites Michael Polanyi who writes, "We attend 'from' its impact on our hand 'to' its effect on the things to which we are applying it. In this process, which is essential to the acquisition of a skill, the feelings of which we are initially aware become internalised in our tacit knowing" (p. 52). A reflection on my use of drawing as a designer and artist includes exploring drawing through the act of drawing. Taking care, noticing, and experiencing the effects of drawing provide "a reflective conversation with the materials of the situation" (Schön, 1983, p. 42). Petherbridge (2014) observes that "the place where design and art practice meet and where methodologies become momentarily indistinguishable is that of drawing" (p. 1). The performative act of drawing - experiencing and knowing the value and 'handiness' of drawing to the designer and the creative process, is vital to understanding the research argument. But how reliable is this practical knowing?

The way we visualise, recall and express what happens during the creative process is elusive. When a person engages in creative thinking, they enter a heightened state of consciousness; they get into the zone; and experience creative "flow" (Csikszentmihalyi, 1990, p. 9). It is often difficult to recall what happened. Nigel Cross (2011) observes that "designers themselves are often not very good at explaining how they create. When designers – especially skilled, successful designers – talk spontaneously about what they do, they talk almost exclusively about the outcomes, not the activities" (p. 16). Indeed, what students are thinking, before, during, and after ideation and drawing activities are subject to many variables. The participants themselves are in continually changing states of *Dasein* – "being-in-the-world" (identified by Heidegger in 1927). The challenges of researching creativity and the creative process, which is subjective and fluid by its nature, are also acknowledged in Chapter 1: Introduction. Despite the limitations inherent in recalling and expressing the experience of drawing, the knowledge gained from doing and reflecting on doing contributes to the study's motivation, design, interpretation, findings, and insights. Coghlan (2016) reminds us of the importance of finding deep meanings through different ways of knowing; "Insight is at

the centre of the knowing process and of the general empirical method that underpins all inquiry" (p. 93). Recollections and insights about the practical aspects of drawing in the creative process are woven throughout the narrative of the thesis.

2.6 Classroom based research

Back to the drawing board? includes commentary on the expanding territories of Graphic Design Education and the continuous debate about the role of digital media tools in teaching and learning (Souleles, 2017, p. 587). Design education is in constant flux; justifying its academic position and responding to competing political and social agendas. A detailed account of the future of tertiary design education in Australia is not included in this thesis. However, I have included summaries of relevant factors that have influenced teaching and educational practices and the direction of this research. Factors concerned with inherent student requirements, course structures, content and Unit sharing practices, reduced face-to-face contact and increased online delivery). In response to these challenges, the WSU *Visual Communications, Design* course has taken a pragmatic approach to course content and design. It aligns course content with industry expectations while striving to maintain a balance of research, creative thinking and relevant software training that will equip students for the ever-changing design industry. However, detailed recommendations on how to increase opportunities and embed drawing activities into an overcrowded, technologically driven curriculum are beyond the scope of this study.

2.6.1 The university

Western Sydney University (WSU) connects the Western region and its communities. It promotes equity and inclusiveness through a student-centered approach (2018-2020 *Strategic Plan*). The University's mission is to provide opportunities for local and international students from diverse backgrounds to attend University and achieve excellence. The *Visual Communications, Design* course has been steadily growing during the last decade accepting students who have come to the course via traditional and non-traditional pathways. As there are no prior skills required to enter the *Visual Communications, Design* course, WSU provides students with the opportunity to catch up on missing knowledge and skills through the first-year program.

Within Australia, there are Indigenous, local, regional, state and national levels of engagement, links and differences between tertiary institutions. WSU is a relatively new university in competition with the inner-city University of Technology in Sydney (UTS), Sydney University and NSW University. The *Visual Communication Degree* at UTS evolved from the Sydney College of the Arts degree, which I completed in the mid-1980s. WSU campuses traditionally service the sprawling greater Western Sydney suburbs across an area that extends from Parramatta to Liverpool to Lithgow to Castle Hill.

In this study, I considered the University's position and course within Australia and the global drawing research network through the literature. Most of the drawing research networks originated in Europe and the UK and spread outwards. Australia is geographically placed within the Asia Pacific and shares close cultural teaching exchanges with New Zealand, Indonesia, Japan, China and the Pacific Islands. Australia had many historical and cultural ties to European design education practices influenced by the movements of traditional visual arts and design education and the mid-twentieth century's Bauhaus. My research provides an alternative voice and another perspective on the changing creative practices in a digital landscape.

2.6.2 The course

Within the WSU *Visual Communications, Design* course different subjects or Units are offered. Some of these Units are required core Units and others are offered as an elective across courses and sometimes disciplines. The *Why draw?* questionnaires and *Speed Squiggling* activities were incorporated into the first-year *Visual Storytelling Unit* and second-year *Researching the Visual* Units. The final-year participants were interviewed about their design thinking processes used during the development of their final assessment in the *Major Project Unit*. References to idea-generating activities using process drawing are found within the learning materials and assessment requirements contained in these three WSU Unit *Learning Guides*. In some Units, there are design process activities embedded in the learning and assessment criteria. They include the production of a mind map, mood board, storyboard, thumbnail, keeping a sketchbook or populating a Pinterest account. *Back to the drawing board?* considers the content, promotion of creative thinking activities and assessment process criteria found in the *Visual Storytelling, Researching the Visual* and *Major Project* Units found in their *Learning Guides*.

Some of the creative thinking activities encouraged through these *Learning Guides* has changed since the beginning of the study. Prior to 2016, most WSU Visual Communication Units required students submit a physical sketchbook or process diary. After 2016, most Units required students to upload their process material to an online repository. The uploaded material includes a mix of scans, found images, digital drawings and computer-generated iterations often collated into one document or folder. Schenk (2016) observed this hybrid approach to creative discovery in the later years of her study. The creative thinking habits of WSU design students appeared to be influenced by assessment requirements, attitudes and practices within the student culture. However, early observations of classroom activities and process submissions reveal a disconnection between what students say they do, what they aspire to do, and what they appear to do, which prompted this enquiry.

2.6.3 The colleagues

At WSU, there is a mix of genders and ages in the WSU *Visual Communications, Design* course. In 2018, most staff members had been teaching at WSU for more than ten years and several new graduates were employed as casuals. The staff was collegial and supportive and shared similar teaching and research goals. Costley, Eliot and Gibbs (2010) acknowledge the influences that professional life, professional bodies, partner organisations, colleagues, family, career goals, values, principles, and financial security have on the pursuit of research and topic choice. They observed that influences also came from educational institutions that required an academic underpinning of the work-based research project (p. 3). Several other staff members had begun their PhDs around the same time as I did, also driven by the need to meet new Australian University employment requirements.

I acknowledge the impact my early colleagues had on the development and direction of the *Back to the drawing board?* study itself. I was a new comer amongst a staff that had been teaching in the WSU Design School for over ten years. Jean Lave (1991) describes the newcomer as one who is "furnished with comprehensive goals, an initial view of the whole, improvising within the multiply structured field of mature practice with near peers and exemplars of mature practice..." (p. 72). As a new comer, I reflected on my recent experiences working as a graphic designer and compared these with the learning outcomes of the Units I taught. I could identify similarities and differences in the way colleagues approached creative thinking tasks without being influenced by old alliances and historical agendas. Costley, Elliott, and Gibbs (2010) note that researching within a community of practice can positively impact an academic's career.

Having to build effective relationships between your professional occupation and the university and justify your work, achievements and intentions to critical audiences in work and academe can promote greater self-belief, wider acceptance amongst peers, intellectual skills and a commitment to continuing self-development in the context of your work (p. 5).

My principal and secondary supervisors were also members of my teaching group. Although each staff member has their specialisation, there is the continual movement across or between Units. I have taught in many of the teaching teams and know most of the *Visual Communication, Design* staff. The teaching and research environment is transparent and supportive. I have presented my research at school symposia, so most of my teaching colleagues are aware of my research agenda to encourage drawing participation. Some colleagues, including my supervisors, have been directly involved in the collection of the *Why Draw?* questionnaires and the trial of *Speed Drawing* activities during their tutorials. I have also been involved in developing Unit content, assessment tasks and learning resources for the first-year *Visual Storytelling* Unit. My interactions with WSU teaching and research staff have profoundly affected the direction and actions taken within my teaching practice throughout the *Back to the drawing board?* enquiry.

2.7 Methods summary

The methods used to investigate the role and value of drawing in creative discovery, design thinking and design education, grew in response to need. The following methods, or research instruments, were chosen to gain theoretical and practical knowledge about the nature and benefits of drawing within my creative practices and those of my students at WSU:

Literature review:

A cross-disciplinary review focuses on design theory, drawing taxonomies and creative thinking practices. The creative disciplines include: Visual communications; Design (graphic design); Visual arts; Industrial design; Architecture; Design thinking; and Australian design education.

Reflective practice:

Observations of changing drawing roles reflect in, and on, actions that explore current image making, teaching, and research practices. This reflection includes explorations of drawing strategies and techniques in the studio and WSU classroom.

Questionnaires:

Why Draw? questionnaires containing qualitative and quantitative multiple-choice and open-ended questions were designed to investigate students prior training and creative thinking practices and motivations.

Interviews:

Individual student interviews investigated the role of drawing in their creative thinking practices through retelling alongside visual examples of their use of drawing activity (or no drawing activity) used in the development of their major project. This is followed by facilitated group discussions with these interviewees discussing and comparing practices and motivations.

Activity trial:

Includes trial and visual analysis of the *Speed Squiggling* warm-up drawing activity through interpretations of *Pre* and *Post-Why draw* questionnaire data, additional responses and visual outcomes.

2.7.1 Questions aligned to methods table

Each method's responses and insights uncovered similarities and differences between other studies found in the literature from other design disciplines and design education outside Australia. The horizontal connections in the table below indicate the methods that provided opportunities to compare findings and insights found in the data.

QUESTIONS	Reflection “in” & “on” actions	Literature review	<i>Why Draw?</i> Questionnaire (Quantitative & Qualitative)	Interviews	Activity trial
Why don't students use drawing to think and communicate in the classroom?	Teaching practice (<i>observations</i>)	Cross disciplinary (<i>Visual Arts, Design, Architecture, Engineering & Neuroscience</i>)		Individual & group discussions	
What is <u>my</u> changing relationship with drawing?	Design & image making practices (<i>practical knowing</i>)				
What is the role and value of drawing in the creative process?	Teaching, design & image making practices	Cross disciplinary	Multiple choice & comments	Individual & group discussions	<i>Speed Squiggling</i> trial & visual outcomes
What creative thinking practices do WSU design students engage in?	Teaching practice		Multiple choice & comments	Individual & group discussions	
What creative thinking activities are encouraged at WSU?	Teaching practice	Unit Learning Guides		Individual & group discussions	
Does the graphic design industry still value sketching ability?	Teaching & design practices	Cross disciplinary		Individual & group discussions	
Do students think having some drawing ability is a benefit to being a visual communicator?			Multiple choice & comments	Individual & group discussions	
What prior visual training have design students engaged in before entering WSU?			Quantitative multiple choice question		
What are the barriers and pathways to drawing participation?	Teaching, image making practices	Cross disciplinary	Multiple choice & comments	Individual & group discussions	<i>Speed Squiggling</i> trial & visual outcomes
Can drawing activities encourage drawing participation in the classroom?	Teaching practice	Cross disciplinary	Multiple choice & comments (<i>Pre & Post- Why Draw?</i> questionnaires)	Individual & group discussions	<i>Speed Squiggling</i> trial & visual outcomes

2.7.2 Data collection rationale

The *Back to the drawing board?* research was interrupted for several years. However, I continued to collect *Why draw?* questionnaires and trial the *Speed Squiggling* activity with first-year WSU Visual Communication students. When I returned to the study in 2017, I was faced with piles of unanalyzed questionnaires, interview recordings and drawing activity responses that exceeded the scope of the thesis. A critical selection of the following data collections was conducted and chosen based on completeness and relevance to specific questions outlined in the *Questions aligned to the methods table* above.

The *Why draw?* questionnaire was first collected from first-year WSU design students in 2013 by myself. Data gathered from this years' students was chosen for analysis and inclusion in the *Back to the drawing board?* thesis because it had the potential to provide a unique perspective of this group who had received a free iPad on their enrollment in the design course. As a result, the questionnaire focused on the materials of drawing. In doing so, it made assumptions about students' processes. Some of the questions lacked clarity, but despite the shortcomings of the first *Why draw?* questionnaires, the responses revealed important information about students' attitudes and practices concerning the use of process drawing in their creative processes.

The *Why draw?* questionnaire was collected again in 2015 with first-year design students attending the *Visual Storytelling* Unit. Unfortunately, this cohort did not receive a free iPad. However, an analysis of this years' data provided an opportunity to compare the responses of iPad use several years on. The 2015 *Why draw?* responses also provided a snapshot of this cohort, some of whom were interviewed four years later about their use of process drawing. Some of these interviewees remembered completing this *Why draw?* questionnaire in their first-year and could reflect on the changes that had occurred to their creative practices since that time.

Individual interviews were first conducted with high achieving fourth-year WSU graduates in 2016. The recorded responses to these first interviews have not been included in the *Back to the drawing board?* thesis. This omission was due to shortcomings in the interview design and process (as previously described in the interview rationale). The interview process and question design were revised and repeated with the 2017 and 2018 WSU high-achieving design students. A group discussion was added as this proved more effective than individual interviews alone, in finding details of how students interacted with process drawing activities.

The warm-up *Speed Squiggling* activity was trialled with first-year *Visual Storytelling* students throughout the study; however, these early results have not been included. Each year's iteration responded to the observation and reflection of *Speed Squiggling* responses gathered from the previous year. These early trials shaped the final *Speed Squiggling* activity conducted with second-year *Researching the Visual* students in 2018. This later sample provided targeted, relevant learning objectives, consistent delivery and collection across the tutorials. A profile of this cohort was collected through a *Pre-Why*

draw? questionnaire and a *Post-Why draw?* questionnaire aimed to investigate the success and impact (if any) of the drawing activity. The *Post-Why draw?* activity provided insights to students' understanding of the role of drawing and their opinions on whether they think having some drawing ability would be beneficial to the visual communicator.

It is important to note that several other speed drawing activities preceded the trial of the warm-up *Speed Squiggling* activity. These included *Speed Mind Mapping* and *Speed Storyboarding*. All three activities were conducted throughout the study; however, a detailed analysis of *Speed Storyboarding* and the *Speed Mind-Mapping* activities have not been included in the thesis. Although both activities proved successful in demonstrating specific tasks related to their assessment requirements, they lacked originality of design and a robust approach to the analysis. *Speed Squiggling* was designed explicitly for the study to demonstrate the role and value of drawing to visualise, create and iterate through the experience of drawing itself. The visual responses or pictures produced during the 55-minute activity, also illuminate the value of generating multiple ideas for original thinking. The *Speed Squiggling* trial's interpretations and findings highlight and reinforce the responses gained from the *Why draw?* questionnaires. The interview discussions and practice-based reflections in and on classroom and studio practices also contributed to the study's understanding of the role and value of drawing to participation.

2.7.3 Data collection table

LIST OF METHODS	TIME & LOCATION	WSU PARTICIPANTS & SAMPLE SIZE
<i>Why Draw?</i> questionnaire Multiple choice questions with additional space for comments	2013 – March Approx. 25 students per classroom Circular desks seating 5-6 students	100 x 1st year WSU Vis. Com. Design students attending <i>Visual Storytelling</i> core Unit
<i>Why Draw?</i> questionnaire Multiple choice questions with additional space for comments	2015 – March Approx. 25 students per classroom Circular desks seating 5-6 students	61 x 1st year WSU Vis. Com. Design students attending <i>Visual Storytelling</i> core Unit.
Student Interviews Recorded audio & transcription of individual & group discussions with assessment process material examples	2017 - Nov 4th year dedicated classroom (<i>Rabbit Hole</i> studio)	9 x high achieving 4th year WSU Vis. Com. Design students Group 1 discussion Group 2 discussion Group 3 discussion
Student Interviews Recorded audio & transcription of individual & group discussions with assessment process material examples	2018 – Nov 4th year dedicated classroom (<i>Rabbit Hole</i> studio)	4 x high achieving 4th year Vis. Com. Design students. Group 4 discussion
<i>Speed Squigglings</i> trial 55 minute in-class drawing activity Visual analysis of squiggle responses <i>Pre-and Post Why Draw?</i> questionnaires Multiple choice & open ended questions	2018 - March Approx. 25 students per classroom A mix of rooms with 2-3 parallel desk formations and circular desk seating 5-6 students	112 x 2nd year WSU Vis. Com. Design students attending <i>Researching the Visual</i> core Unit.

2.8 Analysis rationale

The analytical approach balances interpretations of observations, reflections and narratives with quantitative data and visual examples. The triangulation of the data provides a strong argument for the development of classroom drawing activities and information about drawing practices and attitudes that informed the design, development, implementation and evaluation of the *Speed Squigglings* activity.

2.8.1 Analytical methods

The following chosen methods determined the following interpretative analyses approaches:

- Interpretation of past and current literature and drawing research studies through the lens of a pre-computer trained Australian design practitioner, educator and academic.
- Interpretive analysis of the notes, journal entries, pictorial sketches, schematics, photos and videos gathered as part of my reflective practices,
- Thematic analysis of the questionnaire comments and interview responses,
- Visual analysis of the accompanying interview process material and *Speed Squigglings* activity trial responses,

- Deductive analysis of the quantitative data collected through the *Why draw? Pre* and *Post Why draw?* questionnaires, and
- A triangulation of the qualitative and quantitative data highlighting anomalies, similarities and differences.

2.8.2 Visual analysis

A general picture of students' sketching or lack of sketching activities was first noticed when assessing their visual diaries and sketchbooks submitted alongside design outcomes early in the *Back to the drawing board?* research. These initial observations provided information about the kind of activities promoted and used by students at WSU as part of their ideation practices in the classroom and at home. Sketches, notes, journal entries, photos, and videos served as memory tools or prompts for students and myself throughout the study. These artifacts help illustrate similarities, differences and anomalies between students' use of drawing in their practices and my creative thinking habits and approaches. The visuals provide concrete examples of the kind of process drawing activities described in the thesis.

The study's visual analysis focuses on identifying the frequency and type of drawing activities used by students to provide a general picture of the role and value of drawing in the creative process: a detailed semiotic evaluation of their sketches has not been included in this thesis due to acknowledged limitations. These include the possibility that process material submitted as part of an assessment task might not be an accurate reflection of students' practices. Indeed, informal conversations with participants revealed that students often recreated, added and 'fixed up' their process material to gain higher grades, thus a visual analysis of these process drawings was not a reliable indication of students' practices. Therefore, additional context and meaning was needed to make sense of the participants' scribbles and rough sketches. Even verbal accounts relied on the drawers' ability to recall and describe their processes accurately after the event. The limitations of this kind of visual analysis led the study to focus on providing process drawing examples alongside rich accounts of my, and my students' practices. These concrete examples offer visual examples of the definition and terms used throughout the study and contribute to the tacit understanding of process drawing to design thinking and learning.

The study includes a brief thematic evaluation of the *Speed Squiggling* trial's visual outcomes. This analysis strengthens the proposition that classroom drawing activities can demonstrate the value of iteration to creative thinking. A detailed semiotic analysis of the squiggle outcomes provides interesting visual perception and cognitive discussions for future research, however, an in-depth visual examination of the responses to squiggles goes beyond the scope of this thesis (see Chapter 6: Speed Squiggling).

2.8.3 Thematic analysis

The qualitative interpretation of questionnaires, interviews and the *Speed Squiggling* responses relies on identifying recurring patterns and themes. The study's themes were determined through the tally of recurring answers and known divisions created by theory and practice. The concepts contained in the *Why draw?* questionnaires and interviews were known from observations of my creative thinking practice and those of my students. However, some student responses were surprising, which prompted the creation of different categorisations, along the way to determine how prevalent these practices and attitudes were in each cohort. The categories or conceptual units were selected alongside an analysis of the issues that affected students' practices. The comments were grouped alongside the data compiled in spreadsheets. The interview comments were analysed and coded into discrete units under relevant headings related to sections of the thesis argument using Nvivo. When coding the comments, I strove to retain the fidelity of the student comments, and their integrity recognising that "each unit must be a fair rather than a distorted representation of the context and other data" (Cohen, Marion and Morrison, 2002, p. 478).

The answers to the question that probed students' opinions about the importance of having some drawing ability as a visual communicator, were also grouped into themes. Early findings to this question in the *Why draw?* highlighted the need for more dialogue to qualify this data and comments. The discussion 'threads' or common practices and activities mentioned during the individual and group conversations were analysed and grouped with similar statements. The language and tone of students' responses revealed additional information that informed the selection of the themes or codes. A general picture of students' practices and attitudes to drawing was built through this collation process and comparisons of frequency and content. The themes (codes) included in the interview transcription analysis are included in Chapter 5: Benefits and barriers to drawing.

2.8.4 Triangulation

The effectiveness of triangulation rests on the premise that every single method's weaknesses will be compensated by the counterbalancing strength when compared to the other (Jick, 1979, p. 60). The chosen methods of *Back to the drawing board?* use a triangulation strategy to uncover how process drawing is used in the creative process. Using this strategy can produce unexpected results or unseen contextual factors and reveal convergent data that can build and strengthen the argument and the findings (Jick, 1979, p. 609). *Back to the drawing board?* compares the observational, theoretical and practical knowing of my, and my students' practices to provide a strong argument for drawing to create, think and communicate in the classroom.

The literature review includes evaluating assessment tasks and marking criteria in the WSU Visual Communication course Learning Guides (LGs). Each Unit Coordinator writes instructions for their Unit outlining the assessment task, expectations and learning outcomes. Design thinking activities are suggested or stipulated within the LG and often demonstrated and encouraged during tutorials. Design education literature, industry commentators and drawing researchers make recommendations of best practice and identify current and future designerly thinking activities and trends related to the role of drawing in the twenty-first century.

The literature findings are considered alongside my experiences working as a design professional, educator, researcher-practitioner and artist. How do I use drawing in my creative process, and what activities do others appear to use? These insights were considered alongside the open-ended comments, and recurring themes gathered from the *Why draw?* questionnaire responses. The candid accounts from individual students are included in the group discussions. They help fill in the gaps and strengthen the overall picture and arguments related to students' practices and attitudes. A visual analysis of the accompanying process material also reveals much about what students say they do, what they think is expected, and what they actually do in their creative processes. Using a triangulated analysis also allows a comparison between the qualitative interpretations of students' responses with the quantitative *Why Draw?* responses. This comparison reveals much about the positive and negative drawing experiences of the participants.

2.9 Literature review rationale

The chosen literature for *Back to the drawing board?* defines the theories and strategies underpinning the thesis argument and methodologies, which investigate the role and value of using process drawing in an educational setting. Through a review of past and current literature, I created a consistent cross-disciplinary, theoretical basis for the research. There is a focus on drawing, graphic design, visual communications and design education research disciplines with references to relevant traditional and

contemporary art and architecture educational practices and theories that provided the foundation for design education in Australia. The Australian environmental designer and academic, Terence Love (2002), identified "a need for the development of a sound coherent cross-disciplinary theoretical, epistemological and terminological basis for research and theory making". He also notes the "significant hurdles early career/post-graduate researchers face establishing good reviews of literature, identifying sound epistemological foundations for their research, and building theory that is useable across a wide spread of disciplines associated with designing and designs" (p. 346).

To provide a broad conversation I have included literature that explores visual perception; creativity and creative thinking; neuro-plasticity; and design thinking processes and theories that relate to the creative process across several domains. I acknowledge there are issues associated with conflicting terminologies and definitions across design disciplines. Love (2002) notes that key terms such as "design", "design process" and "designing" have different meanings in different domains. He suggests "one way round this linguistic problem is to step outside the specific terminologies of the different domains of Design Research and use more everyday language" (p. 347). Clarification of the terminology, concepts and theories, have been defined through the literature.

The literature review is woven throughout the thesis featured within the following areas of enquiry;

- Drawing taxonomies, definitions and terminologies used within the creative thinking, design thinking and visual communications industries and institutions concerning fine art and architecture influences (Chapter 1: Introduction).
- Design processes and the historical development of these, including creativity and design thinking theories (Chapter 3: Benefits of drawing and Chapter 5: Pathways to drawing),
- Drawing and cognition studies, incorporating dominant brain and neo-plasticity theories, visual perception and Gestalt principles (Chapter 5: Pathways to drawing),
- Ontological dichotomies of 'being', subjectivity and constructivism including 'ontological design' theories (Chapter 2: Methodology),
- Epistemological approaches, including interpretive and experiential and practical 'knowing' theories (Chapter 3: Benefits of drawing and Chapter 5: Pathways to drawing),
- Methodology theories and practices including reflective practice, practice-led, action research, 'insider' research and triangulation (Chapter 2: Methodology),
- Literature related to strategies of reflection, observation, recording, interviewing, question and activity design (Chapter 2: Methodology),
- Industry perspectives related to a changing technologically driven workforce, workflow and related design thinking practices (Chapter 2: Methodology),

- Design education discourse with a focus on Australian Visual Communication courses and their historical roots and future directions (Chapter 5: Pathways to drawing, and Chapter 7: Conclusion),
- Learning Guides of the Visual Communication course.

2.10 Questionnaire rationale

A *Why draw?* questionnaire was designed in 2013 to discover what creative thinking activities students used and probe the role of drawing and iPad use. The focus quickly changed to encompass all drawing activities using any medium, as students had not yet explored using the iPad as a sketching tool. The responses to the 2013 questions around iPad usage were limited and over the next few years of the study, and I continued to observe very little activity during ideation sessions in the classroom. So the focus of the questionnaire analysis moved away from what students used to generate ideas, to why and how students utilised drawing in their creative thinking processes. For more details related to the rationale behind the initial questions and iPad use see the *iPad versus pencil and paper* discussion in Chapter 1: Introduction.

The *Why draw?* questionnaires were collected from first-year students participating in the *Visual Storytelling* Unit in 2013 and 2015 during the second week of their first semester. The cohort consisted of core and elective students from across the university. Another version of this questionnaire was collected from second-year design students enrolled in the *Researching the Visual* unit in 2018 before they started the *Speed Squiggling* activity delivered at the start of their Unit. I refer to this 2018 questionnaire as the *Pre-Why draw?* questionnaire throughout the thesis. Slight changes were made to this version while retaining the essence of the questions to provide comparisons of results with the previous *Why draw?* questionnaire findings.

The original *Why draw?* questionnaire incorporated six multiple-choice questions. Each question provided a possible ranking and opportunity to add an open-ended comment. A tally of the following multiple-choice answers and thematic analysis of the additional comments for each question shed light on students' prior training, idea-generating activities, drawing frequency, drawing practices and attitudes and opinions about the usefulness of drawing to the visual communicator.

The 2013 *Why draw?* questionnaire example (see Figure 15) shows the layout of the questionnaire and an example of responses gathered from these questions. This participant's comments display a high degree of drawing confidence and an understanding of the role and value of drawing in their creative practice. The comment stating that they "Dropped 'Art' in year 12", suggests there is more to discuss with this participant. It is important to note that not many participants of the 2013 and 2015 *Why Draw?* questionnaires added additional comments, however, some responses hinted at underlying attitudes and misunderstandings about drawing, which required further investigation.

Each question was designed to gain quantitative and qualitative information. Opportunities to give additional comments were also provided at the end of each question. The questions aimed to shed light on observations, outcomes and anomalies related to students' creative practices that arose throughout the study. From the evaluation of these questionnaires it became evident that a more detailed picture of

students' practices and the role of drawing in creative thinking was needed. For this reason, interviews with more experienced students were conducted in 2017 and 2018. For a detailed explanation of the rationale behind each question refer to *Appendix 1: Why draw? questions rationale*.

Why Draw? Questionnaire 2013

Hi everyone,

I am very interested in your responses to the following questions below related to your drawing practices.

It will only take 10 minutes. You can hand it in during class or put it in the DropBox in Building B foyer. All responses will remain anonymous. Ethics approval H10278 has been given for this project.

Many thanks for your input! For more information, please contact me on j.saunders@uws.edu.au or visit <http://improdraw.com>.

Janet Saunders

1. Which course are you currently enrolled in?

- ☒ Bachelor of Design
- ☐ Bachelor of Communications
- ☐ Other _____

2. Prior to starting this University course, which of the following art or design courses had you completed?

- ☐ HSC art/design course or equivalent
- ☐ Tertiary art/design training at TAFE, University or equivalent
- ☐ Community art or design course/s
- ☐ Online art/design course/s
- ☒ None
- ☐ Other or comment: Dropped "Art" in Yr 12

3. When you draw, doodle or conduct a rough sketch, what materials do you usually use?

You can select more than one.

- ☒ Note paper or anything I can find
- ☒ Traditional paper and pencils
- ☒ Computer with stylus and tablet
- ☐ iPad with finger or stylus
- ☐ iPhone with finger or stylus
- ☐ I don't draw, doodle or conduct a rough sketch
- ☐ Other or comment: _____



4. If you selected the iPad above, what app/s have you used to draw with?

- ☐ Pages 53
- ☐ Photoshop Essentials
- ☐ SketchBook Essentials or Pro
- ☐ Procreate
- ☐ Strip Design (Pow)
- ☐ Other/s: _____

5. How often do you draw, doodle or conduct a rough sketch?

- ☐ Daily
- ☐ Weekly
- ☒ Occasionally
- ☐ Rarely
- ☐ I never draw, doodle or conduct a rough sketch

6. Why do you draw, doodle or conduct a rough sketch? You can select more than one.

- ☒ To create artworks for myself and others, or for sale
- ☐ To create illustrations or graphics for commercial design work (not assignments)
- ☒ To think through ideas
- ☐ Just for fun
- ☐ To relax
- ☒ To challenge myself
- ☐ Other
- ☐ Comment: Spur-of-the-moment sketches are high-impulse and motivating

7. In your opinion, is it very important to have some drawing ability to be a visual communicator?

- ☐ Strongly disagree
- ☐ Mildly disagree
- ☒ Mildly agree
- ☐ Strongly agree
- ☐ It depends. Please comment: Hands-on skill improves your understanding



Tick this box if you consent to participate in the research project titled **Back to the Drawing Board**.

I understand that my involvement is confidential and that the information gained from this questionnaire may be published, but no information about me will be used in any way that reveals my identity. The procedures required for the project and the time involved has been explained to me, and any questions I have about the project have been answered to my satisfaction. I understand that I do not have to complete this questionnaire and can choose not to complete it without it affecting my relationship with the teacher/researcher now or in the future.

Image 15: Why draw? questionnaire example, 2013.

2.11 Interview design rationale (2017 & 2018)

Interviews were conducted with individual high achieving fourth-year Visual Communication (design) students in 2017 and 2018. Students in their final year were chosen for the interview sessions. They were more likely to be confident in their design abilities and personal practices than students in their first year at University. Fourth-year students would be more likely to be familiar with descriptive design thinking terms and process drawing terminology, thus uniformly describing their processes. Potential interviewees were approached after they had received their final grades to avoid a perceived impact on their marks or create a perceived conflict of interest, thus giving guarded answers. With the knowledge that their grades would not be affected by any responses or comments, it was hoped they would answer honestly and freely. However, I was mindful that these students were still part of the University culture and guard their reputation among their peers and past teachers lest it affects their ego and employment prospects. Most of the interviewees had only just begun transitioning from student to professional designer; however, there were a few interviewees who were already freelancing or working in a studio. These students were more open thus able to compare and reflect on their new industry experience.

The interview process began in 2016 with a group of high achieving fourth-year students. However, this year's interview responses have not been included in this thesis analysis as most participants did not bring their process material to the interview. My emailed instructions did not explicitly ask students to bring their working roughs to the session, so most students arrived with no process material. In addition, many who had made early sketches noted that they had discarded these before and could not retrieve or send afterwards. They did not talk through their process using visuals, but rather concentrated on their outcomes. Nevertheless, a valuable insight was gained from this first interview. As the participants left the interview room a few noted that in any case they always 'doctored' their process material. Several confirmed that to gain better marks they completed or 'fixed up' their rough sketches after they had finished their final design. These comments triggered an in-depth discussion in the hallway about the relevance of some Unit's instructions and unfair marking criteria. Unfortunately, I did not record this discussion, so I could not use these individual comments in this thesis. This apparent misalignment of expectations and practices required further investigation. More information was necessary to understand why students engaged in these retrofitting activities. What was the role and value of drawing to these high achieving students?

In response to the findings of the 2016 interviews the following amendments were made for those of 2017 and 2018;

- The wording was changed to include a question that explicitly asked participants about drawing in their process.
- An informal group discussion was included to capture casual remarks or discussions where students compared their processes.

- The script was amended to include another study aim, which was to find disconnections between assessment requirements and creative thinking practices.

Ethical considerations were made to avoid any perceived gains or losses that may come from being interviewed. The participants were carefully chosen to avoid any conflicts that might arise from my prior knowledge of their work in their younger years. For this reason, high credit, distinction and high distinction fourth-year students were invited to participate. I had taught most of these students in their first-year. I asked if I could interview them about their processes and explained why they had been chosen. James Spradley (2016) suggests researchers adopt words and actions during interviews that use subtle approaches and direct statements such as "I want to understand the world from your point of view. I want to know what you know in a way you know it. I want to understand the meaning of your experience, to walk in your shoes, to feel things as you feel them, to explain things as you would explain them. Will, you become my teacher and help me understand?" (p 34). My tone was friendly and suggested that they were part of a select group.

When I approached these students on their graduation night, they were 'on a high' and feeling optimistic about their futures. They were relieved that their study commitments were over and feeling proud of their achievements. Many of them had family members and friends present. In 2017, nine of the ten students agreed to be interviewed and provided their contact details. As part of the recruitment stage, I created a website, www.improdraw.com that included an overview of the *Back to the drawing board?* study and additional information for participants. After my initial introduction, I sent each student an official email invitation with a list of the questions and a link to the website's *Frequently Asked Questions* section. I followed this email with an SMS text to alert them to the email, as many students do not look at their University emails after graduation. In November 2018, a similar recruitment procedure was followed, but only five students accepted the invitation. All students were approached following the approved ethics guidelines.

Each participant was given an interview time and reminded to bring to the interview the process material generated in the development of their major project. The interviews took place at WSU Parramatta campus in a large tutorial room used by fourth-year students as a simulated design studio. This was officially known as the Rabbit Hole Studio and was very familiar for these participants. Students waited outside in a lounge area before and after their interviews. Snacks and drinks were placed in this waiting area.

The interview table was covered with printouts of different types of drawings with accompanying terminology to which students could refer when clarification of terminology was needed (see Image 16). These found images and labels were based on the taxonomies of Xenia Danos and Eddie Norman (2009),

Stephen Farthing (2013), Jonathan Fish (1996) and Pam Schenk (2016) and selected to reflect students' experiences.

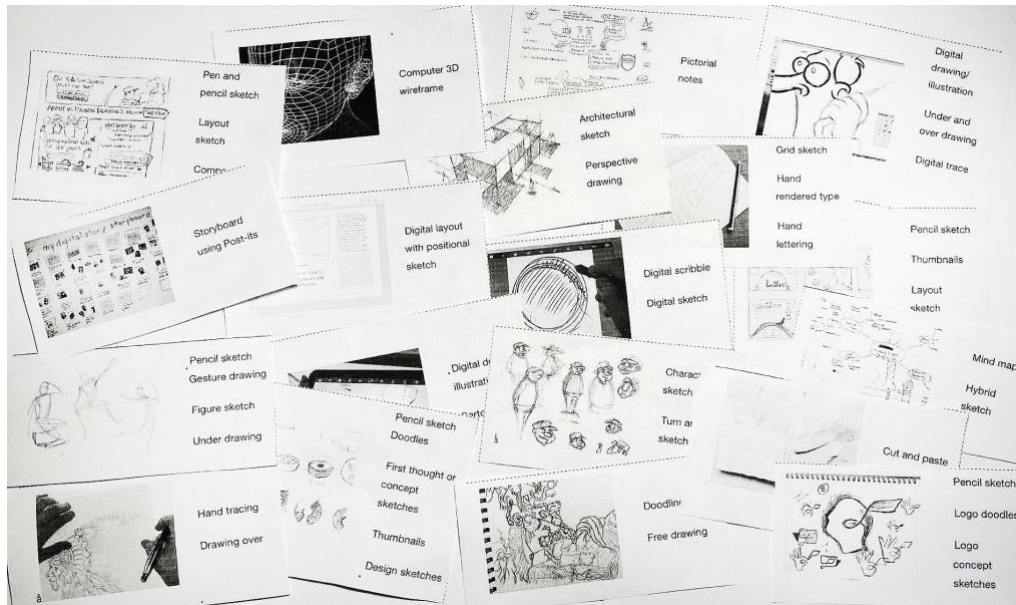


Image 16: Drawing terminology eggs spread out on interview desk.

Each interview began with the following introduction script and was recorded using a Zoom recorder;

I am very interested in your responses to the following questions. It may take 10-20 minutes. Please take your time. I will be recording your answers and transcribing this later to use in my thesis. Your responses will remain anonymous but some of your process images and final designs may be used in my thesis and/or in my presentations. Ethics approval H10278 has been given for this project. Do you have any questions?

Thank you for your input. Everyone develops their own methods of coming up with ideas. You have demonstrated a high level of visual creative thinking through the successful outcomes of your assessments. Can you describe the design thinking process used for your final assessment task for major project from the moment you received the brief?

Each interview took approximately 10 minutes. The interviewees spoke about their processes while referring to their *Major Project* process material. The process material typically included sketchbooks, notebooks, piles of paper, folders of digital iterations, and so forth. The interviewees referred to their process material to prompt their memory and illustrate their use (or lack of use) of drawing in their design process. It is important to note that some students described their use of process drawing but did not bring all their rough sketches with them to the interview. Some participants had discarded their first-thought sketches, which was disappointing, but indicated the fleeting, private nature of this kind of sketches.

The group discussions were conducted in batches. Each interviewee completed a questionnaire (see Image 17) which gathered specific information about their prior training and opinion on the importance of having some drawing ability to being a graphic designer or visual communicator. They were also asked if this opinion had changed since the first-year of their course.

Janet Saunders, BA, MA | PhD Student Interview text | Ethics approval H10278 | 2017

Student interview questionnaire:

Participant's name: _____

Prior to starting this University course, which of the following art or design courses had you completed?

- ☒ HSC art/design course or equivalent
- ☐ Tertiary art/design training at TAFE, University or equivalent
- ☐ Community art or design course/s
- ☐ Online art/design course/s
- ☐ None
- ☐ Other or comment _____

You may have answered the following question in first year as part of the 'Why Draw?' questionnaire.

In your opinion, is it very important to have some drawing ability to be a graphic designer or visual communicator?

- ☒ Strongly disagree
- ☐ Mildly disagree
- ☐ Mildly agree
- ☐ Strongly agree
- ☐ It depends. Please comment _____

Has your opinion changed since first year?

- ☐ Yes
- ☒ No
- ☐ It still depends. There will be an opportunity after this interview to discuss this issue further.

**YEAR 9 + 10 - BASIC MULTIMEDIA EDUCATION IN
PHOTOSHOP, FLASH, VIDEO EDITING, WEB DESIGN.**

☒ Tick this box if you consent to participate in the research project titled **Back to the Drawing Board**.

☒ Tick this box if you consent to allow your images to be published in the thesis **Back to the Drawing Board**.

☒ Tick this box if you consent to being sent a follow-up email requesting comments related to the development of your creative processes post-University.

I understand that my involvement is confidential and that the information gained from this questionnaire and the interviews may be published in the thesis **Back to the Drawing Board**. The procedures required for the project and the time involved has been explained to me, and any questions I have about the project have been answered to my satisfaction. Ethics approval H10278 has been given for this project.

Janet Saunders BA. MA. | 10 Picnic Glen, Springwood, NSW, 2777 | www.improdraw.com

Image 17: Interview questionnaire example, 2017.

During the interview and group discussions students were encouraged to discuss their opinions in so far as they related to the value of drawing ability in their future careers as visual communicators. Discussions around this question were lively and revealing. The interviews were transcribed, and an analysis of common themes and conversation threads were identified using the analysis program, Nvivo.

2.12 Drawing activity rationale

During the study, a series of accessible drawing activities were developed to promote and demonstrate the benefits of process drawing in the Units I taught with WSU design students. The activities aimed to provide motivations to utilise process drawing benefits through tacit understanding and the alignment to assessment tasks. They sought to address the misconceptions, fears and lack of self-efficacy that deters some students from picking up a pencil or stylus to quickly sketch out their ideas in the classroom or the privacy of their home. The activity design and delivery considered the practical, environmental and time limitations of the one-hour tutorial. Traditional pathways to practising hand-eye coordination skills and methods to stimulate the imagination, were explored through my image making practice and then translated to align with learning outcomes of assessment tasks. Experiments with low fidelity mark making, visual perception devices and different mediums allowed me to explore the practical aspects of drawing and reflect on a specific attribute that could be exploited in the classroom. Notes, photos, drawing trails and video recordings contributed to the reflection in-and-on these visual explorations. They led to the direction of the *Speed Squiggling* activity's study and trial (see Chapter 5: Pathways, Finding a way through drawing).

The study began exploring three drawing activities with Visual Communication Design students at WSU; *Speed Mind-Mapping*, *Speed Storyboarding* and *Speed Squiggling*. They were trialled in the same classroom environments with the same cohorts throughout the early years of the study. All three drawing activities aimed to encourage drawing participation during tutorials, help students get started, generate multiple ideas, model ideation strategies, collaborate with others, receive useful feedback, and build drawing confidence. Each activity informed the other, and the participants experienced at least two of these activities during the course. The activities promoted the benefits of drawing while addressing the barriers to drawing participation, particularly in the classroom. The content, design and delivery of the activities have been influenced and shaped by previous pathways to drawing in educational settings and through my studio explorations, teaching observations and responses to the *Why draw?* questionnaire and interview discussions.

2.12.1 *Speed Squiggling* rationale

The *Speed Squiggling* activity was designed and delivered alongside another two quick drawing activities in the classroom; *Speed Mind-Mapping* and *Speed Storyboarding*. *Speed Mind-Mapping* was designed to

get students started quickly on a task, interrogate the problem or issue, plan and collaborate with team members on the same page, and experience the value of suspending judgment to increase idea generation. I began investigating a simple mind-mapping activity with third-year WSU design students enrolled in the *Design project* unit in 2012. The assessment project required students to explore a social, environmental or political issue and create a campaign designed to change opinions and/or practices. The *Speed Mind-Mapping* activity provided a starting point and facilitated the classroom collaboration process during the Unit's first tutorial. The activity modelled what students were expected to include in their process notebooks. Each student wrote their 'issue' in the centre of a piece of paper, identifying and connecting associated reasons, causes or existing initiatives related to the central concern. Students then handed their mind-map to the student on their right who added branches where possible, while considering idea generating prompts delivered by the teacher. The speed aspect reduced early self-editing and promoted fluid thinking as the mind-map was passed from student to student around a group of four or five.

The *Speed Storyboarding* activity was first trialled with first-year *Visual Storytelling* students in 2013. The activity was designed to demonstrate the storyboard component of a video production project. Many of the students lacked drawing confidence and misunderstood the purpose and requirements of the assessment's storyboard component. The *Speed Storyboarding* activity provided students with the reassurance that their efforts would meet assessment criteria. Built into the activity were opportunities for students to consider visual story flow, point of view, lighting, framing, and transitions. A post-activity questionnaire found most participants found the *Speed Storyboarding* activity useful. This drawing activity is now embedded in the *Visual Storytelling* Unit providing drawing confidence to this mixed ability cohort.

The *Speed Squiggling* activity began as a unique warm-up exercise also trialled with first-year *Visual Storytelling* students over several years. *Speed Squiggling* was inspired by Robert McKim's (1980) thirty-circle activity, which was initially inspired by a psychological test (p. 124). The activity design and delivery was informed by practice-led explorations of fast, easy, and accessible drawing techniques like doodling, squiggling and other projection activities. The activity was designed to provide a non-threatening drawing activity for both drawers and non-drawers that would boost drawing confidence, demonstrate and model the value of drawing through drawing. A detailed description of the novel visual perception qualities harnessed by *Speed Squiggling* is included in Chapter 5: Pathways to drawing.

The *Speed Squiggling* activity provided an innovative approach allowing students to experience the role and value of visual thinking using low fidelity marks in a classroom setting. Squiggling is accessible to drawers and non-drawers and includes aspects that encourage further discussions about creativity, visual perception, semiotics, and the creative process itself. A discussion about how the brain works in relation to

the literature on neo-plasticity is also discussed in Chapter 5: Pathways to drawing. This *Speed Squiggling* trial was incorporated into the second-year *Researching the Visual* unit in 2017, providing a relevant addition to this Unit's learning content and outcomes. The activity was refined and a trial conducted in 2018 that these *RtV* students to be privy to the research rationale and design of the trial while experiencing what it is like to be a participant of a mixed-methods study.

The *Speed Mind-Mapping*, *Speed Storyboarding* and *Speed Squiggling* activities influenced one another's design and delivery through iteration and evaluation. In this thesis it is not necessary to include a detailed analysis of all three activities to demonstrate the value of including warm-up and demonstration drawing activities in the classroom. All three activities aimed to align with the learning objectives of the three Unit *Learning Guides* determined in conjunction with the overall goals of the course curriculum outlined in Appendix 2: 2018 Course and Unit learning objectives.

2.13 *Pre & Post-Why Draw?* questionnaires

A *Pre-Why draw?* questionnaire and *Post-Why draw?* questionnaire was collected from the *Visual Communication, Design* students attending the second-year *Researching the Visual* Unit in 2018, (see Images 18 and 19).

2.13.1 *Pre-Why draw?* questionnaire rationale

Students completed this *Pre-Why draw?* questionnaire during the first week of the first semester in the ten minutes before the commencement of the *Speed Squiggling* activity. The multiple-choice questions framed the activity and allowed students to consider their skill level and attitudes to drawing before embarking on the work. Most of the questions from the 2013 and 2015 *Why draw?* questionnaires were retained, however a new question replaced the iPad focused questions. This was due to a review of 2013 and 2015 *Why draw?* questionnaire responses and classroom observations of students' ideation practices.

Replacement question: If you were asked to design a logo, which of the following idea generating activities would you use to come up with your initial ideas? Number the activities to indicate which activity or activities you would most likely do first. Note: This is no right or wrong answer.

This question aimed to capture a general picture of the designerly activities that these participants engaged in for the same task, the design of a logo. They were asked to remember what order they used in their processes. From the analysis of the *Speed Squiggling* trial it became clear that this question failed to address the necessarily messy nature of the design process itself. A detailed discussion is included alongside the *Pre-Why draw?* questionnaire results in Chapter 6: *Speed Squiggling*.

2.13.2 *Post-Why draw?* questionnaire rationale

A *Post-Why draw?* questionnaire was also collected during the *RtV* Unit, first semester, week 3 tutorials. The aim of the *Post-Why draw?* questionnaire was to determine the success of the *Speed Squiggling* activity and capture any changes in participants' opinions related to the value of drawing to the professional visual communicator (or graphic designer). A detailed description of the design and delivery of the *Speed Squiggling* activity and accompanying questionnaire is included in Chapter 6: *Speed Squiggling* alongside an analysis of the squiggle responses.

Pre-Why Draw? questionnaire 2018

Hi everyone,

I know that not all of you are studying to be a designer, but I am still interested in your responses to the following questions. It will only take 5 minutes. All responses will remain anonymous. Ethics approval H10278 has been given for this project.

Many thanks for your input! For more information, please contact j.saunders@westernsydney.edu.au.

Janet Saunders

1. Which course are you currently enrolled in?

- ☐ Bachelor of Design
- ☐ Bachelor of Communications
- ☐ Media Studies
- ☐ Other _____

2. Prior to starting this University course, which of the following art or design courses had you completed?

- ☐ HSC art/design course or equivalent
- ☐ Tertiary art/design training at TAFE, University or equivalent
- ☐ Community art or design course/s
- ☐ Online art/design course/s
- ☐ None
- ☐ Other or comment _____

3. If you were asked to design a logo, which of the following idea generating activities would you use to come up with your initial ideas? Number the activities to indicate which activity or activities you would most likely do first. Note: There is no right or wrong answer!

I would:

- ☐ conduct a search on Google. Would you do a web or image search first? _____
- ☐ look for inspiration in design books and/or magazines
- ☐ look for inspiration on Pinterest
- ☐ do a rough pencil sketch
- ☐ do a rough sketch using a tablet. Which sketch app? _____
- ☐ start trying out fonts in a computer graphics program. Which one? _____
- ☐ start drawing my idea in a computer graphics program. Which one? _____
- ☐ other first approach? Please describe _____
- ☐ I can't remember what I do because _____
- ☐ I have never designed a logo, but my method for coming up with an idea is _____

4. How often do you draw or doodle?

- ☐ Regularly. I am, or would like to be an illustrator
- ☐ Regularly, but just for fun
- ☐ Regularly to work things out or think things through
- ☐ Occasionally when I am on the phone or bored in class
- ☐ Rarely, only if I am required to do it
- ☐ I never draw or doodle because _____

5. In your opinion, is it very important to have some drawing ability to be a visual communicator?

- ☐ Strongly disagree
- ☐ Mildly disagree
- ☐ Mildly agree
- ☐ Strongly agree
- ☐ It depends. Please comment _____

- ☐ Tick this box if you consent to participate in the research project titled **Back to the Drawing Board?**
I understand that my involvement is confidential and that the information gained from this questionnaire may be published, but no information about me will be used in any way that reveals my identity. The procedures required for the project and the time involved has been explained to me, and any questions I have about the project have been answered to my satisfaction. I understand that I do not have to complete this questionnaire and can choose not to complete it without it affecting my relationship with the teacher/researcher now or in the future.

Image 18: *Pre-Why Draw?* questionnaire, RtVUnit, 2018.

Tutor: _____ Tutorial Time: _____

Post-Why Draw? questionnaire 2018

Hi everyone,

I am very interested in your responses to the following questions. *It will only take 2 minutes. All responses will remain anonymous. Ethics approval H10278 has been given for this project. Many thanks for your input! For more information, please contact me on j.saunders@westernsydney.edu.au.*

Janet Saunders

1. The *Speed squiggling* activity was designed to do the following. Tick the outcomes that you personally experienced or understood;

- ☐ Provide you with a non-threatening drawing activity.
- ☐ Demonstrate common aspects of human visual perception, like seeing faces.
- ☐ Demonstrate the value of doing lots of variations (iterations) to find a unique solution.
- ☐ Demonstrate the value of using drawing, rather than just words to describe a solution.

How successful was this for you? Please comment on your experience.

My experience was: _____

2. In your opinion, is it very important to have some drawing ability to be a graphic designer or visual communicator? You may have answered this question before. Has your opinion changed? _____
Please restate your opinion.

- ☐ Strongly disagree
- ☐ Mildly disagree
- ☐ Mildly agree
- ☐ Strongly agree
- ☐ It depends. Please comment _____

- ☐ Tick this box if you consent to participate in the research project titled **Back to the Drawing Board?**
I understand that my involvement is confidential and that the information gained from this questionnaire may be published, but no information about me will be used in any way that reveals my identity. The procedures required for the project and the time involved has been explained to me, and any questions I have about the project have been answered to my satisfaction. I understand that I do not have to complete this questionnaire and can choose not to complete it without it affecting my relationship with the teacher/researcher now or in the future.

Image 19: *Post-Why Draw?* questionnaire, RtVUnit, 2018.

2.13.3 Classroom delivery considerations

Three determining aspects dictated the design and delivery of the *Speed Squiggling* activity in the classroom environment. These were the Unit content and tutorial setting and timeframe; the cohorts' prior knowledge and skills; and the effects of speed on participants' creative cognitive processes.

WSU tutorials are conducted in University workspaces shared with several other disciplines. WSU has several modern campuses spread across the Sydney basin. The classroom observations and drawing activity trials occurred at two of these campuses: Parramatta South and Kingswood located west of the CBD. Both campuses have carpeted classroom spaces designed for a capacity of 20-30 students with moveable desks, whiteboards and audiovisual technology. The face-to-face tutorial environment required classroom activities to be completed within a 55-minute timeframe, including evaluation and clean-up time. Practical decisions were made about the choice of research methods and the design of the questionnaires and activities based on this physical and pedagogical environment.

The WSU classroom environment is structured yet informal. Students are free to sit where they choose. Note-taking and discussions are encouraged through group tutorial activities. Teachers can foster a creative environment through modelling friendly, innovative, non-judgmental practices. Classroom activities can demonstrate the importance of creative thinking and collaboration by taking students away from external distractions. The classroom activities included in most WSU *Visual Communication, Design* Units rarely focus on performance indicators, which rate and compare students' outcomes. Assessment task activities emphasize goal-related messages that focus on design skill development, creativity and understanding. The inclusion of process drawing activities such as mind-mapping, concept sketching, thumbnails and storyboarding activities encourage students to take risks. Through assessment they build self-belief in their abilities to generate novel ideas and complete and communicate the results of their creative endeavors. Beghetto (2010), suggests researchers "keep in mind that not all students experience the classroom environment in the same way" (p. 258). Each student comes to the classroom environment with varying degrees of social skills and self-efficacy.

Finding a way to encourage drawing-through-drawing in my home studio environment provided unique perspectives, which helped develop accessible pathways to drawing participation. However, there were limitations to consider when translating these ideas to classroom delivery. The classroom drawing activities had to be cheap, accessible, clean, easy to deliver and quick to pack up. These limitations influenced which particular drawing activity explorations were expanded upon and considered for further development and use in the classroom. For instance, the early image projection experiments began exploring visual phenomena like pareidolia, by using randomly created accidental marks and marbling textures. The experiments with water and paint developed into activities using randomly drawn shapes, lines and squiggles, to stimulate visual perception. Although the water squiggles provided an interesting canvas to project images on, a hand-drawn squiggle only required a pencil, paper and hard surface (or stylus and finger) to complete. For more details about the development of the *Speed Squiggling* activity for the classroom, see Chapter 5: Pathways to drawing.

2.13.4 Time considerations

Time or a lack of time is a constant determining factor that influences many aspects of the design and delivery of activities and resources at WSU. Many students are generally time poor and work more than 20 hours a week in jobs unrelated to the design industry. Students often change tutorial times or gain extensions for assessment submissions as they try to juggle work and study commitments. Therefore, many students have limited time to devote to study and look for ways to complete assignments efficiently, are conscious of wasting time and look for targeted approaches that directly relate to their assessment tasks.

Time considerations and relevance to assessment requirements shaped the design of the speed drawing activities in the classroom. The Design curriculum at WSU currently has limited time to devote to extra activities like drawing. Any tutorial activities needed to align well with the existing objectives and learning outcomes of the course and individual Units. The available time to complete an activity within most tutorials is limited to 55-minutes including an evaluation of the activity and packing up time.

Many drawing researchers and designers recognise the value of drawing to generate ideas rapidly. Indeed, the word sketch is often prefaced by the words rapid, rough, quick, fast, first thought and speedy. Steve Garner (1999) remarks on the "immediacy" of drawing to exploit serendipity and chance. "The roughness of a sketch would appear to be an important characteristic of some types of design drawing. A very detailed sketch at the conceptual stage may stifle creativity by limiting the interpretations possible with more ambiguous forms of drawing. This might lead to a fixing of early thoughts which might otherwise have been improved upon" (p. 100). Being able to create quick low fidelity marks that can communicate well enough is an advantage to the designer.

Reduced deadlines can also have positive effects on learning as they create a sense of urgency and low-level competition, which can add to students' engagement and motivation if the task is designed well. Having a limited timeframe can reduce procrastination and classroom distractions and get students underway on an assessment task. Limited time can also lower students' expectations of producing a 'finished' outcome in the classroom, which reduces fear of teacher and peer judgment. Different types of process drawing can quickly promote quantity over quality, demonstrating the value of iteration, which is an essential aspect of creative thinking. With lower skill expectations, students can get into 'the zone', defer judgment, let their guard down and allow ideas to flow without stopping to self-edit. Additional time considerations are explored in the design and delivery of the *Speed Squiggling* activity in Chapter 6: *Speed Squiggling*.

2.14 Conclusion

The methodological framework for *Back to the drawing board?* integrates quantitative and qualitative analysis, including observations and reflections in and on my practices and those of my students. The research questions and scope of the enquiry developed throughout the course of the study included the practical and theoretical knowledge gained from observations and reflections of my practices as a designer, image-maker, teacher and researcher. These findings and insights informed the development of the *Why draw?* questionnaire which aimed to build a profile of students' prior training, drawing practices and attitudes to drawing in their creative thinking processes.

The questionnaire responses highlighted the need for more specific information to be gathered from interviews with more experienced students. The proposed interviews and group discussions aim to analyse first-hand accounts of students' drawing practices and reveal possible misconceptions, fears and barriers to the utilization of the benefits of process drawing, particularly in the learning environment. The *Pre* and *Post-Why Draw?* questionnaire and visual analysis of the *Speed Squiggling* activity aims to strengthen the argument for the continued role and value of drawing for the designer, learner, and teacher. A triangulation of the findings and comparisons of participants and my experiences in using different types of process drawing activities to think, create and communicate are woven throughout the following chapters.

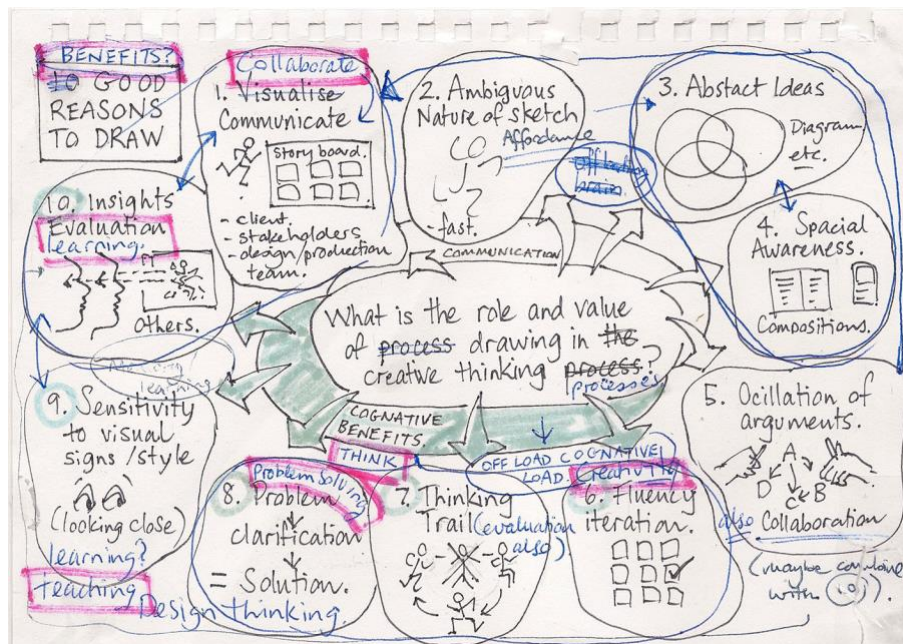


Image 20: Thinking sketch exploring the benefits of drawing, 2018-2020.

Research studies have begun to reveal how fast and imperfectly formed pictorial representations, constructed during designing and taking the form of sketches, are important to designing. They impose both order and tangibility on the one hand, while on the other hand their ambiguity stimulates reinterpretation (Garner, 2003, p. 4).

3 Benefits of drawing

3.1 Overview

A review of past and current research studies focusing on creative discovery, underpins the thesis argument that supports the essential role drawing plays in the novice designer's creative processes in the twenty-first-century classroom. The inherent ambiguous qualities of drawing are explored alongside studies that emphasise the communication and collaborative benefits of drawing to creative thinking. Steve Garner (2012) highlights the dual functions of sketching to support "communication of information and the creative exploration and generation of ideas" (p. 2). He suggests that freehand line drawings don't have the same importance in the virtual design studios of the twenty-first century. However, he agrees that the process of drawing is essential in the facilitation and exploration of solution-focused and problem-focused thinking.

This chapter identifies the cognitive and communication benefits of drawing to think, communicate, collaborate, problem solve, create, evaluate, learn and teach. This thesis focuses on the role and value of drawing in the creative practices of Design students at WSU, however the generation of rough sketches, thumbnails, storyboards, hand-drawn diagrams and maps is not confined to the creative industries. Indeed, during the *Thinking through drawing interdisciplinary symposium* (Brew, Fava, Kantrowitz, 2011), Simon Betts reminds us that drawing is common property. "We all know that drawing can be a tool for research, reflection, analysis, investigation and experimentation. It can describe, record, map, plot, scrutinise and propose. All of these are transferable skills, and drawing as a process can support and enhance learning and understanding in many subjects and disciplines" (p. 27). Many people regularly reach for a pencil to design different aspects of their lives, often doodling while they think or talk through instruction or alternatives.

Specific software can perform similar visualisation tasks, but a rough sketch is still an efficient tool for exploration, communication and rapid real-time collaboration. Drawing is also accessible and cheap. From my observations as a teacher, many students have enough hand-eye coordination skills to use their scribbling ability to express an idea, even if it is not for public show. Gabriel Goldschmidt (2003) writes that "the inventive process does not require wider skills: not necessarily a larger vocabulary or unlimited graphic techniques. Rather, what is required is an ability to use the representational act (drawing) to reason with on the fly" (p. 72). Jackie Andrade (2010) also notes that a simple drawing activity like doodling can focus the mind and allow subconscious thoughts to break through. The following benefits

uphold the thesis argument that drawing continues to support the creative thinking process of novice designers and design education.

3.2 Drawing to think

Drawing and the act of drawing, facilitates active, creative thinking, which provides many unique cognitive benefits to the designer. The cognitive scientist Vinod Goel (1991) makes the observation that when new ideas are generated with free-hand sketches "one actually gets the sense that the exploration and transformation of ideas is happening on the paper in front of one's eyes as the subject moves from sketch to sketch. Indeed, designers have very strong intuitions to this effect" (p. 111). Drawing has endured the technological revolution in many contemporary graphic design studios because of its ambiguous and indeterminate nature. Garner (2000) suggests that fast and imperfectly formed pictorial representations have remained important to the designer because "they impose both order and tangibility on the one hand, while on the other hand, their ambiguity stimulates reinterpretation" (p. 4). It is the potential speed, flexibility and lack of clarity inherent in a pencil sketch that is the crucial catalyst in the creative transformation of information. It is essential to acknowledge that sketching with a stylus on a tablet can provide the same level of flexibility as a pencil and paper with the added advantage of operating within a digital environment.

In 1997, cognitive research scientists Masaki Suwa and Barbara Tversky set out to discover what architects and students perceive in their design sketches. The study included a 45-minute design activity with two practising architects and seven advanced students who used sketching to design an Art Museum. Categorised protocols were determined and interpretations made from the participants' retelling alongside a video of their design thinking session. These protocols or themes were divided into segments that represented design decisions or 'moves'. In this way, Suwa and Tversky (1997) mapped the participants' shifting focus and interrelated design thoughts and the influence of sketching in this process. The analysis of these protocols revealed that "sketches stimulate thinking, not only perceptual relations, but also about inherently non-visual functional relations with both advanced design students and practising architects" (p. 397). The practising architects appeared to think more deeply with each shift in their focus than the advanced students. They organised more elements into cohesive, meaningful units and discovered visual cues or 'read off' different types of information from their sketches' attributes or features. Later, Suwa and Tversky (2002) confirm that "externalisations facilitate memory, both short-term working memory and long-term memory. They reduce working memory load by providing external tokens for the elements that must otherwise be kept in mind, freeing working memory to perform mental calculations on the elements ..." (p. 424). Sketching out ideas allows thoughts to flow unhindered and provides the opportunity for instant and delayed interpretations to occur.

Alexandre Menezes and Bryan Lawson (2006) also note that conceptual sketches are central to the phenomena of emergence and reinterpretation in the early stages of design thinking. "Emergence refers to new thoughts and ideas that could not be anticipated or planned before sketching. Reinterpretation refers to the ability to transform, develop and generate new images in the mind while sketching" (p. 572). They asked sixty students from the University of Sheffield School of Architecture to interpret, describe, draw and memorise aspects of architectural and non-architectural sketches to determine what they perceived in these sketches. Words, drawings, actions and gestures were videoed as students described what they saw to another participant, who in turn drew what they imagined from the description. The describer then drew the same sketch from memory. The participants were then asked to "review the experience focusing on what was difficult or uncertain and what was in their minds at the time" (p. 574). Menezes and Lawson's protocol analysis mainly focused on the verbal comments and insights created when the describer moved from one topic to another. These event segments or cognitive actions were broken down and analysed within the limitations of the study. Menezes and Lawson (2006) concluded "that the way they (designers) describe and the way they use formal and symbolic verbal references might reflect the way they think and the way new thoughts might emerge during the interaction with sketches" (p. 583). Although the visual outcomes varied enormously the interaction appeared to be more relevant to the participants than the physical drawing skill.

In another study five academics, Ilse Verstijnen and James Hennessey - Industrial design engineering; Cees van Leeuwen and Ronald Hamel - Psychology; and Gabriela Goldschmidt - Architectural background, (1998), collaborated to find useful aspects of sketching that could be adapted into computer tools and used in the creative phases of design thinking. They conducted a series of experiments that determined when the externalization of mental images helped in the restructuring and combining stages of visual problem-solving. Rather than to focus on a participant's drawing preferences and practices, Verstijnen, et al., (1998) asked "what limitations do the mental processes have that require sketching?" (p. 522). What kind of visual problems compel people to reach for a pencil? Half the participants had access to a pencil and paper and half performed the process using mental imagery. The experiments included finding novel shapes from overlapping forms and combining 2D and 3D shapes together to form a novel object. The findings of the study were mixed, showing differences between professional and novice performance were linked to sketching ability. "When mental images are projected in sketches, new structures [or] can be seen in the sketches which could not be obtained from the mental images before the projection" (Verstijnen et al, 1998, p. 532). When a visual problem requires mental restructuring most people will spontaneously turn to sketching to gain further insights.

Sketching provides a personal feedback loop that occurs while the designer thinks and draws. Goldschmidt (2003) acknowledges the role of drawing to create "back-talk", or a circular feedback loop, which provides the designer with the ability to make internal representations into external representations on paper or

other digital sketching surfaces. Designers can "read meaning into it (the sketch) and discover new plausible interpretations" (p. 84). Goldschmidt (1991) describes this "operation as 'interactive imagery': the simultaneous or almost simultaneous production of a display and the generation of an image that it triggers" (p. 131). Goldschmidt (2003) observes that "the sketch-in-the-making includes 'autonomous' properties that result from emerging relationships among its elements (i.e., lines, dots, etc.), some of which may be unintended" (p. 82). Drawing allows the designer to oscillate between internal and external arguments and bring about the "gradual transformation of images, ending when the designer judges that sufficient coherence has been achieved" (Goldschmidt, 1991, p. 123). Indeed, creative thinking can occur at any stage of the design process and include re-imaging, re-purposing, and re-positioning in the mind's eye, through the camera lens or by moving elements on a screen. Computer programs have replaced the need for some drawing activities but free-hand sketches still play an important role in the creative thinking process.

Zafer Bilda, John Gero, and Terry Purcell (2006) observed a change in architects' sketching behaviours and set out to discover whether it was essential for conceptual designing. They conducted two ideation sessions with three expert architects—one session using mental imagery (blindfolded) and another using sketching. Interestingly the design outcomes were judged and showed no significant difference in quality. Bilda, Gero and Purcell, concluded that externalisation using visuals was not the only way to achieve a successful design outcome. However, the architects reported a change in their thinking processes and voiced a preference for using sketching to think. They had difficulties synthesising and maintaining imagery when deprived of sketching. Drawing made the task easier. Bilda, Gero and Purcell (2006) surmised that these architects found "sketching puts much less load on the cognitive processes needed to design" (p. 607).

In a similar vein, David Kirsh (2014) reminds us that "what happens outside a brain often affects what happens inside. What we perceive and what we attend to inevitably prime and trigger associations that bias what we think next. Creativity does not occur in a situational vacuum" (p. 6). The act of designing is a conversation with the materials of a situation within physical, digital and virtual environments. Drawing provides quick, easy access to thoughts and the transformation of thoughts on the fly. Schön (1983) describes the design process as inherently complex, providing multiple intended and unintended variables. A designer can "take account of the unintended changes he has made in the situation by forming new appreciations and understandings and by making new moves. He shapes the situation, in accordance with his initial appreciation of it, the situation 'talks back', and he responds to the situation's back-talk" (p. 79). Drawing or sketching out can still provide many cognitive benefits to the creative thinker.

3.2.1 Benefits to thinking observations

My experience and observations of drawing in the creative thinking process reflect many of the drawing research literature findings. I often find myself reaching for a pencil to work through ideas and solve problems in my design, image making, teaching and research practices. As discussed in the Preface and Chapter 1: Introduction, this may result from my early non-computer training. However, these practical insights are supported by the drawing research community and cognitive science studies (see Chapter 5: Pathways to drawing). Observations of my current use of drawing to think, are evident in journals and piles of mind-maps, thumbnails, and hand-drawn diagrams generated in the development of this thesis. During the conceptual stages of *Back to the drawing board?* drawing helped me think through the thesis questions, arguments, methodology and methods. As described in *Finding a way through drawing* (Saunders, 2019), most of these sketches were drawn almost subconsciously, playing around with concepts, analogies, metaphors and fun ideas. The act of drawing allowed me to get into the creative thinking zone and off-load thoughts for later retrieval and consideration.

Classroom observations of students using different kinds of process drawing in classroom ideation sessions, indicate some students become absorbed and gain value from drawing itself. Although there was a reluctance amongst some students to draw in front of other students, drawing participation increased classroom engagement and questions during these ideation and briefing sessions. Fourth-year students interviewed as part of the *Back to the drawing board?* study also noted the essential role of drawing in their creative processes. One interviewee observed;

“...the most important thing for me is when I have an idea I have to scribble it down. Otherwise, within a few days, it's gone. If you look at my sketchbook, there are pages in there where you would not even know what I had drawn. But for me, that's still useful. I can turn that into something later on. If I don't sketch it or scribble it down, or at least write it down - even writing it down sometimes for me is helpful - but if I don't do that, the ideas just disappear” (JB, 2017, group discussion).

Drawing helped this student off-load her thoughts, free her capacity to think and therefore continue the process in stages over an extended period of time.

3.3 Drawing to communicate and collaborate

Although many digital applications are designed to perform similar communication tasks, a rough sketch is still an efficient tool for creative exploration and real-time communication. For example, GPS navigation systems are easily accessible, but occasionally a quick hand-drawn map on the back of an envelope is the most efficient way to give directions. A rough sketch accompanied by an unfolding commentary can reduce complex ideas into digestible chunks, responding in real-time to feedback. Doctors often step patients through challenging diagnoses and complicated medical procedures using a rough sketch to

indicate an operation's location and scale. Despite the crude nature of these kinds of sketches, they draw attention to the necessary information while avoiding emotional details. Similarly, tradespeople use drawings to explain procedures and modifications to plans, often on-site in consultation with clients. A quick spatial diagram can provide information on the same page and clarify a situation in a way that calculations and verbal instructions cannot. New ideas, annotations and instructions can also be made directly on static and dynamic media, such as film, providing a visual conversation. "The drawings may be crude, but that is not the point. Like sketching, it is the timeliness of the commentary and its quality and relevance that is important" (Buxton, 2007, p. 177). As collaborative activities are forced online due to an increase in remote work spaces, travel restrictions and enforced social distancing (due to pandemic conditions), alternative online sketch environments and tools are rapidly being developed.

Drawing, which includes sketching on paper or a digital device, makes thoughts visible and provides exceptional communication and collaboration benefits that other visualisation tools have not surpassed. Barbara Tversky (2002) acknowledges the many attributes of sketching and how sketches contribute to making internal thoughts public and more permanent. "Of course, a written language can do the same. Still, sketches have the advantage of conveying spatio-visual ideas directly, using elements and spatial relations on paper to convey elements and spatial relations in the world" (p. 1). Even a scribble can communicate information in a more concise way than verbal or written descriptions. Nigel Cross (2011) observed from case studies with a range of designers, that "partial solutions or representations can aid the designer's thinking processes and communicate these to others" (p. 84).

Sketching, as part of the communication, planning and feedback process, directs and manages our attention. Being able to talk through, or step out ideas or instructions while producing a rough sketch or diagram in real-time has many collaborative benefits to a design and production team. "Talking sketches" (Ferguson, 1992) facilitate discussions, allowing visual comments, reviews, confirmations and disagreements to be shared and made visible on the same page. Process drawing activities enable team members to see the big picture while focusing and influencing essential aspects specifically related to their agenda, role or task. David Kirsh (2011) also notes that, "Drawing can help us manage our attention, i.e. it is a kind of coordinating structure that directs you as to how you are supposed to do it. Sketching lets us focus on aspects of things, aspect by aspect" (as cited in Brew, Fava, Kantrowitz, 2011, p. 125).

Sketches can be detailed and descriptive or eliminate unnecessary distractions targeting aspects of the concept, message and plan. Goldschmidt (2003) observed that "drawings or 'self-generated displays' have an advantage over found imagery and templates in that they have more control over what is depicted and how they are read" (p. 86). Stephen Farthing (2013) notes that; "pictorial drawings rely on our ability to recognise things by their outlines. Conceptual drawings rely on a more complex translation process that is dependent on our ability to read and make sense of abstractions" (as cited in Brew, Fava and Kantrowitz,

2011, p. 23). A sketch can be targeted, informative and instructive; however, "even when left vague, it shows that vagueness with a desirable precision" (Arnheim, 1993, p. 17). Charlotte Sjödel (2018), discusses the kind of freehand drawing skills a designer needs in the 21st century. "Freehand sketching offers many benefits over other visual media. In difference to a photograph or a fully defined drawing of a person, a box character does not consider unnecessary features leading to discussions around gender, size, ethnicity or other aspects that are irrelevant to the discussion at hand" (p. 2). A rough sketch can guide ambiguity thus providing the designer with more creative freedom.

A rough sketch can also record and communicate specific information through observation while leaving irrelevant material out. The lines and marks of a freehand drawing retain the human qualities and emotions of the drawer. Jason File (2017), a lecturer at the Royal Academy of Art in the Netherlands and war crimes prosecutor for the United Nations, provided a unique perspective on the role and value of drawing in his presentation; *Drawing as Testimony: The Aesthetics of Evidence, and Evidence of Aesthetics*. He based his art practice on the drawings he discovered as part of the United Nations international criminal tribunal autopsy report. Forensic investigators drew these drawings at a mass grave site in the former Yugoslavia. He explained how these simple sketches were used in the actual war crime trials and favoured as evidence over information-dense photographic and video evidence. File's research unpicks the meanings behind the hastily drawn image diagrams and questions why these drawings provide so much information and power. The sketches focus on the visual evidence of horrific crimes, but the viewer looks for the emotions associated with these marks themselves.

Different forms of process drawing can also help in the scoping stages of a design project. A message no longer exists in isolation. Designers must scope and plan within a trans-media environment where multiple formats, platforms and teams need to be considered alongside concepts. The message, purpose, content, format, structure, and production of a project can be considered quickly through the generation of thumbnails and diagrams, in collaboration with teams, client and stakeholders, or in private. "Sketches promote calculations, inferences, and insights by serving as a spatial display on which those mental operations can be performed, and by promoting mental operations based on spatial factors such as proximity, grouping, distance, direction, common fate, and continuity" (Suwa and Tversky, 2002, p. 253). Thumbnails can provide information about format and composition before a more rigid digital plan is produced. Storyboards are also used extensively by designers, to scope and plan every aspect of the filming, direction and editing process to budget and coordinate video and film crews. Storyboards provide the organisation of information related to story-flow, content, props, camera angles and movements, lighting, transitions, and screen layouts.

Although personal, private sketches are rarely shown as part of the communication of ideas in the twenty-first-century design studio, different types of freehand activities can be used to quickly identify and clarify

aspects with others early in the design process. A reduced scale sketch, such as a thumbnail or storyboard, can convey scale, time, and composition quickly and concisely. Thumbnails can 'infer' the content and scope of a project with minimal effort without restricting creative development, thus saving time and money. A hand-drawn diagram can visualise relationships and links between the parts of an idea or project. "Insights, especially those based on proximity, grouping and common fate, may be facilitated by inspection of diagrams. Externalisation of visual ideas allows them to be inspected, which promotes reorganisation, reconceptualisation, and reformulation of the same visual display" (Suwa and Tversky, 2002, p. 242). 2D and 3D rendering programs and other 'ready-made' displays can achieve clarity in the later stages of a design project. However, a sketch or guiding image "can remain tentative, generic and vague and provide distortions and deviations while ideas and plans evolve" (Arnheim, 1993, p. 16).

Remko van der Lugt (2005) explored the value of sketching in the collaborative process during idea-generating meetings. The study's participants engaged in a divergent thinking activity where they drew responses to a problem individually on Pin cards (palm sized light cards) or post-it notes in short rounds called "brain sketching". After each round participants briefly shared their ideas and switched papers. In the next round, they used the ideas already present on the worksheet as a source of inspiration (p. 112). Van der Lugt adapted Goldschmidt and Weils' research approach, known as "linkography", to illuminate how designers build on each other's input during these "brainsketching" sessions. This collaborative idea-generating technique inspired the *Speed Mind-Mapping* activity that led to developing other quick drawing activities as part of the *Back to the drawing board?* study. Van der Lugt (2005) concluded that brainsketching did provide "new ways of seeing" or "focus shifts" which contributed to the creative process by "opening up new directions for further exploration" (p. 116).

Architects and engineers also rely on sketches in the early scoping stages of a project, so having some knowledge of using appropriate systems of measurement like perspective and recording from observations is useful. These paper skills enhance 2D and 3D visualisation skills essential for designing in online and virtual environments. Using drawing to quickly communicate spatial instructions and visualise format, location, position, movement and intent can save time at the start of a project. If the format, shell, structure or container of the message is wrong, then everything that follows will be incorrect or ill-fitting.

Buxton (2007), suggests displaying private sketches on a physical or virtual corkboard is an integral part of the design development process, encouraging informal discussions amongst colleagues (p. 153). Tversky, (2002) agrees "the public nature of sketches allows a community to observe, comment on, and revise the ideas, and enact those revisions in the external representation" (p. 1). With the increase in remote and home working environments, the need for flexible, virtual collaboration spaces that facilitate real-time sketching behaviours is growing. Collaborative whiteboards and online sketch environments are rapidly improving. Their adoption in design and design education environments is also growing. While the

development of digital collaborative drawing tools will no doubt have a positive effect on the use of drawing in shared digital spaces, the exploration of these go beyond the scope of this thesis.

3.3.1 Observations of collaboration benefits

Mind-maps, thumbnails, and scribbles were generated as part of the development of this thesis. This 'drawing trail' helped organise and communicate certain aspects of the thesis with my supervisors. Critical sketches, mind-maps and doodles were pinned to my office wall and viewed during feedback sessions. This was an efficient way to communicate what components I would need to include in the study, the scope of the literature review, and the proposed methodology and methods. The structure and details could be viewed, re-arranged, and feedback scribbled on post-it notes or over existing sketches. These visuals provided immediate feedback and left a reminder of how the thesis structure had developed. I also displayed the process and results of the drawing experiments conducted in my studio. Seeing these drawings displayed along a timeline helped consolidate and communicate the techniques and strategies used whilst exploring pathways to drawing participation. The images invited feedback from both my supervisors and passersby.

I observed the value of drawing to communicate and collaborate when reviewing notes and sketches made in the early days of *Back to the drawing board?*. One page of notes was made during a casual conversation with a part-time WSU tutor. She described the use of drawing in her graphic design practice. I wrote notes and made hand-drawn connections emphasising and questioning points that she made. As we spoke, the tutor contributed to the discussion by using arrows and links between different points. Collaborating on the same page allowed the discussion to return, change and move forward with each new mark. I boxed titles and added speech bubbles to indicate another voice and summarise the conversation. She described how her clients' visual expectations had changed since the late nineties. Long-standing clients used to trust her knowledge and experience, she explained. In the past she would present a rough sketch alongside a colour swatch but now her clients insisted on seeing a computer printout before signing off the job. This process allowed clients to make otherwise costly last-minute changes. She commented that client control did not equate to better design decisions or happier clients. However, despite this change, she still engaged in sketching, doodling, mind-mapping and thumbnails as part of her design practice. However, she no longer sketched ideas alongside clients during meetings. Her comments mirrored my experience working in a busy graphic design studio in 2010. Rough storyboards and hand-drawn diagrams were rarely shown to clients but were still invaluable when collaborating with others in the design team.

Students at WSU are encouraged to attend tutorial review sessions with evidence of their progress.

However, students often attended tutorials empty-handed. From a teaching perspective, it is challenging to give constructive feedback without seeing something tangible. Responses to verbal or written ideas rely

heavily on conjectures from both student and teacher. What the student sees and what the teacher or team members imagine may be completely different. Using found imagery and examples that visually describe various aspects of the proposed approach can partially help communication. However, using found reference work can sometimes serve to limit or shut down possible concepts. Sometimes students spend hours searching for what is in their head and set expectations beyond their current skillsets. Ira Glass (2014), the host of *This American Life* recognised this predicament, "all of us who do creative work, we get into it because we have good taste. But there is this gap. For the first couple of years you make stuff, it's just not that good. It's trying to be good, it has potential, but it's not. But your taste, the thing that got you into the game, is still killer. And your taste is why your work disappoints you" (taken from an interview with Glass for Current TV in 2010).

Incorporating quick sketches and scribbles help students communicate ideas without setting up early, inappropriate or unachievable expectations. A rough thumbnail or scribble allows students to tell the story and clarify their concepts with teachers, colleagues and themselves while retaining space to develop their execution skills.

For some students, hand-eye coordination tasks are more difficult than others. During an ideation session of a third-year Publications unit at WSU in 2013, I observed that students were not confident producing thumbnails in class. The group project required students to produce a magazine comprised of articles written and designed by each student. As a team, they created their magazine's style guide, which included a masthead, grid, colour palette, font specifications and other stylistic guidelines.

Students defined the magazine format and possible grids using quick thumbnail sketches on a shared piece of paper during their first classroom collaboration session. I was surprised to observe that some students found drawing a simple frame difficult without the aid of a ruler and several students sketched a horizontal or square format when they meant to represent a vertical format (or visa-versa). Drawing a rough estimate of a given space is a straightforward collaboration and planning skill for all graphic designers. However, my observations revealed that some students relied heavily on computer-aided visualisations, where a simple sketch would be quicker and retain space to develop.

3.4 Drawing to create and iterate

During the Renaissance, when paper of good quality became affordable and readily obtainable, artists had the luxury of making study drawings for the first time. "The desire to experiment, and to revise and look for alternatives which the activity of rapid free-hand sketching supported, of course, was in perfect harmony with the innovative spirit of this period" (Goldschmidt, 2003, p. 80). Producing multiple studies and drafts was central to the artist and designer to not only practice their skills and creative thinking process, but to communicate and evaluate the best path towards completion. Exploring multiple iterations

in the form of approximations like a rough sketch, is an efficient way to remain innovative, explore the meaning and compositional elements, communicate intentions to others, and remain open to better ideas.

McKim (1980) designed warm-up activities to foster the practice of iteration in the design thinking process. His Thirty Circles ideation activity demonstrates the value of exhausting possible outcomes in the creative thinking process (p. 124). This activity influenced the development of the *Speed Squiggling* activity (see Chapter 5: Pathways) which incorporated McKim's two basic principles for visual brainstorming; one, Defer Judgment, whether brainstorming solo or with others, don't criticise ideas until the brainstorm is over, and two, Reach for Quality through the generation of a series of idea-sketches on a problem (1980, p. 125). McKim recognised that expanding a visual theme was easily achieved through quick sketches. Goel (1992) also observed that free-hand sketching (as opposed to drawing using a computer vector program), generated more ideas or "lateral transformations" in the design problem-solving process (p. 111). Goel concluded that ill-structured representations, like rough sketches, provide ambiguity, which is essential because "one does not want to crystalise ideas too early and freeze design development" (p. 100).

Min Basadur, Mark Runco and Luis Vega (2000) also identified the ability to suspend judgment and generate high quantities of ideas or options as an essential element in the problem-finding and problem-solving process. They conducted a field experiment with managers from a large international consumer goods manufacturer exploring how creative thinking skills, attitudes and practices work together. "Increasing skill in ideational fluency (quantity of solution ideas generated) translates directly into increased skills in both ideation (quality [originality] of solution ideas), and evaluation (recognising non-original solution ideas more accurately)" (Basadur, Runco & Vega, 2000, p. 64 - 65). Sketching during brainstorming sessions can encourage fluency, flexibility, elaboration, reorganisation and transformation abilities which increase "divergent-production" (Guildford, 1967, McKim, 1980; Runco and Chand, 1995).

The founders of Stanford University d.school, Tom and David Kelley (2012), encourage the use of sketching and notation for idea generation, giving their students the following advice: "Instead of letting thoughts run through your head and down the drain, capture them systematically in some form of idea notebook. Keep a whiteboard and marker in the shower. Schedule daily 'white space' in your calendar, where your only task is to think or take a walk and daydream. When you try to generate ideas, shoot for 100 instead of 10. Defer your judgment, and you'll be surprised at how many ideas you have—and like—by the end of the week" (p. 117).

Jonathan Fish and Stephen Scrivener (1990) acknowledge the importance of drawing in designers' translation and transformation processes. They posit that "sketches have the important function of assisting the mind to translate descriptive propositional information into depiction. This depictive information may then be scanned by attentional processes to extract new and perhaps original descriptive

information, which in turn can lead to new depiction" (p. 118). The imprecise nature of hand-drawn visual displays and the myriad of possible interpretations can provide unexpected thinking pathways and happy or productive accidents. Kirsh (2014) also observed that; "Chance has a privileged role in creativity. It can be used to thwart bias, overcome the drive to imitate past solutions, and stimulate new ideas" (p. 5).

Most designers gather reference material and precedents as part of their design process. However, Goldschmidt (2003) observes that carefully collected reference material has no advantage over other "random" material when it comes to clues for new ideas. She notes that "most celebrated works of architecture that have documented process histories appear to rest on ideas that can be traced to concepts and images found far away from the building type in question, and often outside of the realm of architecture altogether" (p. 86). Sketching allows the designer to quickly identify and bring together different resources from multiple disciplines in unique ways.

3.4.1 Observations of creativity benefits

As part of my image making practice, I included exploring multiple responses to accidental marks created by floating oil paint on water and laying a canvas on the water's surface, making a mono-print. The random shapes and textures resulting from this marbling process stimulated various visual responses. I scanned these canvas water squiggles using my iPad, and using the sketch app, Procreate, sketched possible iterations over the top of the images. I explored possible compositions, colours and effects before I began painting on the canvases. This process resulted in more compelling images. Evaluating my creative thinking process drew attention to recurrent themes and strategies that I subconsciously used throughout my practice. I discovered I naturally gravitated toward figurative representations, but this process allowed me to exhaust these possibilities, and develop my natural themes and style in more exciting ways. These early iPad explorations highlighted the value of sketching in the iteration process. They led to the development of the first speed drawing activity using a squiggle as a visual idea generator (see Chapter 5: Pathways to drawing).

Some *Back to the drawing board?* participants also mention how drawing facilitates exploration and iteration in their processes. An interviewee observed;

"If you start on paper, you've got so much more room to experiment with than if you start straight on the computer" (CN, 2017, group discussion).

Another interviewee reflected on the value of drawing to her conceptual output;

"I feel like if I leave something for a little bit and then come back to it, I generate more ideas. Like, if I'm working on it constantly, I get mind-blocked, so I like to leave something and then come back to it" (MJ, 2018, individual Interview).

Sketching can provide new thinking pathways as well as affirm first thoughts and existing design decisions.

3.5 Drawing to problem solve

It could be argued that all drawing is a form of problem-solving. "Creative designing always involves the solution to a problem, the carrying out of a task, and, therefore, the image unfolding in the mind always refers to a goal image. This final objective manifests itself at some degree of abstraction" (Arnheim, 1993, p. 16). Drawing is the perfect abstraction tool for the translation of observations and thoughts when tackling ill-defined, ill-conceived design problems. Different forms of process drawing can find the issues, arguments, starting points or placements, allowing the designer to position and re-position the problems and issues at hand. Richard Buchanan (1992), suggests that "every designer's sketch, blueprint, flow chart, graph, three-dimensional model, or other product proposal is an example of such argumentation" (p. 20). Rudolf Arnheim (1993) notes that "even the most abstract theme is tied from the beginning to concrete images. These images supply the designer with the primary nucleus from which the actual structure develops" (p. 16).

Complex data and problem-solving operations and solutions are often represented effectively by pictures and diagrams. Jill Larkin and Herbert Simmon (1987) posit that diagrams are worth ten thousand words (sometimes). They simplify and group together information in convenient locations, avoiding the need to search, retain and cross-reference while problem-solving. "Diagrams automatically support a large number of perceptual inferences, which are extremely easy for humans" (p. 98). Hand-drawn diagrams can quickly visualise abstract ideas by incorporating 'morphograms'; lines, crosses, arrows, boxes, and blobs alongside other visual conventions specific to different disciplines. "Arrows, for example, are asymmetric lines. They suggest a symmetric connection. As such, they have many uses, among them, to label, to indicate a direction, to indicate motion, to indicate order" (Tversky, 2002, p. 2).

Drawing facilitates the exploration and transformation of design concepts through visual metaphors, analogies and pictorial sketches (Casakin and Goldschmidt, 1999). Goldschmidt (1991) acknowledges the value of "seeing as" in design thinking, noting that metaphorical thinking has led to new developments, innovations, discoveries, and inventions in many disciplines (p. 140). Michelle Fava (2017) also recognises the importance of sketches and sketching to support analogic and symbolic thinking in the problem-solving process. Fava observed, "... in order to consider the ambiguous, we recruit symbol systems of various kinds, which allow for indeterminacy and doubt, while we engage in clarifying our thoughts" (p. 318). Pictorial sketches that explore metaphorical thinking can reframe the problem and solution by providing visual 'footholds' that inspire the next creative leap in the design thinking process.

Sketching can also aid in the combining and restructuring mental processes leading to innovation and invention (Verstijnen, et al., 1998). Process drawing activities like mind-mapping, doodling and producing multiple sketches and thumbnails can help the designer start from the problem before arriving at a solution. Tversky (2012) notes, "There are two ways to invent new things: bottom-up, by altering or combining or rearranging old things, varying concrete instances; or top-down, abstractly, by starting with desiderata, goals, principles, or properties, and instantiating them" (p. 15). She acknowledges there are benefits to having a starting point but warns against limitations and constraints. "The advantage of the top-down way is that it allows flights of fancy; the disadvantage is that it doesn't tell us where or how to begin" (p. 15). Quickly conceived solutions are sometimes clichés, and obvious. Also, ill-conceived ideas may have unrealistic outcomes, unrealised messages and unseen consequences. One design does not fit all. Unique design problems need custom made solutions. Sketching can help designers focus on the design task's elements and bring these together in an innovative way. Seeking visual solutions before defining or understanding the problem can lead to poor ill-fitting outcomes and unintentional plagiarism.

3.5.1 Observations of problem-solving benefits

Several branding activities occur throughout the WSU *Visual Communication, Design* course that include in-class brainstorming sessions. Within these sessions, students are encouraged to play with their first thoughts, analogies, concrete images that come to mind, and letterforms to distil the essence of their brand's message and story. During 2013, I observed an ideation demonstration given by branding designer Simon Young. Young led a logo design activity in the lecture theatre with a large group of third-year WSU students studying how to design publications. The drawing activity preceded an ideation tutorial where students were required to come up with ideas for their magazine masthead's look and feel. During the lecture, students were given a piece of paper and a pencil each. Using an overhead projector, Young demonstrated how he began his design thinking process using gesture lines to explore shapes. Students were then given the word 'exchange' to explore with their pencil. There was no specific brief. Students played with concepts, letters and shapes inspired by this word. After the lecture, I collected the 'exchange' outcomes. I had no specific plan for collecting these responses at the time, other than interest. After a cursory look with another tutor, I remarked how a few pages displayed confident iterations. I discovered that these sheets of doodles were done by two of the four tutors who had engaged in the activity. Their drawing confidence was clearly visible.

After this guest lecture, the students went straight to their tutorial rooms and began a similar sketching process exploring their magazine's name, *Liminal*. I remarked to the Unit Coordinator (and noted in my journal) that the proceeding *Liminal* logo activity had resulted in more viable magazine masthead concepts and greater classroom engagement than the previous year where no warm-up activity had occurred. The

final magazine cover designs and mastheads produced by this cohort were imaginative and well developed. Sketching and using drawing to collaborate early in the ideation process may have contributed to this.

3.6 Drawing to evaluate

Designers traditionally use different kinds of renderings to self-evaluate and gain feedback from interested parties before decisions are set in concrete. Buxton (2007) supports the use of various forms of sketching in the early stages of the design thinking process, noting that "sketches serve to suggest, propose, and question. Part and parcel of this are to provoke scrutiny and criticism of the ideas that they represent. They [ideas] need to be challenged and tested from all angles" (p. 149). He emphasises the value of generative and reductive cycles noting the vital role of evaluation at multiple stages of the design process. Buxton acknowledges that increasingly design teams comprise people who bring diverse skills and experience to the evaluation table. Using quick sketches in the early generative stages of a project can save time, money and egos. Traditionally designers, clients and interested parties sketched over images and plans, often on an overlay of tracing paper. These annotations were an essential part of the development, evaluation, feedback and production process. Buxton notes that these sketches and hand-drawn annotations were crude; however, the commentary's timeliness along with quality and relevance was the most critical aspect of this form of sketching (p. 177).

Crossing out, making mistakes and finding visual connections with a pencil or stylus can leave a visible thinking trail which provides valuable insights into the creative process for designers, students and teachers. Seeing and understanding the intuitive aspects of creative thinking can lead to better processes and outcomes. Traditionally artists and designers keep a sketchbook or visual diary to record and develop their ideas. "Although the sketch stands for a passing stage of the design process, it stops that process and makes the designer examine at leisure what has been done and in what direction the further work must proceed" (Arnheim, 1993, p. 17). The visual artist, David Hockney (2009), discovered the value of analysing his creative discoveries in real-time through sketch app recordings of his iPhone 'paintings'. In an interview with Colin Grant (2010), Hockney reflects on the value of recording the drawing process for analysis, "I can see just how I've made the strokes to form the drawings" (p. 3).

3.6.1 Observations of evaluation benefits

Evaluating students' design ideas and providing feedback at different stages of their design process is essential for learning. Although not all students keep a sketchbook or notebook as part of their design practice, evaluating a student's first thoughts provides insights into their process in a way that a collection of found images on Pinterest does not. Creative thinking sessions that use process drawing activities are still encouraged and demonstrated in the WSU classroom. Rough concept sketches, mind-maps, thumbnails and storyboards not only allow students a means to externalize their ideas but provide a useful

evaluation vehicle. As part of the first-year *Visual Storytelling* Unit, students must sketch a twelve-frame storyboard as part of their creativity and planning process to design their video project; an opening credit and title sequence. Although many students depart from their original storyboard when they start shooting, the sketching process allows students to consider fundamental aspects of story flow, composition, framing, point of view, lighting, colour, and transitions. The storyboard allowed tutors to evaluate and talk through the concept with students before they started filming and allowed potential risks to be identified quickly.

3.7 Drawing to learn

Visual awareness, visual literacy and visual memory can be enhanced through the critical analysis and investigation of historical, cultural, and contemporary visual sources through drawing. Paying attention through the act of drawing can help students understand how to achieve visual abstraction and stylisation or use analogies, metaphors, and design attributes. Casakin and Goldschmidt (1999) found; “In domains in which ill-defined problems are the rule, like architectural design, skills are acquired in a ‘learning by doing’, or ‘trial and error’ manner. Analogical reasoning turns out to be one of the strategies of which skilled designers make heavy use” (p. 153). Experiential learning through drawing provides opportunities for students to practise their creative thinking skills, evaluate their thinking and respond in an efficient, inexpensive way.

Drawing also provides an alternative language from the spoken and written word, stimulating the visual sense and therefore providing an additional pathway to creative thinking and acquiring new knowledge and skills. Neurological studies reveal that the brain can change its own structure and function through thought and activity. “The brain that fires together wires together” (Doidge, 2007, p. 5). Sketching out thoughts while considering the possibilities and limitations of an ill-defined, or open ended design problem can lead to innovative thinking and a greater understanding of the problem itself. Doidge explains that neuroplasticity has the power to produce more flexible thinking behaviours but can also embed more rigid behaviors. He calls this phenomenon "the plastic paradox" (p. 7). Drawing can disrupt and divert habitual thinking while enhancing creative thinking.

Concentration and memory retention and retrieval can also affect the way we learn. Andrade's (2010) doodling experiment compared the short-term memory responses of two participant groups aged between 18 and 55 listening to a monotonous phone call. One group listened, and the other listened while they filled in shapes with a pencil (a directed doodling task). The participants were all instructed to jot down the names of people who could attend a party mentioned in the phone call. The findings demonstrated that the physical act of drawing aids concentration (p. 104). Jeffrey Wammes, Melissa Meade, and Myra Fernandes, (Department of Psychology, University of Waterloo, Canada, 2016) also explored the effects of

drawing on memory retrieval through seven free-recall experiments. The experiments were designed to measure the advantages of drawing compared with passive note-taking. Participants were told words that they either wrote down or drew as a visual representation. Wammes, Meade and Fernandes, concluded that “engaging in drawing promotes the seamless integration of many types of memory codes (elaboration, visual imagery, motor action, and picture memory) into one cohesive memory trace, and it is this that facilitates later retrieval of the studied words” (p. 1773).

Schenk (2016) observed that “simple drawing activities like copying and tracing can encourage profound observation, increasing visual awareness of source material and sensitivity to different visual styles” (p. 209). Drawing can heighten a designer’s awareness of the precepts as well as the messages inherent in signs and symbols. Being able to draw approximate shapes, even if those shapes are drawn in the air as a gesture, can aid thinking and Communication (Kessell and Tversky, 2006). Schenk (2016) notes that “while finding inspiration in visual sources might be achieved by purely technical, i.e. digital, methods of repurposing, the experience of drawing to spontaneously interpret from direct observation not only leads to more considered and original re-interpretations but also enhances visual perception” (p. 211). She observed that copying and tracing is also an effective way for students to learn and practise drawing. Indeed, some industry practitioners saw merit in copying to understand the importance of drawing in historical, cultural and stylistic contexts. Schenk acknowledges that copying and tracing was not regarded as acceptable in educational environment, even back in the 1980s.

Bilda, Gero and Purcell (2006) also found that sketching might not be a necessary act for expert designers under certain conditions during conceptual designing; however, they acknowledged the importance of sketching in learning how to design. “Design education requires an intensive learning process through drawing, thus it is important to learn how to think with sketches. While design students learn how to sketch, they are also learning how to develop ideas, such as starting with one design proposal and developing it into another one. Thus, students learn how to progress their ideas through sketching” (p. 609).

At the *Thinking through drawing Symposium 2011*, Simon Betts outlined the Wimbledon College of Art, Drawing Units, which were launched in 2010. He agrees that “knowing drawing and experiencing drawing can enhance learning” (p. 27). The Wimbledon Drawing Units aimed to provide drawing confidence and promote whatever method of drawing was relevant to the individual student; “not weighed down by believing that ‘good drawing’ belongs to one particular group of practitioners”. Betts added that “this will ultimately allow our students to understand their past and construct their futures” (p. 33). Visual Communication, design students at WSU are also encouraged to acknowledge the distinction between process drawing and illustration in their creative practices. They are encouraged to use drawing as a discovery and learning tool.

3.7.1 Observations of learning benefits

During my pre-computer graphic training in the early 1980s, drawing was incorporated into most assessment tasks. I recall one of the typographic activities in first-year was to trace around enlarged A3 photocopied letters to understand the specific letterforms and attributes used in different typefaces. At the time, I questioned the value of this tedious task. I found the activity expensive (large photocopies were hard to get and pricey during the 1980s) and time-consuming. The exercise lacked context and an accompanying design task; however, I acknowledge my understanding of the anatomy of type and ability to differentiate between certain typefaces came directly from this tracing activity. Drawing allowed me to pay attention to visual details. If this tracing task had incorporated a tangible outcome directly related to the design problem, I believe my engagement would have been retained throughout the process. Drawing activities like doodling and tracing can provide rich, memorable learning experiences if incorporated well in the pedagogic frame.

I experienced the many cognitive benefits of process drawing in the preparation of this study's literature review. Early in the procedure I made many visual notes in journals that helped me remember and make sense of the literature. These personal sketches often resembled shorthand thought fragments. They were unfinished, reworked, scribbled over. Most roughs were discarded after they had served their thinking and memory prompt purposes. However, I am still able to recall the specific points I made in these early visual notes. Although I later collated my written notes into the research program Nvivo, I reverted to making handwritten comments and visualizations when I found the material dense and challenging to follow. Note taking is encouraged during tutorials at WSU; however, most students prefer to take a photo and include this with other resources in a digital location. I have observed that hand-eye coordination activities, including writing and drawing, have become less common in the classroom since I began teaching in 2010. In the twenty-first-century design curriculum, practical hands-on exercises are limited; therefore, quick experiential classroom activities that align with learning outcomes become even more critical to a student's education.

3.8 Drawing to teach

Using sketching activities as part of the ideation process has many thinking, communication, collaborative and learning advantages in the classroom. These advantages extend to teachers and influence the pedagogical approach. Teachers use different process drawing activities to demonstrate, model and talk through ideation practices in the classroom. Information and feedback can quickly unfold in real-time, providing students with instruction and response within the face-to-face and online environments. In the physical classroom environment, sketching activities provide a starting point for both students and teachers by clarifying the brief and stimulating creative thinking. Of course, sketching activities can be done effectively using pencil and paper and digital devices. Sketch apps and drawing programs have

advantages in that they operate within a digital environment and have easy access to other digital resources and other online work spaces. Drawing devices and Sketch apps are rapidly evolving and becoming more common in the twenty-first century classroom, however at the time of this study a collaborative digital drawing space was not available to most students. Providing pencils, markers and paper was still the most egalitarian method to provide a 'public' creative thinking surface in the classroom environment.

Demonstrating, modelling and encouraging drawing activities also provides opportunities to teach more effectively. Jo Mignone and David Blaiklock (2019), presented a case study of a teaching approach and accompanying activity to facilitate creative thinking and more in-depth understanding of lecture material and industry knowledge with third-year *Visual Communication* students at the University of South Australia. The visual notation activity arose from a need to convey important theoretical, contextual, historical, and technical information relating to illustration practices within a limited timeframe. This material was delivered to students through handouts and audio-visual presentations. Nevertheless, students had limited opportunities to ask questions or discuss the material during these face-to-face tutorials. The students were encouraged to analyse and create a critical reflection of the learning material through visual notes and drawings. The students presented these via social media. The visual notation activity was non-prescriptive; however, students were "encouraged to experiment and practice, explore a range of visual techniques and a range of page structures (layout/composition) with the aim of developing a personal visual language and system of rapidly recording information" (p. 4-5). Mignone and Blaiklock (2019) noted that "the lecturers observed a higher quality of drawing and creative thinking in these students' studio work, specifically a high degree of visualisation relating to higher grades during assessment compared to previous years in which the same project had been taught". They concluded that student "engagement in the visual notation project was a contributing factor to this perceivable rise in quality" (p. 7).

From a practical point of view, seeing and engaging with students' process material provides teachers with valuable information about the origins of a students' thoughts and ideas which can help assessment evaluation. As opposed to a folder of found images and accompanying written explanations, seeing students' sketches provides valuable information about students' thought processes. Even if students recreate these sketches after the fact, the drawings still demonstrate the student's understanding of the process, distil their thinking, and clarify what they were trying to achieve. Betts (2011) also identified the value of drawing in the learning and teaching process and noted in his *Thinking through drawing Symposium* article that innovative teaching can give students an "awareness of the relevancy of drawing to the individual, and the confidence to use drawing as part of their everyday relationship with the world" (2011, p. 33).

3.8.1 Observations of teaching benefits

As part of the first-year *Visual Storytelling* Unit at WSU, I developed a drawing activity to provide confidence to the mixed cohort and prepare them for the assessment task's drawing aspects. Each week students were given a short drawing task that aligned with the tutorial content. These speed drawing activities replaced the attendance roll. The weekly *Visual Roll* activities received positive feedback, but the added value was unforeseen by myself and the other tutors. When assessing the final illustrated graphic novel assessment task, difficulties arose when evaluating students who had different levels of drawing ability. The mixed cohort included students who specialized in design and illustration, and thus, the standard of illustration or graphic outcomes was high. Some students felt threatened and used cartoon templates, and traced existing scenes from graphic novels. One student paid someone to draw their images for them. A few students complained that drawers had an unfair advantage. This was despite being given repeated reassurances and criteria focusing on storytelling, composition, framing, and demonstrations for their understanding of graphic novel conventions. The weekly *Visual Roll* activity provided some indication of the student's entry-level skills. Appropriate advice could be given to individual students concerned about their drawing abilities early in the Unit. Evaluation and marking were also fairer and easier for the tutors involved.

Using students' rough drawings for assessment purposes is not without its issues. Some WSU fourth-year design students revealed that they had on at least one occasion created drawings retrospectively, to fulfil an assessment task. When and where process drawing should occur, and whether these drawings should be assessed, needs further consideration. However, viewing students' initial drawn ideas is currently one of the few quick ways teachers can assess an individual or group's thinking process and intervene with advice and direction in the early stages of a design project.

Indeed, process drawing activities can promote original thinking and discourage students from plagiarising. Over the six years of the *Back to the drawing board?* study, observations of students' design processes show that some students deliberately seek ready-made solutions online that match what is in their mind's eye. Sometimes students find images and designs that they would like to copy or emulate. While this approach can be adequate and successful for some simple design tasks, it is evident that some students fail to develop higher-order design thinking skills that allow them to first interrogate the problem. There is a preference for concentrating on the aesthetic qualities of design outcomes over the problem-solving aspects, which ultimately restrict innovative thinking.

During a Publications tutorial, a confident third-year design student presented a potential illustration to be used on the cover of his group's magazine. The reaction from his peers was overwhelmingly positive and encouraging. His image was chosen and ultimately used in the final design. This student was a good illustrator and technically competent. There was no reason to question whether he had done this

illustration himself. It was not until after the magazine was printed that the digital drawing was discovered on another illustrator's website. The student had plagiarized. However, during the official investigation it was clear that he had not set out to deceive his colleagues or the teacher. He had been very busy at work, so presented the found image with the intention of doing something similar when he had more time. He had been overwhelmed during the presentation by positive compliments from his peers, which led him to continue with the deception to avoid humiliation. The group insisted on using the image without changes. He had dug himself into a hole. This situation led him to submit fake process drawings as part of his assessment material to continue the deception and avoid exposure. This incident highlights the importance of providing an ideation space that encourages original thought. Sketching facilitates this process effectively providing first thought visuals for evaluation early in the design process thus discouraging visual plagiarism. In an industry setting, sketching also saves time and money in the early scoping and planning stages of a design project.

3.9 Conclusion

The literature review and accompanying observations support the cognitive and communication advantages of using sketching or process drawing in the creative thinking process. Petherbridge (2010) summarizes the qualities of drawing in *The Primacy of Drawing*; "It's essential aspect is its suggestiveness: open-ended, ambiguous, imprecise, it allows for interpretations and reinterpretations and lends itself to corrections, second thoughts, re-drawings, rewritings and reorderings" (p. 28). Ferguson (1992) identifies three sketch categories: the thinking sketch; the prescriptive sketch and the talking sketch. Within these categories, *Back to the drawing board?* has found seven benefits of drawing in the creative thinking process for novice graphic designers. They are, drawing to think; drawing to communicate and collaborate; drawing to create and iterate; drawing to evaluate; drawing to learn and drawing to teach. Observations of the benefits of drawing in my practices and those voiced by students contribute to the argument that drawing has many benefits to offer creative thinking.

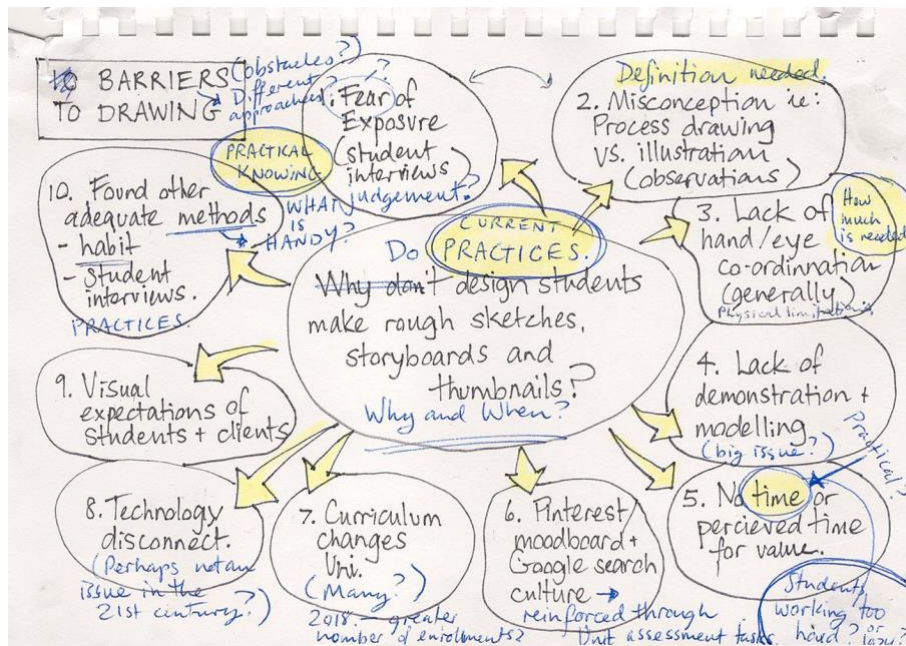


Image 21: Thinking sketch defining barriers to drawing, 2018-2020.

If I draw something, I want it to be perfect. And if it's not perfect, then I need to scrub it out. I don't want to look at it again. And, yeah, that's probably why I don't sketch as much as I could (MJ, 2018 group discussion).

4 Practices and barriers to drawing

Many participants of the *Back to the drawing board?* study voiced an understanding of the value of sketching and expressed a desire to include some form of drawing in their creative processes. However, observations of WSU design students engaged in ideation sessions detected a hesitation, reluctance, and sometimes resistance to creating rough sketches, mind maps, thumbnails, and storyboards in the classroom environment. An investigation into the role of drawing in students' creative thinking and drawing practices reveal some of the reasons why students don't use drawing in the classroom (referred to as barriers and obstacles). What students say about their practices also adds to the body of knowledge found in the literature and the findings of similar comprehensive studies as reviewed in Chapter 3: Benefits of drawing.

This chapter analyses the responses to the *Why draw?* multiple-choice questions and open-ended comments collected from first-year Visual Communication, Design participants in 2013 and 2015. The quantitative results of the questionnaires present a general picture of students' designerly practices. A group of high achieving students who completed the 2015 questionnaire were interviewed in 2018 to investigate the development of their creative thinking practices and use of process drawing. These responses add to the findings gained from interviews with high achievers in 2017. The participants of both years were interviewed individually about their creative processes while referring to the process material generated in the creative thinking process of their final assessment task, for the *Major Project* Unit. In the group discussions that followed, participants compared their approaches with others. They also expressed opinions about the role and value of drawing to the Visual Communicator in the twenty-first century. The quantitative and qualitative results of the questionnaires and interviews highlight the physical and psychological limitations that prevent some students from using drawing effectively.

These barriers are discussed alongside the literature and comments selected from the 2017 and 2018 student interviews. They include discussions about common misconceptions about the role of drawing and lack of drawing confidence and self-efficacy. Other reasons for avoiding drawing include lack of practical demonstrations modelling the function and value of drawing, and reduced opportunities for hand-eye coordination activities at school and University. The analysis of students designerly practices, and their attitudes to drawing, has informed the exploration and development of the pedagogical strategies, design,

delivery and analysis of potential pathways to drawing participation is explored further in Chapter 5:
Pathways to drawing.

4.1 *Why draw?* questionnaire analysis

The first part of this chapter is an analysis of the responses to the *Why draw?* multiple-choice questionnaire collected from first-year Visual Communication Design students at WSU enrolled in the *Visual Storytelling* unit. As a leader of this unit, I developed learning resources and coordinated teaching strategies. The advantages of being an insider in this study include access to participants and environments where data can be gathered quickly, and trials conducted that closely align with student outcomes. As an insider, I was familiar with the design industry, the content of the *Visual Communications, Design* course, and student expectations and shared cultures. I guarded against bias and sought nuanced perspectives.

The responses to the six multiple-choice questions have been analysed below. Some students offered open-ended comments to some of the questions. Still, predominantly the charts represent a tally of the multiple-choice responses—the analysis of these identified several “themes” about practices and attitudes to drawing. I relate these to the perceived benefits and possible barriers to drawing participation (see Chapter 2: Methodology). In the 2013 and 2015 questionnaire, two questions asked students about their use of iPads or tablets and Sketch apps in their practices. Due to low response rates to questions designed to investigate iPad use for sketching purposes were not included in the 2018 pre-trial questionnaire (see Chapter 1: Introduction, iPad versus paper and pencil).

4.1.1 Responses

The following bar graphs have been created in Microsoft Word from Excel spreadsheets of the collated data (see Appendix) from the pattern of answers to each multiple-choice question. An interpretation of the responses is included with each graph and question. I discuss what stands out about the student responses and any variations, which indicate the perceived benefits and barriers to the participants’ drawing participation, analysed later in this chapter.

1. What prior art and design training have you completed before attending University?

- ☐ HSC art/design course or equivalent
- ☐ Tertiary art/design training at TAFE, University or equivalent
- ☐ Community art or design course/s
- ☐ Online art/design course/s
- ☐ None
- ☐ Other or comment _____

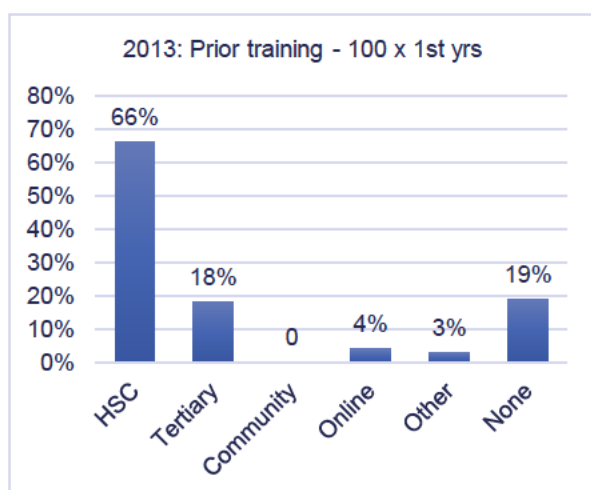


Table 1: Prior training, VS participants, 2013.

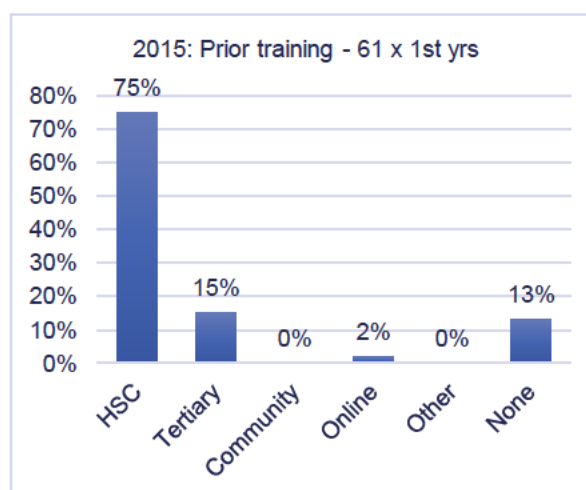


Table 2: Prior training, VS participants, 2015.

Most WSU students who entered the *Visual Communications, Design* course in 2013 and 2015 had completed a course for their Higher School Certificate (HSC) that focused on visual arts, graphic design, or design and technology. A smaller group completed their visual training at another tertiary institution, including the design certificate at Western Sydney University College (WSU College) or Technical and Further education (TAFE). Although most students during 2013 and 2015 had some prior visual training, the number of students with no formal graphic background is significant; 19% in 2013 and 13% in 2015. The HSC art and design curricula cover the foundations of visual literacy; however, many students focus for their HSC major projects on areas that include minimal drawing activities. Tertiary art and design course contents also vary considerably, so students with prior visual training may have acquired different learning experiences and skillsets.

2. When you draw, doodle or conduct a rough sketch, what materials do you usually use? You can select more than one.

- ☐ Note paper or anything I can find
- ☐ Traditional paper and pencils
- ☐ Computer with stylus and tablet
- ☐ iPad with finger or stylus
- ☐ iPhone/Smartphone with finger or stylus
- ☐ I don't draw, doodle or conduct a rough sketch
- ☐ Other or comment _____

This question aims to build a general picture of the range of drawing materials used by these first-year students. The digital sketching options highlighted the prevalence and type of digital devices used for sketching activities during these years. Detailed information about material preference and what kind of tool students used for what type of function was not captured in this question. Indeed, more than one answer could be chosen, so only general assumptions can be made about what drawing materials and devices students used.

However, the results in both 2013 and 2015 show that approximately half the students who selected 'Notepaper or anything I can find' did not select 'Traditional paper and pencils', indicating they differentiated between these two options. 'Notepaper or anything I can find' could be interpreted as note-taking and 'back of the envelope' activities, and 'Traditional paper and pencils' could mean deliberate sketching or perhaps illustration activities using paper and pencil. More information was needed to unpick these results; however, a more apparent distinction can be found when comparing these two paper selections with the digital options.

In 2013, 50% of all students indicated they did not use any digital devices to sketch or doodle despite being given an iPad on enrollment. The low iPad use could be due to the timing of the questionnaire as they had only received their free iPad a few weeks before. However, I observed very few students used their iPads for sketching in class throughout 2015 despite classroom demonstration given to some cohort members during the *Visual Storytelling* Unit. The number of students in 2015 using digital devices to sketch or doodle remained low. Again, this cohort did not receive a free iPad; however, there had been significant improvements to tablet and stylus technologies and sketch app functionalities during 2013-2015. On closer inspection of the 2013 and 2015 data, almost half the students using iPads, selected both the Computer tablet and stylus and the iPad options indicating many iPad users, like myself, were already digital drawers. This percentage rose to 62% in 2015, indicating digital drawing activity had not increased significantly. This may also be a result of reduced digital device ownership. No participants in 2013 or 2015 exclusively used a digital device; however, 3% of students in 2013 selected the statement 'I don't

draw', perhaps indicating a misunderstanding of the definition of a rough sketch or doodle, possible perceived drawing inadequacies, or defending a process that does not include drawing activities.

The open-ended comments to this question were minimal; however, several students made the following comments which indicate the wide range of materials and practices; "I only draw rough sketches for assignments", "Skin, hand or forearm", "Pens, pasers, textas", "Smartphone with stylus", and "markers and pens" (2013 and 2015 *Why draw?* questionnaire responses).

More information was needed to unpick the data from this question, but overall results indicate approximately 70% of all first-year participants in 2013 and 2015 used some form of traditional notepaper, paper and pencils, when roughly sketching or doodling, indicating that many students engaged in some form of drawing activity at school or home. An analysis of the data was unable to determine which materials or devices were used, how frequently and for what purposes; however, we can conclude that most students used a combination of traditional and digital devices to conduct some form of drawing activity.

3. If you selected the iPad above, what app/s have you used to draw with?

- ☐ Pages53
- ☐ Photoshop Essentials
- ☐ SketchBook Essentials or Pro
- ☐ Procreate
- ☐ Strip Design (Pow)
- ☐ Other/s _____

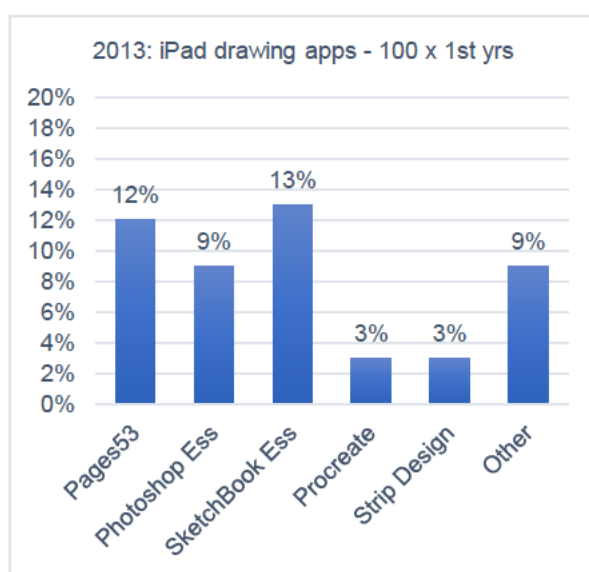


Table 3: iPad drawing apps, VS participants, 2013.

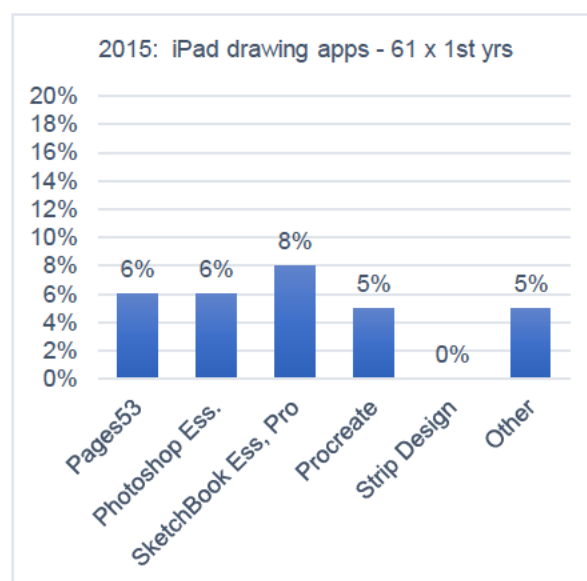


Table 4: iPad drawing apps, VS participants, 2015.

Although the number of students using iPads in 2013 and 2015 was moderately low, this additional question aimed to capture what sketch apps these students were using at the time. This data represents a picture of the early landscape and popularity of sketch apps: *Paper53*, was free and recommended in some first-year Learning Guides. SketchBook Pro was also familiar to Wacom tablet users and one of the few sketch apps that allowed users to import layers into other industry programs, like Adobe Illustrator and Photoshop, in 2013-2015. This functionality made SketchBook Pro more versatile in the design process. Procreate has become a favourite with students in the twenty-first-century classroom. Still, it did not have the functionality to import layers into the Adobe Suite during the early years of the study. The number of free sketch apps available for digital devices, including smartphones, rose sharply from 2013 – 2015 and continued to change throughout the study.

4. How often do you draw, doodle or conduct a rough sketch?

- ☐ Daily
- ☐ Weekly
- ☐ Occasionally
- ☐ Rarely
- ☐ I never draw, doodle or conduct a rough sketch _____

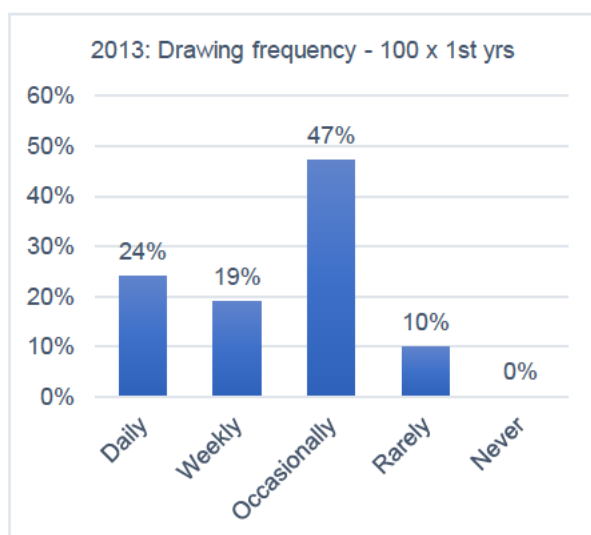


Table 5: Drawing frequency, VS participants, 2013

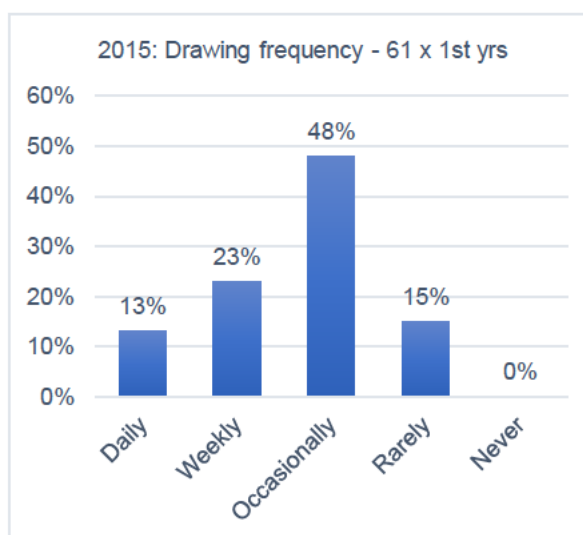


Table 6: Drawing frequency, VS participants, 2015

This question aimed to provide a snapshot of students' drawing frequency. In 2013 and 2015, most students reported that they occasionally drew. Interestingly the three students in 2013 who indicated 'I never draw...' did not select 'Never' for this question. This discrepancy may mean they changed their understanding of the definition of doodling or making a rough sketch or their recall changed. Perhaps the word 'never' was too strong or conclusive and did not reflect their experience accurately. In both cohorts, the participants who indicated they drew daily, weekly, occasionally, or rarely remained similar, with a slight decrease in students who drew daily and an increase in students who selected 'rarely' in 2015. These responses about frequency did not clarify what drawing activities students engaged in and where they occurred. For this reason, this question was replaced with a more specific question in the 2018 *Pre-Why draw?* questionnaire discussed in Chapter 6: Speed Squiggling.

5. Why do you draw, doodle or conduct a rough sketch? You can select more than one.

- ☐ To create artworks for myself and others for sale
- ☐ To create illustrations or graphics for commercial design work (not assignments)
- ☐ To think through ideas
- ☐ Just for fun
- ☐ To relax
- ☐ To challenge me
- ☐ Other _____
- ☐ Comment _____

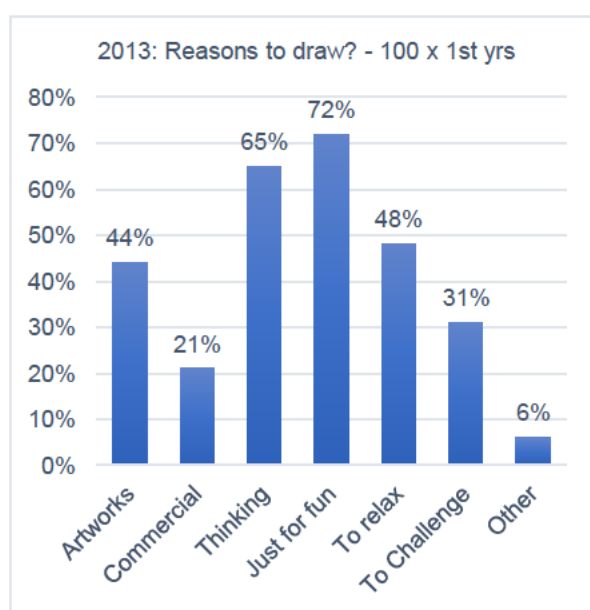


Table 7: Reason to draw, VS participants, 2013.

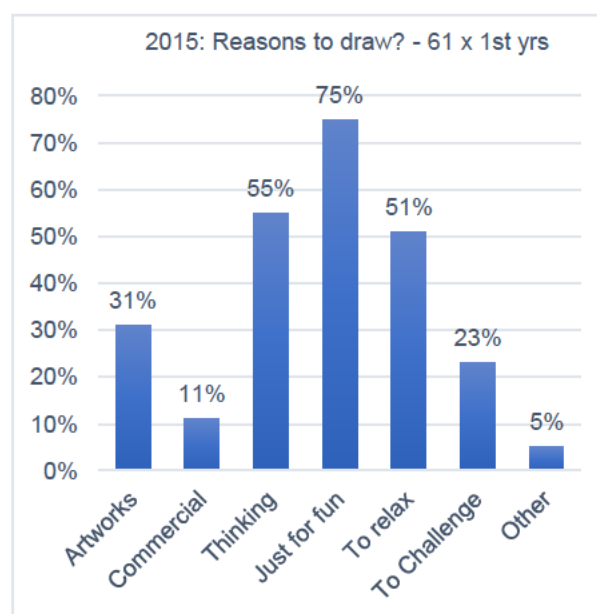


Table 8: Reasons to draw, VS participants, 2015.

This question aimed to probe whether students drew, doodled or sketched for cognitive reasons or to produce an illustrated outcome. As explained in Chapter 2: Methodology, this question contained flaws in the wording of the first two multiple-choice answers. The responses reveal some confusion in how students understood the answers. Students did not necessarily distinguish between making artworks for sale or for commercial reasons, as illustrators commonly sell their work to be exhibited and used commercially. Illustrations explicitly created for a given task, message, and audience are less common as large online libraries and image repositories provide a wide choice. Students also produced artworks to relax and have fun, creating some confusion related to intent. However, the most common reason to draw was 'just for fun'. The data also shows that students use drawing to think and relax, using the cognitive benefits of drawing discussed in Chapter 3: Benefits of drawing. Of the small percentage of students who selected 'Other', only a few added clarifying comments; "As a release, expression"; "Drawing reminders";

"Bored in class"; "Assignments"; "Boredom"; and "To get better" (2013 and 2015 *Why draw?* questionnaire responses).

Despite the ambiguity inherent in the answers to this question, the responses indicate enjoyment of drawing and a positive attitude to drawing generally. This informed the direction of the *Back to the drawing board?* study, which explores enjoyable pathways to drawing participation in the classroom. Changes were made to address the confusion that arose from this question in the 2018 *Pre-Why draw?* questionnaire collected before the trial of the *Speed Squiggling* activity.

6. In your opinion, is it important to have some drawing ability to be a visual communicator?

- ☐ Strongly disagree
- ☐ Mildly disagree

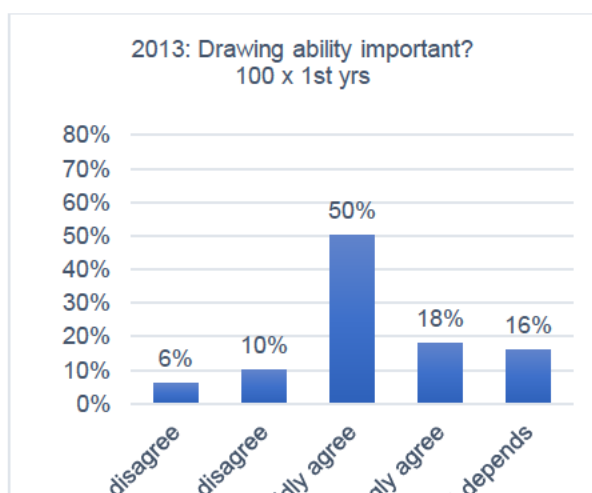


Table 9: Drawing ability important?, VS participants, 2013.

- ☐ Mildly agree
- ☐ Strongly agree
- ☐ It depends. Please comment_____

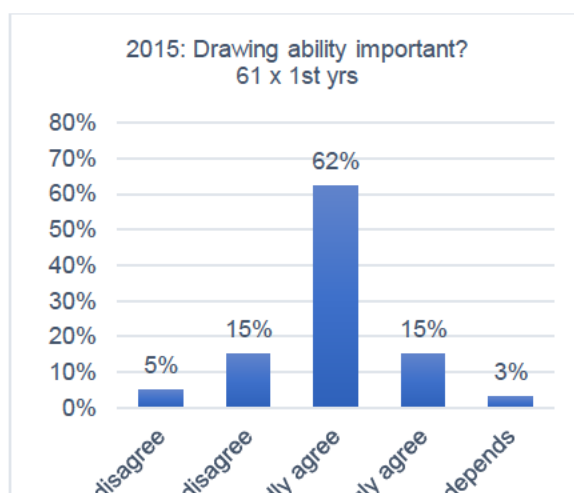


Table 10: Drawing ability important?, VS participants, 2015.

This question proved to be an exciting topic of conversation after the questionnaire was collected. Some students implied an expectation that they should be able to draw, and for others, they felt their 'non-drawing' position needed to be defended. "You can be creative without being a good drawer," one student wrote in 2013. Most students selected 'mildly agree', which could be argued was the middle-ground option. It may also indicate that more clarification about the variables contained within the question and answers were needed, i.e., how much drawing ability? And for what purposes? Interestingly, the tally did not change significantly from 2013 to 2015; however, the sixteen students who selected 'It depends' in

2013 provided several exciting comments that revealed more about students' attitudes and understanding of the question. Perhaps the reduced number of 'It depends' responses in 2015 was a result of better clarification. These additional comments for this question in both the 2013 and 2015 questionnaires were analysed and divided into two main themes;

1. Importance of drawing ability depends on the visual communicator's role and associated tasks;

"If you are an illustrator then yes, strongly agree".

"It depends on what type of Visual communication you're going into. But having some drawing ability to think through ideas and rough drafts are important to all".

"It depends which path you take. Art director or animator etc."

"I think others might have stronger links in other components of design such as type or photography where drawing is not needed".

"It depends on the discipline, certainly for prototyping, but you don't need to be "good" at drawing for that".

"it depends on the main medium you intend to work in" (2013 and 2015 *Why draw?* questionnaire responses).

2. Importance of drawing ability depends on the presence of existing drawing skill;

"If the person is good on the computer, it doesn't matter how rough they are at drawing".

"Not everyone has strong drawing abilities but (designers) can have other abilities that contribute to them being a successful designer".

"Different strengths cater to different aspect of design. People have strengths and weaknesses and learn to work with whatever their strengths are".

Comments affirming the value of having some ability to draw;

"Sometimes a simple drawing is all that is needed".

"Hands-on skill improves your understanding".

"Drawing is an advantage".

Most comments generated from this question acknowledge that drawing would be handy but not essential. Some tasks did not require drawing input, and other skills could compensate for lack of drawing skills.

4.1.2 *Why draw?* questionnaire conclusion

Overall the insights gained from the analysis of the 2013 and 2015 *Why draw?* questionnaire data and comments, provided some information about creative thinking activities that students used in their design processes. Most participants engaged in drawing activities such as doodling and sketching which were considered pleasurable experiences by many. Some responses indicated possible misconceptions about the nature and role of drawing. The findings and insights gained from the questionnaires prompted the need to explore students' designerly practices and the role of drawing. The following interviews with final-year students in 2017 and 2018 aimed to provide richer insights into students' practices and attitudes to drawing.

4.2 Interview analysis

In 2017 and 2018, two groups of high achieving final-year WSU design students agreed to be interviewed about the role of drawing in the creative process of their final year *Major Project* assessment task. Each new graduate was interviewed for approximately twenty-minutes. They described their creative process showing any mind-maps, first-thought sketches, drafts, computer iterations or any other material generated. Small group discussions followed the individual interviews. Students compared their creative practices with other interviewees during these sessions and discussed the value of drawing to them as future visual communicators and graphic designers. They were asked if their opinion had changed about the importance of drawing ability to be a visual communicator?

The following analysis combines an interpretation of the recorded individual interviews and group discussions. Examples of participants' process material have been included to illustrate each student's insights. The interview recordings were transcribed, and participants' comments thematically categorised using Nvivo. The focus of the interviews was to identify what activities students used as part of their creative processes and when, how, and if process drawing was included in these. The interview would add to the interpretations gained from the *Why draw?* questionnaire by probing deeper into students' accounts of their creative thinking practices. I interjected with a comment or additional question only if clarification of their remarks was needed.

Throughout the interview process, I remained aware of the possible bias that may result from knowing these students. As outlined in Chapter 2: Methodology, the insider perspective can be an advantage. During the interviews, I understood the expectations and pressures that accompany the final-year *Major Project* assessment task. I understood the expectations that accompanied young design graduates, the difficulties finding paid employment and the pressures of assimilating into a design studio culture. In addition to knowledge about the WSU *Visual Communications, Design* course, I had taught some of these students in their first or second year at WSU. I acknowledge that some of these students had not displayed

exceptional design abilities in their first year; however, I recognised many students begin the course at WSU with varying levels of visual literacy. From my teaching experience, I understand that some students are late bloomers. I also accept the difficulties of recalling creative decisions made during the design process while in the zone or experiencing creative flow (see Chapter 1: Introduction, Creativity).

The thirteen fourth-year interviewees articulated their design practices clearly in a way that was meaningful to them. It is also important to note that these students presented their design and development process as part of their *Major Project* assessment. In the first week of their major project, students were advised to record and consider their creative processes throughout the project. These students knew that their process material would be included and assessed in their final presentation. At the start of each interview, I suggested that this formal presentation may or may not be relevant to the discussion about their creative thinking practices. I stressed that I wanted to understand what they 'actually did', not merely what they were required to do.

The interview responses provide a snapshot of each participant's design practices and the activities used to create and develop their final-year *Major Project* assessment task. Each interviewee described their creative practices, noting when they used process drawing and didn't, while referring to the process material they brought. The amount of process material varied in type and amount. While it was necessary to see the artifacts and visual trail of students' processes, no judgment has been made about the execution of this material or the quality of their final *Major Project* outcomes. It was accepted that their high grade indicated a level of success and, therefore, a design process that worked for these students. The selection of the interviewees is explained in more detail in Chapter 2: Methodology. Some participants brought very little evidence of their process. This was due to several reasons. Some participants did not produce roughs, others did not value this early material and had thrown it out, and some lacked confidence in showing their messy working drafts. Relevant visual examples have been included alongside the interviewee's account of their *Major Project* design process.

4.2.1 Interviewee profiles

Each interviewee was asked how they identified themselves: as a drawer, non-drawer, illustrator, photographer, graphic designer, or other. Alongside their major project description, the following diagram based on comments made during the interviews, indicates which students aspired to be Illustrators. Some students did not specifically identify themselves but aspired to be graphic designers.

Interviewees who used process drawing	All students identified themselves as graphic designers but the following students strongly identified as;	Major Project
2017 AA	Graphic designer	Peachy: Online social community and App
2017 CN	Illustrator	Disengage: Illustrated zines
2017 DH	Graphic designer	By hand: Illustrated journal
2017 JB	Illustrator	Historical humans and their animal accomplices: Illustrated children's book
2017 JM	Graphic designer Non-drawer	Console: Illustrated publication. Digital line art.
2017 JW	Illustrator	Unicycle giraffe: Animated computer game. Digital illustrations.
2017 LAK	Graphic designer	Inferno: Photographic music publication.
2017 MS	Graphic designer	Too good: Vegetarian recipe book. Illustrated graphics & photography.
2017 RG	Non-drawer	You: Self-care publication. Illustrated graphics.
2018 AB	Graphic designer	The Rebel Girlz: Product & packaging. 3D illustrations and printing.
2018 GF	Illustrator	Space Gummy: Graphic novel. Illustrations.
2018 JMB	Graphic designer Non-drawer	Half/half: Wine labels and branding. Digital collage illustrations.
2018 MJ	Graphic designer	Fetch: Online social dog walking community and App

4.2.2 The major project brief

In 2017 and 2018, the *Major Project* Unit consisted of a series of mini briefs designed to guide students' creative thinking practices and develop an individual major project brief. Students were encouraged to create their brief around personal interests and passions. One student noted;

"I had to think of something that mattered to me, and that would interest me because I know it was going to go for a long period of time" (AA, 2017, individual interview).

Students typically looked for an issue or need that required intervention or a call to action. Their visual solutions often contained aspects of self-expression aimed at a young target audience such as themselves. Two of the interviewees designed their assessments for young children. One of these interviewees commented;

"I knew that I wanted to do something that I was really passionate about. I also have a niece who's really a little bit of a tomboy. I've just always found that there aren't things that suit her, and I guess growing up it was similar for me, you know, There weren't toys and things that suited me. That's why I went down the track that I did" (AB, 2018, individual interview).

Creative thinking activities using rough sketches, thumbnails, mind-maps, post-it notes and mood boards were incorporated in the mini briefs that preceded the main assessment task for the Unit (referred to as their major project). One student described a new-found interest in drawing when sketching ideas for her major project;

"I only started using that [Wacom tablet] recently because I wasn't really into drawing back then, when I first started. I would just jump into things straight away, but then drawing things gives you peace of mind because you can see it before you commit to anything, which I think is really important, especially with websites. You can see it all laid out really quickly, roughly without wasting too much time. It helps with the result later on" (AA, 2017, individual interview).

Not all students embraced process drawing activities in developing their major project; however, a surprising number of illustration-based projects were produced during these two years. Even the two interviewees who strongly identified themselves as 'non-drawers', defending their right not to draw in their creative thinking processes, ironically produced an illustrated outcome for their major project, both incorporating hand-drawn elements. This situation may indicate hidden aspirations of these students or perhaps a bias towards illustrated projects influenced by tutors and reinforced by past student examples. It could also reflect the publishing trends during 2017 and 2018, which favoured graphic illustration with hand-made or 'making' aspects. This trend was also evident in the AGDA print and publications award winners in 2017, with one winning entry incorporating origami and another naïvely drawn illustrations, symbols and hand-rendered typography. In 2017, London Design Week celebrated low fidelity drawings, photographs and the everyday in the *Zines of the World* exhibition held at the Photo Block Gallery, Truman Brewery. Themes of making, recycling, upcycling, and traditional crafts also flowed through the presentations at the 2018 *Semi-Permanent* conference. Students may have been influenced and inspired by these trends when designing the brief for their major project.

During the interviews, students expressed their use of drawing to think and communicate and their reasons for incorporating traditional and digital drawing styles in various ways. One student explained;

"I felt like I had spent four years on the screen, and I wanted my last year at Uni to be hands on as much as possible, and so that's why I decided to use pencil, and watercolor, and sketch, and trace those sketches, and do as much as possible where I wasn't just relying on Google searches of things for subject matter, but getting me or a friend to pose, or arranging things in my room and

taking a photo of that, and then using that as my subject to draw. Yeah" (GF, 2018, individual interview).

Another interviewee expressed a desire to produce a book or physical outcome for their major project.

"I feel like even though I am really immersed in the digital space, at least at the moment, I just wanted to finally be able to say, 'Okay, here's an actual, physical product that I have made'. And just for people to be able to sit down and have a look through it, and physically look through the pages, is something that was really a goal, and really just appealed to me" (JM, 2017, individual interview).

Another student commented on the unique qualities of working with traditional materials in the design of her zine, *Handmade*;

"I really like the hand-made side of everything cause you don't need to worry about it ...like when you're using your computer there's limitations that you have as well... even here you can see straight away with that colour... like you can't really recreate that with a normal printer" (CN, 2017, individual interview).

All interviewees could identify and articulate their processes and the role of drawing in their design practice straightforwardly. Most participants could recognize when they did things because they were directed to by their tutor and when they did things intuitively or unconsciously. In the group discussions, most participants could compare their practices with others sharing insights about their strengths, limitations and habits.

4.2.3 Interview terminology

Drawing terminology can differ amongst students, teachers and professionals depending on the context and other factors such as prior training and cultural differences. The distinction between process drawing and final illustrations or graphics can be woolly. The interviewees used many terms to describe their use of drawing. Not all the interviewees had brought examples of their process material to the interview and relied on verbal descriptions to explain some parts of their process. A series of visual examples were printed on paper and laid out on the desk at the start of the interviews to clarify their explanations. These visuals provided interviewees with an immediate visual example to point to if they needed it. The chosen visuals and terminology were informed by the examples shown in the drawing taxonomies explored in Chapter 1: Introduction. I also selected familiar terms used by students and teachers at WSU.

Some ideation activities contain very little or no drawing input. The non-drawing activities like image searching, note taking and digital compilation were often conducted alongside covert, private and shared sketching activities. Interviewees used different terms to describe these designerly activities. Many of

these align with the succinct terms included in Schenk (2016) in *Drawing in the Design Process: Characterising Industrial and Educational Practice* (p. 176-177). These activities include, to use mental imagery; to make covert sketches of ideas (in a sketchbook or digitally); to note information (keywords, mind-maps and lists); to draw thumbnails and storyboards (composition and plan); to collect visual reference (mood boards); to make an outline facsimile (draft and trace); to illustrate (using traditional materials, digital or hybrid techniques); to work directly on the computer (bypassing roughs and drafts), and to populate existing templates.

4.3 What design students say and do

During the interviews, participants identified various process drawing activities used in their practice and specifically those used to develop their major project. They described both systematic and haphazard approaches used in the idea generation stages. Some participants commented that they always began their creative process with a rough sketch, a list of words, or a mind-map. Several interviewees indicated that they sometimes produced very rough sketches in private, away from the gaze of others, but rarely included these scribbles in their process material submissions. Indeed, these sketches were quickly discarded and very little evidence of this was shown during the interviews. Others noted that they consulted Pinterest or other online search engines and looked for relevant precedents and style inspiration before starting. Some students made rough sketches and thumbnails and experimented with traditional media, while others explored possible ideas compiling elements within a graphics program.

One student described her systematic approach; she explored primary and secondary research online to determine her project's direction seeking ways to help young people cope with anxiety and depression.

"I also did some interviews, spoke to some of my friends about people that I know that were dealing with issues themselves and what they wanted as a place to go to or something they could use to get help with any mental health issues that they have on their own" (AA, 2017, individual interview).

Another two interviewees described a less organised creative thinking approach;

"There was a lot of going back and doing it again, or deciding that it wasn't working, or feeling like I wasn't moving forward, and so I would try something else instead, and I was just going around in circles" (GF, 2018, Individual interview).

"When I went back through my notebook, I'm like, gee, I'm very messy. I just write things randomly or draw something really random, and it doesn't look like anything, but somehow for me, it works" (RG, 2017, group discussion).

Most interviewees used various materials and digital devices, also evident in the responses to the *Why draw?* questionnaire. The way interviewees approached their design process and the designerly activities they employed depended on many factors; the nature of the message, project, task and intended medium. Students' drawing confidence also determined the number of rough sketches produced. Participants who were interested in drawing produced many 'under sketches' for their illustrations and graphics. These sketches were often redrawn and traced over. They differed from the creative thinking doodles and thinking drawings produced in the ideation phases; however, students did not always distinguish between different stages of their design process.

All thirteen participants commented on the following designerly activities, some describing their engagement with drawing activities in more detail than others. The accompanying examples of process drawing illustrate the variety of design activities and applications students use for their major project.

4.3.1 Use mental imagery

Thinking through concepts using mental imagery is an essential aspect of creative reflection. Some students described how they moved directly from a thought incubation stage to the development of their final images or designs without the aid of a sketch;

"I don't do a lot of sketches. Sometimes I will if I'm a bit stuck, but a lot of the time I can just see it in my head, and then, I will make it. If it doesn't look quite right I can just move things around in Photoshop" (AB, 2018, individual interview).



Image 22: Final major project, *Console*, JM, 2017.

"The visuals were already in my head. I had done a bit of research – okay, I'll say that I previously did a bit of research into design styles, although I already did have an idea of what it was going to be. I just went straight into it. I just started doing some digital mock ups and things like that.

I had a visual idea in my head straight away, so I started to develop that very quickly, and then as I was developing that idea it just kind of grew from there. It was more like little tweaks, and just extensions onto what I thought was going to make it better" (JM, 2017, Individual interview).

It is interesting to note that JM did not deviate far from his initial concept throughout the development stages. He aimed to produce something different to the 'tacky' style often used in video gaming publications. His compositions and illustration style resemble architectural blue prints and design magazines of the 1980s (see Image 22).

Another interviewee JMB also describes the ideation process of his major project and the role of mental imagery;

"I can always picture something in my head, and I never have a problem with having to write stuff down or anything to remember it. I have a pretty good memory. Basically, my brain, it never stops working. It's constant, I'll be trying to go to sleep and I'll be like, 'Oh, maybe I can make this red or put this here instead'. My brain's constantly ticking over. Then, I'll just sit down in front of a computer and do it. Or I'll sit down anywhere, whatever I'm making and make it rather than sketching or mind-mapping or anything. In terms of my major project, basically it developed from just a bunch of collaging stuff together" (JMB, 2018, individual interview).

Despite JMB's insistence that he never used sketches in his ideation process, he later noted using process drawing to iterate, collaborate and communicate the shape of a label for his major project using rough sketches.

"I had a sheet made that had the shape of my bottle, and then I just sketched different label shapes on it. I got my teacher to draw some label shapes on it too ... I just had this image in my head that I couldn't shake. I needed to sketch that out first and then force myself to sketch out another 30. That way, I could make sure that's what I wanted".

"Why didn't you use the computer to sketch them out?" (Interviewer).

"Just quicker, quicker. I mean, I had the shape of the bottle, and then it was just rectangles. It was slightly faster to do it [sketch] and then easier to experiment. It was like I could do a circle without having to clip and mask it to an Illustrator [Adobe] document or whatever. Yeah, it was just a time thing" (JMB, 2028, individual interview).

4.3.2 Make covert sketches of ideas

Covert sketches can be made in a sketchbook or digitally. Private sketches and "visual queries" (Schenk, 2016) were often used to explore concepts, play with concepts, try designs out, and get ideas down quickly. All thirteen participants mentioned they used some form of rough sketching and doodling early in their ideation processes. Several students reflected on the role and benefits of making private sketches in their creative practices;

"I think that you become more thoughtful about the concept when you're just doing sketches and you're not getting caught up in how it looks. You know what I mean?" (GF, 2018, individual interview).

"I wanted to get that out of my mind and kind of visualise it before I went onto the computer and then create the final" (MS, 2017, individual interview).

"I jot everything down because then I can always go back to it and remember where I started. That was before and after. Everything always leads back to my initial ideas. I never really fall far from it" (LAK, 2017, individual interview).

Another interviewee described how she used a sketchbook in the development of her illustrations for her children's book, which formed the outcome of her *Major Project* assessment task;

"I have an interest in character design and do a lot of just random sketching and drawing and commissions and things like that. I suppose with most of my projects, and this one included, I started by developing different characters. I was doing a non-fiction piece on historical individuals and pets, so I basically just found a whole heap of information and any person who was interesting to me, or that I could see a character design coming out in their story, I just started doing sketches" (JB, 2017, individual interview).

Some students described how they could track their major project concept back to a first thought sketch in their notes and sketchbooks. The following interviewees commented about this aspect of their process while referencing their sketches;

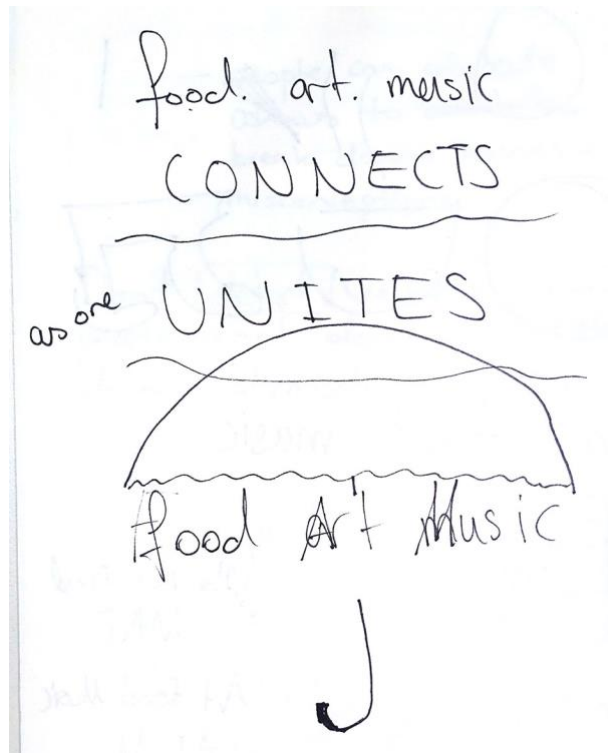


Image 23: Private sketch for logo, RG, 2017.

"This was my initial sketch. It's making me laugh looking at it because it's so messy. But this really helped shape the logo of the project. I just drew ... That's the main logo, and then everything sort of came from that because in my project, you can see little characters of peaches, and that's where all that came from" (AA, 2017, individual interview).

"I'm not a drawer. I just sketch things and get an idea of how I might want it to look and feel and how I want the word to look. I'll write that down too. Yeah, and then here [pointing to *image 23*], I think I was playing around with names here, so I was talking about connecting and all that. Then 'unites' - I was thinking how

all these different ... art, food, art, music, all these categories under one umbrella. So, I just started to play around with visuals like that. Yeah, I think that's the main process that I do for most of my projects, really" (RG, 2017, individual interview).

Another interviewee explained how he uses rough sketches to externalise his thoughts and help him develop his ideas through the act of drawing itself;

"...for example, I was working on a website the other day and I just did some really, really rough drawings and if you look through any of my notebooks, all the stuff in there look like crap, but it's more about just exploring the ideas really quickly. And you might draw something, it won't look good but you can kind of try and visualise it more in your head" (JW, 2017, group discussion).



Image 24: Private sketch for packaging, AB, 2017.

Many interviewees used some form of sketching in their creative practice but drawing practices varied considerably. One interviewee described her use of sketching for her major project while referring to a series of sketches in her sketchbook (see Image 24);

“When it came to my packaging and stuff, I start off with a lot of sketches. So, I start off just doing things like

that. And, you know, working out, playing around with logos. With logos I usually... I always start with my logos, just straight into Illustrator and just use heaps of different fonts and play around with that to start with. So, I don't really do a lot sketching or anything for that” (AB, 2018, individual interview).

4.3.3 Make notes and list keywords

Using keywords and written notes was also a common starting point for many participants. They often used a notepad, diary, sketchbook or typed notes into Microsoft Word. Some participants included roughs and mind-maps alongside written notation. Throughout their four-year course, these students were encouraged to write keywords and create mind-maps as part of their ideation process, so it is not surprising that most of these interviewees produced a mind-map in the first stage of their visual research. One student showed me her sketchbook and realised that most of her first thoughts were expressed in words;

“I don't do a lot of drawing, but I will maybe write a couple of words, because words inspire visuals, for me, as well” (RG, 2017, individual interview).

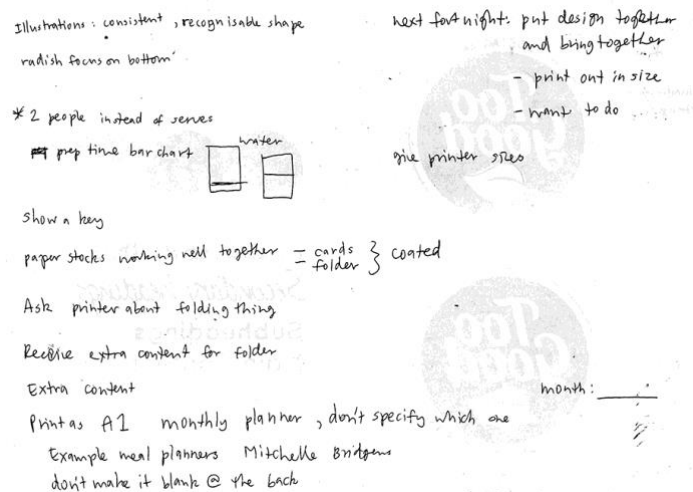


Image 25: Example of notes, LAK, 2017.

Another student explained how she often began her ideation process with keywords and notes;

"I write it down to remember it more. Pretty much most of it is writing because this was jotting down ideas, and then I got into drawing and illustrating. I think at that point [pointing to *image 25*], I started mapping out what I wanted to do, I drew little grids, and then

it just kept going, kept developing after that. Then once I'd figured out what I wanted to do, and had a really solid idea, I started going digital, so that's where it ends. It's pretty much all written" (LAK, 2017, Individual interview).

4.3.4 Draw thumbnails and storyboards

Some interviewees described using hand-drawn thumbnails to create a plan, or impositions of their proposed publication to scope the content and explore composition and story flow. One participant, who identified herself as an illustrator, displayed a solid understanding of the publishing industry. She had

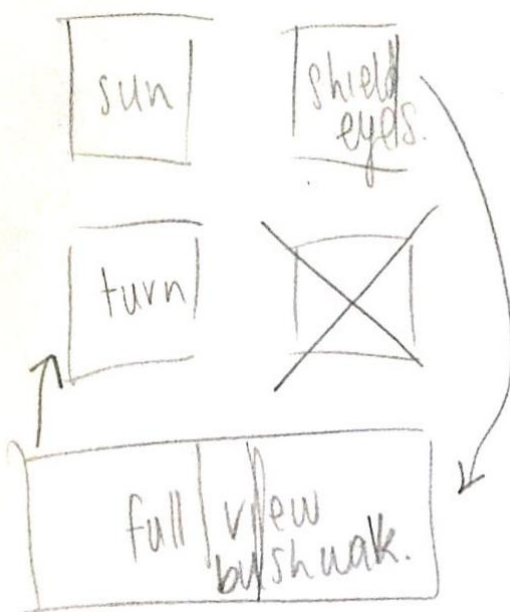


Image 26: Private thumbnail sketch, GF, 2018.

come through the WSU design course in a slightly different way to most of her classmates, taking time away from her studies to pursue her illustration practice. Her major project was an illustrated graphic novel aimed at a young adult audience. She talked through her process which included thumbnails, character sketches and pencil and pen drafts, (see Image 26);

" My process started with story boarding on a thumbnail sort of level, so I mapped things out in really small quick sketches of what the story would look like overall. This obviously changed dramatically from where it ended up. " (GF, 2018, individual interview).

4.3.5 Collect visual reference and make mood boards

All thirteen interviewees commented that they used online image searching in the early stages of their design process for their major projects. These included Pinterest, Behance, Instagram, Dribbble and Google



Image 27: Major project mood board, LAK, 2017.

Image. They searched to find inspiration, research competitors, find precedents and investigate possible styles. The image collections were often referred to as 'mood boards'. Mood boards are encouraged throughout the *Visual Communications, Design* course at WSU (see Image 27). These students were required to set up and populate a Pinterest site as part of the first assessment task

in the *Researching the Visual* Unit in second-year.

"Everybody goes to Pinterest now, don't they? I spend a lot of time on Pinterest looking at other illustrators that I like. I knew part of this project for me was developing my own style and getting that a bit more solidified to what it had been in the past. I spent a lot of time looking at people that I follow online, and stuff like that, before I started drawing as well" (JB, 2017, individual interview).

"I always have a Pinterest board going, especially for this project, because I kept getting really stuck. Because I think this was a really different style for me to what I usually work in, so I had a Pinterest board going all the time and I was constantly going back to that and flicking through and trying to make sure, you know, the packaging suited the other kind of packaging that was out there, but still stood out in a way" (AB, 2018, individual interview).

"I just find that having an idea by looking on Pinterest or looking at other people's (designs), it helps me create my own version of it in my head, and then that's how I want it to look, so then I'll probably ... draw a little wire frame of how that one screen would look, and then I'll start creating a prototype of the app, and then I'll reference that one [on Pinterest] and make the rest of my designs like that. So, it's just the initial one sketch that I draw down and then I do the rest based on the first one" (MJ, 2018, group discussion).

Another student explained how she often wrote down a list of things she wanted to focus on and then quickly moved onto Pinterest.

"I go into Pinterest and create a mood board around the color, shapes, typography, and start to understand how I'd like it to look and feel. According to the research that I found, and what I

think the target audience would most connect to, I'll start ... maybe I'll do some sketches ... for example for the logo design I might do some sketches of logo designs. I do have random things in here [pointing to her notebook], but a lot of it is writing, to be honest" (RG, 2017, individual interview).

From my teaching observations, many students in the *RtV* unit found image searching a helpful way to get started. Some interviewees noted that they continued using their Pinterest account throughout the course.

4.3.6 Make an outline facsimile and trace

Some participants described how they scanned their hand-drawn drafts for logos, graphics or illustrations into Adobe Illustrator or Photoshop (or another graphic manipulation program) and traced over these drawings or photos using the pen tool. Some used a stylus and Wacom tablet or iPad to outline existing imagery. These programs often have 'image trace' functionality used to convert bitmap images into vector outlines; however, the interviewees did not frequently use this automated functionality. One student described how she used rough drawings to refine the logo illustration for her major project;

"So what I did with this [logo], was I drew that, and then I put it into Illustrator, and I'd get the pen tool to make it, like, a nice line, I'd fill them in. So yeah, my first logo concept was just a dog head. Yeah, then I added the name underneath, and some possible color options" (MJ, 2018, individual interview).

Another student described how she transformed her rough sketches into final illustrations through a hybrid approach (see Image 28);

"Sometimes it would be really sketchy at the start, and then I would use my light box to trace it again so the lines were neater, and then I would scan it onto my computer, and then I would print it out, and enlarge it, print it out, and redo it again. I would be doing the same drawing three, sometimes even four times, before it was at the



Image 28: Pencil & pen drafts for graphic novel, GF, 2018.

final stage of being ready to be colored in" (GF, 2018, individual interview).

At each stage of the process GF made incremental changes to her drawings. She repeated images where she could, reducing the number of sketches needed. Perhaps with more drawing confidence, this student could omit some of the tedious tracing steps she had devised for herself.

Another student described her use of sketching, tracing and manipulations using multiple software to achieve her final images in the 3D program, ZBrush.



Image 29: Digital trace in *Illustrator*, AB, 2018.

"I usually do a really rough sketch and then trace it out in Illustrator. Sometimes I will use actual images, because I was using the free color, I got an image of her face [pointing to a painting of Frida Kahlo] and then traced it out to get that image of her face [Image 29]. These were really early ones. They were just traced out. And you can see they totally ended up changing along the way ... like once I got into the computer I played around and I started making things, and it's easy to manipulate in the 3D program I was using, so it kind of just changed that way" (AB, 2018, individual interview).

Tracing and scanning from paper based drafts into Adobe Illustrator or Photoshop was a common approach for many of the interviewees in the development of their illustration and logo designs. The few participants who used an iPad or Wacom tablet were able to streamline their

process.

4.3.7 Draft and illustrate

Using a Wacom tablet or iPad as a sketching device was not common amongst these 2017 and 2018 interviewees. Still, several students noted the use of their devices to fill-in and colour their scanned drawings and computer outlined illustrations. Some students moved quickly between hand-drawn and digital methods when drafting their ideas or constructing illustrations. They used traditional media like pencils, pens, water colour, painting, and print making techniques to achieve different results, save time, and avoid technical barriers. This was often seen as a welcome break from the screen. Final-year students are encouraged to experiment and get out of their comfort zone to develop their major projects. Thus, some students include traditional techniques, and others try a new digital approach combining the two.



Image 30: Children's book sketches (left), final illustration (right), JB, 2017.

One student exclaimed as she flicked through a large pile of sketches and drafts she had generated for her children's picture book (see Image 30);

"I've got my pictures with me. I have all my old ... oh my goodness, I've got so much. I keep everything I scribble, so I had a big sketch book on my desk and pretty much as I was researching I would just sketch character designs, so I have all sorts of random things, from little doodles on bits of paper to more developed sketches" (JB, 2017, individual interview).

4.3.8 Work directly on the computer

Many participants mentioned working out their designs using their final output programs such as Illustrator or Photoshop. They bypassed a rough stage and played with ideas on the screen, making incremental changes throughout their process. Respondents described having a well-formed vision of their approach before they began. One student, identified as an illustrator, enjoyed doodling in a sketchbook for fun but noted that she often skipped making hand-drawn thumbnails and jumped straight onto the computer. In the group discussion, she reflected on her time-saving practice;

"I do think drawing, in these initial phases, can be important, because I feel like when you go straight to the computer, (and this is what I find with my work), I can get caught up with perfecting it and making it aesthetically beautiful. But the concept can be lost in that, and the development of the idea is kind of lost" (GF, 2018, group discussion).

I have observed in the classroom, that using collage or a compilation of existing imagery is a common approach in the idea generation process of many students. Although drawing is not necessarily included in this process it is of interest to this study because it was frequently mentioned as an alternative way to think through ideas and create illustrations and graphics. A few participants explained how they manipulated existing imagery onscreen in a trial and error approach. They explored and amended existing ideas, played with composition through incremental changes, finding what worked or looked right. The line between idea generation and the outcome was often blurred when working directly on the computer.



Image 31: Computer collage concepts, JMB, 2018.

Interviewee JMB used a digital collage approach for the design of his liquor range *half/half*. He did not produce rough concept sketches for these illustrations and appeared to rely heavily on mental imaging. Photoshop masking experiments influenced his project. He liked to make incremental changes until it looked right.

“My major project is based on found images and typefaces. It's all pretty much found apart from these ones up here, [pointing to early digital drafts of bottle designs shown in Image 31, right]. Even the illustration styles, those aren't mine [see Image 31, left] ” (JBM, individual interview, 2018).



Image 32: Computer drafts using iphone app template, MJ, 2018.

4.3.9 Populate existing templates

Some participants described using ready-made frameworks or templates that they populated with new content or customised to suit their needs (see Image 32). Building on existing frameworks and bypassing technological barriers is encouraged in some WSU units that aim to emphasise the design, rather than technical aspects of

design. Several students used hand-drawn diagrams to plan their sitemaps in the design of their apps and websites. Some referred to these as 'wireframes'. These early sitemaps were used to prepare the customisation of pre-existing templates. One interviewee observed the use of rough sketches when designing apps and websites;

"I just drawing it up before I continue with anything really...this really helps. It helps keep me on track as well. It helps decide what content I have to put in. As a UI [User Interface] UX [User Experience] designer, drawing is a really big deal, but then when I make other stuff, I tend to just go straight into it. I tend to just jump on Illustrator or Photoshop and just start - because it's something that I'm used to doing as well" (AA, 2017, individual interview).

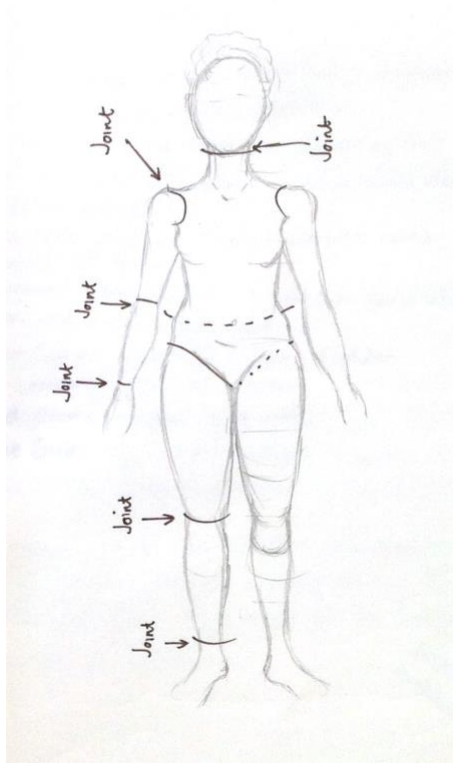


Image 33: Pencil sketch for 3D action figure, AB, 2018.

One student acknowledged the use of 3D templates, but explained why she decided not to use a template for the design of her action figure (see Image 33).

"I wanted to really make sure that the figures weren't really skinny and, you know, there's heaps of templates that you can get online where you can just download the base mesh, and then you can build on top of that. But I had to make it completely from scratch, because all those base meshes have really tiny little waists and huge boobs and that was not what I was going for at all" (AB, 2018, individual interview).

Another student described how the functionality and pre-sets of the program Unity determined the direction, functionality and look of his major project computer game, *Giraffe Unicycle* (see Image 34).

"I usually try to have a stronger concept before I begin, but definitely with game development, you have to kind of

have an idea, test it out, have a new idea, test it out and kind of flesh out your ideas a bit more before you can see if it's even good or bad, basically."

"I moved into this new program called Unity and I was trying to emulate the giraffe walking, just to see if I could use the new program. And I could not get it working. I spent ages on it. So, I just put the giraffe (head and body), and got rid of his legs and just put a circle there. And so I could rotate the circle. So, he just moved that way and I was like, oh, yeah, that's awesome. So, I was like, oh, this kind of looks like a unicycle. So, that's how that idea came about" (JW, 2017, individual interview).

JW used gaming templates and presets to explore possibilities without getting bogged down learning and developing complex code.

4.3.10 Interview questionnaire results

The importance of drawing ability was posed in a mini questionnaire collected from the 2017 and 2018 interviewees. Three selected the options 'Strongly disagree', two chose 'Mildly disagree', three selected 'Mildly agree', one chose 'Strongly agree'. Two interviewees wrote comments; "Depending on what discipline of design you want to get into" and "What you want to design". During the interviews, these final-year students also discussed their response to this question. They understood that the question related to process drawing abilities and not illustration abilities; however, many still disagreed that drawing was an essential skill for visual communication. The interviews and group discussions supplied more detailed opinions and revealed possible beliefs around the usefulness of drawing outside the learning environment. These comments have been included with each of the interviewees' summaries, providing more context for the interviews' analyses.

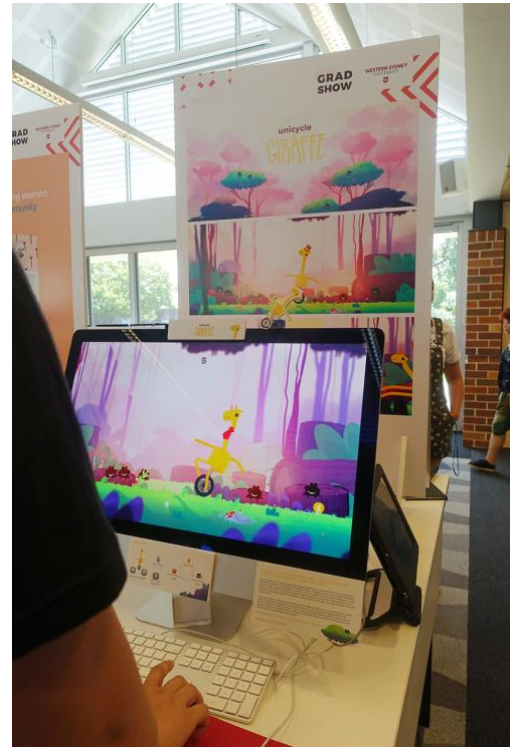


Image 34: Working directly in *Unity*, *Giraffe Unicycle*, JW, 2017.

4.4 Barriers to drawing participation in design activities

The findings of the *Why draw?* questionnaires and interviews reveal students' creative thinking practices and their relationship with process drawing. Students' design processes also show blocks and barriers that some students face when engaged in drawing activities, particularly in the classroom environment. The questionnaires and interviews highlight the complex issues preventing and discouraging students from harnessing drawing in their designerly practices at WSU. These findings and insights align with the literature's studies, exploring reasons for the decline of drawing competencies in design education.

4.4.1 Barriers that align with drawing literature

Simon Betts (2011) observed that "all the foundation course teams from the University of the Arts London were increasingly seeing application portfolios that lacked confidence and competence in drawing; lacked an understanding of the wider uses and purpose of drawing and lacked the rigour of sustained objective drawing. Furthermore, they showed little evidence of drawing for research or ideas development and were over-reliant on copying from second-hand information" (p. 28).

Charlotte Sjödel (2018), a lecturer at the School of Industrial Design, Lund University in Sweden, also identified a decrease in Industrial design students' knowledge and practice of drawing. In her paper, she discusses the value of freehand drawing in the twenty-first-century design studio and identifies students' lack of self-efficacy and fear of creating a 'crappy' sketch.

Tom and David Kelley, (2012) while teaching at d.school, identify four fears that hold creative thinkers back; "1. fear of the messy unknown, 2. fear of being judged, 3. fear of the first step, and 4. fear of losing control" (p. 115). They promote the use of sketchbooks to generate ideas and overcome these fears.

Jansson and Smith's (1991) study of engineering students at the Institute for Innovation and Design in Engineering, Texas A&M University, identified a state of blind adherence to a set of ideas limiting conceptual design output. They noted that "design fixation" can occur when there are no drafts, preventing early feedback. They define this term as "a blind adherence to a set of ideas or concepts limiting the output of conceptual design", and note that it is a "measurable barrier in the conceptual design process" (p. 3).

Alias, Grey, and Black (2002) suggest that students who have a positive attitude toward sketching and drawing demonstrate a high spatial visualisation ability. This ability encourages the use of sketching and drawing, which in turn, develops and improves students' sketching and drawing ability and their spatial visualisation skills. They present a model to illustrate the relationship between attitude, view, usage tendency of sketching and drawing when doing spatial visualisation tasks. This study found evidence linking spatial visualisation ability directly to the usage tendency aspect of sketching and drawing.

The emphasis on drawing as a primary skill for communication, idea generation, and conceptual development has declined in digital literacy and screen communication. The declining use of drawing is exacerbated by the introduction, integration, and emphasis of digital devices and online delivery in art and design pedagogy throughout Australia's primary and high school education systems. Some of these barriers found in the literature were also observed and voiced by the participants of *Back to the drawing board?*.

4.4.2 Lack of understanding

There are many misconceptions about what process drawing is and the necessary skill required to benefit from using sketching in the creative process. For some students, these misconceptions have contributed to feelings of inadequacy and a fear of drawing itself. Schenk's (2016) longitudinal UK study, which includes interviews with professional and novice designers, revealed a need for a comprehensive drawing taxonomy to identify drawing types, tasks and competencies needed to use drawing effectively. The drawing taxonomies outlined in Chapter 1: Introduction, aim to provide a guide that educators can reference. Misunderstanding the role and value of different types of drawing can lead to a lack of drawing

confidence, which contributes to a fear of drawing, preventing some students at WSU from using drawing in their design processes. The responses to the *Why draw?* questionnaire and interviews reveal various attitudes that reflect the need for clear definitions and qualifications about what drawing is and can do. It is easy to understand the students' confusion when rough sketches and doodles can also be viewed as finished illustrations, depending on the context.

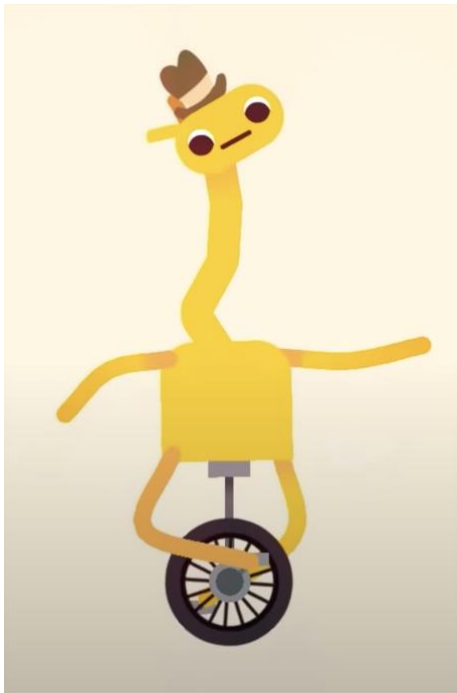


Image 35: Giraffe placeholder, *Giraffe Unicycle*, JW, 2017.

For example, during the interview discussion with JW in 2017, he describes how one of his rough doodles was instantly elevated to final illustration status during a critique for his major project. JW, a proficient illustrator before he began University, had scribbled a giraffe character while playing around with ideas for his computer game, *Giraffe Unicycle*. He had hastily drawn an animal character to explore the animation and interactive possibilities of the software, Unity (see Image 35).

“I was kinda playing around with experimental stuff. And I think I just had one quick slide on a giraffe thing and my tutor was very excited by the giraffe and kind of encouraged me to pursue it further. I didn't have much of a sketch of it. It was like a very simple giraffe, 'cause I was just trying to see if the idea would work” (JW, 2017,

individual interview).

Drawings can change intention and function depending on the context. Within seconds the giraffe switched from “crappy placeholder art” (JW) to a final illustration. JW's level of drawing skill and flexible thinking allowed this to occur successfully.

During the Lund University study, Sjödel (2018) also observed Industrial design students had a fear of making a ‘crappy sketch’. She notes, “it is important to give students the confidence in drawing fast and loose, together with an understanding of how to use the sketch”. Sjödel also cautions against the sketch becoming more critical than the design itself. “A sketch, just like a prototype, is an artefact for discussion, rather than a final product” (p. 3). From my teaching experience, instances such as JW's giraffe changing from a rough sketch to a final illustration are uncommon. From my observations, most students lack the necessary experience and insight to evaluate their process. They can overvalue their working drawings, particularly if they have invested time trying to make them perfect.

Misconceptions about the role and value of working drawings can be challenging to shift, when the spontaneous poetic qualities of a rough sketch are highly appreciated and sometimes revered. Petherbridge (2010) draws our attention to the reverence given to the working drawings and sketchbooks produced by the Renaissance Masters. "The ability of the rapid sketch to reveal the thought processes of the artist has been remarked upon throughout history, and even today sketches continue to be regarded as the touchstone for evaluating the talent or 'genius' of an artist" (p. 26). Petherbridge acknowledges the value post-modernity affords the unformed, incomplete, authentic nature of a rough sketch, more than its potential for completion into another state (p. 28). The *Speed Storyboarding* and *Speed Squiggling* activities aimed to demonstrate the drawing competency needed to work through and communicate ideas to others.

Strong beliefs about what drawing 'is' can be difficult to challenge. One interviewee commented;

" I'm not a drawer, but I feel comfortable and confident drawing on InDesign or Illustrator with the pen tool and so on" (RG, 2017 group discussion).

This comment reveals that this participant did not recognise using a mouse to manipulate vectors on the screen, as drawing. Schenk's (2016) drawing taxonomy's original aim was to demonstrate and demystify fundamental aspects of drawing and help students understand the historical and future importance of drawing to the graphic designer (p. 3). Sjödel (2018) also recognises the need for clarity; "By teaching students to identify the actual function of the drawing, they will better understand the value of a simple sketch and find confidence to use it" (p. 1). For instance, from my classroom observations, some students view the 'smoothing' functionality, which corrects tentative, wobbly marks (found in many sketch apps), as cheating or not drawing. Demonstrations of different types of process drawing using traditional materials and software can provide students with a better understanding of the broad concept of drawing.

Many students at WSU benefit from visual demonstrations that model expectation and clarify the role of process drawing in the creative process. Most of the 2017 and 2018 interviewees clearly articulated their understanding of how different process drawing helped them in the design process of their major project. However, for some students dispelling misunderstandings and clarifying the role of drawing is not enough to overcome the barriers to drawing participation. From classroom observations, lack of drawing confidence and skills represent for many students a far more significant barrier.

4.4.3 Lack of self-efficacy

Fear of failure, exposure, and judgment contribute to the reluctance and avoidance of using process drawing effectively. Psychological barriers can stem from adverse childhood experiences, feelings of inadequacy amongst peers and unrealistic expectations. Judgment can occur when expectations are unclear and not met. Many WSU students feared their lack of drawing ability would be seen as a lack of design ability. David Kelly remarked during his 2012 TED talk; "for some people, a negative experience or casual comment is enough to reduce their confidence and stop them from viewing themselves as part of the special world inhabited by the 'gifted' or 'talented'". These beliefs develop very early in a child's development. Our education system values drawing ability in children, and this is often associated with creativity.

The Kelleys' advocate a small step approach to overcome these fears or phobias based on the "Guided mastery" strategy developed by the psychologist Albert Bandura in the late 1970s. The principle behind Bandura's mastery technique is to expose a person with a phobia to small tasks involving that fear within a safe, controlled environment to help them build self-efficacy. "People fear and tend to avoid threatening situations they believe exceed their coping skills, whereas they get involved in activities and behave assuredly when they judge themselves capable of handling situations that would otherwise be intimidating" (Bandura, 1977, p. 194). In my early teaching years, I identified a lack of regular non-threatening hand-eye coordination activities that could build drawing confidence and self-efficacy around drawing. The drawing warm-up activity, *Speed Squiggling*, aimed to provide WSU students drawing confidence through this creative thinking task that does not rely on a high level of drawing skill to achieve an imaginative response.

The mantra at Stanford's d.school is, "Don't get ready, get started." Taking the first step is necessary to overcome the fear of starting. The Kelleys advocate that the best way to get started is to stop focusing on the vast overall task and find a small piece you can tackle right away. In a business context, this may mean posing the question: "What's the quickest, cheapest way to make progress toward the larger goal?" (Kelley and Kelley, 2012, p.118). At d.school, students are encouraged to use drawing and hand-drawn visualisations to define ideas quickly and capture their thoughts in real-time; "Instead of letting thoughts run through your head and down the drain, capture them systematically in some form of idea notebook" (Kelley and Kelley, 2012, p.117). Keeping a sketchbook or a folder of ideas is also encouraged at WSU to help students get started, but the physical book format is no longer an assessment requirement. Not all students regularly capture or generate ideas in a sketchbook, and those who do, often identify themselves as illustrators or confident drawers.

In 2017 one of the final-year interviewees described her fear of the messy unknown and fear of getting started on her major project. She explained how drawing helped her overcome her creative block. This

student was already working as a part-time designer for a medium-sized company at the time of the interview. During her interview, she talked about the lack of motivation she had experienced towards the end of her degree. She was working long hours and feared she wouldn't have enough time to complete her studies and work simultaneously. Her tutor suggested she move away from the computer screen and experiment and play with alternative materials to combat her ambivalence to completing her Design Degree. This tactic worked well for this student, and she avoided regurgitating an old idea and moved forward in her practice.



Image 36: *By Hand* major project, DH, 2017.

"The process of actually doing it was just a lot of experimentation because my tutors were like, well if you don't know exactly how you want to tackle it, just get a few mediums - so I got paint, ink, chalk and then I just started doing it because mine was going to be typography based. Then I saw which one worked the best and then I was like, I think just drawing it on paper with either ink or paint was the easiest thing to do." (DH, 2017 individual interview).

By breaking the assessment task into achievable chunks, DH overcame her fears. Drawing helped her get the ball rolling, which helped provide motivation, confidence, and ultimately self-efficacy. Her comments expressed her desire to find an easy solution that wouldn't take too long, but I believe this was not an indication of laziness. Her comments indicate she feared commencing an open-ended task that required skills that she believed were lacking. The minor achievements she made early in the project built on

her drawing skills and drawing confidence. She was very satisfied with her final project *By Hand* (see Image 36). Getting started for some students can be the biggest hurdle to overcome. Another participant also observed the value of drawing early in her process;

"Even though this was just a simple drawing, it did shape a lot of the elements in my project. It was a good start for me. It really got the ball going." (AA, 2017, individual interview).

Other interviewees believed their messy, childlike scribbles would be viewed as foolish and expose them as impostors. They actively avoided showing their first drafts or working sketches, making constructive feedback difficult for their tutors. Sjödel (2018) also observed a reluctance amongst her industrial design students to show their working drawings; "When asked to show sketches from their design process, the

students get uncomfortable and concerned that these sketches are not good enough to show and rather refer to the page of polished renderings" (p. 2). Fear of being unfairly judged was also reflected in the following 2017 group discussion.

AA: "I always think that my sketches don't make sense. So, if I was to show them to people, they'd be like ...

LAK: Oh, it's the same with me.

AA: So, that's why I never really showed process drawings and stuff, because they're going to be like ... how did you get that?

RG: Yeah, yeah, totally.

AA: I think that's something I personally have to work on myself. I should be able to just show everyone, because it's something to talk about as well" (2017 group discussion).

RG: "When I went back through my notebook, I'm like, gee, I'm very messy. I just write things randomly, or draw something really random and it doesn't look like anything, but somehow for me, it works" (2017, group discussion).

These comments indicate students gained some value from sketching but were reluctant to show their drawings as they feared judgment from their teachers and peers.

Most of the WSU interviewees expressed a fear of losing marks for bad drawings. One respondent was quite incensed by a poor grade given to her working drawings early in her course. To avoid criticism, she 'fixed up' her roughs before submission. She explained;

"I might do one really rough sketch in my book, and then come up with my work. But they'll [tutors] ask for all your process work, but for me there isn't a huge amount of process work, so you get marked down for that. So, I just sketch out a few things and scan them in so it looks like I've done more" (AB, 2018, group discussion).

Even one of the interviewees who had a high level of drawing skill noted;

" I'd like to think that most of the time I do those iterative sort of illustrations, but there are times where I've done that [added sketches retrospectively] as well. I've had the idea in my head and I've been able to just put it together, refined, and then gone back and done some sort of brainstorming for the of the reports that we have to do at the end - where we show our work development. " (GF, 2018, group discussion).

This practice of cleaning-up drafts was commonplace amongst the interviewees and highlights the need to encourage all forms of process drawing and demonstrate the value of iteration in the design process. It also highlights the need to emphasize the iterative process regardless of how this is achieved.

Brainstorming and ideation sessions are encouraged during WSU tutorials, so overcoming the fear of drawing in front of peers is essential for effective collaboration. Kelley and Kelley (2021) also observed their d.school students feared their peers would harshly judge their creative ideas. They also found that self-judgment and fear of failing also contributed to a lack of self-efficacy. "Most of us accept that when we are learning, say, to ski, others will see us fall down until practice pays off. But we can't risk our business-world ego in the same way. As a result, we self-edit, killing potentially creative ideas because we're afraid our bosses or peers will see us fail" (Kelley and Kelley, 2012, p. 117). To overcome these feelings of inadequacy the d.school encourages their students to engage in crazy, impractical, and fanciful ideas and accept that ideas can come from anywhere and anyone. However, WSU provides ideation sessions and encourages a non-judgmental environment, helping students overcome their fear of drawing.

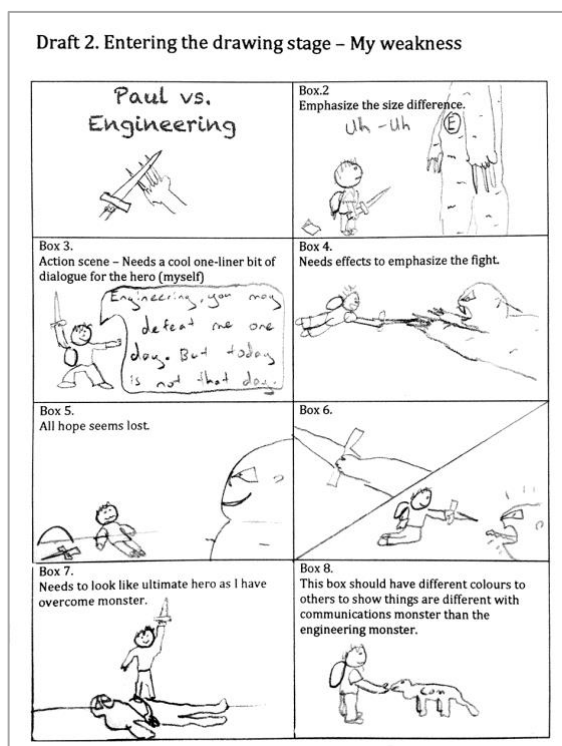


Image 37: *Visual Storytelling* storyboard draft, 2013.

Telling students that they will benefit from drawing will not necessarily change their thinking or designerly practices if this contradicts their personal experiences. If a student falls short of their expectations, this can lead to a greater sense of failure that discredits the persuader (or teacher) and further undermines confidence. One first-year *Visual Storytelling* student revealed their lack of confidence in their drawing abilities titling their draft "Entering the drawing stage - My weakness" (see Image 37). This student also went to the trouble of typing their instructions to avoid messy, or perhaps illegible hand writing.

Success can also be short-lived as students may perform one drawing task successfully, however, unless this is repeated, students will perceive their success as a result of luck or a fluke. Students may be highly motivated and have a strong desire to draw, but they may lack the belief that they can improve. The speed drawing activities aimed to address some of these fears and lack of self-efficacy (see Chapter 5: Pathways to drawing and Chapter 6: *Speed Squiggling*).

4.4.4 Lack of demonstration

Practical demonstrations and modelling of the role and value of drawing are missing in many classroom settings, contributing to misconceptions and a fear of drawing. How process drawing is included in professional designers' practices in the twenty-first century is invisible. In the last year of my professional design career in 2010, I worked in a studio where designers were required to have a clean desk at the end of each day. No funny sketches on the walls or funky designer toys on the desks were permitted. The externalisation of creative expression was de-legitimised. Even conservative dress codes were required. Not all studios are so extreme, but as we interact more in the online environment, the material traces, visual trails, and informal creative thinking demonstrations are diminishing. The transparent creative processes freely shared by early graphic design pioneers like Saul Bass and Abraham Games are rare seen in the twenty-first century studios. *Over my shoulder* (1960), showcases a selection of Games' war-time and post-war posters accompanied by his first thought sketches and gouache thumbnails demonstrating his aim to achieve sincerity and originality in his poster designs. Bass (1996) also generously shares his storyboards and working drawings for his iconic opening credit sequences, which provide valuable insights into his creative thinking and visual storytelling approaches. His advice to students; "Learn to draw! You can get by without it – you can move to a certain point, but you can never go back" (1996, interview with Archie Boston).

Demonstrations and modelling of how drawing might be used in the design process are rare in the classroom. Indeed, many design teachers themselves lack confidence drawing in front of a class. There is a reduction in classroom face-to-face opportunities to learn and master the necessary fine motor skills to draw competently. Activities such as sketching, collaborative mind-mapping, storyboarding and creating iterations through thumbnails are encouraged in the classrooms. However, many learning environments no longer have 'dirty' or subject-specific rooms where drawing activities can be quickly delivered within a one-hour tutorial. At WSU, packing up and moving to different tutorial rooms is unavoidable and dictates the kind of demonstrations and activities that can be delivered. Some WSU Units are also offered online, reducing opportunities for hands-on making experiences. Process drawing demonstrations and real-time collaborations are also limited in an online environment, although developments in this technology are improving.

4.4.5 Lack of time

Most students at WSU juggle work and study commitments and often look for shortcuts to complete assessment requirements. Teachers are also time-poor and forced to choose one-size-fits-all content that is easy to deliver within a one-hour tutorial. Lack of face-to-face time has also reduced the opportunities to obtain rudimentary drawing skills through real-time demonstrations and hands-on activities. Many students need to be pragmatic in their approach to time management, which leaves very little time for open-ended exploration or practising new skills.

One student described her illustration process that involved drawing from her imagination straight onto paper using bright markers. She traced over or copied these images several times making incremental changes;

"A lot of these ones [pointing to *image 38*] started out going straight to that sort of visual [left pink image] rather than drawing little thumbnails because I just found that it was a better use of my time to just visualise what I wanted in my head. There were too many to draw" (CN, 2017, Individual interview).



Image 38: Illustration process example, CN, 2017.

This student perceived this process to be quicker than making compositional thumbnails first. From my observations, students often waste time and money if they have inadequate planning. She had to revisit her illustrations several times as she had not considered the position of the text. Sometimes by-passing a rough sketch in the creative thinking phase or avoiding a quick mind-map or thumbnail in the scoping stage can lead to misdirected or random online

searches, premature refinement of designs, and lack of same page collaboration with peers.

Almost all the final-year interviewees indicated their creative process began from or included some form of online search. This search was done to find existing information about the client, product or message, competitors, target audience, precedents, media platforms, and examples of possible styles or visual approaches. Students rarely referenced images in printed books and magazines or sketched the world around them. This situation is not always a result of a lack of skills and confidence, but rather tendencies to find shortcuts. A solution conjecture approach is popular with time-poor students. One interviewee explained;

"Yeah, I can draw. I just don't do a lot of it. I think it's because sometimes I feel like I can just get it out straight away without doing this [pointing to her sketches], and this [drawing] takes more time. I can just go straight into a program and play around a bit and do the same sort of process, like the same thinking process on the computer" (AB, 2018, individual interview).

Other interviewees also justified skipping an iteration process, noting that their first thoughts were often the best and spending time exploring different ideas through sketching was often a waste of time.

One student explained her approach to the logo design for her major project, *Too Good* (see Image 39);

"Like logos I always do sketches because a logo could be absolutely anything. So, you want to go straight onto the computer and use that one idea cause most of the time – like before in my experience I've never had that one idea that didn't end up becoming the final logo – and even if it did it would've been really similar" (MS, 2017, individual interview).



Image 39: Logo sketches for *Too Good*, MS, 2017.

seen;

However, this student contradicted this approach to logo design later in the same discussion revealing the value of her early sketches;

... "with my leisure project [major project] – I was creating logos up until quite far into it – I already started creating all the other specific stuff like my layouts and it got to a point where - I need to go back to the drawing board with my logo because it wasn't matching everything else that was going on with my project. " (MS, 2017, individual interview).

Another interviewee described his solution conjecture by explaining he always began an assignment with a pre-conceived idea influenced by other design solutions he had

"I'll search on Behance, or I'll search on Instagram, Google, Dribble. I'll search everywhere.

Basically, the first thing I do when I start a project is I'll sit down and I'll figure out what I want to look for, the general thing. Then, I'll just sit down for an hour or two and I'll just look at images.

It'll help build this image in my head of what I want. It'll be like a bit of everything smashed together mixed with what I already had." (JMB, 2018, individual interview).

While this might work for self-generated briefs, where the student has set the parameters of their project, it is a process that can lead students to regurgitate old designs or plagiarise.

Looking for visual inspiration from other designers can be an effective way to respond to a given brief and target audience; however, seeing possible solutions can also restrict creative thinking. Jansson and Smith (1991) discovered that providing visual examples alongside a design problem restricted engineering students' creative thinking. The students were instructed to develop as many possible design solutions as they could within 45 minutes. Half the participants were given sample designs along with the design brief. The other half, the control group, were assigned no accompanying examples with the same design brief. In

all the experiments, the fixation group generated the same number of designs as the control group. Flexible thinking and creativity were measured on both groups' outcomes, resulting in the fixation groups scoring a lower creativity score than the control group. A questionnaire was also given to determine if engineers were aware of the phenomenon of design fixation.

Jansson and Smith's (1991) study raised many questions and conceded that fixation on a helpful feature might not be as detrimental as a fixation on a lousy feature. Indeed, the interviewee JMB produced a unique wine label brand that successfully achieved a high grade for his major project; however, it could be argued that his illustrations did not vary significantly from his found visual examples. Visual research and exposure to past solutions and information are essential, however to rely solely on found images may lead to design fixation limiting the scope of a creative outcome. It is only a barrier if the fixation prevents the consideration of other relevant knowledge and experience, which should be brought to bear on any given problem. Having set pre-conceived ideas and design fixations may appear to save time in the short term. However, traps can arise when students restrict creative outputs, repeat the same design, avoid opportunities for meaningful feedback, inadvertently plagiarise and produce a limited portfolio of work.

It is not uncommon for professionals to begin with the solution or a firm personal conviction about the direction. While this may save time, and prove a promising approach for a professional designer referencing and mining their designs and past experiences, it can be counter-productive to reduce time spent in the initial creative thinking phase of a project. The *Speed Squiggling* warm-up activity was designed to demonstrate the value of a hand-eye coordination task, such as drawing, to the ideation process, thus encouraging sketching in the early stages of creative thinking.

4.4.6 Lack of skills

The analysis of the *Why Draw?* questionnaire data and interview responses show some WSU students enter the *Visual Communication Design* degree with little or no prior training. Participants also had mixed feelings about whether it was essential to have some drawing ability to be graphic designers or visual communicators. Avoidance, fear of wasting time, and poor hand-eye coordination skills point to a need to provide some process drawing guidance and opportunities to experience the handiness of drawing. Acquiring enough drawing skills does not require students to be taught how to make a perfect drawing. Schenk (2016) provides a framework that links specific design tasks with drawing types and drawing competencies, highlighting the value of drawing in all aspects of the design process (p. 188). This framework was referenced when evaluating the types of process drawings students used for different tasks.

Petherbridge (2008) observes that “few students in the twenty-first century develop sophisticated hand-eye skills, and most drawings appear to be slight, spontaneous, expressive and gestural and often deliberately deskilled” (cited from *Writing on Drawing*, Garner, 2012, p. 31). Schenk's (2016) longitudinal

study found that "almost all the graphic designers interviewed expressed a considerable reluctance to draw in front of new clients. In particular, it was felt that this could make design look easy and therefore not good value for money" (p. 58). Some students at WSU favour deliberately naïve, cute or doodling drawing styles that flaunt awkward, tentative marks. These accessible styles allow students with limited drawing skills to try illustration. One of the final-year interviewees (a confessed non-drawer) made the following observation about what it takes to be an illustrator;

"I don't think you need to be a good drawer as such. I think if you're doing illustration, well that's different, but that's obviously your discipline. And I think a lot of illustrators these days are quite unique as well. They're not necessarily great, but their work is really unique, and that's what makes it really good as well" (RG, 2017, group discussion).

From my classroom observations, some students felt confident drawing with a unique style that didn't follow drawing conventions, like perspective, or adhere to a particular illustration genre or styles. However, the majority of students who considered themselves non-drawers were self-conscious about their lack of hand-eye coordination. During the 2018 group discussion, MJ's comments reflect the frustration that many students feel when incorporating drawing into their processes;

"If I draw something, I want it to be perfect. And if it's not perfect, then I need to scrub it out. I don't want to look at it again. And, yeah, that's probably why I don't sketch as much as I could" (MJ, 2018, group discussion).

One interviewee suggested drawing was necessary to be a good designer;

"I don't want to offend anyone in the group, but I would say that the designers I know who have a drawing background, are much stronger designers from what I've seen at work and in class and stuff like that" (JB, 2017, group discussion).

"I would say people who sketch things and are good drawers tend to have a better idea of composition and spend a bit more time, I think, with the idea because you have to think about it when you're drawing something - rather than just rushing in and putting something on the screen" (JB, 2017, group discussion).

Another student disagreed with this statement;

"I'm on the opposite end of the scale. I am a designer who just cannot draw. I can do very crude drawings, but even those I just fail to, you know, show any artistic ability in them" (JM, 2017, group discussion).

"It's not important to be good at drawing, but I think as a way to quickly visualise your ideas, then I think it's really important" (JW, 2017, group discussion).

Another 2018 interviewee, JMB, vigorously defended his creative practices, which did not include drawing. He described the disconnect he experiences when translating what he sees in his head to what he draws on paper and what he ultimately produces on the computer;

"I mean, I've been communicating my whole life and I've never drawn anything. So, why would I need to start now? And yeah, that's just how I feel. I've just never been a drawer. I've always been very visual or verbal. I just don't see the value in drawing at all" (JMB, 2018, group discussion).

JMB revealed his frustration at being forced to do things in specific ways throughout the course;

"That's just the nature of education itself. I think that it funnels everyone into the same lane, not taking into account that everyone has their own process, and everyone does things differently" (JMB, 2018, group discussion).

Another 2017 interviewee, AA, explained that she rarely used process drawing in the early years of the course and would jump on the computer and start designing with minimal thought or planning. She was aware of her limited drawing skills and consciously worked to improve them. AA aspired to specialise as a User Interface (UI) and User Experience (UX) designer. She was not interested in becoming an illustrator despite the apparent quality of her drawing skills. During the process of her major project, she oscillated between writing and scribbling in her notebook, sketching on a Wacom tablet, and jumping straight onto Illustrator or Photoshop. AA was self-motivated and recognised the value of drawing beyond her illustration practice.

Sjödell (2018) also observed students varied approaches to the use of drawing in their practices;

...some students excel at drawing as they are passionate about the subject and put in the needed time and effort to learn how to draw any object out of their imagination, but others lose confidence and abandon drawing altogether. When focusing on high fidelity drawing or not addressing drawing sufficiently in the education, many students fail to see how drawing can be used for a variety of purposes. Learning to use drawing as a design tool is so much more than understanding how to draw in perspective and how to render an object (p. 3).

Alias, Grey, and Black (2002) also support the continuation of sketching and drawing as tools to develop spatial visualisation abilities for all design practices. Students need to be able to draw well enough to fulfil the necessary functions of a designer. Whether a designer has adequate drawing skills to perform a task effectively, is determined by drawing requirements to enable thinking, communication; collaboration; instruction or expression. While drawing has many benefits to designers, Kirsh (2014) reminds us that drawing is only useful to the user if a certain level of competence and ease is reached. "Thinking through drawing is an embedded activity with certain moves and biases, specific patterns and strategies of thought.

Some inferences are facilitated; others are inhibited or limited. Our thought process is biased by the representation" (p. 8). For this reason, acquiring a level of visualisation skill that is useful to the individual should be encouraged.

The educational environment itself can also limit the development of skills and drawing participation. The limited tuition time is divided into thin slices devoted to visual literacy skills, design philosophies, and practical skills, including traditional and graphic software training. The push to provide alternative units online at most Australian Universities has resulted in practical skills like process drawing becoming extinct and only practised by students interested in illustration. Digital sketching tools that allow for online collaboration have been developed but have not been utilised within the online classroom environment at WSU at the time of this study. The benefits and practical advantages of traditional and digital sketching require students to experience these through the handiness of drawing and the tactile feedback.

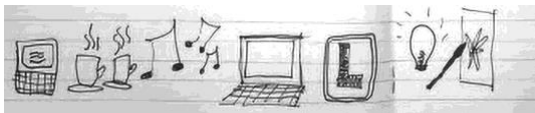


Image 40: *Major Project*, mini-brief example, RG, 2017.

Reduced hand-eye coordination opportunities at school and University have resulted in physical limitations for some students who lack the fine motor skills to draw

and write legibly. Future reductions in handwriting activities may also diminish the benefits of cognitive and creative discovery gained from drawing. Quick process drawing activities are included in many WSU Units to demonstrate effective idea generation and clear communication through low-fidelity drawings. The 2017 interview group reminisced about the drawing activity included in one of the 'mini-briefs' of their *Major Project* Unit (see Image 40);

"Yeah, it was fun. Because as LAK said, everything is digital now. So, we don't draw a lot as designers anymore. So, to have that time just to be able to do whatever, was actually quite fun too" (AA, 2017, group discussion).

The *Speed Squiggling* trial and questionnaire responses indicate simple drawing activities can provide a pathway to overcoming the skills barrier, as discussed in Chapter 5: Pathways to drawing and Chapter 6: *Speed Squiggling*.

4.5 Conclusion

The *Why Draw?* questionnaire responses and interview descriptions of final-year students' design processes highlight students' understanding of the role and the perceived value, of drawing in their creative processes. For these students results also reveal misconceptions, fears, negative attitudes, obstacles, and barriers to drawing. These barriers to drawing are also reflected in the literature that explores the role and value of drawing in current design education. Lack of drawing skills was the biggest hurdle for many WSU students to overcome, despite constant reinforcement during first-year units that acquiring process

drawing skills is within all students' reach. This situation is due to a lack of classroom demonstrations and modelling of professional design practices that contribute to the mystery surrounding drawing skills. Students at WSU are also encouraged to record their design process for creative outcomes, feedback and learning. In the absence of a thinking trail, which might include a combination of rough sketches and computer iterations or drafts, the feedback process is limited. Students can invest unnecessary time or become fixated on an inappropriate outcome.

Interviewees agreed with GF's comment made during the 2018 group discussion;

"I guess it's important in some ways [drawing], but it's not the only way of doing things".

Indeed, the interview responses showcase the variety of creative thinking approaches and activities in which students engage, reflecting the unique role that drawing plays in the creative process. This chapter's discussion underpins the pedagogical strategies, design and delivery of the speed drawing activities developed to promote and foster drawing participation in the classroom. The pathways to these pedagogical strategies are explained in Chapter 5: Pathways to drawing.

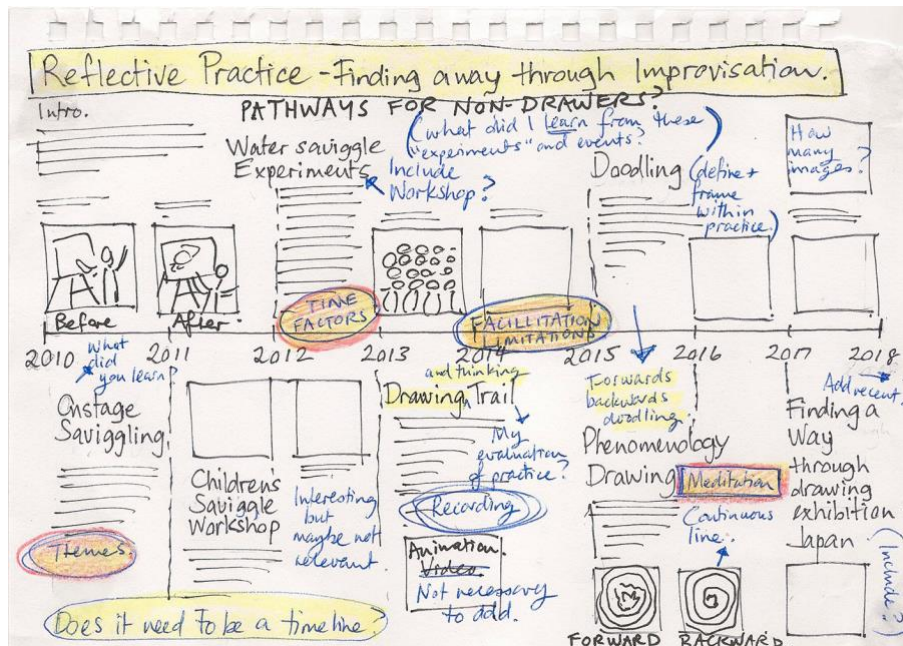


Image 41: Timeline thumbnail of image making practice, 2018-2020.

When thinking is taught in the classroom, conscious modes of thinking are stressed and subconscious modes are rarely even mentioned, much less encouraged (McKim, 1980, p. 4).

5 Pathways to drawing

5.1 Overview

The *Visual Communications, Design* course at WSU encourages students to use different types of process drawing to create, communicate, collaborate and unlock conscious and subconscious modes of creative thinking. However, the responses to the questionnaires and interviews explained in Chapter 4: Practices and barriers to drawing reveal some students have misconceptions, obstacles and habits that they need to overcome to efficiently use the unique qualities of drawing in their designerly practices. McKim's (1980) observation (in the quote to the left) was made over forty years ago and referred to the emphasis on verbal, analytical and numerical modes of teaching in many primary and secondary schools in the UK at that time. There is still an emphasis on mathematics and written language skills rather than visual language skills in the current Australian Higher School Certificate (HSC) curricula, reflected in the steady decline in Visual Arts enrollments since 2010 (NSW Education Standards Authority, 2020). In addition, many handwriting activities and other hand-eye coordination tasks, like model making and drawing, have been replaced by screen-based keyboard and mouse activities in the face-to-face classroom, online and home educational environments. As a result, the opportunities to engage in tactile, practical knowing activities that harness both conscious and subconscious modes of thinking are limited. However, the literature, along with insights gained from the *Why draw?* questionnaire and interviews with WSU students confirm that drawing, and the act of drawing, have many cognitive and communication benefits for the novice graphic designer.

This chapter describes the visual thinking strategies and pedagogical pathways that influenced my creative thinking practices, which contributed to the direction of the *Back to the drawing board?* study. Using my image making practice as a testing ground, I conducted experiments in the field and my studio from 2010 to 2019, exploring the unique qualities of drawing. I explored continuous line, contour and gesture mark-making techniques, playing with different doodling, squiggling and low fidelity drawing techniques that may provide a gateway to drawing participation in the classroom. In this chapter, I also draw upon my lived experience to explore the role of brain plasticity in the creative thinking process and proposed strategies. I have included relevant investigations and insights gained throughout the study that influenced the design and development of the *Speed Squiggle* activity, which forms the response to this thesis's findings. The design, delivery and analysis of the *Speed Squiggling* trial results are included in Chapter 6: *Speed Squiggling*.

5.2 Growing up drawing

Humans have always searched for ways to make realistic representations of the world. This has been occurring since the first person traced the outline of their hand on a cave wall. Tracing around the hand with a crayon is also one of the early drawing activities given to kindergarten children. Betty Edwards (2012) observed that very young children make simple marks or scribbles that represent things that interest them. Three-year-olds attempt to draw the immediate world around them, which is usually a member of their family. Later they add details like clothes and fingers. As children develop language their drawings become vehicles to tell stories and work out problems. At about five and six, children have acquired a set of recognizable visual symbols or pictures. "Thinking symbolically, a child knows that the ground is at the bottom, and the sky is at the top" (Edwards, 2012, p. 71). These symbolic representations are often incorporated into landscapes and include stylised images such as a house with a door, sun with rays, trees with leaves and flowers with rounded petals.

Ken Bayne's (2002) research into children's mark-making at Radmoor Nursery School, Loughborough, confirmed that most children start drawing using scribbles. In the study, children between three to six years of age were encouraged to draw from memory and the imagination on a 'soft board' (electronic whiteboard), recorded for later evaluation. These drawings also showed the origins of actions and marks necessary for written language, mathematical notation, maps, plans, signs and symbols. Baynes (2013) notes, "from a cognitive perspective, it is clear that children use their mark-making not only for pictures but as a springboard for other emergent skills" (p. 44). He found children also display a degree of design ability and engage in designerly play from an early age. "Children see and understand that in order to

make something – let's say a cake- you need the right materials, tools and equipment" (Baynes, 2013, p. 127). Early mastery of drawing skills provides a gateway to expression and learning.

Older children attempt more detail and realistic additions to develop their fine motor skills and visual 'library'. Some enjoy tracing cartoons and popular images they love. Gender differences also occur during this time. However, most children in late primary school experience a period of conflict where their language and symbol

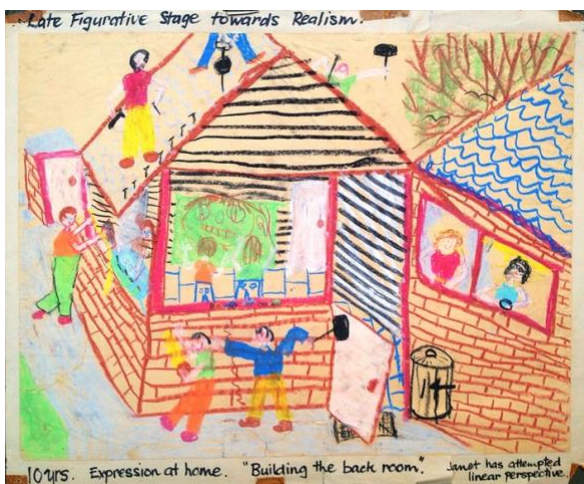


Image 42: Realistic drawing phase, Janet Saunders, 1972.

perceptions override their spatial perceptions. Edwards (2012) observes that "by around ten or eleven, children's passion for realism is in full bloom" (p. 74). Like many parents, my father kept a record of my early drawings. He used these as teaching aids when lecturing Visual Arts at the College of Advanced

Education in Sydney in the early 1970s. This illustration (see Image 42) represents a turning point in the way that I saw the world. This developmental phase is often when children give up drawing as they struggle to visually describe what they can see in their mind's eye while comparing their drawings with others. Many teachers wish students were freer and less concerned with realism during this 'tween' phase. But children during these years want their drawings to look right and less babyish. A detailed account of children's developmental drawing stages is beyond the scope of this thesis. However, it is essential to note that for some people, their childhood experiences of drawing in the classroom and comparing their drawings with others were traumatic and embarrassing. They carry these painful memories into adult life.

Edwards (2012) observed that when adults start drawing, they often pick up where they left off in their development. I too, observed that students seemed to be transported back to their last encounter with drawing, which was not always positive. To counteract possible fears of drawing like a child, I ask students to think back to when they did their last detailed drawing. How old were they? Then I ask them to consider if it is reasonable to expect rapid improvement from themselves if they have engaged in very little drawing activity since those years? Art and design educators strive to provide environments where students can overcome inadequacies and build drawing confidence and skills. Many of these strategies recognised the value of drawing quickly to achieve creative flow (Csikszentmihalyi, 1990) and bypass the inner critic that may remain from childhood.

5.3 Influential pathways

Using low fidelity drawing approaches to harness visual thinking and pathways to drawing confidence is an effective way to provide a gateway to drawing confidence. Many contemporary design thinking courses, including those taught at WSU, encourage some form of idea-sketching and diagrammatic planning within their Units. These modelling practices have been borrowed and adapted from traditional art, crafts, architecture, engineering and design thinking disciplines. The twenty-first century has placed the discussion of design and modelling into a more comprehensive framework. "Neuroscience, cognitive science, psychology and evolutionary biology have all thrown some fresh light on the nature and origins of the human mind and its use of modelling as a basis for thought" (Baynes, 2013, p. 20). There is much to be gained from revisiting creative thinking activities and re-evaluating their current role and value.

Drawing On the Right Side of the Brain had a profound effect on my life during the late 1970s. I distinctly remember copying a complex drawing of Picasso's seated man, *Stravinsky*, from an upside-down picture. I was surprised at how easy it was to draw this accurately. What was happening in my brain? We were also introduced to 'negative space' drawing. I could already draw reasonably well, but I remember having that beautiful 'aha!' moment when I drew a faithful representation of a classroom chair just by concentrating on the space around the chair. These two drawing activities changed the way I 'saw' the world.

I had another significant moment in the first year of my undergraduate degree at Sydney College of the Arts (SCA) during a brainstorming session. We were encouraged to relax, refrain from making negative comments, purge our obvious first thoughts, and uncover as many unique concepts as possible. I remember experiencing the liberation of deferred judgment and took comfort knowing that great ideas were hiding in my brain – I just had to find them. Later, when I began teaching undergraduate design students, I discovered these visual thinking exercises and strategies in McKim's *Experiences in Visual Thinking* (1980). McKim harnessed Gestalt psychology, led by the writings of Arnheim, and explored creative thinking activities and methods to resolve ill-defined problems. McKim's thirty-circles activity profoundly affected the way I understood fluency and the value of iteration in the design thinking process.

Edwards and McKim's resources focus on providing experiential exercises and activities designed to improve their students' ability to see, imagine and practice visual perception skills through the act of drawing. Many of the exercises focus attention on the different functions of the brain and provide an experiential shift from verbal, rational, left-mode thinking to non-verbal, imaginative, right-mode thinking. Both authors were interested in visualizing thought through drawing activity to provide creative solutions. The goals of Edward and McKim's activities aligned well with the aims of the drawing activities I was exploring in my classroom ideation sessions with my students. They, too, aimed to provide positive drawing experiences and tangible evidence that drawing has a valuable role in the creative processes of everyone.

Edwards began developing her theories about drawing during her early high school art teaching days at Venice High School, Los Angeles, in the early 1970s. Edwards's ideas grew from her traditional 20th-century art training and experience as a practising artist and educator. *Drawing On the Right Side of the Brain* was her Doctoral research. Until her retirement, she lectured worldwide, speaking about drawing, creativity, and creative problem-solving to a broad audience, including corporate communities and museum groups. Her popular five-day DRSB workshops are still offered in California at Drawright.com by her son Brian Bomeisler, an artist and educator.

It could be argued that observational drawing skills, concerned with realistic drawing outcomes, are not necessary to gain value from drawing in the creative process. However, entry-level activities focus on developing five fundamental aspects of drawing perception. Edwards calls these "the basic component skills of the global skill of drawing" (2012, p. xv). They are; the perception of edges, the perception of spaces; the perception of relationships; the perception of light and shadows; and the perception of seeing the whole and its parts (aka Gestalt). Kimon Nicolaides (1941) continuous lines, contour and gesture drawing exercises outlined in *The Natural Way to Draw* also provide techniques and strategies for the non-drawer. I began my investigations into activities that encourage and provide drawing confidence by exploring these simple repetitive exercises suggested by Nicolaides.

Edwards and McKim's activities incorporated the latest neurological discoveries with perception and visual thinking theories of the 20th century. During my formative years in the 1980s, drawing to 'see' was a common idea, but drawing to 'think' was a revelation. During this time, Visual Thinking and Visual Communications were the latest buzz words in the design industry. Design Thinking courses sprung up everywhere catering to a non-design audience, including corporate markets. Design thinking courses continue to embrace emerging neurological discoveries and provide new strategies and design resources aimed at disciples grappling with 21st Century problems. David and Tom Kelley's visual thinking tools developed with students at Stanford University's d.school in 2012 were promoted at IDEO. These activities are an excellent example of this trend. Despite the shift in the way we think about thinking, many visual thinking courses still encourage using some form of idea sketching or low fidelity visual representations (see Chapter 3: Benefits of drawing).

McKim's ideas were influenced by his engineering background and experience developing a visual thinking course for Stanford University in the late 1970s. McKim begins *Experiences in Visual Thinking*, inviting the reader to consider how we think. He notes that "no two people ever see, imagine, or draw the same; no people ever think the same thoughts" (1980, p. 5). He observed, "some students claimed that they 'had no imagination' and therefore no ideas to sketch, others had difficulty in departing from stereotyped concepts, and still others were frequently blocked in the generation of ideas" (p. viii). McKim believed that drawing was an essential vehicle of thought and functions similar to words and numbers. "The visual vehicle, with its ability to facilitate holistic, spatial, metaphoric, transformational operations, provides a vital and creative complement to the reasoning, linear operations built into the vehicle of language." (p. 5). Using one vehicle or mode of expression limits flexible operations across conscious and unconscious levels of thought necessary for creative thinking. McKim's activities were designed to foster flexible, original ideas. Both Edwards and McKim's visual thinking strategies were intended to silence the critical voice of left-mode thinking and provide easy access to imaginative right-mode thinking.

Edwards and McKim's visual thinking philosophy is based on the premise that everyone can learn to 'see' and develop drawing skills if they are motivated. Drawing is a transferable skill that can be used across many disciplines. Drawing was not just for children, artists and designers. Tom and David Kelley (2012) advocate idea sketching for all their students, regardless of their drawing ability. Recent discoveries into brain plasticity have begun to explain how the brain can be rewired and form new habits and neural pathways. Many visual thinkers came before and after Edwards and McKim intuitively knew that you *could* learn and change behaviours. When exploring possible classroom designerly thinking and drawing interventions, I incorporated and adapted some of Edwards and McKim's visual perception activities. I rekindled my kindergarten love of repetition and doodling while exploring entry points to drawing for adults in my studio.

5.4 Brain pathways

The way we think about the brain and drawing as a vehicle to externalise thoughts has changed since the first neurological discoveries in the late 19th-century. The Spanish neuroscientist, Santiago Ramón y Cajal, drew the first brain visualisation depicting neurons from observing stained brain cells. These drawings changed the way we imagined the brain. Cajal (1897) observed that "any man could, if he were so inclined, be the sculptor of his own brain". In the following decades, neuroscientists, psychiatrists and psychoanalysts inspired artists, designers, and educators to explore visual perception theory and its effects on visual thinking. Edwards and McKim were developing and trialling their creative thinking resources during the 1970s when theories related to the operations of the left and right brain hemispheres created a paradigm shift in the way we thought about thinking.

Edwards and McKim both reference the groundbreaking research of the neuropsychologist and neurobiologist, Roger Sperry. Through observations of split-brain patients in the 1960s, Sperry identified different functions of the left and right brain hemispheres and the connecting or transference role of the corpus callosum. During this period, the neurologist and author Oliver Sacks (2010) observed sensory impaired patients who had miraculously developed alternative perceptions to compensate for their deficits. His research continues to add to the growing evidence that the brain is not hard-wired from birth. Connections between neurons (synapses) can be strengthened, and brain functions can be re-formed and re-routed through experience and learning. The brain is flexible and pliable, like play-doh or "plastic", as was first described by Cajal in 1897. The brain plasticity theories developed over the next century, replacing genetic determinism. Doidge (2007) articulates these through case studies in *The Brain That Changes Itself*. He explains that the brain is not a computer. It is not fixed or hard-wired from birth. In some respects, brain tissue is more like a "muscle that grows with exercise" (p. 36).

Edwards (2012) viewed the dominant left mode thinking as the Great Saboteur, always wanting to take over the quiet right mode thinking. She suggests students avoid this by presenting their brain with a "task that your left hemisphere will turn down" (p. xxxii). McKim advocates achieving a state of "relaxed attention to balance the left and right hemispheres and create the optimum environment for flexible thinking and memory retention" (1980, p. 38). Both hemispheres are essential for productive thought, but the belief during most of the 20th century was that the right hemisphere needed an intervention to develop its full potential. Brain plasticity theories support the notion that disruptions can change thinking and behaviour. Doidge (2018) explains brain plasticity in an interview with Stuart McNish at Simon Fraser University's Centre for Dialogue;

... it's sort of like snow on a hill in winter. If you want to do something for the first time, and it's a virgin hill, you can ski down that pliable snow and take many different paths. If you go down that hill and you had a good run, being human, you might want to do that run again and again, and then what will happen is you'll get better at doing that run. You'll get tracks in the snow. You keep it up and you can get ruts in the snow to the point that those neurons, that are doing that activity, are so fast, so good at it, that it's hard to do it a different way. So plasticity also contributes to habits, bad and good. So yes, you can sculpt your brain by the choices you make (*Conversations that Matter*, interview).

It is interesting to note that not very long ago scientists found very little justification for the existence of the right hemisphere. They supposed it lay dormant and was suppressed by the more capable left hemisphere. Subsequent studies have shown that along with the ability to comprehend spatial relationships, which is a necessary function in the act of drawing, "the right hemisphere, while it cannot express itself verbally, can recognise the written word" (McKim, 1980, p. 21). Allan Schore's recent research into the development of the right brain functions during the first thousand days of a child's life and its effect on emotional growth are "shifting focus from left-brain explicit conscious cognition to right brain implicit, unconscious emotional and relational functions" (2009, p. 388). Edwards updated the opening discussion in her 2012 edition of *Drawing On the Left Side of the Brain* to reflect emerging plasticity theories.

5.4.1 Personal reflections

I experienced the divisions of brain functions acutely when my late husband, Peter, had an undiagnosed brain tumour in the left hemisphere of his brain. He functioned remarkably well for almost a year without detection. After the diagnosis and subsequent operation, we both reflected on minor 'glitches' in his behaviour that signaled his left-brain hemisphere was compromised. He performed his role as a web manager at CSIRO (Commonwealth Scientific and Industrial Research Organisation of Australia) reasonably well. Many of his daily tasks required left-brain thinking, systematic, cause-and-effect relationships and step-by-step instructions. Neuroplasticity helps explain how his brain compensated. The brain forms and re-organises synaptic connections creating new pathways in the undamaged parts of the brain; it rewires itself. Peter used 'well worn' pathways to complete familiar tasks and gradually built new pathways when these were disrupted.

Another question lingered after Peter's diagnosis; Why hadn't his colleagues noticed any change in his personality? He had become quiet and withdrawn. At the time, I assumed this had gone undetected because most of his colleagues were scientists or programmers who have traditionally left mode thinkers and may not have indulged in right mode 'chit chat'. My assumptions reflect old fashioned beliefs that the brain is hard wired with a predetermined personality and natural skill

sets. Many people still divide the world into artists and scientists. A mature-aged nursing student enrolled in the Visual Storytelling Unit defended her perceived lack of drawing skills by declaring, "I was born without a creative bone in my body". In *Experiences in Visual Thinking*, McKim (1980) refers to the 20th Century neurologist and founder of psychoanalysis, Sigmund Freud and Carl Jung, psychiatrist and founder of analytic psychology, who suggested left and right brain dominance could be linked to different occupations (p. 23). Indeed, the Myers Briggs test, famous in recruitment companies during the 1980s, interpreted the "extravert/introvert" Jungian theory. During the 20th century, the hemisphere dominance theories were disputed by many, including the constructivist theorist Jerome Bruner. McKim (1980) references Bruner, who declared that "truly creative people in every field are ambidextrous - that is, capable of receiving with the left and transferring to and expressing with the right" (p. 23).

My husband Peter could be described as an ambidextrous thinker. He was predominantly a visual person, but he had an odd mix of left and right brain thinking. Peter was a good conversationalist and had an extensive vocabulary gained from reading both fiction and non-fiction. I was always amazed at how he remembered obscure dictionary words and bits of schoolboy French. He was interested in mathematics, weather statistics and navigation systems. He was also an accomplished photographer and good drawer who as a young adult created fanciful, surreal illustrations from his imagination. McKim (1980) suggests that "creative thinkers do what computers cannot. They abandon language when occasion demands and enter into other modes of thought" (p. 26). Peter's memory loss and reduced language skills went unnoticed pre-diagnosis because he could function efficiently in his office without verbal language and access his visual thinking skills readily, in the way that McKim describes.

At home, Peter found it more challenging to function undetected. He was aware of some memory loss and put this down to stress and old age. He had a wacky Monty Python sense of humour replaced by random literal observations that I interpreted as a newly acquired dry sense of humour. Looking back, the changes in his personality were apparent. However, I had attributed these changes to depression resulting from a massive workplace restructure that was occurring at the CSIRO at the time. He also had chronic pain from rheumatoid arthritis and was taking medication that made him foggy and forgetful. It was not until he decided to put labels on the food containers in the freezer one night that alarm bells began to ring. Labelling food was uncharacteristic for Peter so I questioned this behaviour and he explained that he was having trouble remembering insignificant things. When I read these labels a few days later, they were misspelt, unrelated words that didn't make sense. I thought his wacky sense of humour had returned, and these labels were a joke in response to my questioning. I couldn't work out the meaning of the random words and the subtleties of the 'joke', so I asked him to explain it. He became baffled and was convinced that I had written the labels. I then asked him to write his name to prove to him that it was his handwriting. He began writing carefully, but his name came out as a series of random letters. It was immediately apparent to both of us that there was something wrong with his brain.

To complete the story of my husband's brain experience, he had a Magnetic Resonance Imaging scan (MRI), which revealed a tumour the size of a walnut in his left hemisphere. He rapidly lost his ability to speak soon after the cancer diagnosis. The tumour was removed, and his speech, quirky sense of humour, and relaxed attitude to life, miraculously returned. What surprised us both was the way the tumour went undetected for over a year. His brain had rewired and learnt to compensate as the cancer cells grew. Observing the plastic properties of the brain first-hand influenced the way I thought about my creative thinking brain and those of my students.

The brain uses both the right and left hemispheres to operate effectively. However, one hemisphere dominates the other for specific tasks, which vary from person to person. My husband was left-handed, which suggests that he was right-brain dominated for this task. I am right-eye and right-hand dominated. I grew up wishing I was a creative left-hander like my husband. McKim (1980) explains; "You can learn to use both hemispheres, and you can choose to move between them at will. You can train your *thinking* to be ambidextrous" (p 23). We all have "hemisphere preferences" and "hemisphere habits" (p. 22). Left and right brain hemispheres perform different functions, and both are as equally important as the other. Educational, cultural and genetic influences can also create hemisphere preference. Using combinations of different senses (which have hemispheric preferences themselves) can enhance the creative thinking process. In the interview with interview with McNish Doidge (2018) explains; "neurons fire in a repeated pattern and when they learn something, they fire faster, stronger signals. So your brain gets better at doing whatever you choose to do". Doidge (2007) quotes the neuroscientist Carla Shatz's famous statement: "Neurons that fire together, wire together" (p. 50).

Using drawing to think through and visually describe mental images, or what is imaged or seen in the mind's eye, is an example of associated actions that can strengthen memory. Edwards notes in her 2012 edition that new brain plasticity discoveries are both exciting and reaffirming. "At last, we can move beyond the ideas of fixed intelligence limits and special gifts for the lucky few, and look for new ways to enhance potential brainpower" (p. xxi). Knowing that the brain is not hard-wired counters the genetic determinism argument that still lingers in my classrooms; "I wasn't born with a talent to draw". The complexities of past and current neurological and neuroplasticity speculations and arguments go beyond the scope of this thesis. However, the basic principles of how the brain works and its relevance to visual thinking and learning have informed the direction and content of the speed drawing activities.

5.5 'Enough' drawing skill

Betty Edwards (2012) argues that acquiring perceptual skills through learning how to draw should be part of elementary school training for everyone - not just aspiring artists. "After all, we do not teach children to read and write with the goal of training future poets and authors" (p. xxiv). McKim (1980) also believed that language thinking "receives strong reinforcement from education that emphasizes and rewards

proficiency in 'the 3 'R's' and ignores or even penalizes, creative imagination" (p. 4). Unlike other modes of creative expression like music and dance, drawing is relatively affordable. It doesn't require a special room or expensive equipment to teach effectively. "The most significant requirement is a teacher who knows how to draw, knows how to teach the basic perceptual skills of drawing, and knows how to transfer those skills to other domains" (Edwards, 2012, p. xxii). However, as Edwards points out, many art teachers have come through the same system that prevails today where real skills in drawing are rarely taught. "The teachers cannot themselves draw well enough to demonstrate the process to a group of students" (p. 2). However, as identified in Chapter 3: Benefits of drawing, a high level of drawing skill is not necessary to function as an effective visual communicator.

Mark Baskinger (2008), drawing instructor at the School of Design, Carnegie Mellon University advocates for the use of "pencils before pixels" to enrich the creative design process. He suggests "gaining competence in drawing is similar to becoming a marathon runner; it can't happen overnight. But, like running, most of us can already somewhat do it—we just need to devote the time and energy toward building this skill to become truly versed in it" (p. 28). Baynes (2013) suggests; "It is helpful to think of the drawing as a space in which meaning can be created by a process of mark making. The conceptual power of mark making can be demonstrated without much conventional drawing skill" (p. 35). Baskinger (2008) suggests designers and design students keep their design drawings simple and organised; "Knowing what you want to communicate and being able to edit out the unimportant, redundant, or confusing information is key" (p. 33). He provides specific free hand tips on how to create thumbnails and draw simple figure representations but also acknowledges that designers need to develop their own drawing methods. But what are the fundamental aspects of drawing that students need to acquire to create, think and communicate their ideas effectively?



Image 43: *Drawing for Beginners* workshop activity examples, AGNSW, 2013.

In the beginning of the *Back to the drawing board?* study in 2013, I attended six Saturday morning workshops, *Drawing for Beginners*, delivered by the Art Gallery of NSW (AGNSW) to refresh my knowledge of what skills and techniques are considered fundamental to learning about drawing. Although it could be argued that experiential knowledge of visual principles through drawing can enhance students' visual literacy skills, learning to draw is time-consuming. I attended the beginners drawing course to understand what fundamental drawing skills were suggested for beginners and to explore ways to incorporate the necessary aspects of these for designerly activities.

The AGNSW Beginners Drawing workshops stepped through different hands-on activities using traditional materials each week. The course covered; exploration of marks using

different materials; exploration of shape and form using tone, exploration of colour principles, exploration of positive and negative forms, observation drawing principles, exploring collage and mixed media techniques (see Image 43).

I experienced being a vulnerable learner again and drawing in a group situation. Many of the students described themselves as non-drawers. At the end of the six weeks, they all displayed their images proudly, indicating a level of personal achievement. Insights gained from participating in this course provided a helpful guide to the fundamental aspects of drawing and entry-level skills needed to understand visual principles.

Through my visual arts practice, I build on formative pre-computer activities to find ways for students to engage in drawing tasks useful for creative and designerly thinking in the twentyfirst century classroom. Before computers were standard in design education, tuition included observation drawing, drafting, printmaking, and model making. These skills have been removed or replaced by 2D and 3D screen equivalents. However, there are many preliminary design-thinking activities that can be successfully achieved using pencil and paper and digital drawing devices. In 2020, drawing devices were becoming

more commonplace. However, very few WSU students had access to a tablet or iPad in 2018. Paper and pencils were therefore, an egalitarian choice. My studio and field experiments concentrated on utilising a pencil or stylus while demonstrating the level of drawing ability needed to harness the cognitive and communication benefits of drawing.

5.6 Exploring pathways in the studio

I continued to explore traditional drawing techniques with digital approaches using my iPad and sketch apps. Using a practice-led approach, I reflected on the value and role of drawing in my image making practice while exploring possible pathways that align with designerly practices. I revisit the strategies and exercises developed by Nicolaides, Edwards and McKim. I begin the study playing with doodling, continuous line, and contour techniques and continue my observational drawing practice producing rapid gesture drawings while responded to light, movement and sound. The visual perception phenomena, pareidolia, was also extensively explored in the studio and as part of live drawing events performed on stage during an artist-in-residency. I note when I naturally use drawing in my creative processes. The insights gained from the following activities influenced the development of the speed drawing activities, *Speed Mind-Mapping*, *Speed Storyboarding* and *Speed Squiggling*. The results and insights gained from these activities and the *Speed Squiggling* trial are included in Chapter 6: *Speed Squiggling*.

5.6.1 Doodling

Doodling, and indeed tracing are often disregarded as mindless activities. Sunni Brown (2010) observed; "Most people believe that doodling requires a shutdown of the intellectual mind, but my research suggests that this is one of the misrepresentations that need correcting. There is no such thing as a mindless doodle. The act of doodling is the mind's attempt to engage before succumbing to mindlessness. Doodling serves a myriad of functions that end up being thinking, albeit in disguise" (p. 1). However, doodling has many cognitive and communication benefits, it can boost concentration, memory and creative thinking.

In 2010, I began doodling while trialing my new iPad, exploring sketch apps and their functionality features. I was familiar with drawing on a Wacom tablet which provided a drawing surface remote from the computer screen but drawing directly on the iPad surface was more akin to drawing on paper and easier to control the quality of lines. I explored different types of doodling approaches, searching for a way for students to practice drawing using a simple sketch on their iPads. I tried using my finger and different kinds of stylus. In the early stages of my thesis I focused on finding ways to encourage drawing using the iPad as all Visual Communication Design students were given one free. I was looking for an exercise that students with different levels of drawing skill could use to exploit the benefits of this new drawing device.



Image 44: Doodling using iPad, SketchBook Pro app & Bamboo stylus, 2012.

I first played with tracing and patterning approaches. Schenk (2016) observed that there is still controversy and resistance to tracing in design schools, however she acknowledges that simple copying and tracing activities can encourage profound observation, increasing visual awareness of source material and sensitivity to different visual styles (p. 209).

I explored photographing textures found in nature. For example, I photographed the leaves on trees. This image was imported into the background layer in SketchBook Pro. The image was then enlarged on the screen reducing the leaves undefined shapes. I then

traced over these shapes using a Bamboo stylus on the layer above, moving around the image in zoom mode, finding patterns and images in the 'noise' of the enlarged photograph. The final drawing looked like a doodle but retained some of the original tree shape, which provide interest (see Image 44). The whole drawing process could be recorded and played back in real time, which created another interesting time-based outcome. This iPad tracing activity was too time consuming and did not align strongly with useful design thinking practices. However, I did experience calming benefits from this doodling activity.

I had discovered the benefits of doodling and patterning when I was in infant's school in 1968. Being the daughter of a Visual Arts teacher, I began school with some visual literacy skills. I would sit in the shade at lunchtime and draw horses for my classmates. I found it stressful to draw quickly under the gaze of my friends surrounded by chit chat, so I drew the horses at home and at school filled them inside with repetitive patterns. I did not trace the horse from a book as this would have been considered cheating. Filling the horse shape with patterns was easy, satisfying and relaxing even while eating and talking. McKim (2018) suggests creative thinking is achieved through a relaxed state using all the senses, "optimal tonus". He suggests both free and "disciplined doodling" can achieve this (p. 57). My playground drawing activity allowed me to switch between conscious and unconscious modes of thinking easily while producing a pleasing outcome.

When exploring doodling in my studio fifty years later, I was inspired by the patterning activities suggested by Rottger and Klante in *Creative Drawing: Point and Line* (1964) and featured in McKim's



Image 45: Directed doodling experiment, 2016.

(1980) *Experiences of Visual Thinking*. The radiating lines that echo the previous lines "bring doodling out of the conditioned domain or cliché and into the creative realm of visual exploration" (p. 57).

I began to explore my version of this activity using a central shape and mindfully drawing a continuous line that spiraled out to reach the edges of the paper (see Image 45, left). The inner shape of a lotus flower slowly expanded, smoothing the line to form a rounded shape, not unlike a lily pad. I then reversed the exercise and tried to start from the lily pad shape and spiral back into the shape of the flower (see Image 45, right).

The reversal of this task was much more difficult. It seemed to use a different part of the brain. I became good at making the minor adjustments needed to move from the simple outer shape back to the complex inner shape with practice. This activity provides a quick demonstration of the continual switch that occurs when drawing between the unconscious and conscious modes of thinking. I did not try this activity in the classroom as it was also time-consuming and it did not align closely with specific designerly thinking activities. It would however, be an excellent exercise to provide non-drawers with hand-eye coordination practice and the experience of the 'brain shift' that many of Edwards and McKim's activities aim to demonstrate.

5.6.2 Continuous, contour and gesture drawing

Making free expressive marks is an advantage to the graphic designer when producing fast thumbnail sketches or key frames for storyboards. Planning the composition, lighting, movement and position of text can be easily achieved through small free-hand drawings. Of course, wireframes, panels, shapes and text can be compiled using many software programs, and positional or stand-in images can be used to indicate content. But if a designer can master just enough drawing skill to render what is in their imagination or mind's eye, first-thought ideas can be expressed immediately, (and rejected if necessary). My early training provided many activities that practised seeing and drawing skills, but students in twenty-first century classrooms have limited opportunities to draw and gain enough confidence to use drawing in a fluid way and productive way. I set out to find pathways to drawing that could promote fluid mark-making for students with mixed drawing abilities.

Nicolaides's (1941) activities in *The Natural Way to Draw*, include tasks designed to practice seeing and drawing. He suggests making simple contour, continuous line and rapid gesture drawings every day. I used 15 minutes of waking time to devote to this task and explore possible adaptations to use in the classroom.

In a notebook left at the side of my bed, I began drawing a friend's face from memory and images left over from my dreams. I closed my eyes and drew each feature without lifting my pen from the page. From my observations, most WSU students understand the concept of continuous line drawing. Indeed, illustrations based on this approach are commonly seen in student's inspiration collections which form part of their assessment tasks.

Following Nicolaides (1941) suggestions, I drew continuous line drawings while studying things in my room without looking down to the page. I drew slowly and focused my attention on the surface contours of my subject. I allowed my sense of "touch to guide my sight" (p. 10). I also tried Edwards (2012) "pure contour drawing" technique outlined in *Drawing on the Right Side of the Brain* (p. 90). I drew slowly and focused my attention on the surface contours of my subject. I made a few self-portraits, sketches of my hand, feet and my cat. Like practising scales on the piano, Nicolaides and Edward's slow contour drawing activities are repetitive and require many hours to master, however the principles of drawing continuously and focusing on the object rather than the drawing, does model the experience of fluid thinking.

In contrast to these slow, deliberate contour drawings, I also practised rapid gesture drawing during my weekly life drawing sessions. Nicolaides (1941), in *The Natural Way to Draw*, states in capital letters, "YOU SHOULD DRAW, NOT WHAT THE THING LOOKS LIKE, NOT EVEN WHAT IT IS, BUT WHAT IT IS DOING" (p. 15). When drawing from life, I try not to follow the edges but strive to capture the energy and essence of the whole pose. Nicolaides refers to these as "scribble drawings", but they are helpful to convey what Images are doing and where they are situated.



Image 46: Gesture drawing from life, 2016.

Gesture drawings can also convey movement and emotion without being too descriptive (see Image 46). However, gesture drawing relies on practice, confidence and fluid use of the pencil or stylus to achieve an economy of line. Scribbles and stick figures may not have the same aesthetic appeal, but they can often communicate enough information to move forward in the right direction.

Martin Scorsese produced crudely sketched storyboards for his personal use when directing his films, including the 1976 psychological thriller, *Taxi Driver*. These scribbles provided enough clarity and visual information to direct a large film crew. The urgency of Scorsese's creative process is also visible in the quality of his marks. Working through visual problems,

visually defining a brief and communicating your ideas quickly is advantageous to the designer. As Scorsese demonstrated, the accuracy of your drawings is not essential but finding a quick way to indicate figures, objects, and exterior and interior landscapes is an advantage when storyboarding.



Image 47: iPad Procreate recording, *Beauty looking back*, Studio Kura, Japan, 2017.

Another advantage discussed in Chapter 3: Benefits of drawing is that sketching often leaves a visible trail that can act as a valuable learning tool and a reminder of changes in the creative thinking process. In my image making practice, I discovered that recording my observation drawings on the *iPad* allowed me to evaluate the strategies and techniques I used in my creative thinking process in real-time, which helped improve my ideation skills. The recordings of the figure studies, which formed part of my 2017 residency exhibition at Studio Kura, Fukuoka, Japan, reveal the tiny decisions that led to the

final images (see Image 47). I explored the popular 'Floating World' theme, 'Beauty Looking Back', made

famous in the West by Hishikawa Moronobu's iconic image of the same name. Viewing my Procreate app recording of the life drawings, I could see when I discovered the overlapping effects of the figures. It is also interesting to observe when and how I correct proportions but rarely altered my compositions. The recordings made me aware of my strengths and weaknesses, which I then developed.



Image 48: iPad Procreate recording, *Roger Frampton*, 2019.

Analysing later recordings of my illustrations show a change in how I approach my image making. In my earlier life drawings recordings from 2010, I would often start using quick construction lines and sweeping gesture strokes to define the composition. A more recent recording of illustrations drawn

from Roger Frampton's video performances (see Image 48) reveal how I skipped this under-drawing stage, preferring to retain the gesture marks as movement lines, building on these by blocking in areas, defining edges and adding highlights. Recording and reflecting on the drawing process can be an excellent way to understand the visual decisions that are made consciously and unconsciously in the creative process.

5.6.3 Projection and squiggling

I explored accidental marks as a means of finding a starting point in my image making practice. I was introduced to this technique during my undergraduate degree at SCA in the early 1980s. My interest in projecting an image over random patterns or textures has been consistent throughout my life. Like many people, I see faces and animals in random patterns and textures around me. Pareidolia occurs when a person imposes meaningful interpretations on nebulous visual marks. Initially, I viewed this ability as a curse. However, most individuals exhibit perceptual and neural sensitivity to face-like features in objects. According to Alice Proverbio and Jessica Galli (2016), face pareidolia seems to be a universal phenomenon. They cite the work of Akechi, et al., (2015) who observed individuals with Autism Spectrum Disorder also exhibited “perceptual and neural sensitivity to face-like features in objects” (p. 1502). Interestingly, Proverbio and Galli's study found an “anthropomorphizing bias in the female brain” compared to the male brain (2016, p. 1511). The implications and neurological explanations for this phenomenon are extensive and go beyond the scope of this thesis. However, pareidolia and other visual perception principles which include finding patterns, continuing lines, closing shapes, and finding images amongst textures and noisy backgrounds, can provide an entry point to creative thinking for a mixed ability audience.



Image 49: Exhibition Studio Kura, Japan, *Finding a Way Through Drawing*, 2017.

Over the years, I have learnt to harness and enjoy pareidolia and am fascinated by people who don't see images in random marks. Seeing faces, animals, joining the dots and combining elements to make a picture is a device many people have experienced and can relate to. Could this visual phenomenon, pareidolia, be used to provide students with the experience of switching the brain from verbal left dominated thinking to access the expressive visual right

brain in a similar way to Edwards's (2012) upside down drawing strategy? During my Japanese residency at Studio Kura, I gave a talk at my exhibition titled, *Finding a Way Through Drawing*. I explained the use of pareidolia in my image making practices (see Image 49). Finding images or creating images out of other things can be found in some of the earliest Japanese woodblock prints. An example of this is found in Utagawa Kuniyoshi's cat series *Neko no ateji* (1850) where cats form shapes that spell out the names of different types of fish (Robinson, 1961). The Japanese interpreter at my exhibition commented that there was a lot of interest in my interpretation of pareidolia from exhibition attendees. This visual phenomenon has deep roots in Japanese culture. There is even a private museum in Chichibu, Japan that specializes in jinmen-seki; rocks that resemble human faces.

In McKim's (1980), *Experiences in Visual Thinking*, he outlines the many benefits of pattern-seeking to developing skills in problem-solving (p. 65). He explains that humans rely on this inherent perceptual ability to see 'things' when confronted by something visually ambiguous. We try to make sense of it to identify if it is friend or foe. This visual phenomenon reminded me of a game I played as a child which was inspired by Mr Squiggle, a popular ABC television program devised by Norman Hetherington in the 1960s. A squiggle is a series of random marks made unconsciously. The squiggle could be viewed as a visual problem that needs to be resolved. Interpreting a squiggle or 'squiggling' is a form of projection. Finding pictures in clouds, limestone cave formations and even in tea leaves are just a few examples of where humans love to project images. Ben Watson et al. (2008) observed that humans have been responding to existing marks for as long as we have been creating marks. He suggests the most famous is "the dotted horses at Pech Merle, where a natural rock feature that closely resembles the head of a horse is used in the animal's portrayal" (p. 42). Indeed, modern humans continue to respond to anthropic marks and shapes in rock formations. Projecting and responding to random visual stimuli is not a new strategy. In Leonardo da Vinci's (translated in 1888) notebooks he describes projecting images onto accidental and found marks as a "new device" to inspire creative image making;

I cannot forbear to mention among these precepts a new device for study, which, although it may seem but trivial and almost ludicrous, is nevertheless extremely useful in arousing the mind to various inventions (Section 508).

Hetherington's Mr Squiggle drew pictures that he saw in a few random lines and shapes sent in by children. The puppeteer used a broom handle attached to Mr Squiggle's hat that allowed him to easily draw using the puppet's large pencil nose. It is interesting to note that Hetherington was positioned above the set, so his drawings appeared upside down to the audience. This added to the wonder. Squiggling



Image 50: Rorschach ink blots exploring pareidolia, 2014.

became a cheap and accessible drawing game that everyone could play. All you needed was a piece of paper, a pencil, and a few lines and shapes to get started. As a child, I found this challenge very engaging and satisfying.

The psychiatrist Donald Winnicott (1971) used squiggles in his therapeutic consultations with children. This psychoanalytical technique aimed to find meaning and links to the psychological problems of his patients. The Rorschach test or inkblots were also used to examine a person's personality characteristics and emotional functioning using psychological interpretation, complex

algorithms, or both. An example of a simple ink blot is shown in Image 50. The value of using inkblots and squiggles as a psychoanalytic tool has been long disputed, but using squiggles in counselling sessions is still promoted as a form of art therapy. The process of the squiggle game still holds some value in creating a non-threatening, fun environment where discussions between a child and their therapist can occur. To understand and experience this visual phenomenon further, I explored making simple inkblots using acrylic paint on paper. I then coloured the negative areas in different configurations to draw attention to the possible interpretations. Although this activity has some value demonstrating pareidolia through manipulating positive and negative spaces, the experiments using pencil and paper and a squiggle provided more scope to demonstrate the value of drawing in the creative process.

In 2011, I set out to see if the squiggle could be used as a device to demonstrate the value of drawing in the visualisation process and, in doing so, encourage drawing participation in the classroom. Inspired by Nicolaides's (1941) suggestion to practice drawing daily, I aimed to resolve a squiggle a day and evaluate my progress. My husband drew a squiggle on every page of an exercise book, and I practised finding as many responses from that squiggle every morning. After a week, I observed that the number of solutions I could find for each one increased. I also appeared to become quicker at finding quality responses. To investigate this further, I designed a *Speed Squiggling* activity to be included in a workshop as part of an

end-of-year evaluation conference for high school teachers by the Catholic Education Office (see Image 51).



Image 51: Teachers' creativity workshop,
Richmond, Australia, 2011.

The facilitator of the conference requested a one-hour activity that aimed to provide a relaxed opportunity for teachers to collaborate and reflect on their achievements. This first version of the *Speed Squiggling* activity had each person drawing a few random lines and shapes (a squiggle) on an A5 piece of watercolour paper. Each piece of paper was then passed to the person on their right. They

then looked for a picture like a face or animal in the squiggle. If they couldn't see a picture they could make an addition or wait for the next turn or round. Each drawing was then passed to the next person on the right at approx. 2-minute intervals where more details could be added. Some participants were reluctant to draw in the beginning, but inhibitions disappeared quickly after several rounds. The activity was continued until everyone had engaged with each drawing. All the illustrations were compiled to form one artwork and meanings attributed to the collective subconscious.

This drawing activity facilitated discussions about some of the highlights and more challenging aspects of these teacher's year in a fun atmosphere. Some participants were reluctant to draw, but inhibitions disappeared quickly after several rounds. Interaction and interest in the activity waned after approximately eight rounds. Fidgeting and talking halfway through the activity indicated that it went on too long. The drawings became overworked as people struggled to add things to each picture. Participants thought the final image looked a bit like a high school project, which I interpreted as disappointment. I learnt a lot from this workshop. Group drawing activities need to be engaging. The purpose of the activity needs to be challenging with a satisfying outcome. Instructions need to be straightforward and accommodate those with skills as well as those without skills. During the activity, itself, participants need to work quickly to avoid focusing on details rather than the message or how well they can draw. Satisfaction is achieved when the final output exceeds expectation.

Sara Schneckloth (2019) developed a collaborative drawing process in 2009, which grew from her studio practice exploring drawing phenomenology. In her *Common Gesture: Collaborative Drawing* workshops "participants devise graphical games and strategize with partners and teams as they seek ways to create dynamic compositions, a sense of visual space, and colour harmonies within the physical arena of the paper" (p. 2). Schneckloth also used a series of guided directives, but her participants worked on the same sheet of paper, allowing for conversations, deliberations and reflections to occur throughout the process. To engage non-drawers and break the ice, Schneckloth (2019) also uses random marks created by

participants rubbing wax china markers across a dark sheet of paper laid over scattered grains of rice (and the contents of participants' pockets). They then charted a path through the 'dots'. They were not asked to look for pictures or project images; the approach was more abstract and graphic. "The initial page of marks resembles a star field, with thousands of white dots in a black expanse, linked by gauzy traces" (p. 4). This framework is then built upon with participants devising a visual game that is then merged with their neighbour's game creating an interplay of unique marks.

Schneckloth (2019) participants were encouraged to find patterns, compositional aspects and apply Gestalt principles to achieve visual flow and unite the images using colour and line. They learnt when to stop drawing when they saw the image "manifests design integrity and wholeness" (p. 7). Schneckloth demonstrated both the process and the outcome needed to be sufficiently interesting and satisfying for participants to engage, learn and be inspired to continue drawing. Edwards also notes the importance of providing students with a satisfying result. She cites Maslow and his observation that "great satisfaction comes from mastering something truly difficult" (1980, p. 6). Finding an activity with an accessible entry point for non-drawers and enough unfolding challenges along the way for all students, is not easy.



Image 52: *Water Squiggling* workshop, Springwood, Australia, 2011.

In 2011, I experimented with random marks by floating a mixture of oil-based paint and turpentine on water and transferring this to paper or canvas (marbling). I trialled a creative thinking workshop using this water squiggling technique with six non-drawers (see Image 52). I demonstrated and recorded the whole process, stepping through the activity with each person. In this workshop, participants created random marbled textures on an A2 piece of water colour

paper. An additional squiggle shape was created by painting a few random lines and shapes (a squiggle) using water on the paper. This squiggle became visible when the paper was laid face down on the oily water surface, producing a mono-print. The 'water squiggle' resisted the oil paint providing interesting negative shapes and the marbled paint created satisfying tones and textures.

Different results were produced depending on the water temperature and consistency of the oil paint and turpentine mixture. The mixture had been calculated over many experiments to provide a marbling texture that were not too thick, dark or light. Participants were then encouraged to find pictures or designs in these random marks. Design aspects such as patterning, balance and composition, positive and negative shapes, texture and tone were discussed. In the final step an image was found amongst the marks

and textures. Transparent ink was used to block out areas while retaining the texture below. Lines, textures and shapes were added to resolve the image.

While some participants produced interesting images, the process was messy and required lengthy set-up and instruction time. I decided that this kind of wet activity would not be suitable for the classroom environment. Participants also felt rushed and needed more time to explore possible outcomes and play with these variations using thumbnails. This activity was valuable in informing my visual arts practice, but a more straightforward method of providing a relevant satisfying squiggling experience was needed in the classroom.

While I was experimenting with water squiggles, I began demonstrating the *Speed Squiggling* activity on stage to an audience. Could speed be the additional element needed to engage and challenge the participant? Providing a quick time frame also reduced the expectation of a highly finished image. I wanted to see how quickly I could come up with ideas under pressure. I devised a performance, with a fellow musician, which included a number of original songs about drawing. For the *Speed Squiggling* song, a random member of the audience was invited on stage to draw a squiggle. They drew this on a large piece of paper clipped to an easel. I then resolved the squiggle (while singing a song). Like Mr Squiggle on TV, I tried to surprise the audience with an unexpected resolution. Coming up with something different under this extreme pressure was more difficult than I anticipated.

Several years later, I watched a group of young people perform a squiggle act as part of a *Beat the Rhyme* competition in Sydney. There were two teams represented by two artists drawing live on stage. They each gave the other a squiggle to resolve. This squiggle was comprised of a few unrelated lines



Image 53: Squiggling on stage, showing before and after images; Lawson Folk Festival (left), Blackheath Folk Festival (right), Australia, 2011.

around the perimeters of the page. I took a video of the performance and noticed that the pages with the squiggle had dots that appeared to guide their final drawings. They had given themselves a bit of thinking time to resolve the image before getting up on stage. Norman Hetherington (Mr Squiggle) also rehearsed his squiggle response before the cameras rolled.

My performance was entirely improvised (see Image 53). A random audience member would come up on stage and draw the squiggle. I had no time to try out or rehearse a response. This forced me to find a

creative thinking strategy that could be used to imagine a unique response on the fly. After my first two performances, I came prepared with a theme. A theme narrowed down the possibilities and bypassed apparent responses that the audience would imagine. I first used this themed strategy when I performed the *Squiggle Song* at Blackheath Folk Club in 2011. We drove through a storm on the way to the gig and passed a train that a fallen tree on the tracks had derailed. By the time we got to the venue, the highway had closed behind us. Many people had to stay in Blackheath until the highway reopened and the Blackheath Pub where I was performing was one of the few venues open. We had a large captive audience, which included emergency workers. I decided to base the squiggle response on that evening's disaster. When a member of the audience drew their squiggle, I immediately started to project images related to the theme of trains, tracks, trees, roads, traffic jams and storms. I discovered that this thematic strategy could also be incorporated into the *Speed Squiggling* and *Speed Mind-Mapping* activities developed for classroom interaction.

5.7 Conclusion

The insights gained from my practice-led research have influenced drawing activities designed to address misconceptions and fears that prevent drawing participation. These barriers are articulated in the literature studies and analysis of the *Why draw?* questionnaire and interview responses of WSU Design students. The exploration of drawing strategies and techniques, influenced by Nicolaides, Edwards, and McKim's drawing exercises alongside brain plasticity and visual perception theories, underpin my studio practice. The drawing experiments in the studio and the field have led to a greater understanding of the value of doodling, continuous line, gesture drawing, and squiggling in my creative processes.

The techniques and strategies developed through the workshops and drawing performances have helped me overcome my fear of drawing in public and thinking on the fly. The findings of this research reinforce the value of thematic thinking and iteration to produce original outcomes. Using drawing to seek alternative approaches, draft possible solutions and recording the drawing trail have also provided insights into the role and value of drawing for creative discovery and potential applications in the classroom. The practical knowing gained from these drawing experiments, alongside reasons to use process drawing in the design process are outlined in Chapter 3: Benefits of drawing, have informed the content, design, and delivery of the *Speed Squiggling* activity. This is aimed at students with mixed drawing abilities and aligned to relevant designerly tasks and practices.

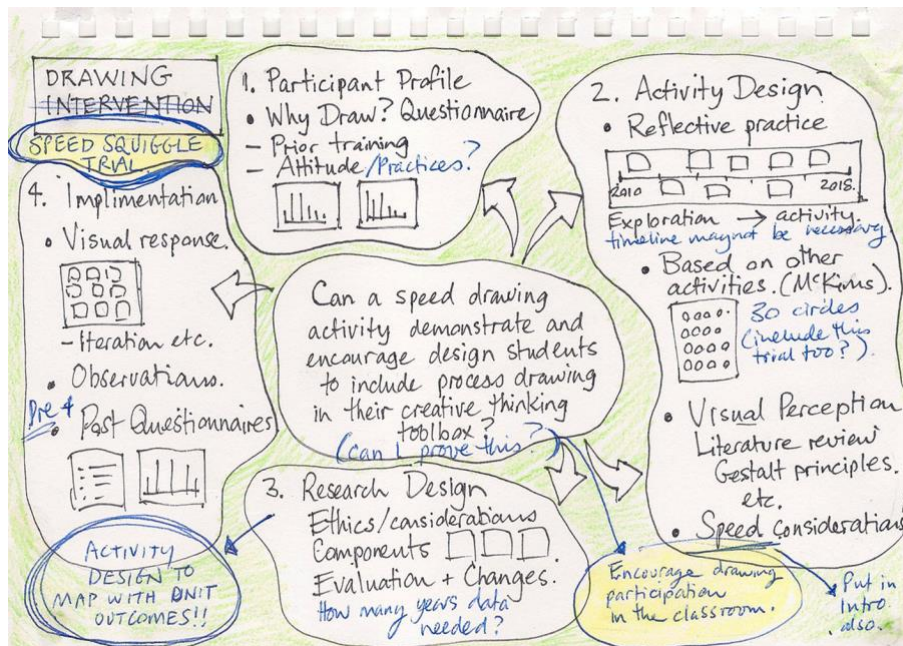


Image 54: Working diagrammatic sketch of drawing activity, 2018-2020.

Unexpectedly fun. It allowed me not to be such a perfectionist and go with any idea that came to me, and see things in a new perspective (2018, *Post-Why draw?* questionnaire response).

6 Speed Squiggling

6.1 Overview

The *Speed Squiggling* drawing activity arose from investigating different pathways to drawing participation in the classroom, specifically for those students who identify themselves as non-drawers. A reflection of my drawing path to drawing-to-drawing techniques like doodling, continuous line and projection activities like squiggling were also explored as part of my image making practices in Chapter 5, and directly informed drawing activities for the classroom. Although the role of process drawing has decreased in all aspects of the design process over the last thirty years, there are still benefits to using low fidelity sketches. Indeed, many Design students at WSU use some form of sketching in their creative processes, suggesting that process drawing is still handy for some creative thinking and communication tasks. However, respondents of the *Why draw?* questionnaires and interviews indicate that many students do not distinguish between process drawing and drawing for final illustration or design outcomes. It was found during interviews that students also noted that lack of time, confidence, and drawing opportunities contributed to a reluctance to incorporate drawing in their creative processes. Some students were compelled to make rough sketches retrospectively to fulfil marking criteria.

In response to these findings, a series of quick drawing activities were designed to foster drawing participation and align with designerly practices throughout the *Back to the drawing board?* study. The *Speed Mind-Mapping*, *Speed Storyboarding* and *Speed Squiggling* activities were developed alongside each other, each activity informing the next with the *Speed Squiggling* activity yielding the most comprehensive results.

This chapter concentrates on the design, delivery, analysis and findings of the *Speed Squiggling* trial conducted with WSU second-year design students enrolled in the 2018 *Researching the Visual (RtV)* Unit. The trial was preceded by a *Pre-Why draw?* questionnaire and a follow-up *Post-Why draw?* questionnaire and compared with the findings of the 2013 and 2015 *Pre-Why draw?* questionnaires. The *Speed Squiggling* activity was designed to be a non-threatening warm-up activity providing engagement and drawing confidence in the classroom. The activity also contains multiple learning objectives which provides an experiential demonstration of visual perception and Gestalt theories while modelling a creative thinking process that incorporates verbal and spatial reasoning. *Speed Squiggling* aimed to address

some of the barriers and limitations to drawing participation in the twenty-first-century classroom identified through; classroom observations, student responses and visual outcomes.

6.2 Participants of the *Speed Squiggling* trial

The 2018 *Speed Squiggling* trial participants were enrolled in the second-year *Researching the Visual* Unit at Western Sydney University (WSU). The trial was conducted across five different tutorials by four other tutors during the first week of the fourteen-week semester. Most WSU students came from diverse cultural backgrounds and were the first person in their family to attend University. Many students had part-time jobs and travelled long distances to attend face-to-face tutorials. A questionnaire was collected before the *Speed Squiggling* trial to gain more information about this specific cohort. This *Pre-Why draw?* questionnaire was based on the 2013 and 2015 *Why draw?* questionnaires to enable comparisons between these three cohorts. The *Visual communications, Design* course did not differ dramatically from 2015; however, the course had undergone some minor structural changes during the years preceding 2017, when this cohort began. Minor changes to enrollment criteria and promotion of the course had also occurred, increasing the number of enrollments in 2017. This high first-year enrollment may account for the rise in the number of second-year 2018 *RtV* participants who indicated they had begun the course without traditional visual training.

The theoretical investigation into the role of drawing in the creative thinking process and the practical exploration into possible pathways to counter barriers to drawing participation confirm that proficient drawing skills are not required to gain value from drawing (see Chapter 3: Benefits of drawing). This research underpins the *Speed Squiggling* trial design; however, classroom observations and the analysis of interview responses acknowledge prior training can give some students a confidence advantage. As a result of insights gained from the 2013 and 2015 *Why draw?* questionnaires, it was decided to trial the *Speed Squiggling* activity with second-year students, rather than first-years who had been exposed to various creative thinking activities during their first year of the *Visual Communications, Design* course.

The second-year Unit *Researching the Visual* was chosen to trial the *Speed Squiggling* activity. It began as a drawing warm-up exercise to demonstrate the expectation that classroom ideation sessions would be collaborative and experimental. The activity also reveals aspects of visual perception, Gestalt principles and creative thinking processes while modelling a research project with students engaged in research studies. This activity became a staple of this Unit as it aligned well with the Unit's learning outcomes which introduces students to various ways of seeing and reading images visually. Students learn how to conduct visual research using a tool kit of methods including semiotic analysis, content and thematic analysis, and basic observational research across the digital and material environments of visual communications and graphic design disciplines.

During 2018 the *RtV* assessment tasks revolved around a ‘real’ brief. The client, Sydney Water, looked for campaign ideas and designs to address the increase in plastic water bottle waste that was clogging the drains and waterways in the Greater Western Sydney region. Students were required to design and conduct primary research to identify and understand the barriers that some people had to drinking tap water and respond to their findings through the design of an intervention or campaign. Students engaged in different forms of ethnographic research, conducted surveys or did interviews with friends and family. For many of these students, this was the first time they had collected any research data.

Incorporating the *Speed Squiggling* activity into the *RtV* Unit allowed these students to be part of a ‘real’ visual research project on drawing that combined a mix-methods approach (see Image 55). The students experienced being a participant, answering questionnaires and being part of a visual analysis process. Being part of the *Speed Squiggling* trial allowed students to reflect in and on their creative thinking processes and the outcomes of the activity, as well as reflect in and on their actions as a participant of the study, expanding their understanding of the research process.



Image 55: *Speed Squiggling* trial, *RtV*, 2018.

6.3 *Pre- Why draw?* questionnaire analysis

The 2018 *Pre- Why draw?* questionnaire was collected from 129 participants attending the second-year *RtV* Unit enrolled in the *Visual Communications, Design* course. The questionnaire was conducted ten minutes before the participants commenced the *Speed Squiggling* warm-up activity in the Unit's first week. For a detailed rationale of the original, 2013 and 2015 *Why draw?* questionnaire collected from the two WSU first-year cohorts and the changes made to this 2018 *Pre- Why draw?* version, see Chapter 2: Methodology. An interpretation of the *RtV* 2018 quantitative data has been added below, with results from each of the five multiple-choice questions. Although each question provided space to make

additional comments, very few participants used this option. The comments have been collated into themes and translated into charts also. The findings are accompanied by explanations of relevant adjustments made to the original *Why draw?* questionnaire.

Q1: Which course are you currently enrolled in?

The first question asked participants which course they were currently enrolled in to separate the answers from core *Visual Communication, Design* students and other students taking the *Researching the Visual Unit* as an elective. This division was made to allow comparisons between the 2013, 2015 and 2018 design cohorts related to prior training and their opinions regarding the importance of drawing to be a visual communicator. Of the 129 students enrolled in the 2018 *RtV* Unit, 112 were *Visual Communication, Design* students. The remaining seventeen students were enrolled in *Communication Arts, Creative Industries*, and *Screen Media Studies*.

These non-design students' responses did not differ significantly from those of the design students; however, some of them noted that they had not engaged in a logo design task. To retain continuity and compare 2018 with the 2013 and 2015 results, the following *Pre-Why draw?* charts and analysis only included students enrolled in the *Visual Communications, Design* course.

Q2: Prior to starting this University course, which of the following art or design courses had you completed?

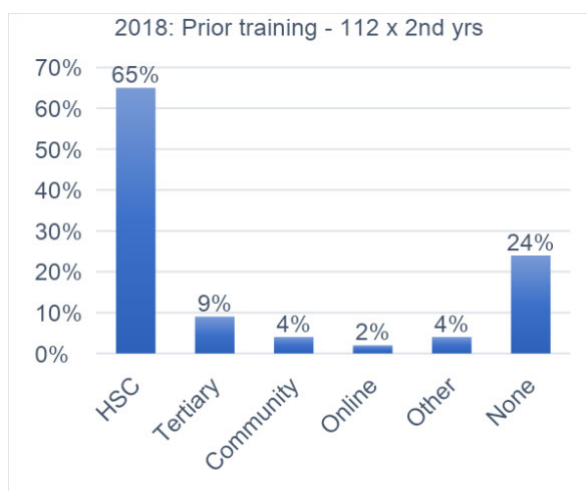


Table 11: Prior training, *RtV* participants, 2018.

Approximately 74% of these 2nd-year students entered the *Visual Communications, Design* course in 2017, had completed some form of formal visual training, either as part of their Higher School Certificate (HSC) or at another tertiary institution. In 2013 the percentage of students with prior formal training was 84%, and in 2015 it was 90% (see Chapter 4: Practices and barriers to drawing). The number of students entering the Design course with no previous visual

training rose from 13% in 2015 to 24% in 2018. This increase may be attributed to the following factors;

- increased intake of students in 2017 due to extended catchment and increased direct marketing to local high schools;
- changes to the course content, aligning with the industry's move into new specialisations, digitisation of content, and production workflows. In turn, these changes attracted a higher number of students with varying skillsets, interests and expectations; and
- changes to the course's promotion through the University website.

These changes reflect an increasing range of roles and employment opportunities for visual communicators across all sectors. The public profile of design as a profession has also been enhanced through social

networks and access to a global audience, attracting a broader group of potential students. These factors may have attracted students who had no prior visual training or aspired to less traditional graphic design areas. It is worth noting that WSU has several other competing creative industry courses, which focus less on the practical design aspects of graphic design. However, most WSU *Visual Communication, Design* students aspire to be graphic designers working in print and online spaces.

Q3: If you were asked to design a logo, which of the following idea-generating activities would you use to come up with your initial ideas? Number the activities to indicate which activity or activities you would most likely do first? Note: there is no right or wrong answer!

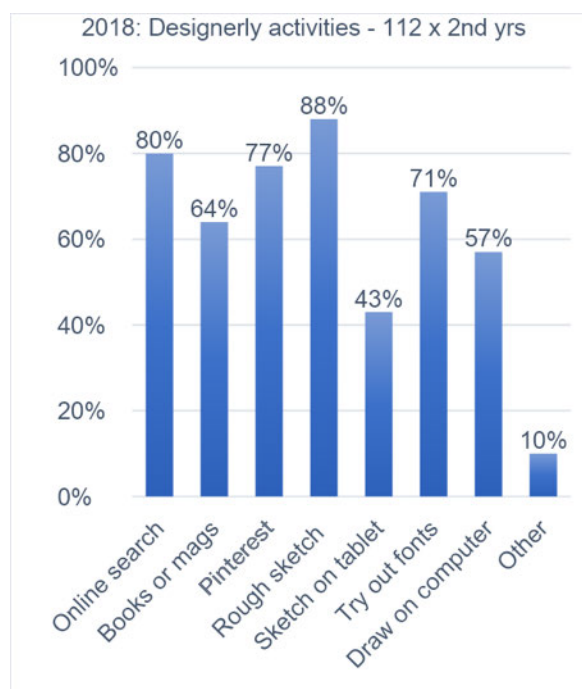


Table 12: Designerly activities, *RtV* participants, 2018.

This question was modified from a similar question posed about participants' designerly activities in the 2013 and 2015 *Why draw?* questionnaires (see Chapter 2: Methodology). Although rough concept sketching was used to get the ball rolling during ideation tutorials, it was also evident that what students did in the classroom was not necessarily how they approached their design tasks at home. What activities students employed independently, depended on several factors, which related to the task, time and their skill sets. However, many students appeared to begin the design of a logo using a rough sketch. This new question aimed to capture more specific

information related to students' creative thinking behaviours and the role of sketching in their practices. Proposing the same kind of contained design task, like the design of a logo, would help participants recall their process more accurately than a general statement about their use of drawing for creative discovery.

A general picture of these participants' designerly activities can be made from the answers to this inquiry; however, the question failed to address the messy nature of the design process itself. Some of the responses to this question indicated that some participants were unclear about how to number the activities to show what they do first in their process. Being able to remember, recall and articulate a procedure, especially a creative act is difficult. The creative thinking process is, by its very nature, messy and intuitive. Creative thinking is rarely linear; there is rarely a consistent first step. The wording of this question also suggests a value judgment, which was not the question's intention. Indeed, all creative thinking begins with thoughts.

Many of the final-year interviewees describe a mental incubation phase that precedes a formal or external thinking stage in their design processes. Indeed, the nature of thought and responding to an idea with actions (which may include drawing) is elusive. Each action creates a question calling for a response. This "oscillation of arguments" (Goldschmidt, 1991) or "backtalk" (Schön, 1983) creates unexpected mental twists and turns. Thus, describing a sequence of unconscious actions that instigate activity is not necessarily possible (see Chapter 3: Benefits of drawing). Therefore, the evaluation of responses to this multiple-choice *Pre-Why draw?* question can only provide a general indication of the types of activities participants use rather than a description of students' creative thinking processes.

88% of participants recalled using a rough sketch when designing a logo. 80% also acknowledged they conduct an online search collecting visual reference material using Pinterest. The high rate of Pinterest activity could be attributed to the *RtV* mood board assessment task that directed students to form a group on Pinterest and explore a visual theme through an image collection task (2018, *RtV Learning Guide*, p. 6).

Another common ideation practice, selected by 71% of these participants, was to play with fonts. Classroom observations suggest that most students play with text on their computers or iPads. Of these respondents, most students wrote they used Adobe Illustrator, with approximately 5% using Adobe Photoshop. Another 57% noted that they drew directly on the computer when coming up with ideas. As this selection sat alongside the Sketch on Tablet option it may indicate that students were referring to the common practice of drawing with vectors, shapes and making changes to fonts and existing graphics in a vector program such as Illustrator, rather than drawing free-hand on an iPad or tablet. Either way, not all students in this second-year cohort had access to a digital sketching device such as an iPad; however, 43% of students indicated that they used a digital device in the ideation process of a contained problem, like a logo design. Using a sketch app rather than pencil and paper, was more prevalent in 2018 than in 2013 despite this earlier cohort receiving a free iPad.

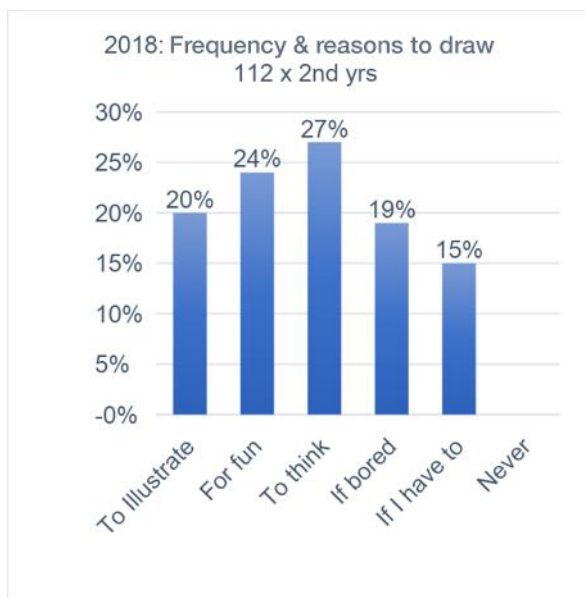


Table 13: Reasons to draw, *RtV* participants, 2018.

Q4: How often do you draw or doodle?

This question aimed to capture students' drawing frequency while discovering the main reasons why participants engaged in drawing activities (or not).

This question was modified from the 2013 and 2015 *Why draw?* questionnaires to distinguish between those students who drew as part of their illustration practices and those who used drawing for cognitive reasons. The frequency and reasons were embedded in the multiple-choice answers.

The rewording aimed to avoid misconceptions that some students made between process drawing and drawing as outcome in the form of graphics and

illustrations (*see* Chapter 4: Practices and barriers to drawing). In the earlier questionnaires participants, could select more than one answer. However, this modified question did not specifically direct them in this way. Thus, students only made one selection. The question also aimed to determine how many students were reluctant drawers or only drew if they had to. All the participants indicated that they used drawing or casual drawing as part of their creative practices. 20% of students engaged in illustration practices, with the majority drawing or doodling for fun or to think. Of the students who used doodling to combat boredom, some benefitted from this activity in the form of a concentration, memory or creative thinking boost (*see* Chapter 3: Benefits of drawing). Interestingly 15% of students noted that they only drew if they had to. This percentage may indicate that some participants have aversions to drawing or have found alternative workaround activities that don't include drawing. Either way, this percentage signals a potential mismatch between students' processes and assessment expectations and requirements.

Q5: In your opinion, is it very important to have some drawing ability to be a visual communicator?

For this question, 74% of students indicated that they 'Mildly agreed' with the statement that it is important to have some drawing ability to be a visual communicator. A small number of respondents strongly disagreed with the proposition, but twice this number strongly agreed that drawing ability was very important. These opinions reflect the 2013 and 2015 results for the same question and mirror some of the final-year interviewees' attitudes (*see* Chapter 4: Practices and barriers to drawing).

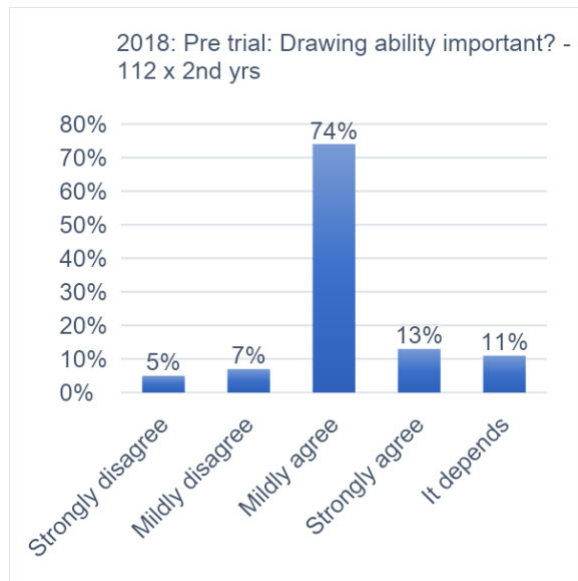


Table 14: Drawing ability important? *RtV* participants, 2018.

Only a few comments were written alongside the 'It depends' option in this 2018 *Pre-Why draw?* questionnaire. Several participants noted that having some drawing ability was helpful but not necessary to be a visual communicator; it "depended on the task", "role of the designer", and "what you are designing". Several students noted that having some drawing ability would be helpful if you already had these skills, perhaps indicating that drawing ability was a bonus rather than necessary. One participant noted that "technology can often compensate" for lack of drawing ability. Participants expanded on the written comments to this question in the *Post-Why draw?* questionnaire.

6.4 *Speed Squiggling* trial design

The *Speed Squiggling* activity aims to promote drawing participation in the classroom and provide an experiential understanding of the role and value of drawing in the creative process. The activity combines speed, visual perception and Gestalt principles with innovative thinking (brainstorming) strategies. A random set of lines and shapes (a squiggle) acts as a 'visual brief'. Like Robert McKim's (1980) thirty-circles activity (p. 124), *Speed Squiggling* demonstrates the value of iteration for creative flow. For more details, see Chapter 3: Methodology.

6.4.1 Speed considerations

Three determining aspects dictated the design and delivery of the *Speed Squiggling* activity in the classroom environment. These were the Unit content and tutorial setting and timeframe, the cohorts' prior knowledge and skills; and the effects of speed on participants' creative cognitive processes. Designing a drawing activity for the twenty-first-century classroom had practical challenges in 2018. The university had no dedicated spaces where students could make a mess. Spaces were often shared, making lengthy set-up and clean-up times difficult to achieve. Most drawing activities were restricted to using paper and pencils.

Other time considerations shaped the design of the *Speed Squiggling* activity. The Design curriculum at WSU currently has limited time to devote to extra activities like drawing. The *Speed Squiggling* activity's aims and outcomes needed to marry well with the existing objectives and learning outcomes of both the *Visual Storytelling* and *Researching the Visual* Units. The available time within the tutorials themselves is usually limited to an hour. Fortunately, the *RtV* tutorials were broken into two-hour sessions every fortnight, providing additional time to set-up and pack away. However, face-to-face tutorial time is precious, and there was a lot of information to get through related to the assessment task during class time. As a result, tutorial activities needed to fit into a 55-minute timeslot.

Directly after the 2018 *Speed Squiggling* trial and *Post-Why draw?* questionnaire, a few students voiced their dislike of activities with imposed time pressures; however other students indicated they liked the challenge of working quickly. "The activity was really fun. I enjoyed it because it made me think quick and not overcomplicate it" (2018, *Post-Why draw?* questionnaire response). Observations of previous informal *Speed Squiggling* activities indicated that setting expectations and creating a relaxed atmosphere was an essential aspect in the delivery of all speed drawing activities. Thus, the 2018 *Speed Squiggling* script aimed to counteract possible fears and apprehensions related to the limited time frame.

6.4.2 Modelling the creative process

The *Speed Squiggling* activity also aimed to emulate a creative thinking process. Creative thinking is rarely linear, however modelling aspects of creative thinking or depicting one cycle of a creative thinking approach has value in the learning process. *Speed Squiggling* was divided into four stages or parts; 1. write, 2. draw, 3. draw again with prompts, and 4. evaluate. The steps were timed and directed by the tutor. This approach demonstrates a creative thinking process, which begins with a verbal or written exploration, often listing keywords, then followed by an externalization of what is in the mind's eye using a sketch: the creative process is then prompted by the tutor with the suggestion of different thinking strategies. The activity concludes with a critical reflection of their process and comparison of visual responses to the squiggles with other participants.

6.4.3 The design of the squiggles

Each participant was given two printed sheets held together with a paperclip. The activity began with students writing a list of what they saw in their squiggle. Seven different types of squiggles using semi-random shapes and lines were created for this activity. Each one was designed to provide a visual entry point; evoke or spark the imagination and potential images as well as creative thinking strategies used as prompts in the third part of the activity (see Image 56).

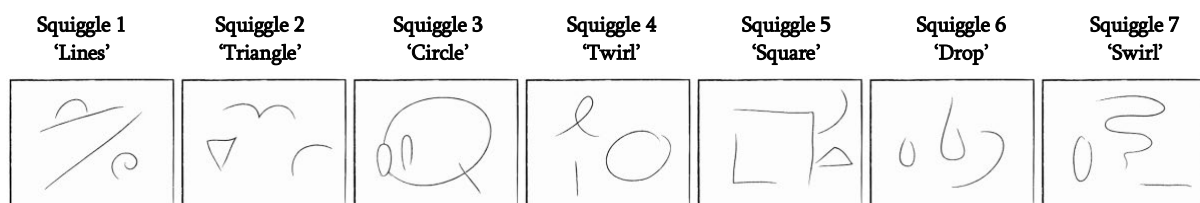


Image 56: Squiggle variation rationales.

- **Squiggle 1:** incorporates converging lines prompting a response which may include perspective and the inclusion of positive and negative responses;
- **Squiggle 2:** uses a typical bird shape and distinct triangle and wave prompting a landscape response if turned upside down;
- **Squiggle 3:** evokes eyes and a face, promoting a pareidolia response;
- **Squiggle 4:** deliberately includes a challenging cross over shape inferring a Image, movement or letter prompting a symbolic approach;
- **Squiggle 5:** incorporates an open square shape to prompt closure and allow for positive and negative space responses;
- **Squiggle 6:** includes a water drop shape which was chosen to relate specifically to another visualisation activity that the *RtV* Sydney Water campaign assessment task presented.
- **Squiggle 7:** evoked a facial profile and positive and negative interpretations with another form of line.

These squiggles were designed to appear random but contained enough ambiguity to allow for many interpretations or abstract responses beyond what was contrived above. Each activity sheet incorporated 24 numbered framed repetitions of the same squiggle; twelve on each side. The number of frames was based on the average number of images produced in previous versions of this squiggling exercise leading up to the design of the 2018 *Speed Squiggling* activity. Additional sheets were available to those participants who exceeded twenty-four images.

6.5 *Speed Squiggling* trial delivery

The *RtV* tutors were given a *Speed Squiggling* kit (see Image 57). This kit comprised of a script, PowerPoint Presentation, *Pre* and *Post-Why draw?* questionnaire, two *Speed Squiggling* activity sheets for each student and a large packet of small HB pencils. The seven squiggles were alternated within the handout pile to ensure that participants did not sit next to someone with the same squiggle. Inexpensive pencils were used as participants often took them home.

Classroom presentation

Tutors stepped through a short PowerPoint presentation introducing and explaining the *Speed Squiggling* activity. The script helped the five tutors, including myself, present the activity in a consistent manner, stay within the 55-minute timeframe and avoid missing crucial steps.

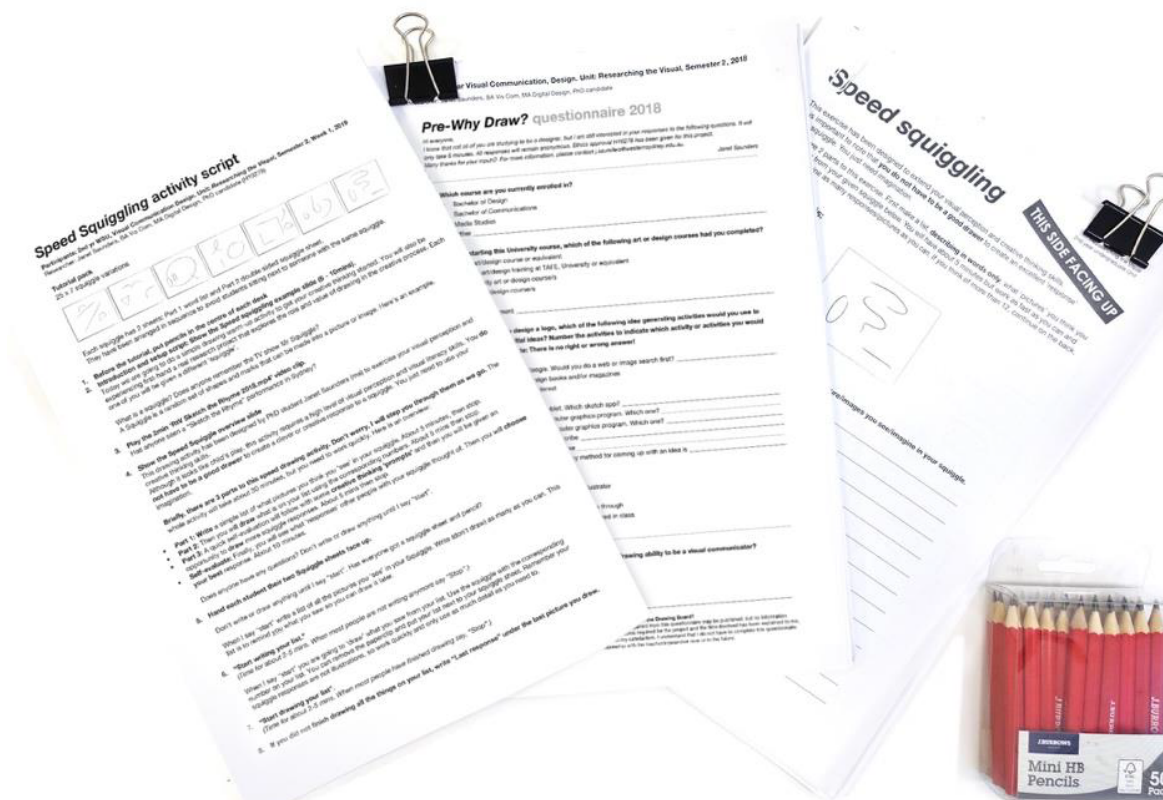


Image 57: *Speed Squiggling* trial kit, 2018.

6.5.1 Speed Squiggling script

Participants: 2nd yr WSU, Visual Communication Design. Unit: *Researching the Visual*, Semester 2, Week 1, 2018

Researcher: Janet Saunders, BA Vis Com, MA Digital Design, PhD candidate (H10278)

Each squiggle handout has 2 pages held together with a paper clip containing;

- 24 x 7 squiggle variations
- 1 x page for the word list
- 1 x double-sided page with 24 of the same kind of squiggle on each side



Note: Each pile of squiggle handouts is arranged in sequence to avoid students sitting next to someone with the same squiggle.

Setup (5 mins)

Before the tutorial, place squiggle handouts face up around desks and pencils in the middle. Discourage students from turning them over or starting to draw until instructed.

Introduction PPT Presentation (10 mins)



Image 58: *Speed Squiggling* PPT screen 1: Pareidolia eg., 2018.

Screen 1:

Today we are going to do a warm-up drawing activity to stimulate pareidolia. Pareidolia occurs when an indistinct and often randomly formed stimulus is interpreted as being definite and meaningful. An example of pareidolia is finding faces in clouds. Some people are better at seeing images in random patterns than others, but everyone can improve their pareidolia capacity with awareness and practice. Why is this visual perception skill important? Understanding how

people perceive the world is vital for effective visual communication and design.



Image 59: *Speed Squiggling* PPT screen 2: Mr Squiggle, 2018.

Screen 2:

Although finding pictures looks like child's play, this activity requires a high level of visual perception and visual literacy skills. YOU DO NOT HAVE TO BE A GOOD DRAWER to create a clever or creative response to a squiggle. You need to look and use your imagination. What is a squiggle? Does anyone remember the Australian TV show Mr Squiggle? A squiggle is a random set of shapes and marks that can be transformed into a picture or image.



Image 60: *Speed Squiggling* PPT screen 3: Squiggle response egs., 2018.

Screen 3:

Here is an example of a squiggle and possible visual responses. This *Speed Squiggling* activity has been designed by PhD student Janet Saunders (me). It not only aims to provide an opportunity to exercise your pareidolia skills but demonstrates Gestalt principles, the value of iteration and applying creative thinking strategies when generating ideas. You will also experience first-hand an actual research project that explores the role and value of drawing in the

creative process. The *Speed Squiggling* activity explores the practical knowing aspects of drawing through reflection 'in' and 'on' action while demonstrating a form of quantitative and qualitative data collection and analysis through the *Pre* and *Post-Why draw?* questionnaires.

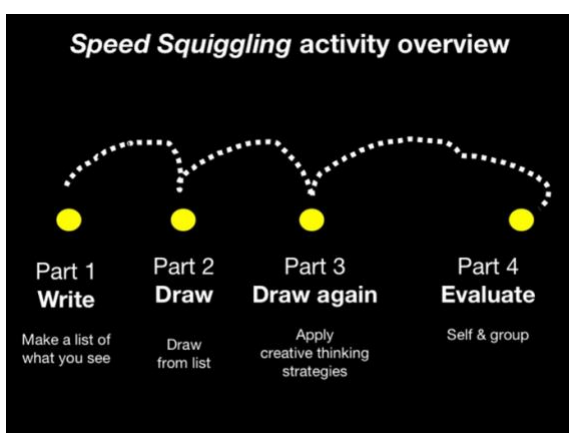


Image 61: *Speed Squiggling* PPT screen 4: Activity overview, 2018.

Screen 4:

There are four parts to this *Speed Squiggling* activity. Don't worry; I will step you through them as we go. The whole activity will take about 50-55 minutes, but you need to work quickly.

Here is an overview:

Part 1:

Write a list of what pictures you think you see in your squiggle.

Part 2:

Draw what is on your list using the corresponding numbers.

Part 3:

Draw again after a brief reflection of the creative thinking strategies you employed. Your tutor will provide some prompts, which may simulate more creative responses.

Part 4:

Evaluate your process and select your best response. Finally, you will see what other people with your squiggle saw and drew. You will be given some time to reflect again on your best response selection.

Does anyone have any questions? Has everyone got their squiggle sheets and a pencil? Don't write or draw anything until I say, start.

Part 1: Write (5 mins)

When I say start, write a list of all the pictures you see in your squiggle. Write, don't draw, as many as you can. This list is to remind you what you saw in your mind's eye so you can draw it later.

Start writing your list.

(Time for about 2-5 mins. When most people are not writing anymore, say "Stop".)

Part 2: Draw (5 mins)

Draw what is on your list. When I say start, you will draw what you saw from your list. Use the squiggle with the corresponding number on your list. You can remove the paperclip and put your list next to your squiggle sheet. Remember, your squiggle responses are not illustrations, so work quickly and only use as much detail as you need to.

Start drawing your list.

(Time for about 2-5 mins. When most people have finished drawing, say, "Stop".)

Part 3: Draw again (5 mins)

Screen 5: (Return to the PPT presentation)

Draw again and apply creative thinking strategies. If you didn't finish drawing all the things on your list, write 'Last response' under the last picture you drew.

Ask for a show of hands to the following questions (prompts).

- Who turned their squiggle upside down or to the side?
- Who did variations on a picture or theme?
- Who looked at the negative as well as the positive shapes and spaces?

- Who used letters? Words? Speech bubbles? Numbers?
- Who did something abstract or used patterns, textures or repetition?
- Who drew outside the frame?
- Who connected one squiggle response to another?

Now you have a few more creative thinking approaches, start drawing as many additional responses as you can.

(Time for about 2-5 mins. When most people have finished drawing, say, "Stop".)

Part 4: Evaluate (10 mins)

Screen 6:

Select your best squiggle response and write a '1' in the box below the squiggle.

Your best response is not necessarily your best drawn picture.

It might be;

- The cleverest
- The most surprising
- The funniest or
- The most creative/original

Screen 7:

Find and sit with people who have the same squiggle as you. Consider and evaluate the following:

- Are your first three responses the same as other people's first three? Compare similarities.
- Did you draw a response that others didn't think of?
- If you want to change your decision about your best response, put a '2' in the box under the better squiggle.

Screen 8:

Where in the process was your best response? Show of hands:

- Your first response?
 - Drawn from your list?
 - Drawn during your second go after the prompts?
 - About halfway through your process?
 - About $\frac{3}{4}$ the way through your process?
 - Was it your last response?
-

Screen 9: Conclusion (10 mins)

This activity demonstrates creative flow and the value of iteration. Your first response is not always your best or the most original. As a designer, you need to know what most people see to understand the shared visual language of the culture you are communicating within. Knowing what most people

perceive will help you find ways to disrupt your audience's expectations and create engaging and memorable outcomes. Understanding Gestalt principles is also vital for effective communication and thoughtful composition and design.

Creative thinking strategies:

- Help designers generate ideas consistently
- Think in metaphors
- Think in themes
- Start from a different place
- Reverse the polarity
- Be alert to accidents
- Start with a rough sketch

Wrap up message

Sketching, whether you use a pencil and paper, or stylus and tablet, can help everyone off-load ideas and eternalize thoughts to create productive working space in our brains. Drawing literally helps you think. Any form of drawing or doodling can boost concentration and memory by allowing your subconscious to take over. Working rapidly can also avoid negative, self-editing, which can block the creative flow of ideas in the early stages of creative thinking. Drawing promotes the generation of multiple ideas and provides a visual thinking trail. This trail can help you remember where your initial ideas came from and avoid accidental plagiarism. Next time you are stuck for an idea, doodle slowly or scribble fast to free (and sharpen) your mind.

6.5.2 Self-evaluation rationale

The visual responses resulting from the 2018 *Speed Squiggling* trial did not undergo an external evaluation determining participants' best responses. This experiential activity's outcomes and success does not rest on the participant or the researcher making an accurate quality judgment of which response is better than another. The activity's value lies in the participant recognizing the quality of their responses by applying an evaluation framework and considering this in relation to their process and other people's processes. Using an external judge would defeat the purpose of the activity, which aims to provide a creative thinking model with no wrong answer. Placing less emphasis on the outcome also provides a non-threatening task and casual learning environment where students can explore and reflect on their creative thinking practices without fear of judgment.

Generating multiple ideas and discerning which ideas are more viable than others to fulfil a specific need and target an audience is an integral part of the creative thinking process. However, discerning whether a creative outcome is more original or unique requires an unbiased, accurate level of criteria and significant numbers of responses to compare with each other. The psychologist Paul Silvia (2008) recognizes that being accurate when determining a creative outcome is in itself "pesky" (p. 139). "I suspect that most

creativity researchers, in their heart of hearts (or brain of brains), would agree that there is no gold standard for creativity" (p. 141). He suggests a self-evaluation would need to be correlated with an external judgment, and participants would also need access to the whole database to make an informed comparison.

Silvia (2008) notes that Runco and Smith (1992) used a 1-7 rating system when evaluating with their participants the uniqueness of outcomes of three divergent thinking activities. The ratings of 6 and 7 were then compared and judged to be 'original' if instances of this approach were low or they were considered 'popular' if the hit rate was frequent. Silvia (2008) suggests that creative judgments can be neither accurate nor inaccurate, and therefore researchers should assess the "extent of agreement" amongst evaluators (p. 141). The *Speed Squiggling* trial was unable to provide this form of evaluation due to time restraints, however the participants were asked to discern their best, most unique, surprising, or novel squiggle response in relation to their other responses. The participants then re-evaluated their selection in consultation with others who responded to the same squiggle. While this allowed students to discuss their choice with two or three other students and see similarities and differences, the evaluation was limited by the group's size. If this evaluation process had been conducted with the whole cohort, participants might have made different choices. It could also be argued that the *Speed Squiggling* participants needed more time to understand the evaluation criteria and discuss with others reasons for their best selection.

Silvia (2008) notes that creative people are doubly skilled in that they are good at generating innovative ideas and discerning which ones are the best (p. 145). Despite possible limitations in the evaluation process and inconsistencies in each participant's evaluation criteria, the activity provided a tangible demonstration of the value of fluency to creative thinking, explored through the evaluation process. Students experienced the value of drawing what was in their mind's eye to communicate and lighten their mental load to achieve creative flow. The value of iteration was also shown because most participants' best responses did not occur in the first few iterations.

6.6 Visual analysis

The visual responses to each of the seven squiggles of the 2018 *Speed Squiggling* trial were reviewed to assess participants' experiences and the learning outcomes of the activity. Below are the most common responses that students drew in their first three frames (see Image 62).

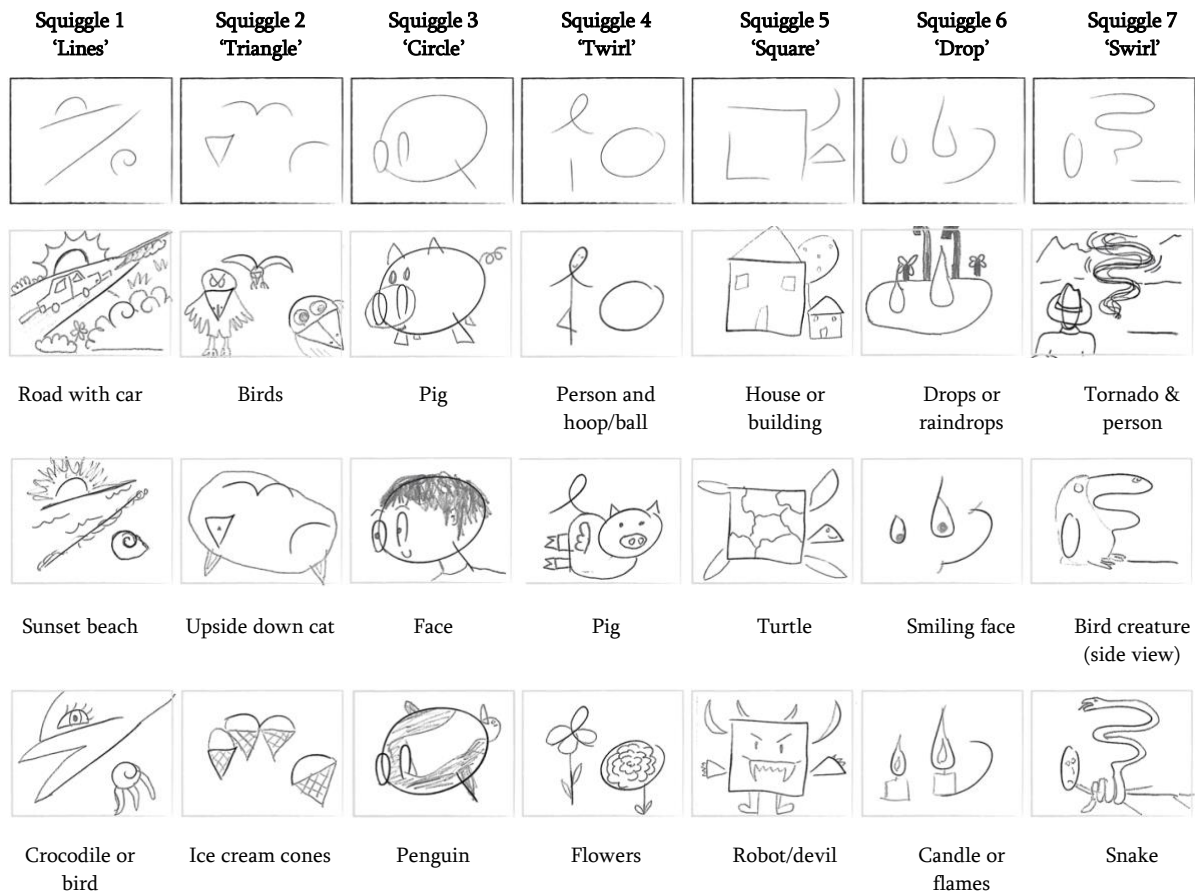


Image 62: *Speed Squiggling* most common squiggle responses, 2018.

During the evaluation of the earlier version of the *Speed Squiggling* activity, some students believed their squiggle was more difficult than others, suggesting they were at a disadvantage. To avoid frustration or feelings of inadequacy, I acknowledged this possibility at the start of the 2018 *Speed Squiggling* trial. It was hoped that recognizing different levels of difficulty would reduce stress or embarrassment for those students who found the activity challenging. From my observations and responses to the *Post-Why draw?* questionnaire, some students believed that the 'Square' squiggle was more difficult than other squiggles. Their responses include the following;

"The experience was mildly successful. I found the squiggle to be too hard to turn into anything".

"It was difficult. It was hard to find objects within my squiggle."

“I found the experience hard! The shapes were really difficult to make a picture. Even whilst turning the page to try and see different aspects and shapes from different views it was still a difficult task.”

These comments may indicate that some combinations of shapes evoke stronger images that are difficult to ‘un-see’ and depart from. One student from the ‘Triangle’ squiggle group observed:

“I found this activity difficult because it took me a while to stop seeing the bird picture, which looked like a kindergarten bird”.

To establish whether one squiggle was harder than another, the number of responses or pictures participants drew for each squiggle type was tallied.

No of responses	Squiggle 1 ‘Lines’	Squiggle 2 ‘Triangle’	Squiggle 3 ‘Circle’	Squiggle 4 ‘Twirl’	Squiggle 5 ‘Square’	Squiggle 6 ‘Drop’	Squiggle 7 ‘Swirl’
Minimum	7	6	4	8	6	8	5
Maximum	22	30	24	18	19	17	19
Average	14	18	14	13	13	13	12

This quantitative data indicates every squiggle type produced similar numbers of responses. The least number of responses (four) was for the ‘Circle’, and the highest number of responses (thirty) was made using the ‘Triangle’ squiggle. The average number of responses for each of the seven squiggle types was similar. The ‘Triangle’ squiggle average is higher due to the high maximum score. Of course, a higher response frequency does not indicate higher quality concepts. Indeed, a few participants produced multiple outcomes using marks that did not successfully resolve or define an obvious idea. Some participants generated very few responses but drew various outcomes that could be described as clever. The quantity and quality of responses varied considerably from participant to participant; however, most marks appeared to be deliberate and ‘good enough’ to form a picture or communicate an idea. It is interesting to note that both the participants who produced the highest and lowest responses drew using confident lines.

During Part 3 of the activity, participants were asked to consider a list of creative thinking strategies and then have another go at drawing more responses to their squiggle. Many of the clever responses occurred after the following questions were posed in Image 63.

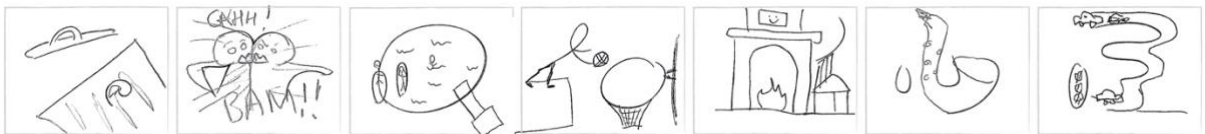
Did you turn your squiggle upside down or to the side?



Did you expand on an idea and continue with a theme?



Did you look at the positive and negative spaces?



Did you create patterns through repetition?



Did you look for symbols, letters, numbers, or add meaning with text?

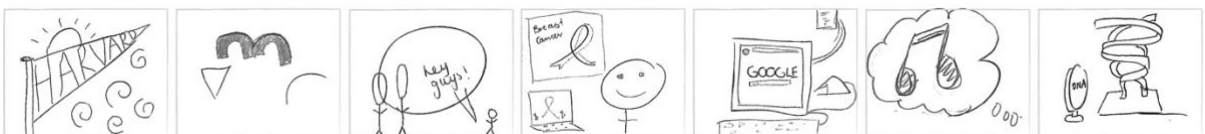


Image 63: *Speed Squigglng* examples in response to prompts, 2018.

Not all participants selected a best response. One tutor noted that they ran out of time to do the final group evaluation properly, which may account for the low numbers of ‘best’ selections in this class. Of the one-hundred and ten participants directed to select their best response, twenty-five did not make an obvious selection. Sixty-one participants indicated a best response using a ‘1’ tick, or cross in the corresponding box but at what part of the process this first selection was made was difficult to quantify. However, it could be surmised that twenty-four participants changed their first best selection during the group evaluation session as they wrote a ‘2’ under the new response.

It is interesting to observe which squiggle responses participants thought fulfilled the criteria presented during the trial. However, the focus of *Speed Squiggling* was to promote iteration as a critical aspect of the creative process and demonstrate the value of using process drawing to generate multiple ideas. The activity concentrates on providing a non-threatening, non-judgmental environment to encourage creative discovery. The success of this aim was seen when participants were invited to see where, in their process, they produced their best, most surprising, cleverest, funniest or original response?

Approx. 1/4	Approx. 1/3	Approx. 1/2	Approx. 2/3	Approx. 3/4
23%	9%	22%	23%	23%

Most *RtV* participants indicated that their best response occurred more than halfway through their process. Of course, there were extremes where 10% selected their first squiggle response, and 3% selected their last response as their best. Participants were also asked if they used one of the following thinking strategies. The resulting visual responses show how these strategies were used for each squiggle type and indicated the typical level of detail that students included in their responses. Most participants found additional responses when allowed to draw again. Whether the prompts or extra time aided this process is difficult to define. However, most participants took the opportunity to draw beyond their list, and many of the creative thinking strategies can be seen in the later responses. The following squiggle responses represent a cross-section of the squiggles made after the following questions were posed.

6.7 *Post-Why draw?* questionnaire analysis

The 2018 *Researching the Visual* participants began the *Speed Squiggling* trial with varying degrees of visual knowledge and skills and therefore interacted with the activity at different levels. The analysis of the *Post-Why draw?* questionnaire responses and comments provide feedback on the effectiveness of the activity. The comments indicate students' engagement and understanding of the learning outcomes. The findings of the *Post-Why draw?* Questionnaire, also highlight individual insights and possible attitudes to using drawing in the creative process. The following questions and responses were collected in the third week of the fourteen-week semester.

1. **The *Speed Squiggling* activity was designed to do the following. Tick the outcomes you personally experienced or understood.**

- ☐ Provide you with a non-threatening drawing task.
- ☐ Demonstrate common aspects of human visual perception, like seeing faces
- ☐ Demonstrate the value of doing lots of variations (iterations) to find a unique solution

- Demonstrate the value of using drawing, rather than just words to describe a solution.

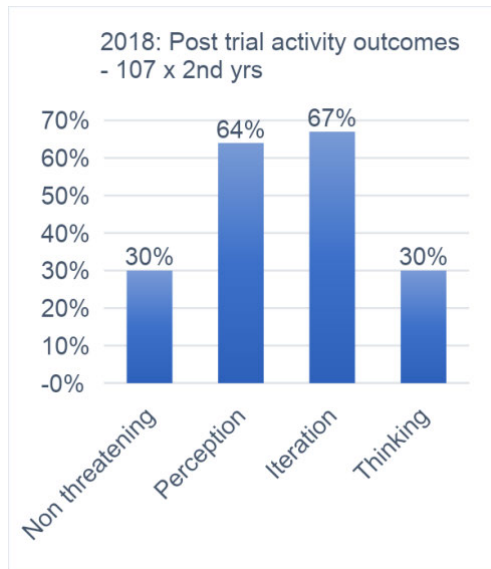


Table 15: Post-Why draw? Speed Squiggling learning outcomes, Rt V participants, 2018.

A tally of the multiple-choice responses indicates that 64% of the participants found *Speed Squiggling* demonstrated common aspects of human visual perception, like seeing faces. Slightly more participants understood the value of creating multiple variations to find a unique solution. 30% acknowledged that using drawing helped communicate their responses. It could be surmised from the relatively low percentage rate of participants who found the *Speeding Squiggling* activity 'Non-threatening' that 70% found the activity 'Threatening'. However, the students who did not select the 'Non-threatening' option often included a comment indicating they had positive

experiences. Perhaps the definition of a non-threatening experience needed further clarification. For example, the opposite of non-threatening need not be threatening it may mean challenging. The following comments reveal a more detailed picture of students' experiences.

Almost all the participants (except two), answered this open-ended question with a comment about their *Speed Squiggling* experience. Some responses were more considered than others, but they all provided

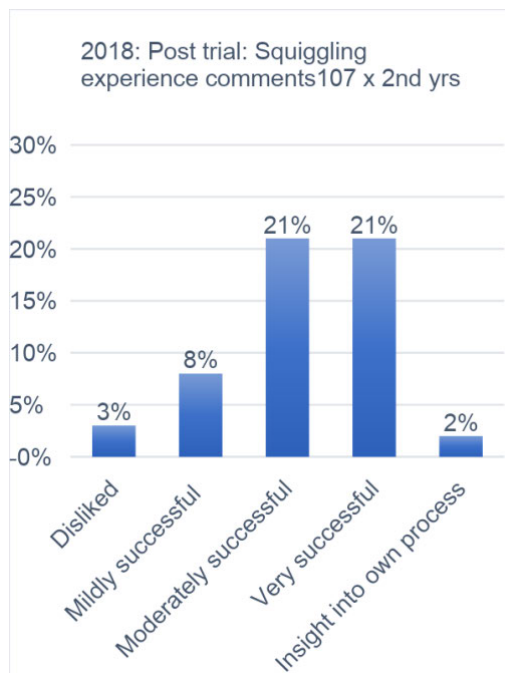


Table 16: Post- Why draw? Speed Squiggling experience, Rt V participants, 2018.

additional insights into how participants related to the activity and what they may have gained from the experience. Some comments also revealed possible barriers and limitations that students needed to overcome during the activity and may indicate why 70% found the activity challenging or why only 30% found the activity 'Non-threatening'.

The additional comments have been collated and presented to represent the main themes and opinions conveyed. Most participants expressed a positive experience and achieved some level of success. 21% noted that their *Speed Squiggling* results, or the experience of doing the activity, were moderately successful. A further 21% commented that the activity

was very successful.

The following comments are an example of the 2018 *Post-Why draw?* questionnaire responses that mention some form of improvement in attitude because of completing the *Speed Squiggling* activity.

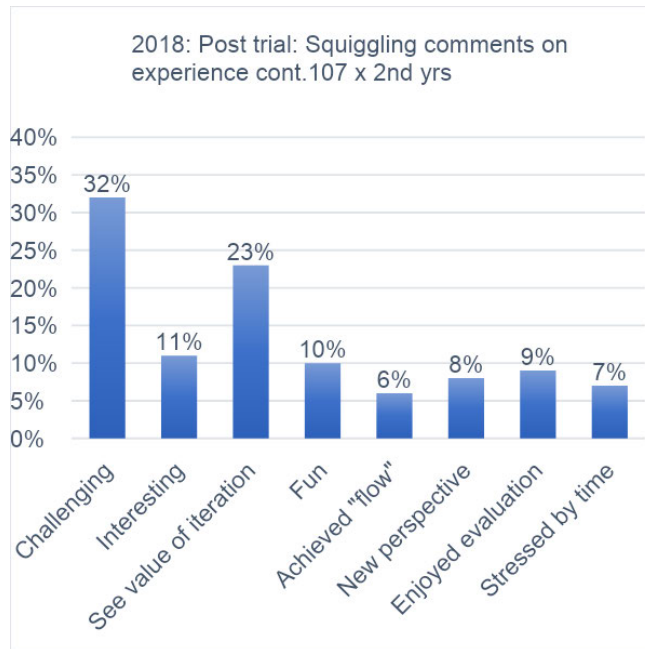


Table 17: *Post-Why draw? Speed Squiggling* experience, *RtV* participants, 2018.

“The experience was somewhat successful. It took me a while to get the hang of things, but after trying and failing a few of the first illustrations it got the creative juices flowing.”

“The activity was alright, quite engaging and creative. I realised that my best drawings come out closer to the end of the activity.”

8% of the participants found the experience “Mildly” successful. 10% of the participants described the experience as “fun” or “enjoyable”, and 11% noted it was “interesting”, 8% gained a “new

perspective”, and 9% valued the evaluation process. Without a detailed interrogation into these comments, only general conclusions can be made, however, the overall experience was generally positive, and participants indicated that they gained at least one of the main learning objectives.

Of the 67% participants who recognized the value of iteration in the multiple-choice responses, 23% added a written comment indicating that they gained a deeper understanding of the creative process through doing the *Speed Squiggling* activity. The following are examples of comments from the 2018 *Post-Why draw?* questionnaire that specifically relate to finding or seeing value in producing multiple ideas to achieve creative outcomes.

“It was hard when I started to do this speed squiggle. But later on, I have found lots of variations to draw. More practice makes me see more clearly.”

“Good experience. I thought this was a great brainstorming exercise that can be used in many areas of design.”

“The drawing activity enabled me to perceive same situations with a number of different solutions. Therefore enlightening me that there is always more than one answer, depending on perspectives.”

“I learned how to re-evaluate my drawings in order to create more ideas. Also, learnt the effectiveness of drawings to communicate an idea.”

“I found the experience immediate. It allowed me to visualise my thinking process around a brief.”

Only three of the one-hundred and seven 2018 *RtV* participants clearly stated that they did not enjoy the *Speed Squiggling* activity.

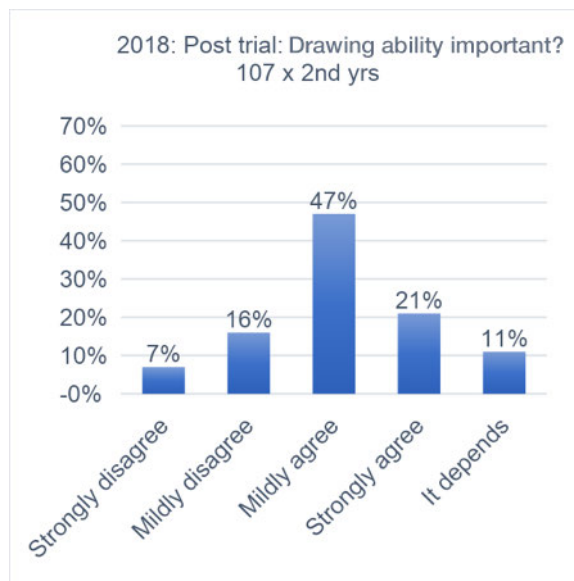


Table 18: Drawing ability important? *Post-Why draw?* responses, *RtV* participants, 2018.

“Terrible because I can't draw.”

“Horrible. I couldn't think in the limited time.”

“Confusing.”

There were also a few participants who found the time pressure stressful but their comments also indicated that they experienced benefits from the activity.

“It was not entirely successful. I think the time pressure affected my theme. I noticed I stuck with the theme from the beginning (nature). It put

pressure on me to draw things regardless resulting in repetition of points. However, I did find my mind broadened as time passed.”

“As a poor drawer it was intimidating to do the exercise under duress, but I saw the benefits of it in the end.”

“Overwhelming at first but once I began drawing it became easier and I felt accomplished with some of my results.”

One-third of the participants commented that they found the activity “difficult” and “challenging at first” but noted that it became easier as it progressed. Some mentioned the “prompts” helped them halfway through, and others described a “creative flow” of ideas.

“Challenging at first, but when you get the rhythm of it, it just comes to you which makes it a lot easier.”

“Quite successful, I was able to come up with many different interpretations of the squiggle and as I progressed through the process I began to recognise more images and make comparisons between familiar identifications.”

“Interpreting and making sense of my squiggle was difficult at the beginning. However, as I started drawing I had more ideas and was successful at it.”

- 2. In your opinion, is it very important to have some drawing ability to be a graphic designer or visual communicator? You may have answered this question before. Has your opinion changed? Please restate your opinion.**

As seen above, the responses to this question about the importance or usefulness of having some drawing ability to being a visual communicator did change significantly from the *Pre-Why draw?* questionnaire responses. Most participants still ‘mildly agreed’ with the statement, however those with strong attitudes either way had moved to this ‘mildly agree’ position after the *Speed Squiggling* trial. The percentage of participants that strongly disagreed or selected ‘It depends’ had remained constant. The accompanying comments also provide insights into students’ attitudes to using drawing in their creative processes. The mixed results of this question may indicate more clarification is needed to explain what kind of drawing skills are useful for particular tasks.

6.8 Insights and conclusion

The responses to the *Pre-Why draw?* questionnaire confirmed that this second-year design cohort had similar practices and attitudes to using drawing in their creative processes as the first-year design respondents of the 2013 and 2015 *Why draw?* questionnaires. Most participants had some form of visual training before entering University. The 2017 percentage rise in students with no prior visual arts or graphics training was influenced by changes to the WSU admission criteria and alterations within the graphic design industry, which responded to the development of online platforms, social media and associated workplace changes. The *Speed Squiggling* activity aimed to fill some of the visual literacy gaps resulting from variations in the prior training of first-year design students.

The 2018 *RtV* participants perceived the *Speed Squiggling* trial as challenging, indicating the activity was successful. Accounts from tutors facilitating the trial observed most participants appeared engaged in the activity's generation and evaluation processes. They considered the creative thinking criteria, and the activity brought to life the concept of a shared visual language for most students. The activity successfully demonstrated the value of visualising verbal or written thoughts through sketching out what is in the mind's eye. Most people drew many more visual responses to their squiggle than they had indicated on their written list. Participants exercised their visual perception skills, utilised Gestalt principles,

experienced the value of deferred judgment and applied creative thinking strategies to generate multiple ideas. Creating iterations on themes was also achieved through engaging in the activity itself. *Speed Squiggling* also successfully demonstrated creative thinking strategies that students could use to combat creative block and design fixation.

From classroom discussions, participants gained insights about their creative process by analysing their best, cleverest, most surprising, funniest, innovative or original squiggle responses. Participants discussed what defined a creative outcome and considered the criteria for their understanding of creativity. I did not always agree with the participants' best squiggle choices when analysing the squiggle responses later in the study. Still, as a designer, I understood the value of self-efficacy and recognising a good idea worth exploring further. Discerning and understanding what criteria are needed in evaluating and selecting potential ideas is just as crucial to the design process as generating multiple ideas.

Responses to the *Post-Why draw?* questionnaire indicate the *Speed Squiggling* activity was moderately successful. Although the trial was conducted within the 55-minute timeframe, another 20-minutes was needed to compare and evaluate students' processes and visual outcomes with others. More time was needed for students to reflect on how drawing helped externalise the flow of their ideas. A close analysis of the visual outcomes would also help students further appreciate the value of experimentation and using different creative strategies to exhaust possibilities. Showing some of the clever, original squiggle outcomes and analysing the reasons why these outcomes stood out from others, would also benefit students' understanding of the evaluation process and creativity criteria.

The *Speed Squiggling* activity included participants in a live visual research project who were also engaged in designing and implementing their own visual research projects. Experiencing research from a participant's perspective further strengthened the *Researching the Visual Unit* outcomes, which included developing insights from practising visual research. However, the *Speed Squiggling* trial's evaluation warranted more time to explain the mixed methods approach. Another twenty-minute session towards the end of the semester would allow teachers to unpack the research findings and demonstrate more effectively the evaluation methods used in the *Speed Squiggling* trial. Students needed more time to consider and compare the methods and findings of the trial with their visual research projects. However, most participants enjoyed taking part in the study and engaging in *Speed Squiggling*. They appreciated the opportunity to be part of a mixed-methods research project while experiencing the role and value of drawing in the creative process.

Although it may be difficult to unpack the research findings from the *Speed Squiggling* trial effectively while students participate and engage in their visual research, other learning outcomes can be strengthened. The *Speed Squiggling* activity has been repeated several times in the *RtV* Unit since the 2018 trial. Each iteration builds upon the last, creating an essential foundation to demonstrate the

significance of a shared visual language, ways of seeing, the value of visual experimentation, and practising hand-eye coordination skills to build self-efficacy. These outcomes are reinforced throughout the evaluation of the squiggle responses and the activity itself. While it may not be possible for students to appreciate the details of using mixed methods, with more time, the scope of this drawing activity could include more opportunities for insights to be gained by participants.

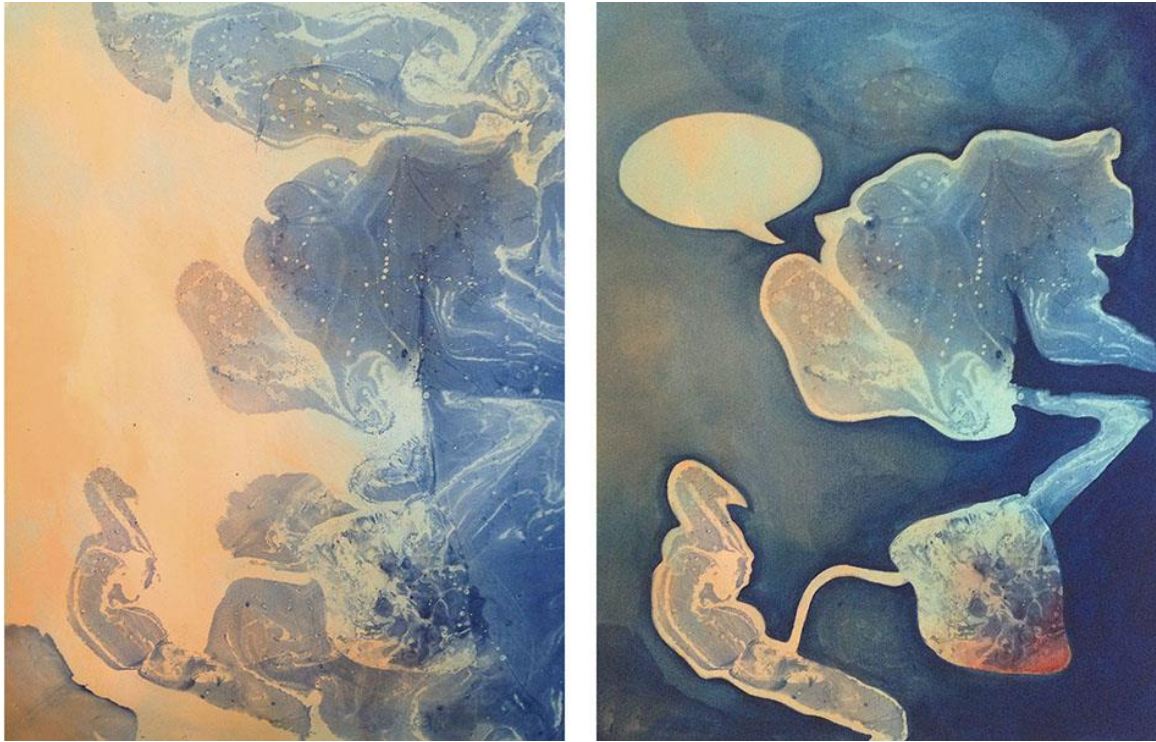


Image 64: Water squiggle exploring pareidolia, 2011.

What works in one setting may not work in another. No two situations are identical. Time has passed; the place has changed. We remember differently. A remembered set of insights are only approximately appropriate to the new situation. They are insights into situations which are similar but not identical. Therefore, our practical knowing needs be differentiated for each specific situation (Coghlan, 2016, p. 96).

7 Conclusion

7.1 Summary of aims and findings

Back to the drawing board? explores the role and value of drawing in the creative thinking practices of *Visual Communication, Design* students at WSU from 2013 to 2019. The study posed the question, "Why draw?" probing the counter-argument, "Why not draw?" while exploring the benefits and barriers to drawing participation in the creative thinking practices of novice graphic designers. The study's aims developed alongside the methodology and evaluation of findings providing a nuanced snapshot of WSU students' drawing practices during this period.

One of the aims of the study was to establish that process drawing has an enduring role in the 21st-century graphic design classroom. Through past and current literature, including cognitive research studies, *Back to the drawing board?* identifies seven good reasons for novice graphic designers to incorporate some form of process drawing within their creative practices. These include drawing for thinking, communicating and collaborating; drawing for idea generation; drawing to solve problems; evaluating the practices of yourself and others; drawing to facilitate learning; and benefits to teaching, highlighting the value of a rough sketch to promote timely feedback thus discouraging plagiarism. Influential drawing research studies, including investigations into neurological factors related to drawing and creative discovery, also confirm the value of process drawing in design education. The seven good reasons to draw outlined in this study not only confirm the value of drawing for design education, they also detail the potential and purpose of such teaching and learning for aspiring professional designers, illustrators and visual communicators.

As there is widespread consensus in research to include drawing in creative processes, another aim of the study was to better understand how WSU Visual Communication Design students use drawing in their creative practices. The questionnaire and interview responses shed more light on students' processes, revealing that most participants engaged in sketching activity in the ideation stages of their major projects. Many students identified specific instances where drawing or sketching provided significant benefits to their creative thinking. However, the study also revealed psychological and physical barriers to drawing participation. High expectations, fear of being judged, limited time and skills affected students' use of drawing in the classroom environment. A few participants described deliberate 'work arounds' and digital approaches to avoid hand-drawn activity.

Interestingly most students experienced a disconnect between their creative processes and assessment expectations throughout the design course, reflecting the variety of ways different students approach designerly tasks. Students also indicated inconsistencies in their design practices which were influenced by many external and internal factors. The implications of these findings and recommendations for assessment design are discussed below.

Another aim of the study was to communicate the value and handiness of drawing and encourage drawing participation in the classroom environment. Several pathways were explored through my drawing and teaching practices which led to quick in-class drawing activities designed to demonstrate the role and value of drawing for creative discovery. The analysis of existing pathways, observations, data, student accounts, and visual outcomes informed the pedagogical approach and design of these drawing activities which focused on the *Speed Squiggling* trial outcomes. The interpretations and findings of the responses to the *Speed Squiggling Pre and Post- Why Questionnaires* highlight participants' practices and provide further information about the role and value of drawing in the creative processes. An analysis of the visual outcomes and accompanying learning objectives also provides a practical demonstration of the function and importance of sketching for teaching and learning design.

7.2 Future considerations

The findings and insights gained from *Back to the Drawing Board?* validate the aims of the study to explore the value of drawing for graphic design students. The careful consideration of scenarios and trials of other drawing activities open further pathways for drawing teaching and learning in the design classroom. The drawing strategies developed throughout the study provide opportunities for students to learn and test the value of drawing for their own practices and discover its handiness. The role and value of drawing are also considered within the aims and outcomes of the WSU *Visual Communications, Design* course that aims to provide multidisciplinary, broad training that addresses a range of design tasks in an ever-changing profession.

7.2.1 Harnessing the benefits of drawing

The *Speed Squiggling* activity models effective creative thinking strategies, such as the generation of multiple ideas through visualisations as well as verbal or written interpretations, which can be used for other creative thinking tasks in a meaningful way. Schenk (2016) concludes in her study of both novice and professional graphic designers from 1984 to 2015;

It is evidently important for design students to be taught drawing in association with design so that they learn how drawing is intrinsically linked to the design process. It is also important that

they learn how drawing is both flexible and accommodating in its use and can be adapted to the particular requirement of both a specialist discipline and particular design tasks. (p. 210).

Back to the Drawing Board? found that although many students have limited opportunities to practise hand-eye coordination skills there is much to be gained from using process drawing in their practices. Indeed, lack of exposure to sketching in the learning environment may result in a life-long misunderstanding of the role and importance of drawing and limit the scope of students' designerly activities. The findings of the *Speed Squiggling* trial recommend students retain vital hand-eye coordination skills to capitalise on the inherent qualities of drawing and use whatever drawing devices come to hand.

The study also found that students quickly moved from rough sketches to a digital environment when a viable direction was found through drawing. How long they spent sketching out possible approaches depended on the design problem they were engaged in. For instance, most participants found that private and covert sketches helped them think through the design of a logo, symbol or brand. Storyboards were also helpful in the design and planning stages of an animation, film, video or a storytelling sequence. Some interviewees described projects where early conjecture allowed them to work directly in the final output program. They believed the time was saved when adequate consideration of the brief, audience and feedback had occurred in their head. In my experience as a design teacher, students often unknowingly regurgitate the same design if they are not encouraged to start at the drawing board. Closing possibilities too early in the creative thinking process can lead to design fixation.

Going straight to the computer can be a time trap for self-directed projects where the limitations of the brief can be easily changed. Students can become bogged down making incremental changes on the computer, wasting time on inappropriate solutions. They often invest too much time creating one final draft and find it impossible to let go of an ill-fitting design solution. Other students look for shortcuts and quick design fixes. Experienced designers will also appear to take shortcuts when building on past visual information and experiences. Narrowing the scope of a project, finding workarounds, combining methods, and thinking through strategies on the fly is necessary to make a living as a graphic designer. Drawing can aid this process by offloading thoughts to the spatio-visual memory and allowing the flow of ideas to occur.

7.2.2 Overcoming barriers

Back to the drawing board? identified barriers that held some students back from participating in individual and collaborative drawing activities. Many students expressed a fear of the unfair judgement of what they believed was inadequate drawing skills by teachers and peers. Design teachers are also reluctant to draw in front of their students hence the absence of classroom demonstrations. Professional designers

rarely share their messy processes. Seeing the working sketches of a cross-section of design practitioners is vital for students to gain a more accurate picture of the creative thinking practices of others. Even if they are poorly drawn, teachers who demonstrate process drawing approaches can model good creative thinking practices.

7.2.3 Assessment considerations

The study also raised questions about the effectiveness of using process drawing activities as an assessment tool within the *Visual Communications, Design* course at WSU. Most *Visual Communication, Design* assessments at WSU are formative and summative. The formative assessment provides feedback on the process stages of a project and the summative assessment often includes marks and criteria for process work, experimentation and research components in addition to the final project outcome. Assigning a grade to process material ensures students engage in creative thinking activities, including the production of rough sketches, doodles and thumbnails. Mind-mapping, hand-drawn diagrams and storyboarding can also facilitate the early evaluation of concepts and planning with teachers and colleagues. Feedback and responding to feedback early in the design process provides valuable learning outcomes to novice designers. Drawing in the ideation stages of a project encourages students to interrogate the brief visually, exploring different formats and approaches. Looking back or revisiting ideas on a drawing trail can also provide valuable information to both students and teachers about their creative processes allowing for future development and modifications. Low fidelity marks can reveal much about the maker - even sketches produced retrospectively provide information about a student's practices that would otherwise be hidden.

Although all the interviewees engaged in some form of sketching in their creative processes, a few students experienced a disconnect and disliked being forced to use sketching when they did not see tangible benefits. Many interviewees described at least one occasion during their four years at university, where they had gone back and created process material to meet assessment criteria. However, students also described circumstances during their creative thinking processes where they naturally turned to drawing to work something out. This occurred when they encountered the limitations of their mental processes, i.e. feeling blocked or stretched. These comments suggest that the lack of ideation drawing may reflect the nature of the assessment task itself. Assessment briefs are often self-generated by students who select issues or design problems aimed at an audience that resemble themselves. Sometimes their briefs are driven by a design or image they have seen and would like to emulate. In short, perhaps the design problems students choose to engage with are not 'wicked' or ill-defined enough to warrant pencil or stylus activity?

Not all creative thinking activities include some form of process drawing. It is also common for students to be inspired by found images and existing design solutions. Inspiration and mood boards are common elements in most students' process material submitted as part of their assessment. While the collection and analysis of precedents and visual styles are encouraged in most Units, care must be taken to ensure that students don't inadvertently copy or reproduce a found or readymade solution. Using different process drawing activities can help students find appropriate ideas that have grown from interrogating the design

brief, not from looking at images and styles that they aspire to emulate. Drawing can help students avoid accidental visual plagiarism. Deliberate visual plagiarism is also discouraged through the transparency of the creative process.

7.2.4 Drawing devices

For egalitarian and collaboration reasons, *Back to the drawing board?* highlights the advantages of using low tech drawing tools, such as a pencil, in the classroom. A pencil is inexpensive, portable, shareable, and its functionality is familiar to all students. It can be distributed easily and quickly in the classroom and home environments. Indeed, making or drawing by hand was identified by several interviewees as a welcome change to working on a screen. Digital equivalents are currently less accessible to all students at WSU, so providing a pencil in the classroom effectively brings students into a shared visual thinking environment. The study also acknowledges the value of digital drawing devices, noting the additional benefits of *Command z* and the translation of working sketches into other graphic programs. Digital drawing also facilitates the hybrid creative thinking activities that many students currently incorporate into their design practices. However, while we wait for technology to mimic and expand on the qualities of sketching, hand-eye coordination skills must be continued to capitalise on drawing's unique cognitive and communication qualities in the design thinking process.

The drawing tools themselves provide additional hurdles for some students. Working in a physical space and translating this to a digital space can be awkward and/or introduce further uncertainty for students. Interestingly, some interviewees preferred to draw on paper first, then scan, trace and manipulate within a digital space. Mignone and Blaiklock (2019) recognised the value of using a digital device for their future visual notation activities. They conclude that digital sketching would allow participants to upload their sketches immediately, thus avoiding the temptation to 'fix up' or redo drawings before scanning (p. 8). Although there are many benefits to sketching on a device like an iPad or Wacom tablet, at the time of the trial in 2018, very few students had access to a device other than their smartphone. In addition, at that time many students felt awkward or less proficient using a stylus rather than a pencil. However, observations made towards the end of writing this thesis in 2021 indicate students' tablet and stylus activity is increasing. There is an increase in the number of process material submissions that include digital sketches. It is also evident that digital sketches are easier to incorporate and edit in drafts and layouts created in software programs. This increase in hybrid and digital approaches need to be considered and factored into future teaching and learning activities.

7.2.5 Classroom considerations

Being able to see students' ideas and look back at their visual thinking trail can also facilitate the feedback process which is vital to students' understanding of the design thinking process. However, care must be

taken to assess the whole creative thinking process. The findings of this study reveal many students engage in a wide range of activities, including periods of internal and external processing. It is evident that classroom ideation sessions require more than one hour to encourage and provide timely feedback of students' first-thoughts through process drawing activities. These may include rough sketching, doodling, or other visual representations, such as mind-mapping. Finding readymade solutions created without interrogating the design problem or understanding the message and audience can lead to design regurgitation and ill-fitting design solutions. Thinking through a given design problem or brief through process drawing can discourage students and remove the temptation to copy a found solution. First thoughts sketches can help facilitate the assessment process providing tangible evidence of thought compared to other image collection activities that students engage in. From a teaching perspective, providing feedback early in the ideation and middle stages of a design project can avoid extensive written feedback occurring after students submit, which often goes unread.

Drawing facilitates collaboration and planning in the classroom, particularly during group assignments. Collaborating on the same page with team members, clients, and shareholders can encourage inclusive behaviour, and save time and money. The ambiguous nature of a drawing can encourage further interpretations by providing room for creative thinking. However, drawing needs to be promoted as a thinking and communication tool rather than an illustration tool to give students confidence that their 'childlike' scribbles will not be unfairly judged. Demonstrations can show how information and ideas can be shared using arrows, dots, frames, numbering, and pictorial representations. The hierarchy of information or data can also be established early. A rough sketch does not shut down further development of thinking in the same way that a computer-generated graphic may do. Like *Speed Squiggling*, warm-up drawing activities can help students focus less on their marks and more on the contribution of ideas.

7.2.6 Expanding pathways

The *Speed Mind-Mapping* and *Speed Storyboarding* activities were developed alongside the *Speed Squiggling* trials. All three activities have benefited from the findings of the *Back to the drawing board?* study and future iterations of the activities will draw on the evaluation of the *Speed Squiggling* trial.



The Speed Storyboarding activity is included in a first-year *Visual Storytelling* unit to model what is required to complete the *Storyboard* assessment task. It was first trialled in 2014 (see Image 65). From questions and comments made during the *Visual Storytelling* tutorials, some students did not

Image 65: *Speed Storyboarding* trial, 2014.

appreciate the vital role that storyboarding plays in the design, communication, and planning of an animation, film, or video sequence. The activity modelled typical storyboard conventions and demonstrated the drawing skills needed to complete the assessment task successfully, and in industry settings save valuable time and money. Like the *Speed Squiggling* activity, *Speed Storyboarding* was designed to build drawing confidence and get students started. Students who identified as non-drawers sought reassurance that they possessed enough drawing skills to complete the assessment task adequately. Drawers needed clarification that the storyboard was not an illustration task.

Students used a pencil and paper to roughly sketch out six frames of a given story incorporating relevant storyboard notation and visual conventions. Each frame of the story was projected and read out by the teacher. The story unfolded, giving students approx. two minutes to visualise what they saw in their mind's eye in the corresponding frame. Students were instructed to; go beyond the words and imagine what meaning and interest could be added using visuals; consider the point of view; consider composition, long shot, mid and close-up; consider lighting; transitions; the flow and overview of the story and not the details; and use stick figures if necessary.

Students had to work quickly, defer judgment, and jot down their first thoughts as in the *Speed Squiggling* activity. *Speed Storyboarding* allowed students to employ their knowledge of storyboard conventions, composition, point of view, lighting and transitions. The exercise demonstrated the value of externalising internal thoughts, achieving creative flow, iteration, and communicating using low fidelity marks. Students were encouraged to reflect on their marks and the quality of their drawings. "Does anyone feel they don't have enough drawing skills to complete the storyboard assignment due next week?" I reassured students that drawing skill was not essential and I would be focusing on the quality of their story, originality of concept, and their use of appropriate storyboard conventions. Students were asked to consider what archetype and genre they referenced.

As in the *Speed Squiggling* evaluation, students were invited to find and compare similar visualisations and approaches in the storyboards of others in class. Students were directed to carefully consider specific frames in the story that aligned with learning objectives and essential points to remember. When directed to the key-frame that introduced the alien character, I posed the question: "Why did you choose to represent your alien in the way you did?" Each class approached this discussion differently. However, there was often an equal division between the representations participants chose.



Image 66: *Speed Storyboarding* visual responses, 2014.

Participants of the *Speed Storyboarding* activity were asked to consider the shared visual language and cultural and generational influences on the way they depicted certain aspects of the story in their storyboards. Typically, over a third drew their alien representations like the famous humanoid *NASA* alien. Fewer than a third drew aliens with antennae as seen in the American sitcom *My Favourite Martian* (1963 – 1966). Another third drew monster aliens, part animal, part human, as seen in films like *Alien* and *Futurama* (see Image 66). Some of these monster depictions included wolf attributes as the unfolding story was titled *Revenge of the Wolf*. Occasionally one or two students represented the alien as invisible or microscopic. The *Speed Storyboarding*, like *Speed Squiggling*, provided learning outcomes that closely aligned with the aims of the assessment task.

Speed Mind-Mapping was designed to get students to start thinking about a social change campaign in the first week of a third-year unit. Like *Speed Squiggling*, the experimental activity aimed to model a creative thinking approach, the value of suspending judgment, and multiple idea generation. *Speed Mind-Mapping* was not as successful as the other two activities using speed. Observations of students' behaviours indicated that the short interaction times restricted instead of expanding their creative thinking processes. As students passed their mind-map around their small group, they found it challenging to make connections and expand on ideas quickly. Each mind-map required considerable thinking time to respond in a meaningful way. The activity modelled the mind-mapping assessment task, but many people indicated that the task was not useful, without the benefit of more time and practice.

The development of quick drawing activities designed to encourage and foster drawing participation and model creative thinking strategies in the classroom, continued as part of the development of the first-

year *Visual Storytelling* Unit content at WSU. Another successful application of the *Back to the drawing board?* findings can be seen in the development of a *Visual Roll*. The attendance roll was replaced with a sheet of paper given to each student at the start of the tutorial. The sheet had 14 frames, each representing a tutorial week. Students named these sheets and handed them back at the end of the class.

Each week a mini 2 to 5-minute drawing activity was introduced. Each drawing activity is closely aligned to the learning outcomes of that week's topic. The *Visual Roll* successfully encouraged all students to participate in a weekly drawing activity. They were not forced to participate and could write 'present' in the weekly frame if they preferred not to draw. The activity received positive feedback from students through the official Student Feedback surveys collected at the end of the 2018 WSU semester. Student interactions during class time increased, and some students continued drawing throughout the tutorials, inspiring others.

Other unexpected benefits of this drawing activity were identified and require further investigation. The *Visual Storytelling* cohort contained students with mixed abilities from across the university. Questions of inequity and fairness were raised early in the semester concerning drawing skills. The weekly drawing outcomes indicated each student's sketching ability and possible limitations they may face in the Unit's final illustration assessment task.

7.3 Drawing conclusions

The study's findings provide a timely acknowledgment of the value of sketching, confirming that drawing has a vital role to play in the creative processes of novice graphic designers. The importance of drawing was verified through observations of my, and my students' drawing practices and the evaluation of questionnaire and interview responses. An acknowledgment of the practical aspects of drawing is needed in the delivery and design of classroom activities and assessment tasks and the drawing activities developed as part of the study provide additional future pathways to drawing participation.

Demonstrating and modelling how drawing can be used as a tool in the classroom encourages students to give sketching a try in their private practices at home. Acknowledging the difference between drawing as process, and drawing for outcome, can also help students overcome their fear of unfair judgment of their ideas from peers and teachers. Whether students use traditional drawing, digital or hybrid sketching approaches, drawing has an enduring role in the design processes and skills set of aspiring visual communicators. The insights gained throughout the study underpin the argument that drawing should continue to be encouraged and demonstrated in the *Visual Communications, Design* course at Western Sydney University.

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APPENDIX 1: *WHY DRAW?* QUESTION RATIONALE

A brief rationale is included for each of the following multiple-choice questions.

1. Which course are you currently enrolled in?

- ☐ Bachelor of Design
- ☐ Bachelor of Communication
- ☐ Other _____

This question separated the *Visual Communication, Design* students from other students enrolled in *Visual Communication, Arts, Media Studies* and *Creative Industries* courses as well as elective students from across the University. The questionnaires from non-design students were set aside and not included in the *Back to the drawing board?* analysis.

2. Prior to starting this University course, which of the following art or design courses had you completed?

- ☐ HSC art/design course or equivalent
- ☐ Tertiary art/design training at TAFE, University or equivalent
- ☐ Community art or design course/s
- ☐ Online art/design course/s
- ☐ None
- ☐ Other or comment _____

This multiple-choice question was designed to provide a general 'picture' of the possible visual literacy skills or visual experiences that participants may have been exposed to before University. A tally of responses indicated the number of students who completed some form of formal tertiary training that included an art or design component. The specific Higher School Certificate (HSC) subjects that students may have completed include Visual Arts, Graphic Design, Media Studies, and Design and Technology courses. It is also acknowledged that some students are self-taught and engage in visual hobbies. A space for 'Other' additional comments was provided to capture unknown courses and pathways that some students may have engaged in.

3. When you draw, doodle or conduct a rough sketch, what materials do you usually use? You can select more than one.

- ☐ Note paper or anything I can find
- ☐ Traditional paper and pencils
- ☐ Computer with stylus and tablet

- ☐ iPad with finger or stylus
- ☐ iPhone with finger or stylus
- ☐ I don't draw, doodle or conduct a rough sketch
- ☐ Other or comment _____

This question aimed to provide a snapshot of the kind of materials, devices and software commonly used in these first-year students' drawing practices. It also sought to tally the number of students who do not engage in any drawing activity. Students could select more than one option. The 'Note paper or anything I can find' option was included to see if students differentiated between this 'back of an envelope', on the fly drawing to more deliberate 'Traditional paper and pencils' activities. The digital options were listed to see what devices were common or used exclusively.

4. If you selected the iPad above, what app/s have you used to draw with?

- ☐ Pages 53
- ☐ Photoshop Essentials
- ☐ SketchBook Essentials or Pro
- ☐ Procreate
- ☐ Strip Design (Pow)
- ☐ Other/s _____

Many sketch apps were being developed during 2013 to 2015. This question aimed to provide a snapshot of the different apps students were using during the study. The free *Pages53* app was recommended in the 2013 *Visual Storytelling* tutorials and other information given to when they received their free iPad. The sketch apps, Photoshop Essentials, SketchBook Essential and Pro, Procreate and Strip Design were also recommended, as they could be translated easily into Adobe Photoshop and Illustrator which were used extensively in the graphic design industry at that time.

5. How often do you draw, doodle or conduct a rough sketch?

- ☐ Daily
- ☐ Weekly
- ☐ Occasionally
- ☐ Rarely
- ☐ I never draw, doodle or conduct a rough sketch _____

Although this question about students drawing frequency could be interpreted in many ways by the participants, the main aim was to determine what percentage of students selected 'I never draw...' to contrast this with those who regularly drew.

6. Why do you draw, doodle or conduct a rough sketch? You can select more than one.

- ☐ To create artworks for myself and others for sale
- ☐ To create illustrations or graphics for commercial design work (not assignments)
- ☐ To think through ideas
- ☐ Just for fun
- ☐ To relax
- ☐ To challenge me
- ☐ Other _____
- ☐ Comment _____

This question aimed to capture the number of students who used drawing for cognitive purposes, i.e: to play, think through their ideas and relax. It also aimed to calculate how many students used drawing to express an idea or illustrate for personal or commercial purposes. This question was reviewed in 2015 after the analyses of the 2013 responses revealed the need for added clarification of the definition of process drawing before students answered this question. Another issue related to the wording of the first two answers was identified after the collection of the 2015 *Why draw?* questionnaire. Both multiple-choice answers contained a financial option. On reflection, the first answer should have removed the 'for sale' aspect to identify those students who use drawing to express personal concepts i.e. artworks for themselves rather than to a given brief.

7. In your opinion, is it very important to have some drawing ability to be a visual communicator?

- ☐ Strongly disagree
- ☐ Mildly disagree
- ☐ Mildly agree
- ☐ Strongly agree
- ☐ It depends. Please comment _____

This question aimed to capture students' attitudes to drawing and gauge their opinion on the importance of having some drawing ability for future employment. Understanding the benefits of drawing can provide valuable motivation to draw: this motivation and engagement providing an important aspect of the learning process.

It is important to note that some students needed additional clarification of this question. Students asked; "how important?", "how much ability?" and what jobs do "visual communicators do?". In response to these questions, I verbally expanded the question to add clarity. I said that 'important' could mean 'useful', some drawing ability could convey 'just enough drawing ability to communicate adequately. A 'visual

communicator' is someone who works in one of the many visual design industries that include print, web and media – as opposed to being an illustrator or graphics. The other three tutors involved in the study did not have these qualifications when distributing the questionnaire in their classrooms. However, all tutors encouraged students to add additional comments to clarify their answers.

APPENDIX 2: 2018 COURSE AND UNIT LEARNING OBJECTIVES

***Visual Communication, Design* (BA. Design) course Learning Objectives:**

The following learning objectives are included in *Learning Guides of most* Units included in the *Visual Communication, Design, Learning Guides*. At the successful completion of this course, students will be;

- Capable, competent and effective in their chosen professional and vocational area.
- Ethical, responsible and aware in carrying out their design practice and professional responsibilities.
- Sensitive to cultural and intercultural issues, especially those of Indigenous Australians.
- Adaptable, flexible and resilient in the face of rapidly changing design practices.
- Able to initiate and contribute to the practice, industry and community of designers.
- Critical and reflective of information, knowledge and ideas in the field of design.
- Confident, articulate design professionals who can work independently and collaboratively.
- Able to demonstrate an understanding of ecological impacts in personal and professional contexts.
- Able to contribute positively to sustainable social, economic and environmental change in a diverse and evolving world.

***Visual Storytelling and Researching the Visual* Unit Learning Outcomes:**

The following learning outcomes are included in *Visual Storytelling* and *Researching the Visual* Unit *Learning Guides*. Both units take a Blended Learning approach and include both online and face-to-face activities. The following learning objectives represent research and design thinking processes encouraged through the *Visual Communication, Design* course. The Unit's Learning Outcomes specifically support the Bachelor of Design (*Visual Communications, Design*) Learning Outcomes. At the successful completion of this Unit, students will be able to:

- Exhibit a critical understanding of visual languages at work in contemporary culture
- Demonstrate a theoretical understanding of key concepts in visual research
- Exhibit competency in designing, conducting and presenting visual research
- Apply techniques of visual analysis to collected images
- Effectively utilise visual research findings in the development of original design concepts
- *Visual Storytelling* Unit Learning outcomes
- Articulate understanding of the role of visual storytelling for exploring the relationship between content and context.
- Evaluate visual communication contexts to identify principles and structures for visual storytelling.
- Apply visual storytelling approaches using a range of digital media applications.
- Apply visual approaches to generate relevant findings as storytelling outcomes for given briefs.

- The drawing activities' specific goals aimed to reinforce and facilitate the Course and Units' broader learning objectives.
- Engage in process drawing activity
- Build drawing confidence
- Engage in a creative thinking strategy
- Model visual perception principles (Gestalt)
- Engage in real-world designerly thinking activity
- Demonstrate the value of iteration (within the task itself)
- Facilitate assessment task feedback
-

APPENDIX 3: 2017 AA INDIVIDUAL INTERVIEW TRANSCRIPT

AA: When I first received the brief for my major project, because it was so broad, I had to think of something that mattered to me, and that would interest me because I know it was going to go for a long period of time. That was one thing that my tutors said, to make sure that it's something that interests you, otherwise you wouldn't want to keep going on with it later on.

Mental health was a big thing for me, especially with anxiety and depression. Those were not just things that I'm really passionate about, but it's also based on experience with me, with people I know, so that's what I wanted to focus on.

First of all, I did a lot of research, and then during my research, I did both primary and secondary research and I had to obviously look online for some information. Then I also did some interviews, spoke to some of my friends about people that I know that were dealing with issues themselves and what they wanted as a place to go to or something they could use to get help with any mental health issues that they have on their own.

During my research, I found out that young women age 16 to 24 were more likely to experience anxiety disorders than men, so then I focused my major project on that. During that time, I realised that I had to make my design purely for young women, and we had to appeal to young women - only because that's what the target audience was.

So, I don't know if you remember my logo. It was a peach. It was a peach shaped as a love heart, and then there was some leaves on top. But the moment I think of that idea, I literally go to my notebook, and I just draw anything that comes into mind. I told you, it's very messy, but I literally draw anything that comes to mind. I thought of names for my project and I would ... for example, this is very close to what I did at the end.

Interviewer: Is that the first drawing you did?

AA: Yeah. The moment that I thought of it, it was like I knew I definitely wanted the love heart because that was something that ... it's a message of its own. Then I just added the leaves to make it look like the peach, change the color. All digitally, obviously. I had to jump on my laptop to do this.

This was my initial sketch. It's making me laugh looking at it because it's so messy. But this really helped shape the logo of the project. I just drew ... That's the main logo, and then everything sort of came from that because in my project, you can see little characters of peaches, and that's where all that came from.

Even though this was just a simple drawing, it did shape a lot of the elements in my project. It was a good start for me. It really got the ball going.

That's what I showed ... because we have to do a big presentation, and I showed the logo and the logo mark itself, which was this. It was really good. My tutors loved it, so it worked out well from this drawing.

For that project itself, I didn't really do a lot drawing because I was designing an app. I don't have it here with me (looking through some folders on her laptop computer), but another thing that I had to draw was the wire framing of the app and website designs.

I have an example of another app that I designed ... it's so messy. But yeah, even things like this. It's so simple, but it really helps in the long run, especially because I do want to specialize in UI and UX design, so I'll be designing a lot of websites and a lot of apps. I just drawing it up before I continue with anything really...this really helps. It helps keep me on track as well. It helps decide what content I have to put in. As a UI UX designer, drawing is a really big deal, but then when I make other stuff, I tend to just go straight into it. I tend to just jump on Illustrator or Photoshop and just start - because it's something that I'm used to doing as well.

Yeah, that's pretty much it.

Interviewer: Do you use your iPad?

AA: I don't use an iPad ... to draw? I don't have an iPad to use, so I use my tablet - because I also illustrate as well. I can show you what I make, if you like.

But I usually illustrate straight onto the tablet because when I'm illustrating ... so this is like my illustrations. Yeah, I would illustrate straight onto my tablet because it's already fresh in my mind, and I just want to draw it out real quick. So, I do a lot of illustrations that work with my design stuff.

But that's mainly all sort of improvised.

Interviewer: You have a Wacom tablet?

AA: Yeah, a Wacom tablet. I only started using that (Wacom tablet) recently because I wasn't really into drawing back then, when I first started. I would just jump into things straight away, but then drawing things gives you peace of mind because you can see it before you commit to anything, which I think is really important, especially with websites. You can see it all laid out really quickly, roughly without wasting too much time. It helps with the result later on.

APPENDIX 2: 2017 CN INDIVIDUAL INTERVIEW TRANSCRIPT

CN: So, I think from the moment that we got this brief (major project) – cause the first semester was all about getting your idea – so we had a lot of different mini briefs to get through. So this idea in particular I started off – um - let me think about it - I guess doing research was the first thing that we started doing and then I used that to figure out what I kept getting drawn to. Yeh, so for this project there was the idea of our reliance on technology - you know the little things we rely on and get frustrated by - or - you know –let me find a good example – yeh, like the lack of communication that we've got going on at the moment. They're all talking on their phones and... they're not talking to each other when they're right there and - (the internet) it's where we get our news and everything... Yeh with drawing I really like the hand-made side of everything cause you don't need to worry about it ...like when you're using your computer there's limitations that you have as well... even here you can see straight away with that colour... like you can't really recreate that with a normal printer.

Interviewer: Did you do this as a rough?

CN: Yeh, I start off with pencil drawings and then keep going over the same one until I have something I'm happy with and then - you know finish it off with the pen. You can see that was one of the earlier versions that I had and then I got feedback and everything and then I realised that this one sort of works better having it, you know on the angle, so you can see more of what was going on –so it was like trialling different things I guess. A lot of these ones started out going straight to that sort of visual (left pink image) rather than drawing little thumbnails because I just found that it was a better use of my time to just visualise what I wanted in my head. There were too many to draw.

Interviewer: So, you did them to size?

CN: Yeh, I just found it was easier to work with if I did it that big. Originally I had all the coloured versions here just so I could test out the colours I guess, but eventually it just turned into just the black and white lines. I got the final versions and then highlighted each one individually because it was easier to get that colour that way. I tried doing some riso printing with it - ah but that was pretty expensive so, (laugh) – so I couldn't do that. Yeh I ended up with just going with a really inexpensive way of recreating that riso look so I printed them in here (University print facilities). How much do you think that was (pointing to a riso print)?

Interviewer: Um - Im not sure – fifty bucks?

CN: More – but we did a lot of copies and wasn't charging me for the copies. It was \$200. I was like – not doing that! So, I just did the extreme thing you know, and highlighting it all and that's how it came out.

Interviewer: Yeh, it still looks retro with the markers. Do you think you'd do the same process like where you use pencil and then going over it for all your graphic work?

CN: Um, I have done it for a few of them - like I prefer doing it like that. I think - once I realised how much I preferred doing things by hand the more I would develop something by hand before turning it digital – so yeh I can see especially when last year I'd done a lot more like that. I think that's where you're different from how other people design – like it allows you to experiment a bit more.

Interviewer: Did your drawings change as you went along.

CN: I guess I went back to pick up my own style. I didn't worry that some were a bit bad – I just went with it. It became my style.

APPENDIX 3: 2017 DH INDIVIDUAL INTERVIEW TRANSCRIPT

DH: When we got the brief (major project), I think I was like, I'm not too sure exactly what I want to do, so I went to just look online. You're like okay, I like this about this. Because I was going to do sculptures at first and I was just like, I don't know how I'm going to do that, and then take photos and then that would be in a book or something. But then I was like no, that's going to take too long.

DH: Then I don't even know how I came about with the idea. The process of actually doing it was just a lot of experimentation because my tutors were like, well if you don't know exactly how you want to tackle it, just get a few mediums - so I got paint, ink, chalk and then I just started doing it because mine was going to be typography based. Then I saw which one worked the best and then I was like, I think just drawing it on paper with either ink or paint was the easiest thing to do.

DH: Then if I wasn't happy with it then I'd keep going and do it a few times. Then just putting it into Illustrator and then doing image trace, and it was fine because it was my work. Then putting that into InDesign. It was a bit of a process. I also used one of those, what are they called?

Interviewer: Tablets?

DH: Yeah, yeah, tablets.

Interviewer: You didn't use your iPad?

DH: No, no I didn't use my iPad. I had that and then it was just easier just to quickly draw it straight on to the computer. After we got marked, not marked, but after the feedback my tutors were like, oh this would be better if you filled in the illustrations, for instance. Then I just filled it in with the tablet, which is quicker. I don't know if you want to see this (pointing to notebook).

Interviewer: Yes.

DH: Because it's a lot of writing. I don't know, I like to draw things, draw and then I'll write next to it what it was. I'd go back and be like, what is this for?

Interviewer: Your project was very illustration based.

DH: Yeah.

Interviewer: Do you see yourself as an illustrator?

DH: I wouldn't say I'm an illustrator. I'd say I like it because I like doing stuff on the computer as well, like graphics. This (pointing to an illustration) is not even for Uni, this is for work. This is my major project (pointing to written notes). Initially I was just going to do drawings and then the viewer would look at it and be like, oh this means this. But then not everyone understands what goes through someone else's mind, all of the thoughts. That's why I put the ... because originally it was just notes that had been given to me - and then I made a design about the note. Then it was just going to be images, but then after our presentation, my tutor suggested putting the note next to the image - but doing it in my own handwriting. Yeah, so this was the first initial idea (pointing to an image of a sculpture she had submitted for her HSC visual arts major project).

Interviewer: Ah.

DH: But then with the sculptures, I was like, how am I going to do this?

Interviewer: Are you happy with your final outcome?

DH: Yeah. I am actually.

Interviewer: Do you use the same process for all your assignments?

DH: For the advertising (part of the major project) we had to do little thumbnails and then we had to choose one of the thumbnails and then do a series of illustrations from that one thumbnail, but that's only because they asked us to. Usually I go straight to the computer, except for this one I guess because I just drew it randomly. This one's probably better.

JB: My picture book that I created for my major project, it really came about because I wanted to focus on illustration and wanted to do a large-scale piece of illustration work. I'd known that for a long time.

JB: The design process really started with, I have an interest in character design and do a lot of just random sketching and drawing and commissions and things like that. I suppose with most of my projects, and this one included, I started by developing different characters. I was doing a non-fiction piece on historical individuals and pets, so I basically just found a whole heap of information and any person who was interesting to me, or that I could see a character design coming out in their story, I just started doing sketches.

JB: [I've got my pictures with me. I have all my old ... oh my goodness, I've got so much. I keep everything I scribble, so I had a big sketch book on my desk and pretty much as I was researching I would just sketch character designs, so I have all sorts of random things, from little doodles on bits of paper to more developed sketches](#)

JB: As I went along I found that my sketches became more and more detailed. To start with I'd just be doing little thumbnails and shapes and some of them you can't even understand what they are. But as I got into a rhythm and over the weeks that I was developing my characters, they got a lot more detailed. This one's probably a good example of that. That sketch there was the initial sketch but it was also the final sketch, which I found it was getting a lot quicker as I went along.

JB: I also, I suppose make myself a bit of a mood board. [Everybody goes to Pinterest now, don't they? I spend a lot of time on Pinterest looking at other illustrators that I like. I knew part of this project for me was developing my own style and getting that a bit more solidified to what it had been in the past. I spent a lot of time looking at people that I follow online, and stuff like that, before I started drawing as well.](#)

JB: I did a few texture examples and things like that. Even though I was illustrating digitally, I knew I wanted a traditional look, so I did a lot of painting and drawing and then on my computer, turned these into textures and things like that as well. A lot of it, for me, comes from I have to be attached to the story. When I was doing my book, the characters I picked were the ones I thought that's a really cool story or I wish I knew more about that person. I see something in that and really run with it. Usually in my first few sketches, even if they're really crappy, something comes out of it.

JB: This was the first illustration I did for the whole book and this was what became one of the main pages. If you have a look in the actual book this one here is actually, in the back here, that's my old copy. That monkey there, that was one of the first scribbles I ever did and she ended up being one of the main illustrations, which is pretty cool. That one became one of the portraits as well. Generally it just starts with a lot of scribbling and I just find something that I'm interested in, so I do a lot of research to find the things that I really want to focus on.

APPENDIX 4: 2017 JM INDIVIDUAL INTERVIEW TRANSCRIPT

JM: Okay. With this assessment, it was very iterative, which is actually not usually something that I feel like my process ... something that is reflected in my process. I'll just start off by saying that, normally, in my design process, I'm not a sketch person. I'm not really much of a person to just jot down ideas on paper, like write things down.

JM: I just go straight into the digital design phase, and I just immediately just start making something, so I have an idea and a visual in my head, and I'll just start creating it from there. Sometimes, I don't even think of it as a draft. I just think I'm going straight into it, and I'm just going to make it, and I'm just going to see how it turns out.

JM: In a way, it kind of is a draft, but I'm not just putting together colors, and shapes, and all of that jazz. I'm just going straight for it. However, with this project, I really was thinking about it. Although, I still wasn't really taking a lot of notes and sketches and things like that.

JM: I was diving into it, but as I was creating content it just kind of was growing from there, so I feel like the designs were already there in my head and ... how can I word this? Sorry, I just got to think about that.

JM: *The visuals were already in my head. I had done a bit of research – okay, I'll say that I previously did a bit of research into design styles, although I already did have an idea of what it was going to be. I just went straight into it. I just started doing some digital mock ups and things like that.*

JM: And nothing really that was on paper. It was more so like building a strong foundation already, not so much sketching and just that kind of thing. Anyway, I'm rambling, sorry.

Interviewer: No, it's fine.

JM: *I had a visual idea in my head straight away, so I started to develop that very quickly, and then as I was developing that idea it just kind of grew from there. It was more like little tweaks, and just extensions onto what I thought was going to make it better.*

JM: A lot of the visual ideas that I had came through in the final piece. There were some ideas that I wanted to incorporate into the final piece that didn't make it in, but I feel like the initial idea that I have is what shines through in the piece. Maybe I'll just go through, so I can actually just have some examples to show.

JM: When I was initially thinking of how this is going to be laid out, this is I would say about 90% what I was thinking initially, when I had the first idea. But it did come with a lot of edits. I think, at first, it was very text heavy. I had a lot more than this.

JM: Even if you might think this is text heavy, it was a lot more than that initially, so I did cut that down a lot, and I initially did want to have this sort of style of layout fit each of the consoles. I was also thinking of doing an exploded view.

JM: Like how they have a piece of tech, and they kind of just pull it apart, and it's all diagram. But I just thought I can't do both. It would take so long to do both, and I just have to stick to one style, otherwise it's just going to become too much, and I want to keep it focused on the visuals of each of the consoles as they are, and not so much a technical breakdown, I suppose.

JM: And I also, in line with my style, I really want to keep it minimalistic and professional looking, because that's what I feel like I'm just suited to the most. There is some color, obviously, throughout. I wanted to try and reflect the color of each of the consoles in the layouts, and in some of the more colorful spreads like this one.

JM: But still, just keeping it professional, keeping it ... injecting a little bit of fun, but not too much fun, because I see this as more of an appreciation piece. Sort of like a museum, if you will, if you're just kind of strolling on through, and having a look, and these pieces of artwork are displayed, and you just kind of see them for what they are.

JM: Yeah, that was really my process in the end. I had an initial idea, and I just very slowly built upon it in an iterative way, and yeah, that was my process for the project.

Interviewer: Thank you.

JM: Is that all?

Interviewer: Yep.

JM: Oh, okay.

Interviewer: That was great.

JM: Sorry. I do tend to ramble a bit, but it's because I don't want to stop talking, and I'm just kind of feeling it out as a talk, so there's probably a lot you want to edit out.

Interviewer: No, that's fine. That's good. But you're not an illustrator, are you?

JM: No, and, well-

Interviewer: And yet you have done a fair bit of illustration.

JM: Yeah, and that's the thing is that ... maybe I should've added this, but I suppose I can say it to you anyway.

JM: I'll just add it now. You can rearrange this however you like, I suppose. I'm definitely not an illustrator. I consider myself to be a person who specializes more in the branding, and layout design. Just a much more simple process than, you know, plotting out character designs, and having to focus on things like anatomy and stuff.

JM: I just don't consider myself to be so great with that, however, with this project, I wanted to challenge myself. I wanted to say, "Well, although I think my strengths lie in branding, I think I can kind of make that shine through in an illustration project, and still be able to keep it very simple, very, I suppose, methodical. Mechanical, perhaps."

JM: But in the end, it was like a huge challenge to myself. And although I've never really considered myself to be interested in the publication space, because I'm more in the digital space, I just really wanted to give it a go. When thinking of the outcome of a major project, I thought, "Wouldn't it be nice to just be able to hold an object in my hands?"

JM: I know that you could create an app, or have a website, or something, but it just doesn't have the same impact to me. *I feel like even though I am really immersed in the digital space, at least at the moment, I just wanted to finally be able to say, "Okay, here's an actual, physical product that I have made" And just for people to be able to sit down and have a look through it, and physically look through the pages, is something that was really a goal, and really just appealed to me*

Interviewer: Did you do any thumbnails at all, or go straight into it?

JM: I actually just went straight into it.

Interviewer: Because you did say you did a few sketches.

JM: Well, it was mostly like, with the sketch part, I suppose it wasn't even like anything on paper. Just a rough idea, - "This is the visual in my head, let's put it on the thing (computer)." And then that very first one (illustration) looked similar to what it is right now.

JM: I don't want to sound cocky, but I feel like once I have an idea, I put it on there, I feel like that's just good. I feel like, to me, it's just already good.

Interviewer: OK, but when you look at that (pointing to a spread of his final major project), do you think, "Ah, that looks like something else I've seen." Or, "That's what inspired me." Can you think back to what inspired you?

JM: The problem is, is when I look ... when you look at publications that are about video games, and just ones that are in this kind of style, there wasn't anything that inspired me because a lot of them look very sort of tacky, and video gamey, and they're full of video game characters and things like that, so just in that area nothing really inspired me.

JM: But I did find a lot of things online, like as I said, even the exploded visuals. Not that I included exploded visuals in mine, but there were just some sort of blueprinty visuals like that that did kind of inspire me. But no, nothing really that was directly a publication that I looked at and went, "Oh, wow. I want my book to look like that."

JM: I just wanted my book to be something different. I wanted it to be a more professional piece of work that sort of stands out in the video game publication world.

APPENDIX 5: 2017 JW INDIVIDUAL INTERVIEW TRANSCRIPT

JW: So my project, *Unicycle Giraffe*, was bit of a process, for sure. There was no, "I woke up one day and I'm like, yeah this is the idea", because a lot of my work revolved around my technical ability as well as illustration. So I guess, I think my project started off with making a giraffe walking game. And it kind of worked but it wasn't really a game and I don't know it was, you could kind of play with it. But yeah, it wasn't a game basically. And then I was like, I was trying to just think of cool ideas but, I don't know, it's hard with games 'cause you can think of a really cool idea but it might not translate that well into a game if your execution isn't very good or you have technical limitations.

JW: *I moved into this new program called Unity and I was trying to emulate the giraffe walking, just to see if I could use the new program. And I could not get it working. I spent ages on it. So, I just put the giraffe (head and body), and got rid of his legs and just put a circle there. And so, I could rotate the circle. So, he just moved that way and I was like, oh, yeah, that's awesome. So, I was like, oh, this kind of looks like a unicycle. So, that's how that idea came about.*

JW: *I usually try to have a stronger concept before I begin, but definitely with game development, you have to kind of have an idea, test it out, have a new idea, test it out and kind of flesh out your ideas a bit more before you can see if it's even good or bad, basically.* Yeah, it was a very iterative process of seeing if it'll work and then once it did work, trying to make it fun and trying to see if it was achieving the goals I wanted the game to have - being addictive and short gameplay. Yeah, it worked out somehow. And that's about it I think.

Interviewer: So, for the idea for the giraffe, did you do any drawing or sketching or thumbnails before that?

JW: I think, let me have a look through my files. I think I did. So, for the first semester I was actually making weird hardware, custom controller games. I had something where you can move your hand up and down and it would move a little, it was like a little spaceship kind of thing in a game, by using my hand. So, I was kinda playing around with experimental stuff. And I think I just had one quick slide on a giraffe thing and my tutor was very excited by the giraffe and kind of encouraged me to pursue it further. I didn't have much of a sketch of it. It was like a very simple giraffe, 'cause I was just trying to see if the idea would work.

JW: So, it's what you'd call placeholder art or something or programmer art, where you just do something like kind of crappy art to put it in and see if it works. And then if it does work you usually make the art a bit better. But I never made the art better, I don't think. I was just like, oh yeah, it's simple, it works. That'll do.

APPENDIX 6: 2017 LAK INDIVIDUAL INTERVIEW TRANSCRIPT

LAK: Okay, so the first thing that helped me create the brief was the mini-briefs that we had to do during class. One of them was a collage and I think working with my hands, I've always gone back to the basics of the working with my hands. I always find that that's the best way for me to get any ideas.

LAK: From there, once I came up with the brief, I started researching what is currently happening in trends in the world. Then once I came up with how I'd connect that to my brief, I would sketch and I'd draw and I'd write lists. But everything is hand

written at that point and then once I feel like I've found the idea and the direction I want to go, I start doing everything digitally from that point on.

LAK: Even my research is in sketches as well. This is pretty much all the notes I did in class and it's all me writing, me drawing. These are the exercises. A lot of it doesn't make sense but as long as I had an idea down I could always go back to it. [I write it down to remember it more. Pretty much most of it is writing because this was jotting down ideas, and then I got into drawing and illustrating. I think at that point \(pointing to a page of written notes\), I started mapping out what I wanted to do, I drew little grids, and then it just kept going, kept developing after that. Then once I'd figured out what I wanted to do, and had a really solid idea, I started going digital, so that's where it ends. It's pretty much all written.](#)

LAK: Even with the experiments, I'll show you my slideshow. This is me looking at other artists and what they were doing online and that was from the brief, the collage work. That's what I wanted to show in my major project. I did a few experiments with other people and I would play music, any kind of genre and then I would get them to sketch what they could hear. The idea was - What does music look like? This is some of the stuff that they came up with. I guess it really helped because I could pick up some symbols that really connected with everyone's work. You can see clearly with some of them that there's something connected between each one. Then I went even more specific and I played a specific song, instead of a genre. From the sounds, there's pictures that started developing.

LAK: Then another experiment I did was with video. Putting grains of rice is a traditional African way of predicting the future - so they would place grains of rice on a drum and then they would hit the drum and see where the grains of rice would fall and it would form an idea of what was going to be predicted for the future. I tried to do that with the music, I tried with grains of rice and I tried with other ingredients as well - so this one was with sprinkles. I don't know if it will play (the video).

Interviewer: Ah - fascinating.

LAK: Visually it was interesting. I didn't get to use this as a part of my work but I thought it was something really interesting.

LAK: Yeah, that's where all my ideas came from and then I got a bit lost when I was developing my major work. I went all digital and that's where I felt like I lost my ideas. I felt like it wasn't showing what I originally imagined. I went a bit more digital with the way I did things and then the feedback that I got was that I really lost where I was going when I went all digital, so I took it back. I did a before and after. Originally I was going for this (digital) look and then I ended up going somewhere more organic. My typeface changed, my styling, so it went from this digital look to a bit more collage based again.

LAK: [I jot everything down because then I can always go back to it and remember where I started. That was before and after. Everything always leads back to my initial ideas. I never really fall far from it](#)

LAK: I did everything by hand, so I would photograph everything and then I'd print it out. I'd either rip it, create some sort of treatment to the image and then I'd scan it back in. I'd do a bit more digitally but I was still trying to keep within that organic style ... it was supposed to be very nostalgic in a way, to his music. You could hear this a bit in the way he made his music, there was some sort of grainy effect and it was hinting to that 90s rap, R&B kind of music, so I wanted to take it back to that. That's what I ended up with. I can show you the full major project.

LAK: It was just the journey. I always went back to my initial idea and I always make sure that I write everything down in case I lose my way again. I made him, the artist, a digital booklet and it had his lyrics in there, so that's the front cover and then these are each of the pages with the lyrics on them.

Interviewer: Amazing.

LAK: Everything was treated by hand and then scanned in. See the typefaces of all the words, the textures on all the images, everything was done by hand.

Interviewer: Looks great.

LAK: Thank you. I didn't get enough time to ... I really wanted to do a book version of this. When I have more time I think I'll go through that and make a book.

APPENDIX 7: 2017 MS INDIVIDUAL INTERVIEW TRANSCRIPT

MS: So, before we got into the brief we had to do a lot of researching and experimenting, like sketching. It was mostly researching on what exactly we wanted to - what topic we wanted to explore, and the problem we wanted to solve or the details about that. Once we had the idea, we started to do the sketches. So for example I did a vegetarian food delivery service and once I thought about what the idea was, and the reason behind the name and everything, then I could start creating the visualisations - so this is the sketching process. Do you want me to talk about the stuff after that?

Interviewer: Yes

MS: So yeh, I did just a bunch of sketches - there's not really a specific number of them it was just all the ideas I had in my mind after I did all the researching and all the thinking process behind that. [I wanted to get that out of my mind and kind of visualise it before I went onto the computer and then create the final.](#) That's why this was a really important stage to - just to get all these initial ideas out. Once I created all these ideas I chose the ones that I thought might work - like I thought they would go somewhere, so then chose specific ideas - it would have been about five ideas. it wasn't two or three, it was like quite a few actually, and that's when I started to digitalise it. So, I started to refine it to see if it does work and then - but also keeping in mind that it relates back to the research stage - like it makes sense to why I'm choosing things - specific things within the sketch.

Interviewer: Would you start all your projects like that?

- MS: Not all of them, it depends on what the project is. So for this one we spend most of the first semester just experimenting and researching. So we had a lot of time to do that - some projects don't allow much time....you have strict deadlines so you kind of need to get straight into it. Yeh, you know it also depends. *Like logos I always do sketches because a logo could be absolutely anything. So you want to go straight onto the computer and use that one idea cause most of the time - like before in my experience I've never had that one idea that didn't end up becoming the final logo - and even if it did it would've been really similar.* It would have been similar but it would have been quite different to what that idea was. Things like layout and stuff - it also depends, like sometimes for example I'm working on a report and I already know how its going to look because there's been previous reports so it's kind of like a series - I know where its heading, so I don't need to do a sketch in that situation. But like other layouts for posters and stuff sometimes you do need to do a sketch in case - it just saves time you know - cause you could have this idea and then create it on the computer but it doesn't end up becoming as good as it was in your mind, so just doing a quick sketch you can actually see it before it becomes something.
- Interviewer: That's interesting. Do you have anything more to add?
- MS: Um, just in terms of the sketching stage - well I just think it's really an important part of your entire design process because it's pretty much the foundation. Like without it you can't really get too far. But also another thing - your design process isn't always the same for every project - it could be linear - I create the sketch I make it better on the computer, like I keep developing it instead of going back, but then there could be other project where it's kind of like a circle so sometimes you do have to go back to the drawing board if something doesn't end up working out. Like for example *with my leisure project (major project) - I was creating logos up until quite far into it - I already started creating all the other specific stuff like my layouts and it got to a point where - I need to go back to the drawing board with my logo because it wasn't matching everything else that was going on with my project.* So, it depends on every project.

APPENDIX 8: 2017 RG INDIVIDUAL INTERVIEW TRANSCRIPT

- RG: With most projects, I'd say I usually begin by researching either the client or the specific sort of idea, I guess. I do a lot of research into that before anything, to inspire some visuals, I guess. From there I would research precedents, so what's already out there. How can I make whatever I'm creating different and unique to what already is out there?
- Interviewer: What do you use for that?
- RG: For precedent, I would just go into Pinterest. Probably Pinterest is the main thing, otherwise just Google. I'd just type in ... for example, I did a project around self-care for my major, so I just type in maybe self-care publications, and just get an idea of what's already out there. And then same thing in Pinterest and get an idea of visuals. Then after that, I guess I'd go onto Pinterest and start to get a feel of how I'd like it to look. *I don't do a lot of drawing, but I will maybe write a couple of words, because words inspire visuals, for me, as well.* So, I might write down a few things, key things that I want to focus on.
- Then *I go into Pinterest and create a mood board around the color, shapes, typography, and start to understand how I'd like it to look and feel. According to the research that I found, and what I think the target audience would most connect to, I'll start,... maybe I'll do some sketches ... for example for the logo design I might do some sketches of logo designs. I do have random things in here (pointing her notebook), but a lot of it is writing, to be honest.* But just little things, like this is just for a racism campaign. This was this project. For example, that was just who, why, what. Then client's take order.
- Then these were some drafts that I started. This is from this book here. From there, I would start to actually do things on the computer and play around with colors and shapes and things. Until I find something out of this. As you can see, I did have something going here with the circle and everything. This one, I think most connected to me, so I started really playing with that. It's just a matter of refining really, until I find something that works and that can be quite versatile.
- RG: See, even these, it's all very ... *I'm not a drawer. I just sketch things and get an idea of how I might want it to look and feel and how I want the word to look. I'll write that down too. Yeah, and then here, I think I was playing around with names here, so I was talking about connecting and all that. Then "unites" - and I was thinking how all these different ... art, food, art, music, all these categories under one umbrella. So, I just started to play around with visuals like that. Yeah, I think that's the main process that I do for most of my projects, really. Yeah. A lot of this is writing, but it's not anything neat - there's no thumbnails. I don't do thumbnails. I guess this scribble is - but that's for a website.*

APPENDIX 9: 2017 GROUP 1 DISCUSSION TRANSCRIPT

Group 1 discussion (AA, LAK, RG & DH)

- AA: So, as I answered earlier in this sheet - I said it depends on what discipline you want to get into. Some disciplines require more drawing than others. As I said, UI/UX design with wire framing and stuff like that, you do need to know how to draw somewhat. So, I guess it depends.
- LAK: Yeah, I'd have to agree. And I think we're moving more towards digital. And we don't really need as much of that process anymore, I feel. But there are professions that will need that and really rely on that stage, yeah.
- DH: Yeah, I agree as well. Because it depends on what you're doing. If you like to start drawing on paper, or if you want to get straight onto the screen and start drawing on there. It's a similar kind of thing...
- RG: I would strongly disagree. And I get what you guys are saying but *I'm not a drawer, but I feel comfortable and confident drawing on InDesign or Illustrator with the pen tool and so on. Or copying things like images with the pen tool and things like that. So, I don't think you need to be a good drawer as such. I think if you're doing illustration, well that's different, but that's obviously your discipline. And I think a lot of illustrators these days are quite unique as well. They're not necessarily great, but their work is really unique, and that's what makes it really good as well.*

Interviewer: And do you find that the processes that you're asked to do for an assignment (leading up to an assignment), match with the processes that you use yourself?

RG: Yeah, as far as researching precedents we're often told to do that, and get a real background of whatever the idea that we're exploring. We have to do a lot of research into that. I think the Rabbit Hole was really good this year with how we went about the design process. The steps of doing the logos and refining each week, trying different colors, and fonts, and things. I think that was really good. Yeah.

AA: Yes -you know when we were doing the major brief at the start of the semester - remember when we did those mini briefs? (everyone said yes and agreed). Yeah. Oh that was fun too. Some of them did include drawing, I remember I had to draw myself.

LAK: Yes.

AA: And it was so ugly, I loved it. Yeah, it was fun. Because as LAK said, everything is digital now. So, we don't draw a lot as designers anymore. So, to have that time just to be able to do whatever, was actually quite fun too.

LAK and RG: Yeah I agree.

DH: I disagree, because I drew a lot for my manager project. I mean, like, I chose to do that.

AA: Yeah. That's true.

DH: Because you did the app.

AA: Yeah.

DH: Yeah. I mean, you were drawing, but on the screen.

AA: Yeah.

DH: That's a bit different.

AA: Yeah.

Interviewer: Is drawing digitally as opposed to drawing on paper that different?

DH: Well, I don't know.

AA: Well I don't have to do a lot. Because digitally, if I drew one thing, it's so easy to just copy it and change it in Illustrator, or whatever. But with your project, it's different.

DH: I found, when you're drawing, you're like, "Oh yeah, I just want to change a little bit," but I found that I couldn't. Because I would have to start from scratch.

DH: Yeah, you have to start again.

RG: And that would be hard especially if you're doing a book or some sort of drawings where you have characters. You have to keep drawing and make them look the same and that would be really hard. Whereas digitally, it would be a lot easier. (They all agree)

Interviewer: Would you try doing the next design straight into a digital format? Because you drew it on paper first and took it into Illustrator and traced it and then took it into Indesign. Would you do it straight on the computer using a tablet next time?

DH: Depends what it's for. If they (the client) want it looking hand drawn, or if they don't really mind, then yeah, I would just go straight on to the computer. Then I was like, "oh I want to do something different and make it harder for myself". (laughter) Yes. It's a struggle.

RG: Could it have been a sculpture...

DH: It could have been a sculpture. But, yeah.

Interviewer: So, you (directed at all participants) never through the course of the units, first to the last year, you never felt that there was a disconnect between what you were asked to do, in terms of process, and what you actually did do.

LAK: Yeah, I think so.

Interviewer: So nobody went back and did sketches retrospectively knowing I'm going to be marked?

DH: I must admit, sometimes ...

AA: Yeah, I feel like there were occasions where it felt like it was a waste of time to go through that whole process.

RG: Yeah. I know a lot of people weren't happy doing the milestones for their major project.

LAK: Oh, yeah.

RG: But I really liked that (the mini-brief milestone projects), because I had no idea what I wanted to do. But people that knew what they wanted to do found that a waste of time.

DH: Yeah.

RG: I think you need to be more open-minded to begin with, to see if you can find anything else.

DH: And it gives you more experiences? If you're experimenting with different things ...

LAK: Yeah.

DH: Then you might find something that you do like. You're like, "I never even thought of that..."

LAK: Yeah, “find something else by doing.”

AA: That's true.

RG: Yeah. Because I found my idea by looking through the newspaper. Remember when we had to do that? We had to find articles that were interesting in the last month or so. And mine was around self-care. And that's how I got my idea. So ...

AA: Yeah, I got mine from the collage mini-brief. You know, we had to create that collage? It wasn't the idea of the whole brief, but it was the style that I wanted to go with.

RG: But the only other thing is, with the individual reports that we often had to do, if they said include sketches and thumbnails, I must admit, I sometimes didn't have any. I would go back and just go, “Yeap, this is what it looks like now, I'll just do a quick sketch of what it would look like”. Sometimes I did sketches, but sometimes I didn't and I just had to make something up a little bit.

DH: Yeah, because I find I have to see the whole thing, how it's going to be on the computer. And then be like, “Oh, it needs to be this,” or “No, it doesn't look good like that.” Because when you're drawing it, and then when you're actually doing it, it's different.

RG: It's funny, because I was a bit the opposite.

LAK: Or, really?

RG: The previous years when we first had to do the individual reports, I got into the habit of saving different versions of my artwork. Then I always had copies of my thumbnails.

DH: Yeah, right.

RG: Yeah. So I got into that habit of creating versions of my artworks.

AA: *I always think that my sketches don't make sense. So, if I was to show them to people, they'd be like...*

LAK: *Oh, it's the same with me.*

AA: *So, that's why I never really showed process drawings and stuff, because they're going to be like ... how did you get that?*

RG: *Yeah, yeah, totally.*

AA: *I think that's something I personally have to work on myself. I should be able to just show everyone, because it's something to talk about as well.*

All: *That's true.*

Interviewer: Well, sometimes you have things you do just for yourself. You don't need to show everything.

LAK: When I was showing you my sketchbook before there were swear words in there and I was thinking “like Why? Was that even me? What was I thinking at the time? Was I just stressed out?” Oh my gosh.

Interviewer: Nothing I haven't seen before.

RG: *When I went back through my notebook, I'm like, gee, I'm very messy. I just write things randomly or draw something really random, and it doesn't look like anything, but somehow for me, it works.*

Interviewer: We don't get to see any designers' messy sketchbooks. So, you never really get to see that the way you work is possibly very similar to how somebody else works.

Everyone: Totally.

Interviewer: Is anyone taking a year off? Are you all going to go straight into work?

RG: I took a gap year between high school and Uni. I feel I've sort of done that. I'd love to, but at the same time, I'm ready to get in there. It's a year ... I don't want to forget things.

Interviewer: So, RG, have you got a job in the industry now?

RG: No, but I'm working. I'm doing a summer scholarship though. I'll be working with the Center of Research In Excellent Health For Adolescents. The CRE. They're creating a new health service for adolescents and I'm doing their visual identity and branding.

Interviewer: As a freelancer?

RG: Yeah, I'm doing it by myself and my tutor will be my supervisor. I'm also working casually at a café.

Interviewer: And DH, what are you doing at the moment?

DH: Some work. It's this air filtration company. They're called AES Environmental. They needed someone to do their marketing and stuff. So, I was like, I'll just apply - whatever. Probably not going to get it. And then they ended up asking me to do their brochures and their website. They needed a new logo and other stuff.

Interviewer: And you're there as a contractor? Full-time?

DH: No, I was just doing it part-time, because of Uni which was perfect. But now I want full time. So yeah ... we'll see what happens.

Interviewer: So, have you applied for any other positions anywhere?

DH: Well, no, because I don't want to apply for jobs and then my managers come to me and be like, “Oh yeah, we've given you full time.”

Interviewer: So, you want to work there full time.

DH: Yeah. But I'm worried that it's going to come to a point where they're just like, "Ah, okay. You've done everything that we need you to do."

AA: It'd be good if you did apply for other jobs - just in case.

DH: That'd be too efficient. (laughter) and I thought, it's coming to the end of the year...it's a very awkward time of year to start training someone new. Everyone's told me- "Just have a good holiday".

AA: That's why I've been applying. There are some places. I'm trying to apply now so at least I'm kind of at the top of the list.

LAK: That's not a bad idea.

AA: But we'll see how it goes. I don't expect to hear from them for a while anyways.

DH: I've been wanting to fix up my resume.

LAK: I just haven't had the time to do that stuff.

DH: Yeah, I didn't realize how long it took.

RG: You're constantly changing it also...

Interviewer: Yes - you want your portfolio to reflect your most recent skill level.

Everyone: Yeah, definitely.

Interviewer: So, LAK, what are you doing at the moment?

LAK: I am working as a primary producer at TVSN. But I am looking for a graphic design role.

Interviewer: So, you're applying for internships, or are you applying for jobs?

LAK: Jobs.

AA: I'm the same as LAK. We both got scholarships. Just branding for the University Life mag. But I am trying to keep in touch with people I've met at the Grad show. I'm saying to them, "Hey, I'm busy right now, but I'll get in touch with you, later on." And they've replied saying, "Yeah, just email when you're ready." So I probably could find something.

Interviewer: That's good. When does the scholarship finish?

RG: End of February. So, it's good timing. I feel like I'm having a break, but at the same time still doing something.

AA: And it's good that we get to keep ourselves busy in design.

Everyone: Yeah, totally.

LAK: Just to keep it going and not stop.

RG: Yeah, that's what I found.

DH: I don't get to do much design work anymore.

Everyone: Yeah, exactly.

LAK: Unless you want to do something for yourself.

Interviewer: Well, there's always somebody who will ask you to design something - you just need to put yourself out there.

APPENDIX 10: 2017 GROUP 2 DISCUSSION TRANSCRIPT

Group 2 discussion (JB, JM & JW)

JB: Process for me, I have to sketch anything that's going to be good, but my sketches don't have to be good. So the most important thing for me is, when I have an idea I have to scribble it down. Otherwise within a few days it's gone. But if you look at my sketchbook, there are pages in there where you would not even know what I had drawn. But for me, that's still useful. I can turn that into something later on. If I don't sketch it or scribble it down or at least write it down, even writing it down sometimes for me is helpful. But if I don't do that, the ideas just disappear.

As far as whether I think it's important to have drawing skills. I personally, I know a lot of designers now who can't draw, but I find that fascinating because I don't think I could, I can never imagine designing anything without sketching it first. I actually do some work at the moment where there is no planning process and I struggle with it a lot 'cause I can't just jump onto a computer and start something. I need to have thought about it and come up with a concept and at least scribbled something down. I can't even do my sketches straight onto their computer. I have to have them on paper, take a photo and then put them into Photoshop. So I can't imagine designing without drawing.

And I would say, and I don't want to offend anyone in the group, but I would say that the designers I know who have a drawing background, are much stronger designers from what I've seen at work and in class and stuff like that". "I would say people who sketch things and are good drawers tend to have a better idea of composition and spend a bit more time, I think, with the idea because you have to think about it when you're drawing something - rather than just rushing in and putting something on the screen. So I would say yes, it's very important.

JM: So, I'm on the opposite end of the scale. I am a designer who just cannot draw. I can do very crude drawings, but even those I just fail to, you know, show any artistic ability in them. But I mean, like I said, this was an illustration project of mine. However, not so much a traditional illustration project like how JB has the process of, you know, sketching characters and really focusing on the anatomy of not just people but animals and stuff as well. And I'm doing a lot of study into, all different types of animals. But no, for me, I don't even use any, like a Wacom tablet or anything. Or any sketchbooks, I just go straight onto the screen and I just, like I said before, I just start to make it, I don't really do much sketching. It's all just about getting the main idea in my head onto the screen, and kind of having it finished as much as possible.

I feel like the drawing can be important depending, like drawing skill can be important, depending on what discipline of design you want to go into. I just feel like for me, it's really not that important. There are just multiple ways you can approach design. And even though my processes are very minimal, I still feel like I can produce a strong piece of work and it's something that reflects my minimalist style as well.

JW: So I guess my process, is the question. So for me, I think, I don't know, I usually do a lot of different styles. I'm pretty inconsistent. But I think the best way I usually work is actually thinking about, spending quite a bit of time thinking about a concept and really trying to start with a strong concept. And then once I do have a concept, for example, I was working on a website the other day and I just did some really, really rough drawings and if you look through any of my notebooks, all the stuff in there look like crap, but it's more about just exploring the ideas really quickly. And you might draw something, it won't look good but you can kind of try and visualise it more in your head.

So I'll usually have a few ideas of how I'll do it and then I'll usually go in the program. But I usually, it's quiet adaptive, so I'll probably do my first idea and then I'll kind of look at it and be like, I don't like this, don't like that and I'll keep working on it and kind of, I don't know, it's like you've got a rock or something. You've got to chisel it away until you've got the gem or whatever. So that's usually how I work and then usually, hopefully have something nice at the end. So it's pretty ugly at the start usually.

Interviewer: Do you think it's important?

JW: To draw? It's not important to be good at drawing, but I think as a way to quickly visualise your ideas, then I think it's really important. Yeah.

Interviewer: How did you find the process of the assessment tasks mapping with how you did your process?

JW: Mine didn't really line up very well with what I was doing, I don't think. I think most of mine were kind of late and done quite poorly and I just kind of did them because I had to do them, it wasn't me thinking much about myself or the world or whatever, I was just kind of ... yeah, just things I had to do.

JB: I think for my major work the process probably matched up quite well, but I specifically picked, it's like I already had that illustration process, so for me that's why I picked that project, because I wanted to do an illustration project, but in terms of other assessment tasks, I don't think I would always ... I don't approach everything the same way, like if I was doing my motion graphics, stuff like that, that was less about the design and more about learning the software, and learning how to do the key framing and doing tutorials and things like that to try and actually work out how to do the stuff.

I don't know, I think there's some of the other assessment tasks that were a bit more, I don't know, commercial illustration, I don't know, a bit more businessy or corporate sort of style. Stuff like business cards or websites and things like that. It's a different process and it's probably not as ... it's probably more structured and more based on looking at inspiration and then jumping into the screen based stuff. But for me that doesn't work as well. So I guess I'm saying that my assignments that weren't illustration based, and that were more sort of digital things probably weren't as good as my illustration based ones, because I don't have a good process for those, if that makes sense? Do you know what I mean?

JM: Yeah. Sure. It's hard to say for me. My processes for assignments were inconsistent, and I felt like a lot of the assignments and any projects that I worked on, I don't feel like I really enjoy them that much because they just didn't appeal to what I wanted to do. In a way sometimes it felt like I was just kind of being told what to do and I was like, "Okay, I just have to ..." not like meet the requirements, because that makes it sound like I'm going to the absolute minimal effort, but I guess ... it's hard to say. I guess most of the time it was just kind of like, I don't want to say winging it, but I just wouldn't think about it too much I suppose. I don't know. But there were other assignments as well where I could, like this one where I already had the idea in place and it was sort of a slow process, just slowly cooking and building up to what it is. But that's probably not a great answer though.

I think for only some of the time I felt like I had a lot of freedom and even like JB said with the motion graphics one, she said it was like more about learning the software. I actually kind of felt like it was more about the design on my part. I felt like the techniques I didn't use as much of in the software, but with the visuals it was mainly focused on that part.

APPENDIX 11: 2017 GROUP 3 DISCUSSION TRANSCRIPT

Group 3 discussion (CN & MS)

CN: So, I think at the beginning I didn't realise the importance of that phase of drawing, because as I said, I've really always wanted to just jump straight onto finalizing the first idea that pops into your head.

MS: Yeah, 'cause your first idea will normally be other people's first idea as well. So, that's where you want to go beyond that. And you can't really go beyond that without doing sketches to get all of that out there. And also, for example, when I do sketches, you will look at the first few good ideas that you like and you might make them better on the computer, but then they don't make it in terms of meeting the brief and all that. So, you can go back to your sketches and see what else was there as well that you probably missed. So, that's another good thing to have as well.

Interviewer: Do you always use paper and pen to sketch?

MS: No. Sometimes I will do it on my iPad on the sketching app and that's where I can choose different thicknesses for the brush, and different colours.

Interviewer: What sketch app do you use?

MS: Bamboo paper.

Interviewer: What kind of stylus? Do you use your finger?

MS: Yeah.

Interviewer: Do you use the iPad for anything? (Question directed at CN).

CN: No, I haven't really used it a lot. Maybe I will give it a go.

Interviewer: Where you given a free one?

CN: Mm-hmm (affirmative).

MS: Yeah. Otherwise I wouldn't have purchased one.

CN: Yeah, I think so too.

Interviewer: So, when you talk about your research, what do you mean by that?

MS: So just having a look at what's already currently out there and also getting inspiration from different platforms like Pinterest, even Google as well. But it's just a way to see what's out there and how you can be different and just to get yourself into the mindset of that topic area. So, for example, food, you would look up logos to do with food to see the colour palette they use, the typography that they use. Just to get yourself into that mindset. So, that you have somewhere to go when you start doing the sketches. It's not just done without any research.

interviewer: Do you use Pinterest?

CN: Yeah, the same way. I think it's both a mixture of going on Google, but I find that Pinterest is a really good place to, as you said, to see how everyone else is doing everything and how your design's going to fit into that as well. Not designing too similar to everyone else, having your own style, but also working with trends as well.

MS: In my process, just so you can quickly get all those ideas out there because after you've done all the research and everything like you have all this happening in your mind you want to put it down and you wanna do it really fast and I think the faster you do it the more ideas develop as well.

interviewer: You two seem to work quite similarly.

CN: Yeh - like once you've got a brief and you've done some research its the best way to go about - your next step is to draw thumbnail to get your idea moving along - like helping you to get heaps of ideas. It helps you narrow down your ideas as well - quickly - cause you can see some stand outs of the style you've got straight away and it like helps you narrow it down to three or four ideas. Um and guess it helps you get rid of all the unrealistic ideas that you have when you first get a brief.

MS: To test techniques - like things you learnt while you were doing this stage of the design process.

interviewer: You seem to both use sketches quite often in your process. Do you think it is important though?

CN: I think it is - like there are plenty of designers who can work without it but for me I think that if you start on paper you've got so much more room to experiment with than if you start straight on the computer. You're limited and I think if you worry too much about alignment or what type face you're using and sort of get carried away before you're looking at the main overall idea.

MS: Yeh, and especially as a young designer, because you don't have that much experience, yeh, so you don't know um how somethings going to turn out. Like sometimes like if youre experienced in something - like for example - I create a lot of layouts so I don't create that much sketches for them because I think I've done it enough that I think I know how it might look. But for things like logos and that, I do need to do sketches just to get all that out there, because I know that if I had used my first idea its probably not going to be the first.

interviewer: You are both confident drawers. Do you see yourself as an illustrator?

MS: Not in terms of specialisation. That's why like I did do illustration for this just to do something out of my comfort zone. But I specialise more in layout designs, like the recipe card that I made - and branding as well, that's why I created a brand for this.

interviewer: CN, do you consider yourself an illustrator?

CN: I think so like its definitely something that I really enjoy doing. Like probably what I would go to first in design but I also like doing layout design as well and a little bit of branding.

APPENDIX 12: 2018 AB INDIVIDUAL INTERVIEW TRANSCRIPT

AB: Okay. So I think for me, I was kind of, just like, I did a big brainstorm on feminism. That was my very first thing, I knew that I wanted to do something that I was really passionate about. I also have a niece who's really a little bit of a tomboy. I've just always found that there aren't things that suit her, and I guess growing up it was similar for me, you know, There weren't toys and things that suited me. That's why I went down the track that I did.

AB: I guess brainstorming is my first step. I just write down notes and things. I guess for me, because I was making the 3D action figures, it was more about getting into the program and just playing with it. And I kind of worked out joints and things just through sketches. I guess later on it was more about just getting into the computer and playing with it. I did

some other ... I guess I did some sort of digital rendering of what I was planning to make in a 3D space and I did those just in Illustrator. Let's see what I can find.

Interviewer: Did you draw directly in there or did you draw-

AB: No, I think I usually do a really rough sketch and then trace it out in Illustrator. Sometimes I will use actual images, because I was using the free color, I got an image of her face (pointing to a painting of Frida Kahlo) and then traced it out to get that image of her face. These were really early ones. They were just traced out. And you can see they totally ended up changing along the way... like once I got into the computer I played around and I started making things, and it's easy to manipulate in the 3D program I was using, so it kind of just changed that way.

Interviewer: What program did you use?

AB: I was using *ZBrush*, which is really amazing for digital sculpting. And then when it came to my packaging and stuff, I start off with a lot of sketches. So I start off just doing things like that. And, you know, working out, playing around with logos. With logos I usually ... I always start with my logos, just straight into Illustrator and just use heaps of different fonts and play around with that to start with. So I don't really do a lot sketching or anything for that.

AB: But I do this kind of rough sketching when I was working out the shape of the packaging, and my first one, it started to look too much like a milk bottle, do you know? I was just, you know, go through that and trying to work it out. And then it was a matter of me actually working out how to create that box shape which then I did. I had cardboard and I was just cutting out cardboard and trying to make that. And then once I worked it out, I'd just take all the measurements into Illustrator and mock up a flat template.

AB: And then that flat template, I pretty much just went straight into putting things ... I just kind of moved things around in Photoshop. But I also did, for parts of it, I kind of do these rough render sketches. It's so I can work out the placement where it is, so I just do that whole thing and I know that the opening to the box is here, and I have the actual template overlayed on that and then I rough it in. This was the second time around when I was adding to it, because that was my first one and then I added those extra leaves once I could see it needed more.

Interviewer: Did you draw directly using the stylus?

AB: No, I was using my computer. Just straight on. And then I'd do the same thing, once I got it there, I just go straight in using Illustrator and just draw it straight in and then color each section.

AB: But that's basically it. I don't do a lot of sketches. Sometimes I will if I'm a bit stuck, but a lot of the time I can just see it in my head, and then, I will make it. If it doesn't look quite right I can just move things around in Photoshop.

Interviewer: Do you start with a mood board at all? Perhaps [crosstalk 00:05:21].

AB: Oh yeah, I always have a Pinterest board going, especially for this project, because I kept getting really stuck. Because I think this was a really different style for me to what I usually work in, so I had a Pinterest board going all the time and I was constantly going back to that and flicking through and trying to make sure, you know, the packaging suited the other kind of packaging that was out there, but still stood out in a way.

AB: It wasn't exactly the same, but that was really important. It was something ... you know, I'm not really into collecting action figures and things, this is totally way out, it was just this ... like Leo says to me, "Oh, what have you made?" And I was like, "I was kind of thinking about doing action figures." And he's like, "Oh yeah, you could do that." And I was, "But how?" And he's, "I don't know, we could get them 3D printed." And I was, "Oh yeah, all right." And then that night, I was, "Why don't I know how to do this?"

AB: But then I just kept going with it, and you know, in the end it worked out fine. It was all very different to how I usually work for this project. But yeah, the Pinterest board was really important for this one.

Interviewer: So, with the figures, because they're the major part of your major project, you did some sketches?

AB: Yeah. Just really rough ones. It was more about working out where I'd put joints and things, so that was looking at other figurines and how they were jointed together and it was more about the technical thing. Also I wanted to really make sure that the figures weren't really skinny and, you know, there's heaps of templates that you can get online where you can just download the base mesh, and then you can build on top of that. But I had to make it completely from scratch, because all those base meshes have really tiny little waists and huge boobs and that was not what I was going for at all. I wanted it to be really accurate, and a really good role model for kids. So I did a lot of playing around with that sort of thing.

Interviewer: So, you're quite a good drawer.

AB: Yeah, I can draw. I just don't do a lot of it. I think it's because sometimes I feel like I can just get it out straight away without doing this (pointing to her sketches), and this (drawing) takes more time. I can just go straight into a program and play around a bit and do the same sort of process, like the same thinking process on the computer.

Interviewer: I'm just wondering about the drawing straight into the computer. You were saying that you don't use a stylus?

AB: No.

Interviewer: You're using a touch pad to draw with.

AB: Yeah. I do have a tablet and a stylus, but sometimes it's just quicker for me to do it like this. I'm really good at using the pen tool in Illustrator, so I can still get the same thing. When I'm coloring, I do tend to use the stylus more for coloring, but not for outlines and stuff, I just go straight onto the computer.

APPENDIX 13: 2018 GF INDIVIDUAL INTERVIEW TRANSCRIPT

- GF: My process started with story boarding on a thumbnail sort of level, so I mapped things out in really small quick sketches of what the story would look like overall. This obviously changed dramatically from where it ended up. Yeah, and working out colors and sketches - just really heavily sketch based development. I don't know how to put it.
- GF: And then it moved into more the illustrations themselves, doing these larger rough sketches on paper, scanning those, putting them on the computer and then printing them out again so that I could trace them much more neatly. The main reason that I decided to do illustration by hand rather than using a computer (because I'm also capable of doing that) - but it wasn't just about the aesthetic and the end result - I wanted time away from the screen.
- GF: I felt like I had spent four years on the screen, and I wanted my last year at Uni to be hands on as much as possible, and so that's why I decided to use pencil, and watercolor, and sketch, and trace those sketches, and do as much as possible where I wasn't just relying on Google searches of things for subject matter, but getting me or a friend to pose, or arranging things in my room and taking a photo of that, and then using that as my subject to draw. Yeah
- Interviewer: You did some observational sketches?
- GF: Yeah, I mean, there were times where I had to refer to imagery on the internet, but as much as possible I tried to produce it all myself. You know what I mean? Because I feel like my practice before had just become so reliant on...I don't know how to explain it, but on the screen - too repetitive, yeah.
- Interviewer: Did you do any doodling?
- GF: Oh yeah. Lots of doodling. And it's funny, because I don't think it's fully translated over into my design practice overall - doing actual design work other than illustration. I still have this tendency to want to see the end result too quickly, and so I skip over the sketching by hand and these sorts of layout sketches, and thumbnail sketches, and stuff like that.
- GF: I skip over that a bit, and I just go straight to screen, because I just want to see what it will look like, and I think that's just me being rushed, and perfectionist, and things like that. I do remember how you mentioned in class that in the future you'd like to check up on us and see where we're at and stuff - way down the line, over the next year or so. I thought then that I really wanted to work on just getting back to not relying on the screen, and just doing everything by hand, before moving onto the screen.
- GF: I think that you become more thoughtful about the concept when you're just doing sketches and you're not getting caught up in how it looks. You know what I mean?
- Interviewer: Do you ever use a collage style cut and paste, either physically or on the computer?
- GF: Yeah, using post-it notes. We had to do a bit of this in the Rabbit Hole at the start of the year when we're doing branding stuff, and I've kind of adopted that in my own personal space where I stick things up on my wall. Yeah, not quite story boarding, but just for brainstorming generally.
- Interviewer: Do you ever use pictorial notes?
- GF: No, I don't. Mostly, when I'm taking notes, it's just word based.
- Interviewer: Were these rough symbol sketches done for the major project?
- GF: No, they were actually done for one of the Rabbit Hole branding projects for Fairfield City Museum and Gallery, so that was like logo brainstorming. Yeah.
- Interviewer: Was this something that you were directed to do during the class?
- GF: No, we weren't told to do that, no. We had to show up with more realized versions of our logos, but that's kind of where I started.
- Interviewer: I know you're interested in branding.
- GF: Yeah.
- Interviewer: Do you use Pinterest mood boards in any way?
- GF: Yeah, for sure. Yeah, I always start out by creating mood boards and stuff. Sometimes on Pinterest, or sometimes I'll just create my own in InDesign, and then keep that as a file on my computer to refer to. Yeah.
- Interviewer: When you're putting a mood board together, is this something that you learned about during the course?
- GF: Yeah, yeah. I remember, in maybe second year or something, there was a class where we all had to set up a shared Pinterest board and a personal Pinterest board, so one that was public and one that was, just individual and private - that's when I started doing it.
- GF: And I find it really, really useful. I always, always create mood boards.
- Interviewer: Is that the first thing you do?
- GF: Yeah, I think so. Yeah. Maybe after doing some notes, and just brainstorming. So, if I was doing a branding project, I would brainstorm keywords and ideas about, just on paper with pen, about the company and stuff, and then I would do the mood board, and then I would probably do more, like those logo sort of sketches and stuff. Yeah.
- Interviewer: Would you ever use a mind map?
- GF: Yeah, yeah. That's how I would do my brainstorming, yeah, with my maps. Yeah, keywords, and ideas and offshoots from those.
- Interviewer: I'll just have a quick look through. We have a large pile.

GF: I know. It's ridiculous. I'm so glad I didn't throw them out.

Interviewer: I like your technique of drawing, then enlarging, and then tracing. Have you always done that?

GF: No, no. I mean, I can't say that I've ever really done a project like this before. It was more than just looking at the end result. I never really thought about doing the major project in a strategic way. For me, it was about development. About development of style and the practice and how I would approach it. This was thought out in a very new way to what I usually did.

GF: I have never done a book or something like this before, so.

Interviewer: A lot of drawings?

GF: Yeh. Sometimes it would be really sketchy at the start, and then I would use my light box to trace it again so the lines were neater, and then I would scan it onto my computer, and then I would print it out, and enlarge it, print it out, and redo it again. I would be doing the same drawing three, sometimes even four times, before it was at the final stage of being ready to be colored in.

Interviewer: Why don't you sketch it straight in the computer?

GF: For me, I don't know if it's a matter of my skills or whatever, but I just find using these tablets and stuff like that, they just don't feel the same as ... I don't feel like I have as much control over the result as I do by hand. Because as a kid that's how I always drew, so it would probably require a little bit more work and practice for me to be able to produce the same sort of work.

Interviewer: Oh, this little series of thumbnails; did that come before or after the ones in your sketchbook?

GF: After. That was me revisiting the storyline. And the one in my sketchbook, you can see, wasn't quite finished. I think I got to a point where I was like, "I don't know what's coming next" and that was kind of stunting my progress. So I went back to drawing what I had in that original storyboard. That drawing is where I returned to do it again, and attempt to outline the story for myself again, so my process was never linear.

GF: There was a lot of going back and doing it again, or deciding that it wasn't working, or feeling like I wasn't moving forward, and so I would try something else instead, and I was just going around in circles.

APPENDIX 14: 2018 JMB INDIVIDUAL INTERVIEW TRANSCRIPT

JMB: Yeah. Basically, I knew I wanted to do some sort of branding and liquor branding was a passion, an interest. Basically, I started off by Googling some statistics. I came up with the basic statistics, well, the fact that under 30s drink way less wine than over 30s. From there, it was sort of like, "Okay. My project's going to be how do I get the under 30s to drink the wine?" Then, in terms of the design process, it just started off just me thinking, in my head, what do I want to represent? What do I want people to be able to tell by looking at it? What's the vibe of the whole brand did I want it to do?

JMB: Then, from there, it's just do. I'm sort of like if I want something, I'll just make it. If I, say, if I want a bottle, if I want to know how a label looks on a bottle, I'm not going to sketch it. I'm just going to get a bottle and a label and put them together. I mean I've never done any sort of traditional art in high school or anything. I did woodwork, which is sort of like ... I mean it's a lot of perspective drawing. It's very technical but, I used to just skip most of that and just get straight in and just make something.

JMB: I feel like that's always a lot easier for me. I can always picture something in my head, and I never have a problem with having to write stuff down or anything to remember it. I have a pretty good memory. Basically, my brain, it never stops working. It's constant, I'll be trying to go to sleep and I'll be like, "Oh, maybe I can make this red or put this here instead." My brain's constantly ticking over. Then, I'll just sit down in front of a computer and do it. Or I'll sit down anywhere, whatever I'm making and make it rather than sketching or mind-mapping or anything. In terms of my major project, basically it developed from just a bunch of stuff collaged together.

JMB: Yeah. Using found images, collaging them together just to try and get the vibe I was going for. Then, eventually, I settled for this very basic sans-serif type, because I wanted it to be like a building block, like a foundation for the rest of the brand, which is meant to be this wild party brand. Basically, the way I started it off was maybe I would make 10 different concepts. Then, from there, I'm going to narrow them down, narrow them down. I actually presented most of this in a presentation to the teachers, so I got feedback from peers, teachers. I'm constantly bothering my mom. I'm just like, "Hey mom." She's like, "I don't know anything about design." "Just choose one. Just choose one." I rely a lot on external feedback to narrow these concepts down.

Interviewer: Was this image found?

JMB: Yeah. That's a typeface, it's like a Matisse typeface. My major project is based on found images and typefaces. It's all pretty much found apart from these ones up here. (pointing to early drafts of bottle designs). Even the illustration styles, those aren't mine. It's just sort of like that's the only one that's mine.

Interviewer: What program did you do the illustration in?

JMB: Photoshop. My illustration process is basically - I gather some reference images, put them together and then block it out, block sections out. I'll block the eyes out and the nose out and the mouth out or whatever, whatever body part or whatever I'm doing, I'll block it out. Then, I'll just continuously add detail and add detail and add detail until I'm done.

Interviewer: Are you doing any hand drawing within that program- or are you just using collage techniques and filters?

JMB: So maybe I'll scan in some brush strokes, some paint strokes and I'll take them out and collage them together. Or I'll use Photoshop brushes to paint in sections. Yeah, I can't describe ... there's filters, there's brush strokes, there's scanned in images, there's texture. I work with a lot of textures.

Interviewer: Your illustrations have a very painterly, collage feel.

JMB: This was my first presentation. A lot of this was forced upon me due to the brief. These were the questions they (tutors) wanted answered. It's not really my typical process. There's a word summary of the project and target audience - which is helpful. I do that for a lot of projects. I always try and focus on who I'm targeting the design towards.

JMB: Then, yeah, I just make it. For this project, there was a lot of work on the illustrations. The branding was nailed down super early, pretty much within the first month of the project. There was a lot of work on the illustrations. Then, there was a lot of word slogan work, lose your boring half or half red, half white, all good. I don't know how many slogans I came up with over the year, but there was probably at least 50, 60 different things.

JMB: Then, also, I like to narrow down anything I'm working on to keywords. I like to get into the keywords. For example, for my major, I wanted it to be fun, like a party wine. I wanted it to be about creating new experiences and then letting loose, getting away from your nine to five self.

Interviewer: Now, you mentioned you didn't use Pinterest or mood boards?

JMB: I did many years ago. I do have a Pinterest account that's got 1,000 or something pins on it, so I used to use it pretty extensively. I just found that I don't get anything from going back and looking at images twice. I'd rather get the images, look at them once, get what I need from them and move on.

JMB: I'll search on Behance, or I'll search on Instagram, Google, Dribbble. *I'll search everywhere. Basically, the first thing I do when I start a project is I'll sit down and I'll figure out what I want to look for, the general thing. Then, I'll just sit down for an hour or two and I'll just look at images. It'll help build this image in my head of what I want. It'll be like a bit of everything smashed together mixed with what I already had.* At the start of this, I knew that I wanted to have this wild approach. I had some illustrations that I had done prior to this, like this one here, anyway, I'd done prior to the commencement of the project.

JMB: I knew the vibe that I wanted to get across. I already had this little mood board of stuff I'd made before that fit the vibe. I think this was the first. These are the two names that I had at the start, ha ha from Camelot. Camelot's a farm that my grandparents used to own when I was a kid. Then, half half comes from the fact it's a blended wine. It's sort of like all about letting your other half loose. I knew that I wanted this wild feel. I also knew that I wanted it to be like these people who just look like regular people, but they're represented in this abstract expressionism style - I think that's what it's called.

JMB: I checked out a few books at the library about abstract expressionism and all of this traditional art stuff. The essence of my process is basically just looking at stuff and compiling everything in my brain and then sitting down and doing it. That's pretty much a summary of what I do, yeah. Sometimes, say, if I'm working, not for this project, but say if I'm working on an app or a website or if I really can't nail down a branding brief, if I want to do a logo, sometimes I will do rough sketches. They're very scribbly because I'm not really a big drawer.

JMB: For this project, none. I don't think I could find a sketch. Oh, actually, wait, I can. *I had a sheet made that had the shape of my bottle, and then I just sketched different label shapes on it. I got my teacher to draw some label shapes on it too ... I just had this image in my head that I couldn't shake. I needed to sketch that out first and then force myself to sketch out another 30. That way, I could make sure that's what I wanted.*

Interviewer: Why didn't you use the computer to sketch them out?

JMB: *Just quicker, quicker. I mean I had the shape of the bottle, and then it was just rectangles. It was just quicker to do it, and then easier to experiment. It was like I could do a circle without having to clip and mask it to an illustrator document or whatever. Yeah, it was just a time thing.*

APPENDIX 15: 2018 MJ INDIVIDUAL INTERVIEW TRANSCRIPT

MJ: So, the first thing that I ever did was to create the mind-map of ideas of what I wanted to do, or where my interests lie, and kind of like figure out what path I wanted to go down, what topic and concept.

MJ: Yeah, and then the next thing would be to break it down into a smaller mind-map. So, one of my interests, for example, for my major project was a social network platform, which I also wanted to use a medium that I hadn't used throughout my studies. I wanted to teach myself how to figure out the UX and the UI for an app, which is what I wanted to do. Then I would list them down in dot points, my interests, and kind of like figure out the themes and where my most interests lie. Then I'd do some more mind-mapping because I just feel like that helps me figure out what I want, where my mind's going. So, I did some secrets, goals, and medium, so what medium I wanted to use.

MJ: Then I would brainstorm, so I'd find the recurring themes and ideas. For example, here, my recurring themes were social communication and social media, seeking advice, giving advice, feelings of acceptance, supporting others and being supported, socializing through technology, and links between socializing and emotional psychology, and sharing things with others. Then I just wrote a sentence of what I want to do and why I want to do it. So, my idea would start off with what is it, who's it for, and how will I show it? Then I would start thinking about my target audience, so, who I want to target. This is all mostly just written down.

MJ: Yeah, noting it down, so, at the time that I think about it I would just quickly write it down. Yeah, and then I would do some more brainstorms. I like to go to brainstorms, yeah. I just feel like if I write all down in one burst I come back to it later, and I see maybe I can change the way that I thought of it.

MJ: Then we had an exercise in class that we gave our ideas to peers in the class, and they'd ask us questions about it. I found that very helpful as well. Then I'd also write down to-do lists, like, what else I need to do in my book. Then I started to do mood boards. So, I decided to research how the UX and UI designers have created their designs because I've never done it before. I wanted to see, like, what it looked like, what path they go down, try and find out a little bit more about it. So, I created mood boards on, like, styles that I liked, and how I wanted my app to look. For example, if I wanted the style to be very clean, minimal, I'd research the minimal designs and kind of get inspiration from that.

- MJ: Once I got my theme ... so, for example at the beginning of the year I wanted to do mental health, and help users with mental health issues through an app. But I started doing research and I found that there was already a lot of apps. So, I did research on competitors, so, for example some apps were Sober Grid, Flipd, Recovery, SoberTool, Fitbit, S Health, Strava, Lifesum, then more of the fitness tracking apps. Then, yeah, I wrote down some pros, like, some features of each app. So, this would be for Mood Mountain, Pacifica, I just wrote down what they did because I didn't want to do something that someone's already done. I wanted to do something that was different, and not there, not existing yet.
- MJ: There's some more apps - I wrote down their features. Then I wrote down a little list of what they don't have, and what I would want to have in my app. So, at this stage it's still wanting to help mental health sufferers. Then I started writing about what I want my app to have, and I did a little sketch of it. Kind of like a possible screen.
- Interviewer: A little wireframe?
- MJ: Yeah, a little wireframe. Then, after speaking with others, and sharing my idea, I just thought that it was too commonly done. There was already many apps out there that helped with mental health.
- MJ: So, I decided to focus on an interest that I liked. In a unit before that research design project, it was in third year, I did a concept for a social group that encourages pet therapy. I love animals, I love pets, I love my dog. I wanted to do something with my interests as well, so I wanted to indirectly help people with their physical activity and mental health by encouraging them to socialize, and encouraging them to go out of the house. The research that I did for that unit, I already had this, so I reread over it and there was, like, statistics that dogs, and pets, can help reduce blood pressure and release feel-good endorphins, and promote physical activity by, I think it was, 54%. So, I decided to change the direction of my project and make it a dog social media, and to indirectly help them improve their mental health.
- MJ: Yeah, and then the next things I would have done is rewrite my thinking on it, like my concept statement. I just had to rewrite why I wanted to do it, and what would benefit users. Then I checked out the competition again, for pet-based social media apps. There was a few apps out there, but they weren't very well developed. They were just very basic - simple. I wrote down some of their features, and I also started looking at other apps that were social-media based, not related to dogs. For example, Tinder.
- MJ: The thing that intrigued me with Tinder was their settings section, where you can determine, like, how far you meet people. I downloaded the app and opened up the settings, and it had, like, a scroll bar that lets you choose if you want to meet people 10 km in your radius, or 300 km. I wanted my app to connect you with locals in your area, so I was really intrigued by the way that their settings worked, and how the GPS location is set.
- MJ: Then I also started looking at apps like *Snapchat*, *Meetups*, and *Instagram*, how people share their media - and Facebook as well. Then I started writing my thing out as a mind-map. Mind-mapped features, like, what features I wanted it to have. I started crossing out things that I didn't need anymore, that I didn't think were necessary, because I didn't want it to be fully loaded with everything. Then I did some research. I wanted to decide on a target audience. I did some mood boards, some surveys, brainstormed names. Did some sketches, started to think about the logo, the name, and all that together.
- MJ: This is pretty much my to-do list. What I wanted to do before the next week - before class. I wrote down questions to ask myself. "How will I make the app safe for users?" I would need to be able to block users, to report users. I'd need privacy agreements. Then, yeah, what else would I do to make the app not just another app. I wanted to do a promotional video as well and figure out how to promote the app.
- MJ: Yeah, so then I got tasked to find three potential names and three potential brands for each of the names. So, I must have done that in another book, or a bigger book. Inspirational apps, I wrote down my inspirational apps, sort of what inspired me. Then I started doing another mind-map on dogs. Oh, these are, like, statistics that I found. For example, dogs promote physical activity by 54%, reduce loneliness, provides us with a sense of community, increases our socialization with others, helps reduce the symptoms of anxiety and depression, and studies show that kids who grow up with dogs are less likely to develop allergies. So, I was just doing research on stuff like that, which I found pretty interesting.
- MJ: Then I started doing brainstorms on the name, and dotting down some name ideas. So, I did quite a few names, and started sketching out some possible logo ideas, one or two only. I do a lot of writing - more than sketching, because I'm not much of a drawer. Yeah, drawing's not my strong point, but I started mapping out the sections, so, like, the community feed, the profile sections, the messaging sections. So it's kind of like ... a sketched flow diagram of how I want my app to be set out. So, you'll start in the community feed, you'll be able to go to the profile, the messaging. At the time, I wanted to have groups, which I ended up taking out. I had the settings and the search bar with those sections.
- MJ: Yeah, and then, after I mapped that out I started to go back to the logo, because *I feel like if I leave something for a little bit and then come back to it, I generate more ideas. Like, if I'm working on it constantly, I get mind-blocked, so I like to leave something and then come back to it.* Then I started doing the names again, thinking of writing down some more name ideas. I started sketching out some possible logos again. I liked the name Fetch. My teacher continued to push me to find a different name. I went through so many names, and I always fell back on Fetch because I just felt like it worked perfectly for the app.
- MJ: So, I did some more logos, as you can see, I can't really draw very well. I tried to integrate, like, the features, so that's kind of like the location marker with a dog face. I started writing keywords that related to dogs, so stuff they do, like sniffing, but ... I don't know what that says. Oh, it says to find some figure and ground logos. There's a random wireframe just by itself. I've got some more dot points of the event sections. I think I went digital and started doing my UX flowchart and stuff on the computer, which I can show you as well.
- MJ: Yeah, these are just my to-do lists. I like to write it down so I know what I have to do. I could tell my tutor where I was up to, what I've done. This was during the mid-semester break. So, I did my photography, I took all the photos for my app - all the dogs and all the people in the app. It was very hard, and the locations too, I was having troubles with the locations because of the weather, and I had minimal time to take the photos, and it was raining every day at the time. Yeah, I feel like I didn't get to finish all my photos.
- Interviewer: When you talked about doing a mood board, what does your mood board look like?
- MJ: I can show you. I think it's still in my Pinterest.

Interviewer: You also mentioned some other rough sketches that you'd done between that time. Were they just on random bits of paper?

MJ: Yeah, they were probably on bigger paper so I could have more space, because that's pretty small. But I like a small book because I can carry it around with me. Yeah, so I probably did it on different paper. So, here we go, major project inspiration – the mood board. I just got a whole bunch of images I liked the look of with features that I liked. Anything that pretty much inspired me to create my designs. That one's a very long one.

Interviewer: Did you do a Google search as well?

MJ: No, because I find Google images not good. I always look on Pinterest, or if I was to want to find something specific, hashtags on Instagram as well. I don't know if you've heard of Dribbble? It's for UI and UX designers, there's also a bit of branding in there, but it's mostly for UX and UI, and I love to see other people's works on there. It's really inspiring as well. I also have my first presentation, so I've got all my research in here for my major project unit - my concept and audience.

Interviewer: So, this is a PowerPoint presentation that you produced?

MJ: Yeah, I also had a massive brainstorm on an A3-sized paper, but I couldn't find it. I wanted to bring it with me, but I couldn't find it today. So, showed my early major project ideas. I had three main groups, socializing, technology, and psychology. I just wrote all these points for each section and circled out the ones that I liked the most.

Interviewer: Is this your first brainstorm?

MJ: Yeah. I also did research on Mapbox, which is an engine that creates maps, and that's what *Snapchat* uses for its map as well. I find the map very nice looking. I think it's pretty. This is Tinder, the settings, so I wanted my app, originally, for privacy and security, to include settings that allowed you to connect with people in a certain age range that you choose. I did some prototypes, then a mood board. That's just some of my inspirations, name ideas, brainstorm, logo sketches.

Interviewer: So, you started with some logo sketches... Did you quickly move into Illustrator from this?

MJ: Yeah. After doing some sketches I would scan them in with an app on my phone. I forgot what it's called. I'd scan them into Illustrator, and trace them in Illustrator. Or I'd make shapes. To make my logo I'd make shapes, like a circle, and then I'd cut out bits. I do this because I can't draw properly. I'd use shapes because they're already perfect.

Interviewer: Very interesting.

MJ: [So, what I did with this \(logo\), was I drew that, and then I put it into Illustrator, and I'd get the pen tool to make it, like, a nice line, I'd fill them in. So yeah, my first logo concept was just a dog head. Yeah, then I added the name underneath, and some possible color options.](#) This was my UX flowchart, this is my first one. I think I made a bigger one. Oh, no, this is the same one, it's just spread on two pages.

Interviewer: Did you do this specifically for the presentation?

MJ: I did this for myself as well - so I know how people will get to certain sections. Kind of like mapping out the app, because it's a lot of screens that I would have to do. If I was to jump straight into it, I might forget. It's kind of like a reminder for me of how I want it to be. I try and stick to that, unless, I change things. But I only made one UX flowchart, so as I went along, if I wanted to change something, I wouldn't make a new one. I made the initial one, and then I'd like, look at it as a reference, but I didn't make anymore.

MJ: My timeline. We had to make a timeline for the unit, so that's how I wanted my timeline. That was it.

Interviewer: Great.

MJ: Yeah. That's pretty much my process from the beginning to the first presentation. The rest of it was just designing the look of the app, and I also would get my friends, and even non-designers, to test out my prototypes, because if some non-designer was able to pick it up, look at it, see any mistakes, I find that, like, a bonus, because they're the people that are mostly going to use it. My friends, they all have dogs, and I was like, "If you had an app that had this feature would you use it, or would you not use it? Would it be helpful to you?" Then, eventually, I just ended up throwing some things out, adding some things in, and that's how I got my final product. Yeah, so user testing was a really big thing, as well the wireframing in Figma and XD [Adobe experience design tool].

MJ: That's another thing I did. I researched so many different app prototyping programs. Like, I tried InVision Studio, XD, Sketch, Figma. I tried so many of them to find the perfect one, because some of them are limited in what they do. For example, Adobe XD doesn't allow you to do horizontal scrolling, it only has vertical. Then, InVision was very new. It's called InVision Studio. It was very new, so it had a lot of bugs in it, so I decided not to go with that for my major project, just in case. Then, Sketch, it was \$100 to pay for it, but I felt I did the 14-day trial, and I felt that Figma just worked the best, so I ended up recreating my whole project in Figma after figuring out that Adobe XD doesn't allow you to do horizontal scrolling.

MJ: Yeah, it was a very big task but Figma allowed my map feature to scroll - pan around the map. So, I took a photo of the map and then added that photo in, which allowed me to pan around it in Figma. At the time, it was the only app that allowed me to do it. So, I had to recreate my whole project. I had to do so many screens. I had about 30 screens already done, and you couldn't just transfer it in, you had to start again, and make the whole thing again. But yeah, I should have figured out what program before I started.

APPENDIX 16: 2018 GROUP 4 DISCUSSION TRANSCRIPT

Group 4 discussion (AB, GF, MJ & JMB)

Interviewer: How did you find the process of the assessment tasks mapping with how you did your process?

- JMB: Basically, the way I come up with ideas is I sit down, and I look at a bunch of images, and then build an image in my head of what I want. And then, I sit down and I do it. I make it. I just make it. And a lot of assignments throughout the course have sort of been you have to submit 20 thumbnail sketches, or something. And it's sort of, I would just make it, and then the day before it was due I would do the 20 thumbnail sketches, knowing I'd already made what I wanted to make. So, there was a bunch of retro-fitting for me. I would do that for pretty much every assignment.
- AB: Yeah, I did the same thing. Heaps of retro-fitting for me where I'd just do the same thing. I might do one really rough sketch in my book, and then come up with my work. But they'll (tutors) ask for all your process work, but for me there isn't a huge amount of process work, so you get marked down for that. So, I just sketch out a few things and scan them in so it looks like I've done more.
- GF: I actually do a bit of sketching ... although, It depends. For me it just depends on the time I have to do the work, the sort of project it is. I mean, I'd like to think that most of the time I do those iterative sort of illustrations, but there are times where I've done that (added sketches retrospectively) as well. I've had the idea in my head and I've been able to just put it together, refined, and then gone back and done some sort of brainstorming for the of the reports that we have to do at the end - where we show our work development. But it just, I don't know, it just depends. I'm all over the place.
- MJ: I feel like mine (process) also just depends on the brief. If I have an idea, I will start creating it straight away, but if I don't know what I want to do, or if I'm lost, I'll start doing mind-maps, rather than sketches because I can't draw. I just don't think drawing's very... If I draw something, I want it to be perfect. And if it's not perfect, then I need to scrub it out. I don't want to look at it again. And, yeah, that's probably why I don't sketch as much as I could.
- But I just find that having an idea by looking on Pinterest or looking at other people's (designs), it makes me print my own version of it in my head, and then that's how I want it to look, so then I'll probably... If I was to do an app screen, I'll draw a little wire frame of how that one screen would look, and then I'll start creating it in a prototype, and then I'll reference that one and make the rest of my designs like that. So, it's just the initial one sketch that I draw down and then I do the rest based on the first one.
- JMB: I don't think being able to draw is important to be a designer - as long as you can show your ideas and communicate in another way. As long as you can explain verbally or you can just make it, and people can understand what you're trying to get across, and understand what you're trying to do. I mean, I don't see really any value. I know a lot of people do. That's how they show ideas. They'll be like, "I'll just sketch it out for you quickly and show you." But I'm not like that. I'd rather just explain it, or just quickly do it.
- AB: Yeah, I don't think you need to be able to draw to be good at design, but I think you need to have an understanding of composition and if you have an understanding of composition, then you can design. It's not about being able to draw.
- GF: Yeah, visual communication is so multi-faceted that there's so many different ways to communicate ideas visually - it doesn't all rest on your ability to draw. There's just ... yeah, composition. I feel like that's the central thing. That's the important thing.
- JMB: I mean, I've been communicating my whole life and I've never drawn anything. So why would I need to start now? And yeah, that's just how I feel. I've just never been a drawer. I've always been very visual or verbal. I just don't see the value in drawing at all. If I'd want to show someone something, I would just show them it. I'm not going to be like, "No, this is how you do it. I'll sketch it out for you." If someone doesn't know how to eat an apple, I'm not going to be like, "I'll just sketch it...you just take a bite. Here's a drawing of the bite you're going to take."
- GF: I do think drawing, in these initial phases, can be important, because I feel like when you go straight to the computer, (and this is what I find with my work), I can get caught up with perfecting it and making it aesthetically beautiful. But the concept can be lost in that, and the development of the idea is kind of lost. But when you're sketching and when you're just using that sort of method of coming up with ideas, you can be a little bit more ... You're less focused on how ... Well, this is for me. I'm less focused on how perfect it is and how refined it is, and I'm more thinking about the idea with the end appearance in mind, but that's not the central thing with the sketch. So, I guess, it's important in some ways, but it's not the only way of doing things.
- JMB: I think it's important for us ... It depends. I think everyone has their own process. And I think that the university sort of needs to make it part of the course. So, obviously, it's going to have some restrictions. That's just the nature of education itself. I think that it funnels everyone into the same lane, not taking into account that everyone has their own process, and everyone does things differently.
- Interviewer: So, I guess this is only an issue when there are marks associated with your process.
- AB: Yeah. Yeah, definitely.
- GF: Mm-hmm (affirmative)
- MJ: Because you want to get all the marks that you can. You want to get HDs and sometimes I see myself as well, like you guys said, finishing off little research tasks or sketching or thumbnails, at the end of the assessment after I've done all the major work, just so I can get those marks as well.
- JMB: I think that a Unit that is developing creative process and developing the way you do work would be a good idea. But I think that that's a lot of design education in a lot of places right now - changing it up. And I think that maybe a bit further down the line, there's sort of going to be this difference between the teachers forcing everyone to do these sketches and all this process work, to being able to sort of more accurately represent people's way of doing things.