

Appendix I: Comparative study - interview schedules

Interview Questions – Set 1

Practice (about the interviewee, the work itself, and the area it's in – not necessarily specific to this body of work)

- broadly, what is the nature of your work?
- what type of work are you producing?*
- how would you describe your practice, and yourself as a practitioner?*
- please could you tell me why you have chosen to work in this area/field?
- what attracted you to it*
- what do you like about this particular area/field?*
- related to interviewee's background? – esp. if working in digital and have a background in material practice*
- do you hope to achieve something particular by working in this area?*
- what is the broad focus/content of your work? (narrative, aesthetic, ...)
- in what ways do you think your work differs from others' in this group (or elsewhere)?
- how would you characterise your work?

Approach (general, not specific to this body of work)

- how would you describe your approach to your work?
- particular features of way of working*
- (if background different, do you work differently in this environment?)*
- what are the most important characteristics/elements of this approach?
- in what ways do you think your approach differs from others' in this group (or elsewhere)?

Process (specific to this body of work)

- what are your aims this year?
- what do you hope to achieve this year?*
- how are you choosing to pursue these aims?
- what is it most important to you to achieve this year?

Outcome (creating this particular body of work)

- what drives your work? (e.g. goal, tacit aim?)
- how will you know when you've got where you want to be?*
- please could you describe/show me how you are developing/expect to develop your work/ideas?
- what media/techniques are you using/will you use?*
- how do/will each of these contribute to the process? where do your ideas come from?*
- what are you working on at the moment?*

- which features of your work are most important to you?
- what do you think will have the strongest influence on the direction of your work? (e.g. ideas, materials?)

Media

- what media do you/will you use in your work? (e.g. materials, elements of the software)
- (also, processes and techniques)
- why have you chosen these?*
- what attracts you about them?*
- in what ways do you/will you use them?*
- what roles do/will these media (processes, techniques) play in your working process?
- (esp. if digital media – can be many different things)*
- what do/will they each contribute to your process?*
- e.g. used to communicate ideas, or dialogue with to develop ideas?*
-
- what kind of relationship would you say you have with the media/material that you use?
- e.g. acting upon it, engaging with it?*
- what is the nature of your relationship with it?*
- what is the extent of your engagement with it?*
- do you experience any sense of 'dialogue' with your materials?

Anomalies

- do you anticipate/are you experiencing any difficulties or problems in your work, e.g. technical limitations, constraints?
- how do/will these affect/influence your work or your processes?*
- what do you think will be the major challenge for you in your work?

Other

- what are you looking forward to most about your work this year?
- is there anything you are concerned about your work this year?
- is there anything we haven't covered that you feel is important to your work?

Interview Questions – Set 2

Orientation (specific to this body of work)

- what are your aims this year? *what do you hope to achieve this year?*
- how are you pursuing these aims?
- what is it most important to you to achieve this year?

Work (creating this particular body of work)

- what is the broad focus/content of your work? (narrative, aesthetic, ...)
- how would you characterise your work?*
- in what ways do you think your work differs from others' in the group?
- what is driving the direction/development of your work? (e.g. goal, tacit aim?)
- what media/processes/techniques are you using to produce your work?
- why have you chosen these?*
- what attracts you about them?*
- what has had the strongest influence on the direction of your work so far?
- what has caused you most problems*
- what has caused you least problems*
- what has surprised you most about your work so far?

Approach (specific to this body of work)

- how would you describe your approach to your work?
- what are the most important characteristics/elements of this approach?*
- in what ways do you think your approach differs from others' in the group?
- is there anything that has surprised you about your approach/process this year?
- what has had the strongest influence on your approach/process this year
- internal/external*

Process

- what are the major elements of your working process in developing your ideas/work? (e.g. research, script, storyboard etc.)

- which are you most comfortable with*
- which are you least comfortable with*
- what is the relationship between these different elements?
- has this relationship changed over the year?*
- which has the strongest influence on the direction of your work?
- what media/processes/techniques are you using for each of these elements, and why?
- please could you describe/show me how you have been developing your work/ideas?
- what media/techniques are you using/will you use?*
- how do/will each of these contribute to the process? where do your ideas come from?*
- what are you working on at the moment?*

Media

- what roles do the media/processes/techniques play in your working processes?
- how would you compare your relationship with each of the media that you use?
- e.g. acting upon it, engaging with it?*
- what is the nature of your relationship with it?*
- what is the extent of your engagement with it?*
- do you experience any sense of 'dialogue' with your materials?

Anomalies

- are you experiencing/do you anticipate any difficulties or problems in your work?
- how have/will these affect/influence your work or your processes?*
- what is the major challenge for you in your work?

Other

- what have you found most satisfying so far this year?
- what have you found most frustrating so far this year?
- is there anything we haven't covered that you feel is important to your work?

Interview Questions – Set 3

Orientation (specific to this body of work)

- what were your aims this year? *what did you hope to achieve this year?*
- did these change? if so, why?*
- how have you pursued these aims?
- did this change? if so, why?*
- what has been most important to you to achieve this year?
- anything you haven't achieved that you'd wanted to/achieved that you didn't expect to?*

Work (creating this particular body of work)

- what is the broad focus/content of your work?
- has this changed? if so, why?*
- in what ways do you think your work differs from others' in the group?

Work (continued)

- what has been the main driver in the development of your work? | what 'defines' the body of work?
- development of 'body' of work
- (clear ideal/emerge)*
- relationship between pieces
- when (serial/over/tap)*
- how they relate*

Work (continued)

- what has had the strongest influence on the direction of your work?
- were there events or decisions you had to make that were particularly significant to the way your work developed?
- when did these occur?*

Work (continued)

- what has surprised you most about your work?

Approach

- how would you describe your approach to your work?
- what you plan, what you let emerge*
- what you control, what you're willing to 'let happen'*
- in what ways do you think your approach differs from others' in the group?
- has your approach changed over the year?
- if so, why?*
- has your approach differed from previous years?
- if so, how?*
- has your perception of the way you work changed over the year?
- is there anything that has surprised you about your approach/process this year?*

Process

- what are the major elements of your working process?
- how do these elements work together in developing your work?
- has this relationship been different from what you expected?*
- what is the role of source in your process?
- where did the original idea come from?

Process (continued)

- relationship between studio work and workbench
- has this changed over the year?*
- where does the main decision about what work will be take place (drawing <-> workbench, storyboard <->?)
- has this changed over the year?*

Media

- what media/processes/techniques have you used in the development and production of your work?
- what are they each used for?*

Media (continued)

- has your relationship with these media changed over the year?
- ways of learning about it?*
- how do you view the digital as a 'medium'?
- what role does the material/digital as a medium play in your working processes? (act upon <-> engage)
- has this changed over the year?*
- internal/external – visual/ideas*
- what is the extent of your dialogue with the medium?
- has this changed over the year?*

Anomalies

- did you experience any difficulties or problems in your work?
- how did these affect/influence your work or your processes?*
- did anything unexpected occur in your work?
- how did these affect/influence your work or your processes?*
- what has been the major challenge for you in your work this year?
- what impact has this had on your work or your processes?*

Other

- what have you found most frustrating/disappointing this year?
- what have you found most satisfying/rewarding this year?
- what is the most important thing you've learned about yourself/your practice this year? *(that you are able to tell me!)*
- is there anything we haven't covered that you feel is important to your work?

Appendix J: Comparative study - example of completed analysis sheet

Interview no. 8 Group: M.Phil. / ~~SSU~~ Date: 31 October 2002
 Tapes used: (ser 4) 2+3
 Questions: (start) 2.2-0.1 (end) 3.2-4.9

Indicators	'hard', distanced				'soft', situated	tape ref	quote
		strong	near?	strong			
Orientation							
1. goals (how do you know when you've got what you want)	explicit goal	✓			lucid aim		
2. direction in work	conscious purpose	✓			open to experience		
3. process and product	emphasis on product	✓			equal or greater emphasis on process		
4. form and content	separate				developed together		
5. constraints, limitations	working to go beyond constraints, freedom of choice		✓		working within constraints, choosing to work within constraints		
6. understanding, mastery through...	analysis & abstraction		✓		mastery of detail		
7. by...	break down, decompose, analyse				reorganise, rearrange		
8. relationship to context	abstract, formal, remote				situated, contextual		
Medium							
9. ends and means, 'medium and message'	medium is means to an end, means separate from end	✓			ends become means and vice versa, means becoming end, ends developed through means		
10. what is the role of the medium - tool or medium?	expressing, communicating ideas using medium, monologue	✓			developing ideas through dialogue with medium, medium as interlocutor		
11. how do you relate to the medium?	acting upon the medium	✓			engaging with the medium, being acted upon		
Process							
12. outcome - when you decide this	pre-planned, predetermined goals	✓			unforeseen consequences, discovery, goals emerge through work		
13. how is this accomplished, how does this exhibit (process)	planned in advance, premeditated?	✓			collaborative venture with medium, through dialogue with the materials and means of execution, repertoire		
14. decisions	pre-planned e.g. through abstractions	✓			keeping options open		
Work/outcome/form							
15. organisation, form, structure	imposed, predefined, (premeditated, as in thought about before?)	✓			emergent, arranging, rearranging, playing with ideas, sculpting		
16. achieved by	e.g. hierarchy, abstraction	✓			finding 'pattern', 'rhythm', 'form'		
17. level of engagement	abstract, with representations, models, metaphorical	✓			working with the medium, literal		
18. relationship to details, material	opacity, distancing from details	✓			transparency, keeping in touch with the details		
19. dealing with complexity	abstraction e.g. decomposition, design-by-drawing	✓			growing incrementally		
20. choice of materials	brought in as required by 'project'	✓			working with what's there, well-known materials, chosen previously, heterogeneous repertoire - not specific to project, brought in as need arises		
21. implications of this...					speaking through the medium of things		
22. use of materials	used for predetermined purpose	✓			used in 'devious' ways, 'truth to materials'?		
Attitude to Events							
23. attitude to unexpected effects, surprise, risk	control	✓			"springboards for how to proceed"		
24. attitude to mistakes, problems	misstep, to be corrected	✓			essential part of process of negotiation		
Ways of relating to materials, objects							
25. type of relationship	distal (distanced)				proximal (close)		
26. boundaries	distant, objective	✓			intimate, 'connecting' with them, subjective		
27. awareness	selfconscious, conscious purpose	✓			immersing yourself, placing yourself psychologically in their 'space', 'down in there'		
28. experience, bodily participation	objects as formal, abstract?	✓			unselfconscious, forgetting yourself, 'hear what the material has to say' experiencing objects as tangible, sensual and concrete		
Ways of seeing objects							
29. attributes	formal properties ('what they are for')				concrete or tangible properties ('what they can do')		
30. physicality	as embodying abstract concepts (e.g. sprite - computational object with variables)				as material objects, esp. non-material objects (e.g. sprite - object attributed 'physical' properties - can cover one with another)		
31. relationship to context	abstract, in terms of properties, rules				situated, in terms of relationships, with each other		
32. transparency	working with concepts, abstract properties, transparent e.g. words being used to express an idea				working with signs, resonances, material e.g. words as textual objects		
Ways of thinking							
33. ways of explaining things, tackling problems	in terms of rules		✓		'reasoning from within', bodily thinking, putting yourself in the situation		
34. learning about things, understanding things	analytic, dissection, wanting to know how it's supposed to work, learning before interacting with it		✓		through its behaviour, learning through interacting with it		
35. what think with	thinking with rules of logic (abstract)				thinking with objects (concrete)		
36. ways of understanding	formal, abstract				sensible intuition, perception		
37. internal/external	mental		✓		bodily thinking e.g. writing as a way of thinking		
	mental revision				physical revision		
	composition takes place 'internally' then expressed				writing to think, ideas come through the act of writing		
	internalisation				externalisation & spatialisation		
Other/Emerging Themes							
38. finding a 'voice'							

Appendix K: Comparative study - definitions of uses of materials

Technical sampling, technical samples

These terms refer to the process of producing (often small) samples to test materials, explore their capabilities, or refine techniques for working with the materials, such as ways of achieving different textures, finishes etc. I have distinguished it from the terms ‘3D sketch’ and ‘3D drawing’ as its main purpose is to test processes and techniques, rather than to generate or visualise ‘designs’ or the form of the work. Depending on the processes and techniques involved, this activity may be done using the ‘final’ materials themselves, but often substitute materials are used that have similar properties but are less ‘precious’, e.g. copper instead of silver to test etching techniques. (It is not necessarily monetary value that makes a piece precious in the context of this study – for example, having a very limited supply of found objects such as entire leaf skeletons can make them very valuable!)

3D sketching

While technical sampling is primarily concerned with exploring processes or techniques, students also worked directly with physical materials to generate and explore design ideas. I have termed this process ‘3D sketching’: the idea generation is being done directly in 3D/physical materials (I have included making 3D visualisations from 2D sketches and drawings under the term ‘3D drawing’, below). Again, this may be done with less ‘precious’ materials than would be used for the final piece.

3D drawing

Whereas 3D sketching is about generating ideas using physical materials, the term ‘3D drawing’ describes the process of ‘realising’ or visualising an existing design idea in 3D physical materials. The purpose of 3D drawing is to see how the design idea actually looks in physical three dimensions. This idea may have been partially developed through 2D sketching or drawing, or through a more internal process:

“I can sit there and quite happily go through the motions of a page in a sketchbook in my head, drawing it down, I can sit and I can rotate things in my brain and I can see things from every different angle. And actually when I draw it down, it loses something that was up here, and actually I think I'm now better making it three-dimensionally, and then recording that on paper, and recording the bits that haven't gone wrong. Because if I draw things down, now, or if I go through pages in my

*sketchbook, I get lost half way, and it's that thing where you're reading a page in a book and you're at the bottom of the page and you realise you haven't actually read it. That's what I found I was doing. I rely far more on actually sitting down and making, and just letting things kind of inform me from that, and sketching while I'm doing that...*⁸¹

Physical model/mockup

I have used the term ‘physical model’ or ‘mockup’ to describe the process of modelling aspects of a piece to see practically how it will work, e.g. how a piece might be detached for cleaning, or how segments of a piece might join together. Whereas technical sampling is concerned with testing and refining techniques and processes for working with materials, or exploring the properties of materials, making a physical model or mockup is focused around testing aspects of function or design. This may be carried out in the actual materials, or again, substitute materials such as card or cheaper metal, depending on the purpose of the model:

*“...another thing I've been doing recently is working in paper. Because with these ones, I need to work out where my rivets are going to go, so instead of going through a ton of copper just working out that I need holes here to go, for the rivets to go right through”*⁸²

Physical element

This term is used to describe a physical element which is, or is used to represent, part of an actual piece. The key feature of such elements is that they are ‘predefined’, like components: they will often have been made by the student, or be objects such as semi-precious stones, beads, pearls, and found objects such as shells.

Prototype

This term denotes a physical working replica of a final piece, often used to test its function, or how it will be made. Unlike a physical model or 3D drawing, which may not be to scale, or only focus on one part of a design or piece, a prototype is concerned with validating all aspects of the design and construction before making the final piece. In some cases if the student has used the ‘final’ materials, and the process is successful, then it will become a final piece. Alternatively, if a final piece does not work out for some reason, it may effectively become a prototype for a further piece.

⁸¹ Material student 5, interview 3

⁸² Material student 6, interview 1

Appendix L: Practitioner interviews - interview schedule

Practitioner Interview Schedule

[prompts in *italics*, background information in script]

Interview Details

Date:

Time:

Tapes:

Actions:

Preliminaries

- check consent letter signed and confirm permission to tape interview
- any questions on any of the arrangements before we begin?

Introduction – myself and my research

- My background is originally in computer science, and more recently in design/applied art (silversmithing and jewellery). My Ph.D. research is broadly concerned with designers' use of artefacts (sketches, models etc.) within their design processes and the implications for future digital environments for 3D design and modelling. A previous study I made of a number of designer-makers suggested that individual practitioners experience different relationships with the artefacts they create and work with in their processes. I believe that elements of these differences can be attributed to the nature and extent of a dialogue between designer and media, and this is the focus of my current research.
- I have chosen to examine this 'dialogue' by comparing design and making practices in the material environment with those in the virtual environment, as the similarities and differences between the two environments foreground those aspects of the relationship that I'm focusing on. As part of this study, I'm speaking to 3D practitioners who have worked in both material and virtual media – I'm interested in how their experience, perceptions, skills and working processes have transferred to the virtual environment, particularly in terms of their engagement with the medium.
- In this interview, I'd like to explore some of these aspects of your practice.

- In the context of my Ph.D. research, the reason for examining these differences more closely is to assist, in a sense, in dissociating some of the ways in which different designer-makers/3D practitioners work from the physical artefacts that they use, and to gain insight into ways of working and knowing that are not embodied in the material context of the real world, and that could be usefully explored in the development of new ways of working in the virtual world of the digital design environment.*

Practice

- how would you describe your practice, and yourself as a practitioner?
 - . material
 - . digital
- please could you tell me about your background, leading up to your current practice?
- how would you characterise your approach to practice?
- what are the key elements of this approach?

Focus of work

- what types of work do you produce?
 - work itself
 - to commission, for exhibition, etc?

- what is the focus/content/aim/aesthetic of your work?
 - *material*

- *digital*

- what characterises your work?

Digital practice [emphasis on 'medium', 'environment']

- what intrigues you about/attracted you to this area of work?

- what digital technologies/media do you use in your practice?

- *how did you arrive at these ones?*
- *what is the impact of these technologies on your practice/work? (relationship between 'vision' and 'crafting')*

- the nature of the 'digital' allows it to be viewed as many different things. What is its role in your practice?

- *e.g. tool, medium, environment*
- *'cyberspace'/digital medium or digital technologies as medium?*
- *virtual/digital*
- *functional use v creative engagement*
- *originality/replication/simulation/realisation*
- *what is the 'digital medium'?*

- how do you engage with it? (if as medium, environment? what if tool?)
 - *could be described as entirely passive, almost a 'non-medium', or a 'non-environment'*
 - *can be anything you made it*
 - *on the other hand, it currently requires very explicit, precise ways of working*
 - *what is the impact of working in this context?*
 - *role of surprise/opportunism*
 - *what are the main challenges*
 - *what have you found most exciting/unexpected?*

- **Relationship between digital and material practice [approach, work, etc.]**
 - how does your digital practice relate to your material practice? (in terms of work, aesthetic, approach, knowledge, skills, working practices, role of other media, etc.)
 - *how does your work/practice in the two environments compare?*
 - *focus, aesthetic*

- *how does your material practice contribute to your digital practice?*
 - *direct? inform? have little to do with?*
 - *skills/knowledge (approach following...)*

- *how does your working approach manifest itself in the digital environment?*
 - *similar? different? why?*
 - *working practices, experience*
 - *what distinguishes it from other approaches?*

- *are you conscious of anything in particular that has appeared, disappeared, been retained, changed, developed in moving to your digital practice?*

- how does your relationship with the medium compare, and its role in your practice?
 - *what was the role of the materials in your material practice?*
 - *what was the role of other media?*

Digital practice in context

- in what ways do you feel your practice contributes to a 'digital aesthetic'?
 - *is there such a thing as a 'digital aesthetic'? if so, what?*
 - *impact of your work on the digital 'world'*

- what insights into your practice have you obtained from working in what are two very different media?
 - *has anything from your material practice been of special significance/especially valuable in your digital practice?*
 - *is there anything that your digital practice has made you conscious of that you weren't before?*
 - *has it thrown anything into relief?*
 - *does anything in particular surprise you?*
 - *anything you expected/didn't expect?*
 - *what is missing from the digital 'medium' that has or would have the most impact on your work?*

- what do you feel is the role of <description> in the digital arena generally?
 - *impact*
 - *contribution*

- what is the impact of your digital practice on <discipline>?

- in what ways would you distinguish your approach from other practitioners working in this area?

Emerging themes

- is there anything that you feel is important to your practice that we haven't covered?

Writing quotes

“In contrast to Planners, Discoverers regard instrumental definitions as reductionist, thinking of language as far *more than* a tool, and perhaps as inextricable from their sense of self. Language is here more like a *way of knowing*.” (Chandler)

“For May Swenson, a poet: ‘Language is *not only a tool* in poetry, it is its very being. In a poem, subject is not presented by means of language but language is the thing presented with the aid of subject.’” (Chandler)

“Individuals differ strikingly in their responses to the notion of media transformation. They range from those who insist that they are in total control of the media which they ‘use’ to those who experience a profound sense of being shaped by the media which ‘use’ them.” (Chandler)

- (arising from the interview)

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