Constructing Bodies: Gesture, Speech and Representation at Work in Architectural Design Studios

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Dedication

For my husband Luke Mewburn: without whom I could not have completed this work. Not only did he offer unstinting love, support and encouragement, but he has proved himself to be a man who is proud to have a wife who has a few more degrees on the wall than he does.

For my son Brendan, age seven, who has endured his mother undertaking two post graduate degrees in the span his short life to date. His affection, patience and willingness to play Nintendo for long periods of time can never be fully rewarded in the form of a completed thesis, but I hope he will read it one day anyway.
Abstract

Previous studies of the design studio have tended to treat learning to design as a matter of learning to think in the right way, despite the recognition that material artifacts and the ability to make and manipulate them in architectural ways is important to the design process. Through the use of empirical data gathered from watching design teachers and students in action, this thesis works to discover how material things and bodies are important to the fabrication of architectural meaning and architectural subjectivity within design studios. In particular the role of gesture is highlighted as doing important *work* in design studio knowledge practices.

The approach taken in this thesis is to treat design activity in design studios in a ‘post-human’ way. An analytical eye is turned to how things and people perform together and are organised in various ways, using Actor network theory (ANT) as a way to orientate the investigation. The assumption drawn from ANT is that that architectural meaning, knowledge and identity can positioned as *network effects*, enacted into being as the design studio is ‘done’ by the various actors — including material things, such as architectural representations, and human behaviours, such as gesture.

Gesture has been largely ignored by design studio researchers, perhaps because it tends to operate below the threshold of conscious awareness. Gesture is difficult to study because the meanings of most gestures produced during conversations are spontaneous and provisional. Despite this humans seem to be good interpreters of gesture. When studied in detail, ongoing design studio activity is found to rely on the intelligibility of gesture done in ‘architectural ways’. The main site for the observation of gesture during this study was the ‘desk crit’ where teachers and students confer about work in progress. In the data gathered for this thesis gesture is found to operate with representations in three key ways: explaining and describing architectural composition, ‘sticking’ spoken meanings strategically to representations and conveying the phenomenological experience of occupying architectural space – the passing of time, quality of light, texture and movement.

Despite the fact that most of the work of the thesis centres on human behaviour, the findings about the role of gesture and representation trouble the idea of the human as being at the centre of the action, putting the bodies of teachers and students amongst a crowd of non human others who participate together in design knowledge making practices.
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Introduction

While the importance of tools and representations to architectural practice has been recognized, the contribution of bodies has been left relatively under explored. This thesis works towards a better understanding of how our bodies contribute to design knowledge and knowing through a study of gesture in design studios. By analysing gesture I explore what kind of knowledge work bodies can do when teachers and students talk to each other about design propositions, how this work depends on the knowing manipulation of things and what a better understanding of the role of the body in design practice might have to offer design teachers.

It is important to better understand the contribution of bodies to design knowledge practices as the tradition of face to face training in the design studio is now under threat. The design studio, as the place where fledgling architects learn their craft, has been central to most architecture courses since professional education moved into the academy in the mid twentieth century. However, in recent years rationalising processes have occurred within universities across the world which, coupled with the revolution in digital technology, are now starting to affect the operation of design studios in architecture courses. In some institutions the amount of time an architecture student spends in the studio with their peers is being reduced\(^1\), while in others the various activities of the design studio are being moved to online formats\(^2\). More generally, there is growing concern with this issue of the physicality of bodies in design practice. Recently an entire issue of the journal ‘co-design’ was dedicated to the analysis of designers working together with others; this included some work on the production of speech and gesture between designers in the workplace\(^3\). This other work recognises the dangers of not knowing what our bodies contribute to the knowledge work of the profession. In design studios the concern is not only how bodies might contribute to efficient and elegant practice, but in finding ways to translate the knowledge work bodies do into alternate formats, such as online classes, where bodies are not physically present. By working towards such an understanding, this thesis aims to create insights to benefit current and future teaching practices.

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\(^1\) This was happening at the University of Melbourne as this thesis was being produced; a common three year undergraduate degree was being offered such that design studios were not populated by a single discipline until 4\(^{th}\) year

\(^2\) For example, The Academy of Art University in San Francisco ran part of its architecture course online at the time of writing: http://online.academyart.edu/architecture.html

at the same time that it develops a new theoretical understanding of the design studio as a pedagogical space.

All humans have the capacity to gesture. The pervasiveness of gesture in everyday life, combined with the fact that gesture has a surprisingly long history as an object of research, makes it a good way to anchor the study of bodies in design studios. Gesture is defined as the spontaneous movement of hands and arms which occurs as we speak. While gesture helps us to add expressive colour and flavour to our speech, it also has the capacity to take on more demanding communicative roles, for example gesture is used in sign language for the hearing impaired and as a ‘battle language’ for soldiers in the field. As well as helping us to manage turn taking in conversation, gesture can be a good way to convey concepts that are not easily articulated through spoken language. It is perhaps for the interpretive processes that gesture enables between people, as much as for its expressive potential, that we, as a species, have maintained highly developed gesture skills, despite having sophisticated language abilities.

In this thesis gesture is treated as a knowledge practice that helps to weave together architectural practitioners as a community. Silvia Gherardi notes that ‘practice’ is a malleable term; while it can mean routine action it has, of late, come to signify the entanglement between knowing and doing. Knowledge practices knit together professional communities through shared understandings and ways of doing. While the architectural community’s knowledge practices may at first glance seem to be amenable to being learnt and transferred, gesture is one of those that are difficult to access and measure. Further, its graphic nature resists more accepted notions of what knowledge is, which tend to privilege writing and speaking. In fact the tacit, taken for granted nature of gesture is probably one of the reasons that scholars of architectural education have failed to grasp that ‘doing gesture like an architect’ can even be considered a form of knowledge at all. Donald Schön, scholar of professional education, was on the right track when he talked in the 1980’s about the design studio as being a “dialogue in the media of words and performance” whose aim is a student who is capable of “thinking and doing like-an-architect”. The fact that he left gesture out of his account altogether is, unfortunately, common in design studio research, which has tended to focus on speech at the expense of action and interaction. One of the premises underlying

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6 Ibid. pg 64
this thesis is that architectural forms of gesturing are socialised behaviours: a form of knowing in action which has to be *learnt* in order for the student to be able to act convincingly in the role of architect. Since the surest way to interrupt ‘smooth functioning’ of gesture is to try to teach it deliberately, it is in the design studio and its immersive, project-based forms of learning, where this knowing is given time to develop and mature.

The fact that architectural training has long been a form of enculturation as well as training in a set of skills makes it a difficult area to study. In fact the literature on the design studio could almost be described as polarised into the apologists and the critics. Partly this is a response to the way that design studio pedagogy has been theorised in the past. Schön identifies the ‘desk crit’ as the locus of knowledge production in design studios. The ‘desk crit’ is where students engage in ‘story telling with things’ to account for the forms they have produced and teachers discuss and critique this design work in process. Teachers in design studios are therefore powerful creatures; through their interactions with students in desk crits they are in a position to empower students to gain architectural knowledge and degrees. In the contemporary state systems of the Western world these degrees will enable the students to take up a legitimatised position in the profession. The work of Michel Foucault\(^7\) reminds us that empowerment always brings disempowerment in its train; to get knowledge and degrees students are positioned in an inherently asymmetrical power relation — the teacher always knows more than the student and the student is not in a strong position to ‘speak truth’.  

By privileging the figure of the studio leader as a ‘coach’ to the students, and claiming that their personality and actions were vital in the processes of student learning, Schön, and scholars who have subsequently taken up his work, have drastically over simplified the design studio as a teaching and learning environment. This leaves us, both as scholars and as teachers, in a difficult position. Criticising the design studio by playing students as victims of oppressive effects of power is a knee jerk response that has served mostly to aggravate teacher practitioners, who rightly point out that they are just trying to do their job. But neither should we let the ‘design studio system’ (such as it is) off the hook by only playing up the positive outcomes. There’s no doubt that the intensity of engagement with design studios can be detrimental to a student’s health and well being.

Therefore it is important in any study of the design studio to attempt to keep the effects of power always in view.

Materiality, knowledge, power and identity are complexly intertwined in any design studio. Attempting to clear away this mess by looking at gesture through experimental methods would smooth away this interesting complexity. To this end this thesis uses Actor-network theory (ANT) to orient itself in an empirical study of gesture captured within ‘naturally occurring talk’ in desk crits within several design studios in Melbourne, Australia. In this study gesture is treated as an actor which can perform certain kinds of knowledge work.

According to John Law\(^8\), actor network theory can be understood as “a form of empirical post-structuralism” which is concerned with exploring how reality is made or performed into being. In other words, it is not just how things or people act, but how they act together and are organised in various ways that make ‘reals’ which are both multiple and entangled. Therefore using ANT involves taking up a relational ontology. In addition it is a difficult and evolving area of theory; in fact there are arguments as to whether to describe ANT as a theory or as a set of research methods. John Law asserts that ANT is the study of material semiotics with a particular sensibility towards method that is highly reflexive and attentive to ‘mess’. Bruno Latour suggests that ANT is a theory of: “...how to study things, or rather how not to study them. Or rather how to let the actors have some room to express themselves”\(^9\).

ANT is a good companion to this study of design studios because it is sensitive to all forms of materiality, animate and inanimate. Bruno Latour describes an actor as an entity in a field of human and non human things that makes some kind of difference. Actors can enroll other actors into a network through a process of translation, where a thing or a person is empowered to act in some way. In fact the design studio can be thought of as being assembled from multiple actors — bodies, gestures, representations, physical and institutional environments, class handouts and so on — which are translated into a design studio actor network which then does particular work. Rather than power being concentrated in the central figure of the teacher, it is diffused through the whole actor network which produces effects. These effects might take the form of architectural meaning(s), knowing(s) and subjectivities which are performed into being as the design studio is


‘done’ by the various actors — including gesture. Because the process of translation is never perfect there is always potential for other possibilities to emerge. Therefore ANT offers a way to study teachers and students at work in design studios without retreating into the sterile oppositions that tend to characterise the design studio literature.

The key difference between ANT and other forms of observational studies is that the researcher presumes there are actors other than humans who have are capable of having agency. It is the responsibility of the researcher to work to discover what this agency might be and surface it in their accounts. Here, through the deployment of a suite of tools such as observation, the collection of objects, drawings and images, two different kinds of accounts of gesture in design studios are produced. These accounts act as a way to challenge the very idea of that we can productively separate gesture from action with things in the production of design knowledge and knowing.

Throughout this work I ask a series of questions about gesture in design knowledge practices: what ‘work’ does gesture do in the design studio during design conversations? What can a study of gesture tell us about the nature of design teaching and learning? How might developing a capacity to gesture in certain ways help students become architects? While it is not the intention of this thesis to study online spaces, it aims to contribute to the scholarship in this emerging area by establishing why physical presence is important to design teaching and learning and beginning to sketch out how teachers might have to change their practices if physical presence is no longer possible.

In Chapter One I explore the design studio through a discussion of how the spaces of architectural education have always been the product of socio-material relations, from the medieval craft guilds to academia. This chapter argues that how and where bodies are mobilised produces different kinds of architectural subjectivities – from master mason to knowledge worker.

Chapter Two is concerned with how bodies, knowledge and power are always complexly entwined. Three theorists of the design studios are singled out in this discussion: Donald Schön and his empirical accounts of design studio activity, the work of Bryan Lawson who uses insights from cognitive science and Snodgrass and Coyne who work in the hermeneutical tradition. All of these theorists, to various degrees, suggest that materiality is important to design practice. While all recognise the materiality of representations they do not grapple with the materiality of the body. I then ‘talk’ an ANT approach to the problem of the body through the story about one design teacher’s practice, what his studio demonstrates about the entanglement between knowing and doing and how non humans are implicated in these processes.
Chapter Three starts with a story of the difference between the way my father in law (a builder) and I handle drawings. I discuss how ways of knowing and ways of acting in the world are deeply entangled through various theorists including Marcel Mauss, Erving Goffman, Pierre Bourdieu, Michel Foucault and the recent discourse on practice epistemology. I then highlight gesture as a good site to investigate the ‘disciplining’ of the body into architectural ways of being in design studios knowledge practices. I then survey the literature on gesture to see what is already known about this phenomenon in relation to cognition, language use and learning, including what little exists about architecture studios.

Chapter Four is a discussion of the methods, the theory informing them and the collection and analysis of data. The approach to method was to attempt to *study gesture like one would an animal in the wild* and the main site for the observation was the ‘desk crit’, which seemed to be a particularly rich location for gesture activity. The research participants are identified and researcher construction is discussed. The aim to present two different accounts of gesture in the design studio is explained and the strengths and weaknesses of the different methods used are discussed.

The next two chapters are the two different accounts of gesture are presented.

Chapter Five, originally presented as a conference paper at the “50 years on: Resetting the agenda in architectural education” conference at Oxford University in the UK, is an extremely long chapter which is broken down into three different parts: ‘performing space’, ‘performing connection’ and ‘performing feeling’. These correspond to three different types of knowledge work that gesture is capable of performing. Transcriptions of selected episodes of design story telling are used to demonstrate the various ways in which gesture was found to be performing these three different kinds of work in design studio activity.

In Chapter Six, originally published in the book “Plastic Green” published by RMIT University Press, what has previously been found about gesture is put back into the ‘flow’ of design studio activity and close attention is paid to how gesture participates in various kinds of design studio ‘ordering processes’. One of these ordering processes — and how it produces ‘networks of affect’ — is singled out for further study through an in-depth analysis of a single interaction between a teacher, student and a cardboard model. The patterns of gesture identified in chapter five are seen to dissolve into the action, supporting the claim that gesture, action and knowledge can never be productively separated.
In the conclusion I draw together the various threads of this thesis — materiality, representation, power and identity — and sketch out some implications of these findings for architectural design teaching and learning in the contemporary academy.
Chapter One: The spaces of architectural education

Over the last 500 years or so architectural design education has moved from the building site, to professional office spaces and finally to the University. While there have been some radical changes to the way architects have learnt their craft, architectural design education has always involved experienced designers working with less experienced ones on architectural problems using tools and/or representations. What might the history of architectural education tell us about the importance of bodies in the contemporary design studio?

This chapter sketches out the various forms architectural education has taken as it shifted from building sites to academic spaces; charting the mutation from an oral culture working with the materials of construction, to a visual and literate culture that works with representations. Through this historical survey an argument is put that as various forms of materiality, including the materiality of the body, are mobilised in different arrangements, different kinds of protected social spaces\textsuperscript{10} have been produced which have performed both an enculturation and a skills training role as well as acting to produce certain kinds of subjectivities. “Subjectivities” is used here in the sense that Michel Foucault employed it within his work\textsuperscript{11}: as a fashioning of the self in relation to discursive practices within a complex network of power relations.

The contemporary design studio is a hybrid of some of these previous forms of education now adapted to academia; the anxieties that this has provoked in contemporary scholars of architectural education is discussed and the aims of this study are positioned within this discourse.

The shape of the contemporary studio

Architects no longer learn on the job, either in building sites or in offices; they sit at tables in University rooms working on fictitious projects in classes we call ‘design studios’. Presently, the structure of architectural education and of design studios seems relatively homogenous across

\textsuperscript{10} The term ‘space’ is employed here in a sociological rather than an architectural sense: educational spaces are not just classrooms but not separate from them; they are networks produced by the action of people and things that both structure actions and are structured by them. Refer to the introduction.

\textsuperscript{11} Foucault, Discipline and Punish: The Birth of the Prison.
Australia and throughout the western world. As it is commonly presented, the design studio provides fledgling architects with the opportunity to develop design skills by working on hypothetical projects with the help of experienced practitioners in the presence of their peers. Although each studio is potentially as different as the teacher that conducts it, the consensus amongst scholars is that the form of the studio activities tend to remain relatively stable and be reproduced over time and space. In particular they have noted the importance of the ‘desk crit’, where teachers mentor and guide students through one to one interaction with them about their design proposition which is positioned as central to the functioning of the design studio. In fact, the desk crit is such an established form that some writers have developed useful descriptions of the practice for others, such as the following:

The pedagogical core of the desk crit is the idea of scaffolding. During a crit, the critic works to understand what the student is trying to do with his or her design work and then helps the student develop that design idea…Often the critic and the student will “design together”, with the critic quickly sketching a number of design possibilities, exploring the consequences of possible design choices. In doing so the critic both offers design choices and models design thinking.

Design studio pedagogy as it is set out in the academic literature is described as a form of problem based learning that explicitly mimics parts of the professional goings on of an architecture office; specifically the process of producing design work where an architect or team will work with

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12 Architecture courses in Australia today seem to by quite similar in the way they task of educating architects and the amount of time they allocate to design teaching. The latest report in Australian Architecture education by MJ Ostwald and Anthony Williams, “Understanding Architectural Education in Australasia (Volume 2): Results and Recommendations,” (Association of Architecture Schools of Australasia, 2008). Claims that classes that are called ‘design studios’ in Australia tend to take up between 40% and 45% of the curricula of any given architecture course


clients, developers, user groups and consultants to design buildings to a brief and provide representations of those designs for the purpose of construction. The studio leader or teacher is a put forward as a pivotal figure in this process. As well as acting like a mentor, the studio teacher can step into other ‘roles’ by providing the student with information and feedback from the point of view of other consultants, or they may take on the role of client and respond to any number of design moves the student has made from the point of view of an imaginary client’s concerns.

At RMIT University and the University of Melbourne, where this study was carried out, this form of design training translates to semester long courses arranged around a project brief to which the architectural student is asked to produce a design response. While the student is asked to take on the identity of the architect who produces a range of designs and refines them, the studio leader acts like a mentor or more senior designer who oversees the progress of the student’s design work week by week. Students may work to put proposals together for the same project brief either individually or in small groups. These proposals require the performance of a number of design related tasks which can include analysing sites, examining precedents, working through various proposals for the site using various design methods and making representations of their design propositions.

Design studios typically take up between one third and one half of the week of an architecture student’s week. At the time of writing, RMIT University design studios were

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17 The range of activities can be seen in catalogues and books of student work produced by universities. An example is the regular catalogue at the University of Melbourne held in the University Library: Building and Planning Faculty of Architecture, "Eyes: A Selection of Design Projects Completed by Students in the Faculty of Architecture, Building and Planning," in Eyes (Melbourne: University of Melbourne, 1996 - 2006).

18 http://www.architecture.rmit.edu.au/About/RMIT_Campus_Architecture.php accessed 03/10/08 The architecture school is on the top floor. Source: RMIT University Website

19 http://www.infodiv.unimelb.edu.au/external_event/venues/architecture.html accessed 03/10/08 The Melbourne school of design occupies the whole building. Source: Melbourne University Website

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Figure One: façade of building 8 at RMIT University

Figure Two: façade of building 133 at the University of Melbourne.
convened for four hour sessions, once or twice a week, depending on the stage of the course the students are in. They tended to take the form of a group of approximately 12 students in a variety of year levels who would meet with their tutor, usually an architect or architecture graduate. At the University of Melbourne the classes were somewhat larger, containing up to 70 students who were served by a number of tutors and arranged by year level, but otherwise the structure of class time was basically the same with the addition of a lecture once a week.

At both these universities during the class time the tutor and students reviewed design work in progress either in the form of one on one consultations (desk crits) or as presentations to the whole class and perhaps an invited critic (‘pin ups’). Both these activities are essentially a form of ‘design story telling’ where each student attempts to account for how he or she arrived at certain architectural forms, what the nature of these forms is, as well as their function and significance. The purpose of this story telling was to prime the teacher and (to a lesser extent) the rest of the class to provide feedback to the student story teller and help them generate ideas for future directions.

The honing of skill with making and using architectural representations is one of the results of the long immersion in design studios. These representations tend to take the form of 2-D drawings and 3-D models, in either digital or physical form. At both RMIT and the University of Melbourne these representations are produced outside of class time and bought into the design studio class as there are limited facilities for students to produce their work on campus.

It should be noted that the type of class described above is often called a ‘design tutorial’ in the UK and the USA; however the difference with Australian practice seems largely in name only (the terms ‘design studio’ or ‘studio’ are used throughout this document to refer to the time that students spend with their tutor in the classroom).

The design studios described above are the most contemporary manifestation of a history of architectural education where architects have learned both ‘on the job’ and/or in the academy.

20 Ostwald and Williams, “Understanding Architectural Education in Australasia (Volume 2): Results and Recommendations.” See note above
21 While this thesis was being written the amount of time students were spending in studios was being altered. University of Melbourne was in the process of changing from a 5 year undergraduate degree to a three year ‘general’ degree and a 2 year Masters degree. RMIT University quickly followed suit. At RMIT this change did not make much difference as the students still had a specialised undergraduate degree, whereas at the University of Melbourne the undergraduate degree became less specifically ‘architectural’ – students could take subjects in a wide variety of different disciplines before they took a masters degree in architecture.
22 The other local architecture course at Deakin University did have an on campus studio but still convenes class time for review of work in progress. As this thesis was being completed RMIT University had re-introduced a collective studio space where students could work in a ‘hot desk’ arrangement.
Architectural education has always involved absorbing cultural mores, theoretical concepts and ideas of professional norms along with the requisite technical skills. In this way the design studio can be seen as following in the tradition of architectural education in that it is an induction into a set of shared community practices and values at the same time as it acts to translate architectural knowledge and knowing to a new generation. As such, how and where design training takes place, and what tools and representations are used, produce different kinds of architectural subjectivities. The next part of this chapter will trace the changes in the way architectural design has been taught from the early 13th century in order to understand how the design studio came to take the form it does today.

The Guild System

As a professional activity in the Western World, architecture can be connected back to ancient and medieval forms of guild organisation. The Guilds of Master Masons came to dominate the building industry of Western Europe from the 9th century to the Renaissance23. The guilds were essentially collectives of artisans, often relatively confined to a geographic location, who shared work practices and knowledge and, often, significant kinship ties24. In many ways master-builder guilds resembled collections of small business owners rather than modern trade unions; the vital difference being that they owned many of the means of production, such as tools and workshops.

Guilds tended to be very protective their trade secrets. Design ability, as a form of ‘intellectual property” (although it would not have been thought of in this way at the time), was a significant financial resource that had to be carefully guarded as the deployment of it in building sites contributed to the wellbeing of an entire community. Family structures, especially father/son relationships, tended to determine who was allowed into the guild and what parts of the guild knowledge they were able to acquire. The apprenticeship system, still current in many building trades, was an extension of this idea of a familial bond25.

This community and kinship model of education is quite different to the state sponsored systems we are familiar with today. Specifically, its aims were subject to the inter-generational complexity of traditional groups who were interested in the development of the whole person. The stakes were high; as those who were trained may, through marriage and/or the joint

24 In the 8th and 9th centuries some Benedictine monasteries had schools attached to them which, amongst other things, acted to pass along such architectural knowledge that had preserved from Greek and Roman times, such as the books of Vitruvius. Ibid. Pg 73
25 Ibid pg 73
ownership of property, become a long term member of an extended community as well as a
colleague in the workplace. Michel Foucault points out that the time given to training in guild
structures was different to more modern ‘disciplinary’ time – it was not separated from the
work time of the adult world or broken into stages that signify progress towards mastery as we
do today. Significantly the modes of qualifying for independent practice were different; guild
novices were subject to one master rather than a system of examination administered by the
state.

In the absence of mass produced books, transmission of knowledge not directly related to
workplace practice, such as geometrical principles or plan forms, was carried out in an oral
tradition. Matila Gyka describes these oral traditions as including rituals closely resembling
Christian rites. Obviously guild knowledge was considered powerful as these rituals included oaths
of secrecy in relation to specific parts of received knowledge, such as cathedral plans.

The guild members, as early building industry professionals, were trained on site to be
proficient at many roles, from designer, to engineer and contractor. The transition between guild
forms of organisation and a recognizable profession called ‘architecture’ was gradual. Likewise it is
difficult to determine when the use of architectural representations as a way of procuring buildings
became commonplace. Nicola Coldstream claims that Medieval masons made templates rather
than drawings and that the earliest form of architectural representation (at least elevational drawings
that are comparable to what we currently understand today as architectural documentation) only
survive from the 16th century. Coldstream describes the difficulty in ascertaining how work was
organised in medieval time without recourse to drawings and contracts as records. From the middle
ages through to the Renaissance no one person could be claimed to be filling the role of ‘architect’
or, if they did, their role was subservient to their wealthy clients. If architects were producing
representations in these times they were almost certainly doing them in the context of actual
projects.

27 Gykha, “Gothic Canons of Architecture,” pg 73
28 Ibid. pg 73
30 Ibid.
As many kinds of trade and artisan work, including elements of the building trade, moved into modes of mass production, guilds began to be construed by governments and early industrialists as close minded and intent on stifling innovation\textsuperscript{32}. Foucault argues that it was in the interest of employers to promote different modes of organising training: “… although the workers preferred a framework of a guild type to this new regime of surveillance, the employers saw that it was in-dissolvable from the system of industrial production, private property and profit\textsuperscript{33}.

\textit{Figure Three: representation of a medieval building site} \textsuperscript{31}

Governments in England and elsewhere worked to break the guild’s stranglehold on production; not even academics, with their own peculiar brand of guild mentality (perpetrated through the monastic system live-in colleges) were immune to this process\textsuperscript{34}.

One of the ways guild power was eroded in the building trade was to formalize its training role in other institutions located outside of the guild kinship structure. The invention of the printing press helped to speed along this development\textsuperscript{35} by allowing construction knowledge to be stored in drawings and descriptions and circulated outside of the boundaries of the oral tradition. Nevertheless the enculturation role of education was still considered vital, as can be seen in the way early forms of architectural training in the formal educational institutions of Northern Europe.

\textbf{Moving to the Academy}

The first recognizable formal academic training for Western architects began in the 17\textsuperscript{th} century with the establishment of the Academie Royale d’Architecture by King Louis the 14th in 1671. However the transition from the workplace to the academy was not complete in most of the Western World until the late 20\textsuperscript{th} century and has never been without controversy. Paul Cret,

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{31} Image from Cuff, \textit{Architecture: The Story of Practice}.
\item \textsuperscript{32} For a description of the efforts of industrialists in England to break the power of the guilds refer to Chapter 8 “Towards an industrial society” in Roy Porter, \textit{English Society in the 18th Century} (London, New York: Penguin, 1991).
\item \textsuperscript{33} Foucault, \textit{Discipline and Punish: The Birth of the Prison}. Pg 175
\item \textsuperscript{34} William Clark traces the transition from guild forms of production to the early German ‘police state’ in William Clark, \textit{Academic Charisma and the Origins of the Research University} (Chicago, London: University of Chicago Press, 2006).
\item \textsuperscript{35} Gykha, “Gothic Canons of Architecture.”
\end{itemize}
\end{footnotesize}
writing from the point of view of an educator located in a modernist period, laments this shift away from the guilds as being detrimental to architecture because it separated education from construction:

In architecture, (the move to a formal system of education) developed a tendency to follow the ideals of the court and the aristocracy rather than to express the national tradition, and it tended to change the architect into a professional man, or as he would be called today, a white-collar man – remote from the chantiers and less familiar with the actual work of construction than his predecessor, the master-builder.

However the ‘de-privatisation’ of architectural knowledge had other implications. With changes in the structure of practice (the move of architects from building sites to offices) the role of architectural representation became, over time, more prominent until it took over from the oral practices of the guilds and became the primary site for the epistemological practices of the profession. In formal education the representation became the primary means for students to deploy and display design learning and develop design judgment. At the same time representation started to become a site for experimentation rather than replication of traditional formal arrangements. Representational practices helped education became a place where the artistic and aesthetic potentials of architecture could be explored in a space insulated from the exigencies of practice.

The inception of the Academie Royale d'Architecture in 1671 in France, and the appointment of a set of academicians as ‘experts’ sanctioned by the Sovereign also marked the beginning of the idea that the quality of architectural education could be a responsibility of the state and that quality control was best exercised through the auspices of a professional body. Initially the group of academicians appointed by the King comprised six practicing architects and one professor; eventually the membership expanded to 30. The members had certain duties and responsibilities such as being required to reside in Paris and attend weekly meetings as well as having the right to elect new members. These ‘Architectes-Du-Roi’ also had a monopoly on court work and government projects and the conduct of education.

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36 French: ‘building sites’
This French academy did not really organise formal education until 1762, some forty years after its formation. Peter Collins claims that its only real educational effort until this point was to run a series of free lectures. Collins outlines how the academy influenced the education of young architects by controlling selection by keeping the number of enrolled students in academy school “proportionate to the number of academicians.” Clearly the academy aimed to reproduce the professional body through education rather than expand it. Cret claimed this closely monitored education was evidence of the apprentice system and the mentality of the guild workshops still in operation.

However, unlike the guild training, the academy was the first location where students were primarily occupied in the making of architectural representations and judged on their competence in producing these representations. Cret describes the academy school as offering a three year course of study where students attended lectures on “… construction, geometry, mechanics, military architecture, and other required branches” in a room adjoining the room in the Louvre where the academicians met. As well as controlling admissions to classes, the academicians judged the drawings and designs of the students. The inclusion of this jury system resulted in students adopting an approach to design work which conformed to professionally organised systems of taste and decorum, albeit more formalized and based in traditional mores than those that exist today.

Early on, the notion of a problem based learning method was introduced to design education in these new institutional spaces. The academy professor, JF Blondel (1705 – 1774), had run a private school for young architects before running the academy school where he had developed methods of teaching through what would be called today ‘problem based learning’. Professors would devise the brief and the fictional site and client but already have solutions in mind before presenting the brief to the students. As Blondel advised:

Before dictating the program, he (the professor) should himself, in the tranquility of his office, have made preliminary sketches, as the only means of keeping to essentials thereby in a way preparing the student’s work. After having thus conceived it he should, in everybody’s presence, analyse, extend, and develop speculatively the type of project concerned, giving

39 Ibid.
40 Each academy member could appoint one student – presumably their own assistant and the professor could appoint 6, Ibid. pg 2
41 Cret, “The Ecole Des Beaux-Arts and Architectural Education.”
42 Ibid. Pg
43 Now notions such as ‘taste’ are more implicit than explicit in design studio operation. Rather than being codified they are ‘done’ in everyday interaction, as can be seen in my earlier story about my interaction with the student.
reference to precedents, and reminding students of similar buildings by great masters, or those described by the best authors. He should try to make them realize the subtle differences which distinguished buildings, constructed for the same purpose… so that those participating can stock their minds with those things bearing most analogy to the project given.

Figure Four: Original editions of Blondel’s text “Reimpression de l’Architecture Francaise” published c.1900.

This advice gives us insight into the kind of architectural subjectivity this system worked to produce. A student working with a professor following Blondel’s suggestions (and we can presume that many did because as a director he had great power over the way the academy was run if we can believe Blondel’s account) would have most of the struggle of arriving at a design solution hidden from their gaze such that the teacher was firmly configured as the ‘expert’ while they were positioned as ‘aspirant novice to the mysteries’.

The Beaux Arts and Atelier system

The academy school was closed by the French revolutionary government in 1793; but this was really a period of reorganization rather than an end of this system of architectural instruction. Two years later the ‘Institute de France’ was opened and it was from this formation that the next model of schooling arose: the Ecole des Beaux Arts and the Atelier system.

In 1807 the ‘Ecole des Beaux Arts’ was hived off from the ‘Institute de France’ and, over the 18th and 19th centuries developed a reputation for liberalism; giving students the chance to manage their own development within an overall structure of participation with academics and other

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45 Image Source: www.chestertownoldbookco.com/archbooks.htm
students. In his description of the French system as it existed in the 1940’s, Cret states that once students gained a place through examination, they were largely allowed to manage their own time so much so that they should be considered: “much more (as) a self-governing body of students, men in their twenties, than an autocracy controlled either by a group or the government.” Cret supports this statement with the fact that no attendance role was kept so that students could go to as many or as few lectures as they liked. The only requirement was that they pass the examinations; no time limit was set for completion of work but no one could still be a student at the age of 30. In addition the school was open to foreign students, which goes some way to explaining its influence on subsequent forms of architectural education in Universities.

The Ecole des Beaux Arts’ companion institution was the ‘atelier’ system and it is here that the tradition of the one on one consult between more experienced and less experienced designers became increasingly important. The Ecole set the examination briefs and supervised student’s initial making of a ‘esquisse’ in response to these parameters, which the students were then required to develop over a period of six weeks inside the workrooms of the ateliers. The final design was submitted as a set of drawings to a design jury who judged the result in the absence of the student. Thus the day to day design instruction took place in the ateliers which were arranged as workshops overseen by professors. The atelier system was largely managed by the students who might choose professors operating outside of this system. If a sufficient numbers of students (around 40) decided to take on another practitioner as their atelier leader, that leader could become a professor and take part in the judging activities.

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46 Cret, “The Ecole Des Beaux-Arts and Architectural Education.”
47 Ibid. pg 14
48 Ibid. pg 14
49 French: ‘outline’
51 Carlhain, “The Ecole Des Beaux-Arts: Modes and Manners.”
The ‘patron’ of each atelier was expected to work with the students passing on their knowledge and expertise, as the students worked on developing the preliminary equisses. However, according to contemporary accounts, much of the knowledge work took place within peer to peer learning situations. Jean Paul Carlhian⁵³, writing in 1979 of his experience in the ateliers just after World War Two, described a working system whereby patrons would make weekly and sporadic two hour visits to the atelier to set the tone of the problem, the general goals and provide general leadership. The students of the atelier (usually numbering between 50 and 100), in particular the senior students (or ‘aciens’), would then work together producing representations of final design solutions. The system worked through a system of mutual benefit, senior students would trade off advice and assistance for the junior student’s help with menial tasks⁵⁴. The atelier system produced a tight knit cohort through this working arrangement, as Caltain remarks:

Changing atelier in the course of one’s studies, was not only universally frowned upon and actively discouraged, but made very difficult, if not practically impossible due to the total

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⁵³ Carlhain, “The Ecole Des Beaux-Arts: Modes and Manners.” pg 8
⁵⁴ Ibid, pg 8 This is supported by accounts in Donald D. Egbert, The Beaux-Arts Tradition in French Architecture Illustrated by the Grands Prix De Rome, ed. David Van Zanten (New Jersey, Surrey: Princeton University Press, 1980).
severance of personal friendships already established. Its effect was a general ostracisation from the student body at large leading towards the psychological traumas caused by the damage inflicted upon the individual's prestige and reputation and the resulting time lost in regaining one's position in the newly chosen atelier the considerable afferent increase in the degree of hazing not-withstanding.\textsuperscript{55}

The atelier and jury system, particularly the closed jury, placed an emphasis on students' ability to produce compelling representations and placed them in competition with one another. Some critics have contended that this competitive element centered on such speculative schemes had certain drawbacks, for example that students paid too much attention to drawings, especially in making pleasing plan compositions, for example in entries for the coveted Grand Prix de Rome.\textsuperscript{56} As Cret remarks:

\begin{quote}
The Prix de Rome became such a big stake for future success and honors that it soon gave birth in each atelier to a little group of "race horses" trained especially to "run the Grand Prix." These students, having completed the regular work of the School and armed with a certain prestige, spread the view among the younger men that winning competitions was more important than disinterested study.\textsuperscript{57}
\end{quote}

The designs made for the Grand Prix de Rome were never meant to be built; they were often monumental or civic buildings, produced for 'ideal' clients, with no attention paid to cost and very little to engineering details; a tendency that is reproduced in some design studios today.\textsuperscript{58} Cret claims that competition in the system as a whole was so intense and the lack of time constraints so permissive that students tended to linger in the system much longer than was healthy and not look to extend their experience in practice.\textsuperscript{59}

The tension between the formal Beaux Arts system, with its emphasis on aesthetics and competition, and the demands of architecture as a technical discipline has begun debates about the best way to educate architects that continues today.\textsuperscript{60} In the Academy and the Beaux Arts the site of

\textsuperscript{55} Carlhain, “The Ecole Des Beaux-Arts: Modes and Manners.” Pg 7
\textsuperscript{56} The most comprehensive discussion of the Grand Prix de Rome is in Egbert, The Beaux-Arts Tradition in French Architecture Illustrated by the Grands Prix De Roma.
\textsuperscript{57} Cret, “The Ecole Des Beaux-Arts and Architectural Education.” Pg 13
\textsuperscript{58} The catalogues produced by universities for their graduating cohorts are a good reference for this; refer: Faculty of Architecture, "Eyes: A Selection of Design Projects Completed by Students in the Faculty of Architecture, Building and Planning."
\textsuperscript{59} Cret, “The Ecole Des Beaux-Arts and Architectural Education.” Pg 13
\textsuperscript{60} While this thesis was being written the author attended a conference in the UK (The Oxford Conference: “50 years on: resetting the agenda in architectural education”) which attracted scholars of architectural education from around the world. The conference opened with a debate on whether schools of architecture were necessary to the profession or a detriment.
design teaching moved from the materiality of the building site and its oral traditions to the different materiality of the architectural representation and the academy setting. Representation practices became the main site of the epistemological work of the profession both inside and outside the academy.

As the size of groups of students increased in relation to the teaching staff, peer to peer relationships began to be more important and the social dynamic we are familiar with in contemporary design studios started to appear. Leadership was provided by the more experienced students and professors as to what constituted ‘good taste’ and adequate modes of representation. Junior students worked to make designs what would be considered de rigueur in their atelier, based on the reaction of their peers and mentors and within a system that simultaneously valued competition and co-operation.

The early development of the schooling system in France was destined to have a lasting effect on the formal education of architects worldwide. However, until the late 19th century, the direct apprenticeship tradition remained strong in the rest of Europe and in the colonies. It is to this tradition that we now turn to see how the ordering processes of contemporary democratic states started to make its presence felt in architectural education.

**Article clerkship and governmentality**

The movement of architectural design training from practice to Universities was a gradual one in many countries outside of France, and Australia was no exception. Significantly, this change from the spaces of practice to the spaces of the academy coincided with the establishing of recognised building standards and the beginning of standardised tests as a condition of entry into the profession. This could be understood as a process whereby architectural education started to come under the surveillance of modern forms of what Michel Foucault called ‘governmentality’ or social control by means of institutions, regulatory regimes and disciplinary systems rather than the ‘top down’ rule of a head of state.

In England in the 18th and early 19th century the most common route into the profession, at least for those of the middle class, was working in an architect’s office as an articled clerk — a form

of indentured apprenticeship. J.M Freeland highlights the ‘medieval master-apprenticeship’ underpinnings of this system of training, where aspiring architects would pay a practitioner a sum of money, often in advance, for a set number of years of training – spending most of these years working without any form of financial recompense.

The unregulated system of articled clerkship meant that the quality of education was highly variable. At its best it offered a collegiate education, with some of the educator-practitioners dedicated to turning out ‘gentleman architects’ who would be a credit to the profession. However, many articled clerks were systematically exploited, as is hinted at in an excerpt Freeland highlights from one of these contracts where, in exchange for tuition, the prospective clerk promised his master to: “…faithfully serve, his secrets keep, and his lawful commands everywhere gladly obey.”

In architect’s offices articled clerks may have been fully integrated into the running of a practice or hived off in a room on their own to work from pattern books, turning out representations of speculative projects, much like the briefs set for the Beaux Arts, under the guidance of their master. During this period, replication and improvement on precedent rather than experimental novelty and originality was the design method of choice. Some of these teaching offices were run by ex Beaux Arts students, such Julia Morgan in San Francisco, who spread the design philosophies of the school. A description of her office / atelier, around 1930, gives something of the flavour of these transitional teaching environments where articled clerks would learn ‘on the job’:

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62 Ibid, pp. 205 – 206
63 Refer J.M. Freeland, The Making of a Profession: A History of the Growth and Work of the Architectural Institutes in Australia (Sydney, London, Melbourne, Singapore: Angus and Robertson (in association with the Royal Australian Institute of Architects), 1971), pg 205 Note: until relatively recently architecture has been a very male dominated industry. Women still make up a smaller percentage of the active workforce in Australia, although the intake into most architecture courses is slightly biased in favour of women refer: Ostwald and Williams, “Understanding Architectural Education in Australasia (Volume 2): Results and Recommendations.”
64 Ibid. Pg 205
The heart of the Morgan office was the library … At least 500 books related to architecture were available for study, and everyone in the office was expected to consult them. The larger area of the main drafting room, with long, broad tables around which the designers worked (nine or ten of them in good times), had a massive drawing file topped by a bust of Dante. Here for reference were the drawings for earlier Morgan buildings. A prominent bulletin board featured different architectural photographs from Morgan’s collection each week and every member of staff had to be familiar with these.

In Australia there was no officially recognized set of building standards until the mid 20th century. In the early days of colonial settlement in Australia the definition of an architect was imprecise. Most practitioners began their training as engineers or surveyors, as Freeland puts it, “…(who) added a little architectural icing to the basic engineering cake”69. Much of the knowledge required in constructing buildings and making ornamentation lay in the hands of master-craftsmen, therefore the architect’s drawings did not have to be precisely detailed. As a consequence architectural practices could be small. Most were, as Freeland puts it, of the ‘one man and a dog’ variety, consisting of an experienced practitioner with at most two assistants (who might be students) to carry out the “heavy lifting” of the drawing work.70

The early 20th century marked the beginning of significant mechanisation of building services; lifts, electrical lighting and mechanical ventilation and the introduction of high rise structures, made it increasingly difficult for small practices to design and oversee all aspects of a

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67 Boutelle, Julia Morgan Architect. Pg 61
68 Ibid. Pg 42
70 Ibid. pg 206
building’s construction. Very small practices could not cope with the scale of the work that was required to document and manage complex projects; most required an increasing number of assistants and, slowly, the intimate workplace relationships that were the pedagogical basis of the articulated clerkship system started to come undone. Freeland\textsuperscript{71} also notes that as buildings became more complex the profession started to splinter into different specialisations such as engineering and quantity surveying — a process that has continued to the present day.

\textit{Figure Seven: Building sites old and new. Concrete construction in Queensland, Australia in the 1960s\textsuperscript{72} and, on the right, Workers dismantling the vaults of Santa Maria de Olila, California, c. 1930\textsuperscript{73}}

Articled clerkship was beginning to be superseded around the turn of the century and was pretty much out of use in Australia by the 1930’s. Although there had been some part time courses to supplement articled clerks technical training from the mid 19\textsuperscript{th} century, those who aspired to be architects did not have access to fulltime university courses in Australia until the first half of the 20\textsuperscript{th} century. The move to the academy was precipitated by the profession pressuring governments to bring in various registration acts to restrict the use of the term ‘architect’ to those with recognised qualifications\textsuperscript{74}. These were discussed and drafted for many years before finally being passed.

\begin{itemize}
  \item Freeland\textsuperscript{, The Making of a Profession: A History of the Growth and Work of the Architectural Institutes in Australia.}
  \item Freeland pg 206
  \item Source: Boutelle, \textit{Julia Morgan Architect}.
\end{itemize}
through the Victorian state parliament by 1922 and the rest of the country by 1950\textsuperscript{75}. Registration acts were argued as a necessary condition for the public to have confidence that those who met the registration standards would provide a certain level of service for their clients.

Responsibility for registering architects was handed over to local registration boards who set and administered exams for students and graduates to gain registration. These registration boards were usually appointed by state minister who asked for recommendations for appointment to this board by the Royal Australian Institute of Architects (RAIA). So, not unlike the process of regulation instituted by the appointment of the academy by the King in 18\textsuperscript{th} Century France, the state moved to regulate the profession by encouraging self regulation administered and overseen by a peer group self selected from the professional body.

As the state took over more and more organizing functions it sought to minimise legal risk for those doing development and building work through the auspices of common law. The doctrine of tort law relates to owing a duty of care to those over whom you have some kind of control or power. Teachers owe a duty of care to their students, doctors to their patients, and so it follows, architects to the inhabitants of their buildings. The doctrine of tort law meant that the government and the industry had to find ways to ensure that those who became recognised professionals would practice in a way that was not going to incur liability for any negligent acts. This took the form of laws relating to design, the organisation of work on building sites and the education of building professionals.

As a form of governmentality which relied on self discipline, registration was not seen as enough protection for clients and other investors. There was ever increasing pressure from the profession to standardise the education of architects. Eventually education was fully de-privatised

\textsuperscript{75} The Australian act is administered by various registration boards in each state with representation from practicing professionals and educators appointed by the relevant government minister from recommendations by the Royal Architecture Institute of Australia (RAIA). The website for the architects registration board of Victoria (ARBV), where this study was located, states it’s charter as: “The Architects Registration Board has existed since 1923 when it was established to carry out the duties entrusted to it by the Architects Registration Act 1922. The Board has operated since that time. While there have been a number of revised Acts in intervening years, the current Board was established under the Architects Act 1991. The Act defines the Board’s charter and The Architects Regulations 2004 are made by the Board within the powers of the Act to implement its provisions”. To become a registered architect it states that: “In each State and Territory of Australia it is a legal requirement that any person using the title 'architect' or offering services to the public as an architect, must be registered with the Architects' Board in that jurisdiction. Generally, the following steps outline the requirements for registration as an architect in a State or Territory of Australia. You must: “have an accredited academic qualification in architecture or a pass in the National Program of Assessment (NPrA), see www.aaca.org.au for details of NPrA; have a minimum of 2 years recent practical experience and successfully complete the AACA Architectural Practice Examination (APE)’’’’ http://www.arbv.vic.gov.au/the-arbv.aspx”
and full time courses in state administered institutions began to be the almost the only entry point into the profession.\(^\text{76}\)

Whether or not architecture was best taught in technical colleges or in Universities was disputed for some time. Lewis\(^\text{77}\) argues that architects recognised that they needed to position themselves as a profession, but wished to be viewed as one that was highly specialised and therefore required university training, rather than be incorporated in the technical colleges that were starting to be established. Freeland\(^\text{78}\) also suspects that a desire within the professional organizations such as the Royal Australian Institute of Architects (RAIA) to elevate the social status of architects was behind the push to move architectural education in the University as opposed to recognising the various part time drafting and engineering courses at ‘Working man’s colleges’ as a sufficient route to practice.

The design studio as we know it today started to take shape in this shifting landscape; at the same time that education hovered between the two sites of the academy and practice. Various kinds of formal and informal training for architects started to appear outside of the articled clerk system. Willis\(^\text{79}\) cites the existence of various architectural clubs from 1890 to 1920 and the availability of part time study at Gordon Institute of Technology (now known as Deakin University) and the Melbourne Working Mens’ College (now RMIT University). The first full time architecture course, at the University of Sydney, began in 1918 and followed in the Beaux Arts tradition in that, Freeland claims, it emphasized philosophy, theory and aesthetics and attractive rendering at the expense of construction and science.\(^\text{80}\)

A version of the atelier ‘mode’ was taken up in the studio workspaces attached to fulltime courses when these courses became compulsory after World War Two. One example is the ‘Melbourne Atelier’, which started operation in 1919 on the University of Melbourne Parkville campus and closed in 1939 on the eve of the Second World War. In 1918 Rodney Alsop, who had just been appointed as lecturer in charge of the Diploma course at the University described the atelier as existing for:

\(^{76}\) In Victoria there still remains provision to apply for registration after ten years of practice with registered architect and passing the registration board exams


\(^{78}\) Ibid


… the encouragement and advancement of the younger Architects, Draftsmen and Senior Students, who have attained proficiency in the draftsmanship [sic] and Building Construction and who wish to turn their attention to the finer problems of design, composition and rendering, in competition with their fellow members, and under criticism and assistance from the Instructor in charge, and from leading practitioners, who support the atelier\textsuperscript{81}.

Young architects who had a diploma or membership of the Royal Victorian Institute of architects (RVIA)\textsuperscript{82} could apply for membership to the atelier for a fee. Students had access to the atelier building, located on the University of Melbourne’s Parkville campus in the evenings where they would do design work, responding to set esquisisses, under the tutelage of an instructor in charge and various visiting practitioners who would lend their critical expertise. As in the atelier system accompanying the Ecole des Beaux Arts, students were expected to largely manage the day to day operation of the atelier. They would work on design proposals in a range of historical styles for the first two years and then move on to work in “any style to suit modern conditions”\textsuperscript{83}.

\textit{Figure Eight: The Melbourne Atelier c. 1931}\textsuperscript{84} \textit{Figure Nine: Meis Van Der Rohe with Students at the University of Illinios c. 1960}\textsuperscript{85}

The teaching staff appeared at certain times to consult with students at their desks as well as instigate more formal ‘pin up sessions. It was from this the ‘design studio’, as three to four hour

\textsuperscript{81} Quote in Willis, “Conscious Design: The Melbourne University Architectural Atelier 1919-1947.” Pg 44
\textsuperscript{82} The RVIA was the precursor of today’s Royal Australian Institute of Architects. The student members of the RVIA are more than likely those still studying under the articled Clerk system which was in steady decline, but still a valid route to professional practice at the time.
\textsuperscript{84} Source: Willis, “In Australia, Between America and Europe, Beaux Arts and Modernism, Scholarship and Qualification: The Melbourne University Architectural Atelier 1919 - 1947.”
\textsuperscript{85} Source: archives of the Architecture School, University of Illinois \url{www.iit.edu/arch/about/history/mies.shtml}
group sessions as we know it today, was born. However certain elements of the Beaux Arts remained, for example the use of the closed jury judging panel which continued for sometime in most institutions.\footnote{To date there has been no investigation of the more recent history of the design studio in Australia; I base this claim on interviews with senior staff members conducted throughout this thesis.}

So far this story of architectural education has compared the medieval guild system education, where aspirants were inducted into an oral culture through residence in an extended community and its building sites, to the Beaux Art system of state imposed systems of quality control coupled with part time residence in educational sites. There was a corresponding shift of the location of the epistemological practices of design education from an oral tradition located on materiality of the building site to a visual tradition located in the alternate materiality of representations. Both produced an architectural education that was simultaneously a form of enculturation. The Ecole Des Beaux Arts added elements of peer review with the introduction of the design jury and training in acquiring design judgment by immersion within the atelier system. The articulated clerk system continued the apprenticeship model of the guild and the representational training techniques of the Beaux Arts, but as the technical demands of the building industry became more pressing contemporary forms of governmentality began to inform educational practice.

The scene was set for the development of contemporary design studio as a hybrid of the various historical methods of instruction of architects, adapted to the habitat of academia. Part of the adaptation to the academy was the development of the design studio as a site of speculative design practice and as a site for academic research.

**Design studio as ‘knowledge generator’**

The idea of the design studio as a place to generate new design knowledge, rather than manipulate formal language according to acceptable modes of architectural decorum, began with the move into representation and continued as the studio came under the influence of Modernism and then post modernism. At the same time discourses from its new academic environment started to be taken up by teachers, in particular the notion of *research*.

One major influence current in architectural practice as design teaching shifted from offices to academia was the design ideas and style of the Bauhaus, set out in writing by Walter Gropius.\footnote{Walter Gropius, *The New Architecture and the Bauhaus*, trans. P. M Shand (London: Faber and Faber, 1935). pg 24}
The Bauhaus teaching ideology was originally based on an Arts and Crafts model88, underpinned by the idea that manual skills were a good all round training for “hand and eye”89.

What singled out the early Bauhaus as a pedagogy was a willingness to amalgamate the different design professions and focus on technical aspects of design practice. Early on, students at the Bauhaus were trained through manufacturing things by hand, working in large workshops and selling the products of their enterprise to the public. This emphasis on practical training continued even after the architecture school split off from the other arts and developed its own philosophy under Walter Gropius. In his polemic text on the Bauhaus: The new architecture and the Bauhaus, Gropius sets up this emphasis on hand skills as a democratizing force. He pities the students training in the Beaux Arts, even going so far as to describe them as “hapless drones”, because they were deprived of practical training that could have helped them become “useful members of society”90.

Gropius’s teaching philosophy was set in opposition to the idea of architecture being derived from traditional forms according to established patterns of decorum. Critics have long commented on modernism and the early 20th century as stemming from a time of great upheaval in Northern Europe. For example, the designer Natalia Ilyin91 claims that Gropius’s design and teaching philosophy were inevitable after his participation in the trenches of world war one, where approximately 10 million soldiers died and another 20 million were injured. Ilyin argues that, through their design work, Gropius and other modernists:

… fought against anxiety and meaninglessness, fought against the dull, futile ignorance they had seen all around them at the front… they chose to build a new world out of the mud, to build a utopia that did not admit death and disease and rain and trenches and blood, did not admit the primal, brutal, unkempt side of people92.

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88 The Arts and Crafts Movement (1880 – 1910) was influenced by the theoretical writings of John Ruskin (John Ruskin, The Seven Lamps of Architecture (London: Century, 1988)).
91 Natalia Ilyin, Chasing the Perfect: Thoughts on Modern Design in Our Time (New York: Metropolis Books, 2006).
92 Ibid. pg 35
Although the aesthetics of Modernism with its white walls and ‘clean lines and surfaces’ started to appear in the work of the students at the Melbourne Atelier, Julie Willis claims that the teaching methods remained Beaux Arts at heart. Although the Beaux Arts was open to design experimentation, it was usually confined to picking up classical or vernacular forms and adapting them to new situations. But modernists rebelled against this romantic tradition of the Beaux Arts; they were radicals who claimed that old forms were not consonant with contemporary ways of living.

Little has been written on the influence of post modern thought on the conduct of architectural design studios. Architect-educators like Charles Moore, Robert Venturi started to be interested in previously unfashionable decorative detailing and began to employ over-sized classical forms, pop culture references to suburban strip malls. The locus of post-modern expression shifted to ‘Deconstruction’, a style that gripped academic circles from the early 80’s. In the studio this translated into an interest in critical theory; Mark Taylor claims there was a worldwide impact of...
the 1988 Deconstructivist Architecture exhibition at the Museum of Modern Art in New York, which circulated in journals and newspapers at the time:

In classrooms and journals as well as at conferences throughout the world, architects discussed philosophy as never before, made clear how deeply theory influenced the practice of many leading architects. Whether you were for it or against it, theory was unavoidable.

The postmodern strains in architectural education are too complex to trace out here, but one aspect that bore on design studio practice was a new relationship that developed to architectural representation. Under the influence of post-structuralists such as Jacques Derrida, Jacques Lacan and Gilles Deleuze, architecture, meaning started to be seen as something that was actively constructed, rather than a quality naturally inhering in architectural representations.

Drawings and images produced by leading academic practitioners such as Peter Eisenman or Daniel Libeskind imagined architecture-like spaces that could never be concretely realised. These drawings were quite different to the earlier imaginings of Boullee, Ledoux or other Beaux Arts practitioners, who put together unexpected compositions that were grandiose in scale or eclectic in detail but were still ultimately recognisably building like. The influence in the schools, profoundly sensitive to the power of the image, was enormous and the representation started to become a site of playful interrogation rather than being treated as a reasonably faithful mirror of the world.

Finally the new location of design teaching and learning in the academy, particularly the emphasis in Universities on teaching staff being involved in research, helped to give shape to the idea of the design studio as a site of experimentation.

Research, and its home in the academy, is an idea and a relationship of surprisingly short duration. When the universities of Northern Europe started to take shape in the Middle Ages they were formed around similar traditions of oral culture as the medieval craft guilds; aiming to replicate knowledge and transmit it from one generation to the other. William Clark describes how German Universities came under the rationalising influence of the German ‘Cameralists’, political reformists working in a similar spirit to the English proponents of Utilitarianism, who deployed a number of strategies to ‘de-privatise’ the academic workforce from a guild like structure to a state

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98 The idea that the moral worth of an action can be based on its outcome in terms of how it increases the wellbeing of others, From the work of John Mill “Utilitarianism” (1861) : http://etext.library.adelaide.edu.au/m/mill/john_stuart/m645u/util02.html
sponsored and controlled environment\textsuperscript{99}. The idea that research acts to generate knowledge for the public good developed out of these reformations of University governance\textsuperscript{100} as well as subsequent theorizations of the role of the University and its relationship with the State\textsuperscript{101} and the translation from an oral to a written culture.

Early on, the tension between the studio, as a place of creative ‘doing’ and the ‘rigour’ of academic research in a positivist vein, was seen as a problem for architecture; Donald Schön puts the dilemma in a characteristically colourful metaphor:

One can imagine a cliff overlooking a swamp. Researchers may choose to say on the high, hard ground where they can conduct research of a kind the academy considers rigorous, though on problems whose importance they have come increasingly to doubt. Or they may go down to the swamp where they can devote themselves to the social problems they consider truly important, but in ways that are not rigorous in any way they know how to describe. They must choose whether to be rigorous on the high ground or relevant in the swamp\textsuperscript{102}.

More recently architecture academics have started to argue that design can be a form of research\textsuperscript{103} and idea of ‘design research’ has extended into the conduct of studios. Kazys Varnelis\textsuperscript{104} gives an account of what he calls ‘the research studio’, a contemporary form of design studio practice which uses representation as a form of analysis, rather than purely a design tool. Varnelis traces this kind of design studio practice back to the practice based work of Ray and Charles Eames in the USA and Peter and Alison Smithson in the UK and the more recent work of Rem Koolhaas at Harvard University, Robert Venturi and Denise Scott-Brown and others\textsuperscript{105} and argues that such studios are an example of using architectural methods to research architectural form.

\textsuperscript{99}Clark, Academic Charisma and the Origins of the Research University.
\textsuperscript{100}In particular the rise of disciplinary clusters in the form of seminars (departments) rather than a live in culture of the Oxbridge Colleges (refer: Ibid. Chapter One to Five)
\textsuperscript{101}In particular the work of the Prussian Educationalist Wilhemin Von Humboldt (1767 – 1835)
\textsuperscript{103}This idea has much currency in the Australian architectural education scene and has been pursued by a number of local authors, such as Peter Downon, Design Research (Melbourne: RMIT Press, 2003). The concept of design research is furthered by academic journals such as ARCHITECTURAL DESIGN RESEARCH, an academic journal affiliated with the Association of Architecture Schools of Australasia AASA which represents all Architecture Programs and Schools across Australia, New Zealand and Papua New Guine.
\textsuperscript{105}Ibid.
Contemporary anxieties?

The location of design studios, both as physical places and as a teaching and learning practice, within the contemporary academy has always been somewhat tension filled. As a place of creative ‘doings’ it does not easily fit within the tradition of theosophical and philosophical inquiry and the system of examination which is associated with the University.

Like previous forms of architectural education, the design studio inside the academy has become a site for the development of specific disciplinary skills as well as a powerful way of ‘disciplining’ undergraduate students by acting to produce architectural subjectivities: the experience of performing a certain role and the sense of becoming subject to that role and the possibilities that it can and cannot allow to emerge. However the new location of the design studio inside the academy has meant that debates in architectural pedagogy continue and are complicated by power relations previously considered benign: particularly the mater-pupil relationship and the idea of peer control over educational quality.

Since architectural education has become fully ‘institutionalised’ other kinds of academic quality control measures can be bought to bear, such as systems of assessment and grading. All assessment involves establishing a set of norms by which students can be judged. Previously the norms of the profession, such as those produced in a social dynamic by the atelier and jury system of the Beaux Arts, have been considered sufficient, but in the political environment of the contemporary academy and the wider community these are no longer uncritically accepted. For assessment processes to be transparent they must be based on clearly articulated expectations and standards, which in the case of the design studio, especially with its experimental ‘design research’ leanings, can be difficult to articulate.\(^{106}\)

The master-disciple mode of transmission was considered unproblematic while architects learnt on the job and only spent only part of their time in the academy. The figure of the working practitioner was seen as a mode of correct practice for students to copy. However, since the early 1990s there has been an undercurrent of unease with the figure of the design studio leader and education as replication of existing professional mores. This unease has manifested itself as a

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\(^{106}\)This claim can be supported by the number of procedures that are put in place in Universities around marking in an attempt to render it transparent. For example, teachers in institutions involved in this study are required to regularly report to students on their progress and assign marks with the assistance of a panel (the design jury). At RMIT University this system is supplemented by a ‘moderation’ procedure where all student work is compared across year levels and teachers are required to defend student grades to a panel consisting of other staff and an industry representative.
polarized debate where design studios are figured as ‘bad’ because they are composed of inherently asymmetric power relations or ‘good’ because they are efficient at producing a certain kind of professional ‘knowledge worker’. The dyadic student-teacher relationship is the locus of this debate, in particular the way that it is ‘built into’ the design studio fabric. Alternative critical discourses current in the academy, such as feminism, have surfaced and made their influence felt in these debates. As a result, some scholars have questioned whether design studios should stay as they are 107.

In her history of architectural practice in America, Dana Cuff108 worries about the insular nature of design studio culture. She questions whether the practice of only having other architects critique student work results in a community of practitioners who do not really value the judgment of those on the ‘outside’ judgments. For Cuff the insularity of architectural teaching and learning amounts to a form of architectural education that is almost a form of indoctrination, an argument she supports, in part, by citing the internal cohesion of architects as a group on campus and their relative isolation from outsiders. Cuff wonders if this mode of teaching is evidence of an unhealthy and even elitist culture which not only works to exclude public opinion from educational spaces, but downplays the importance of teamwork in offices. Her careful observational work in architect’s offices charts the progress of novice architects in their transition from the academy to the workplace cultures that they later inhabit, highlighting the deficiency of their education in preparing them for these new spaces of architectural work.

On a more strident note, Kathryn Anthony questions some of the cherished traditions of the design studio, such as the final presentation to a jury panel and the culture of working late to meet studio deadlines which she claims should be changed because of their deleterious effects on student morale and health 109. Anthony frames these traditions as negative, comparing the experience of the formal education system by the beginner architect to the “hazing rituals” that young men undergo during their induction into fraternities; drawing parallels between military training, athletic coaching and architectural education in terms of discipline and rigour 110.

108 Cuff, Architecture: The Story of Practice.
110 In this reference to military life Anthony’s critique echoes that of Christine Williams in C Williams, Gender Differences at Work (Berkley, CA: University of California Press, 1989). Williams examines how men and women in the US Marines construct their gender.
Gary Stevens\textsuperscript{111} continues this style of critique, in particular calling into question the assumption of “natural genius” that he claims operates to create inequity in design education. For Stevens, informed by the theoretical position from the work of Pierre Bourdieu\textsuperscript{112}, believes that students are immersed in the “cultural field of architecture” while participating in design studios. Those with ‘natural ability’ have merely had longer exposure to architectural culture and have been able to cultivate the correct \textit{habitus} or embodied ability to ‘play the game’ of the design studio by producing the ‘right’ kind of design work and the right kind of expressive behaviours. Stevens claims the dominant motif of a design studio education is competition which is honed through this process of game playing and that this acts to discourage questioning of the status quo. According to Stevens, only those with the right habitus, or who are able to develop and craft one adequately, will flourish, and thus design studios act as a ‘filter’ which only permits a certain class of students to pass.

Helena Webster highlights how most design studio teaching is ‘autobiographical’. In the absence of formal teacher training, teachers tend to teach as they were taught; this tendency is increased in the contemporary academy where the design teaching workforce in increasingly supplemented by casual lecturers, who are hired to bring in their outside expertise. Webster strongly criticises architectural educators and theorists for failing to embrace more student centred understandings of learning and remaining stuck in the “master-pupil” relationship. She claims there are three main types of architecture teacher experienced by architecture students: “the entertainer”, “the hegemonic overload” and “the liminal servant”\textsuperscript{113}. The “entertainer” acts as an architectural “propagandist” who likes to tell stories from their own experience and from architectural history. The “hegemonic overload” attempts to keep students in line by “correcting” their projects, often by re-drawing them. By contrast, the “liminal servant” adopts a “student centred approach” that helps the student to “construct their own learning”\textsuperscript{114}.

\textsuperscript{114} Webster, “Facilitating Critically Reflective Learning: Excavating the Role of the Design Tutor in Architectural Education.” pg 109
Not all scholars of the design studio present it as a teaching and learning environment that is inward looking, destructive to student health or necessarily iniquitous. In his paper *The Critique*, Peter Wood uses stories of the early Bauhaus to argue that architectural students, for the most part, willingly submit to these rituals and are highly motivated to participate in them. He accounts for this by reframing these rituals as a public manifestation of a process of ‘encapsulation’, a term used to describe the formation of cults. Encapsulation operates by removing the subject from his or her previous environment and transforming them by a new set of influences operating in a different environment. What Wood describes is a “crafting” of an architectural subjectivity through studio activities in which the student is a willing participant. For Wood the most important aspect of the studio is that students are treated as if they are architects and made to account for their work, and its shortcomings, in public and take on, embody and react to criticism like a professional.

Nicholas Habraken dances around the edge of this argument when he puts forward his theories about the function of the design studio within architectural education. Habraken compares the design studio to a class on musical composition and claims that the problem with the design studio is that architecture students are asked to take this class in “composition” without “learning to play an instrument”. The “instrument” that he believes architecture students need to learn are the basic “lessons” of form-making as it is enacted in the everyday urban environment; in other words – learning from urban precedent by analyzing and producing forms without an overall brief. He claims this needs to be done in isolation from the design studio setting so that the studio can be freed up to perform its real purpose: “a social and organizational setting” in which to “learn the art of good judgment”. He argues that good judgment is an art because it is the “irreplaceable ability by which we can steer towards coherence” that can be learnt but not taught.

While thesis has sympathy with both sides of this debate, too little work has been done on how these teaching spaces operate in practice and the complex institutional ecologies of which they are a part to come to a final judgment the value of the design studio. If we do not yet really know what makes design studios work like they do, such as the current lack of knowledge about the role of the body, deciding whether or not the design studio is outmoded and what, if anything, should replace it is perhaps premature. Learning good judgment in the design studio does seem to be

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117 Ibid. pg 11
through ‘doing architecture’ accompanied by a process of trial and error in which the presence of peers and teacher, giving feedback along the way, are indispensable. The design studio as it is currently designed does operate to produce architects who exercise their judgment in form-making in particular, socially informed ways. This thesis is interested in how the ‘disciplining’ of bodies in design studios might be one of the ways these socially organized ways of knowing come into being; the task of working to changing these will be left to others.

**Student as ‘knowledge worker’**

Cultural reproduction has long been recognised as a feature of design studio[^118], but little work has been done on how architectural meaning, knowing, and subjectivity is actually produced through design studio action[^119]. While critics like Webster and Dutton, as well as Cuff, Antony, Wood and Stevens, provide interesting points of departure for a critique of the ‘master-apprentice’ flavour of design studio pedagogy on ethical grounds, there is, as yet, not much evidence to support the claim that design teachers, through their actions and especially their opinions, are the primary shaper of student’s experience of architectural subjectivity and the development of their architectural knowing.

This chapter has discussed how architectural education is a history of various different kinds of protected social settings where more experienced designers have interacted with less experienced designers in the materiality of practice – whether it be bricks or drawings. As the materiality of practice and institutional relationships have changed, so too the type of social setting that is produced. The position that this thesis will adopt, as stated in the introduction, is that architectural knowledge, meaning and subjectivity is collaboratively produced by the performance of networks formed by the relations between animate and non animate actors. Architectural subjectivity and architectural knowing are therefore network effects; they inhere in network relations.

As the network relations shift so too does the type of knowledge and subjectivity that results. In the case of the guilds, knowledge was produced through a primarily oral culture located on the building site. The kind of professional that resulted from this process was a master-craftsman who had a different relationship to design authorship than the students of the Royal Academy, who


[^119]: One recent exception is Helena Webster, “The Architectural Review: A Study of Ritual, Acculturation and Reproduction in Architectural Education.” Which reports on data gathered during presentations to design juries.
produced knowledge through representations under the guidance of a select group of practitioners with the imprimatur of the King.

A different kind of professional emerged from this move to the Beaux Arts modes of organisation: the individual artistic genius who could exercise his architectural imagination in the realm of the representation. As this system took on the atelier and design jury this architectural imagination became subject to peer review. However the number of students who participated in the articled clerk system outnumbered those educated by the French Beaux Arts. In the Articled Clerk system in Australia and elsewhere, we see another kind of professional figure take shape: the businessman-artist (who was sometimes now the business-woman) who produced credible reworkings of traditional architectural form.

Finally, in the contemporary university, design teachers interact in social discourse with the students, using various tools of the trade such as pens, paper and computers to have conversations about design practice through the vehicle of the design proposal. The architecture student has the added identity of scholar and designerly researcher who is associated with a large and sophisticated building industry composed of various specialists. The contemporary design studio system produces a ‘knowledge worker’ who can imagine new architectural propositions through representation and exercise judgment on them as a design specialist.

Any theorizing about the role of the body in the design studio needs to recognise and respect the complex role of representations in the work of the architect. In part, because of the emphasis to date on the idea of knowledge transference between teacher and student, no one has investigated, empirically, how bodies perform knowledge work with representations in design studios.

This thesis aims to start to address this gap by looking at gestures produced in design studios and examining what sort of work they do in the discourse between teachers, students and representations. This examination of gesture is a way of putting some of this missing materiality back into an account of design studio practice so that the nature of the knowledge work that happens in the design studio and the role of teachers can be better understood. However to understand the importance of bodies to design studio practice they have to be studied such a way as to be sensitive to the material-semiotic practices. This has not always been the case, even when observational material has been used to form a theory of design studio pedagogy.
The next chapter furthers this ANT line of critique through a discussion of the dominant pedagogical models of the design studio and some case study material. In particular it challenges the notion that design studios only teach students how to think in the right way. An argument is put that ‘architectural thinking’ relies on materiality, including the performance of bodies and that, when it comes to understanding design studios, thinking cannot be productively separated from acting and being. In order to mount this argument some dominant ideas of the pedagogy of the design studio must first be examined and challenged.
Chapter Two: Design studio as actor network (or: Mr Corrigan’s sighs)

This chapter positions this study in relation to the most dominant theory of the design studio: Donald Schön’s ‘reflective practitioner’. Schön is seen to privilege a cognitive account of design learning by smoothing away much of the materiality of the design studio, including the bodies of the participants themselves. By focusing his analytical gaze on language, and uncritically adopting the idea of the teacher as a ‘coach’, Schön positions the studio as a place where students can come to “think like an architect”.

Two newer positions on design studios are then examined: cognitive science and hermeneutics. Both of these positions tend to express the idea that learning to be an architect is a matter of learning to think the right way, but they offer more nuanced accounts of bodies and how bodies and representations might be implicated in thinking by way of the idea of ‘distributed cognition’. Both these approaches are found to be inadequate to an understanding of the materiality of the body in design studios.

Actor-network theory (ANT) is then put forward, by means of a case study, as a useful way to understand the role of bodies in design studio without losing sight of materiality or power relations. Gesture is identified as one actor among many. ANT offers a way to surface the importance of gesture at the same time that it offers a way in which gesture may be studied; one that is sensitive to the complexity of design studios as knowledge environments.

Prologue in the form of a story about studios

It’s 2006, I’ve just started my PhD and for the moment I’m still working as a part time architectural design teacher. This year I am in a team of four tutors with a very large 2nd year student cohort at the University of Melbourne. We sit at large white tables in a big, north facing room; it has white walls and dark corporate quality carpet. The chairs are of the standard office variety. Throughout the morning a seemingly endless parade of students come and take a seat next to me at one of the tables. They show me their design work for the week using a variety of media: laptop screens, computer printouts, physical models and the occasional sketch. All of them are working on a brief for a local cultural centre located in the centre of Melbourne, the second largest city in Australia.
After they tell me about their proposed designs I start talking while drawing with a HB pencil on their drawings or printouts; sometimes I stop to manipulate 3-D models on computer screens or hold up physical models to my eye level. I highlight certain features with my pencil as I talk about what I see. I am aware that I am using gesture as I speak, but it is frustratingly difficult to pay attention to it; whenever I try to analyse what I am doing with my hands I lose track of what I am trying to say. Trying to analyse gesture as I produce it is like trying to analyse which word to use before it comes out of my mouth — almost impossible. So I stop trying and just concentrate on discussing with the students their various options. I usually recommend a book or an architect they can look at and they go away.

Late in the afternoon a student presents me with a mile high tower design. I ask him why he has done this when the brief he has been given asks for a modest cultural centre. As he launches into a baroque explanation for his design I feel an urge to crush his youthful exuberance, but this feels unkind – like kicking a puppy. Nevertheless, after a good while, I feel I have to interrupt him. Using my best teacher voice I say: “You are on the wrong track here”. The student looks at me for a moment, obviously puzzled, and then asks me why. “Because it’s just not what architects do” I reply, realising that the explanation is pretty poor even as I say it. He thinks for a moment and then points out that some architects do very high buildings – what about Dubai and such places? I back peddle slightly and say “Well, it’s true that some architects do very high buildings, but in this case the brief asked for a cultural centre, which is usually for a government or non profit group”. I tell him I can’t imagine a client, other than a rich industrialist, perhaps living somewhere like Dubai, wanting a tower even close to one mile high.

He then asks me why he can’t speculate such a client exists since the project is made up anyway. Isn’t his place as a student to exercise his imagination and stretch the boundaries of the profession? What was a design teacher trying to stifle his creativity? Shouldn’t I be encouraging him? For a moment I was struck by the logic of his argument — was he right? Then I remembered something Donald Schön, the most famous author on the matter of the contemporary design studio, had said about design teaching: the role of the teacher was to be a ‘coach’ who brings the

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student into alignment with disciplinary norms. I carefully explained this part of my role to the student, but he just looked at me sceptically.

I reached again for Schön’s wisdom. He had said that the design teacher’s role was to ‘coach artistry’ through demonstrating his or her own approach to solving design problems. This was basically what I had been doing with the previous students wasn’t it? Maybe the problem with this student was that I wasn’t being a very good coach. So I took out a piece of paper and started to translate some of the ideas from his mile high tower into a lower rise structure, talking all the while about what I was doing. The student watched silently and, when I handed over my sketches, thanked me politely for my efforts. He then told me I had not presented a compelling argument for changing the tower project; in fact he had decided to keep working on it because it was probably the only chance he was going to get to do such a project. As I watched him gather up his materials I wondered: how was I going to be his coach for the rest of the semester if he wasn’t going to play the game I knew?

**Studying the design studio**

The story above recounts my own experience of the desk crit. The desk crit is such an established form in architectural education that some writers have developed useful descriptions of the practice for others, such as the following:

The pedagogical core of the desk crit is the idea of scaffolding. During a crit, the critic works to understand what the student is trying to do with his or her design work and then helps the student develop that design idea …Often the critic and the student will “design together”, with the critic quickly sketching a number of design possibilities, exploring the consequences of possible design choices. In doing so the critic both offers design choices and models design thinking.¹²¹

While this seems to be an adequate description of what I was doing with the student who had the mile high tower, there is a disturbing idea emerging towards the end. The last sentence and the statement about modelling “design thinking” is a good example of a common tendency for such writing to treat design teaching (at its heart a form of design collaboration) as a matter of teaching people to think in the right way. Consider the following statement from the Dean of a well known architecture school, which was posted on their website during the time this thesis was written:

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¹²¹ Koschmann, Hall, and Miyake, Cscl 2, Carrying Forward the Conversation: Carrying Forward the Conversation.
Every semester, the school launches more than 35 explorative studio projects that head off in different directions before reporting back their findings in juries, exhibitions, and publications that stimulate an intense debate and trigger a new round of experiments. With a biodiversity of continually evolving research trajectories, the school operates as a multi-disciplinary think tank, an intelligent organism [emphasis in original] thinking its way through the uncertain future of the discipline and the global society it serves.\(^\text{122}\).

This thesis takes issue with such disembodied and dematerialised accounts of the design studio and concerns itself with discovering how material things and bodies are important to the fabrication of architectural meaning, knowledge and subjectivity.

This focus on the body, while not new, is not one that has been pursued in any great measure in relation to architectural education. In a landmark study of architecture schools in 1981 called the ‘Architectural Education Study’ (AES) several ethnographers undertook observations of teachers and students in design studios located in the USA for a period of six months. In the introduction to the AES the authors recognise that their final documentation of the study has a heavy emphasis on verbal transactions but make the following interesting statement:

\[\ldots\text{ the analysis also rests on observations of much visual material and of gesture, facial expression and other dimensions of human communication. However, both norms of research and the form of these reports underplay the influence of these non-verbal factors on design learning and, in any event, leave them less studied than they deserve.}\]\(^\text{123}\).

While it is unclear what ‘norms of research’ the authors are referring to which prevented them from analysing non verbal facets of design studio behaviour, the AES is an important point of reference for this study because it marks the beginning of empirical research and analysis of contemporary design studio culture. This telling comment right at the beginning is indicative of the problem with this body of research as a whole: a realisation that bodies are important to design teaching and learning in some fundamental way, but a lack of a serious attempt to clarify exactly what the nature of this contribution is.

\(^{122}\) Part of the Mark Wigley’s ‘Deans Statement’ on the Columbia University Website http://www.arch.columbia.edu/
\(^{123}\) W. L. Porter and M Kilbridge, “Architecture Education Study,” (Consortium of East Coast Schools of Architecture supported by the Andrew Mellon Foundation, United States of America, 1981). Pg 1
Since about the mid 1980s, Donald Schön’s much cited\textsuperscript{124} theory of reflective practice has dominated discussions of design studio pedagogy. Schön claimed that the design studio leader is a reflective practitioner who coaches students to ‘think like an architect’ by demonstrating their own ‘architectural’ way of working through design problems. He called this process ‘coaching artistry’ and claimed this was the way the studio leader aligns the student with disciplinary norms.

Design studio pedagogy, the legacy of the previous practice based education and the Beaux Arts system as discussed in the previous chapter, had remained under theorised until Schön came on the scene so he was eagerly embraced. Helena Webster has criticised academics for becoming “besotted” with Schön’s theories, while failing to recognise their limitations and methodological errors\textsuperscript{125}. This line of critique can be furthered by comparing the original case study material from the AES that Schön based his theory on.

Schön drew on a transcript of an encounter between a teacher (Quist) and his student (Petra) captured by Roger Simmonds, an ethnographer working in the AES. A close examination of this original material reveals that Schön strategically reduced this original account in order to produce a workable epistemology of design studio practice.

The class Simmonds studied was in a professional Masters Degree course. Only a few people in the class had any previous architectural training\textsuperscript{126}. Simmonds was a careful researcher who provides copious details\textsuperscript{127}. He tells us that the students spend most of their time in a design studio room working and consulting with their teachers\textsuperscript{128}.

\textsuperscript{124} On the 4th of December in 2008 a broad database search of academic journals (‘supersearch’) using ‘Donald Schön’ as a search string came up with 491 hits within 91 different journals over a period of 50 years. The most hits are located in ‘Philosophy and Phenomenological research’, closely followed by the ‘Journal of Philosophy’ and ‘The academy of management’. Many of the articles found in this search are authored by Donald Schön himself (32), although there are four different spellings. On the same day a Google search on the term ‘Donald Schön + reflective practice’ returned over 10,000 hits. Supersearch trawls through a series of publications that my university has paid to subscribe to (this is an extensive list because this university is a well established and well funded research institution), while Google looks over the whole of the internet and captures free material and commentary, including throw-away statements on mailing lists. Google might be more representative of the grip that Schön’s ideas have in the broader community, including practicing architects and students of architecture because it is a free and open resource, while the Supersearch result might be indicative spread of Schön’s ideas in academia.

\textsuperscript{125} Webster, "Architectural Education after Schon: Cracks, Blurs, Boundaries and Beyond." (Unpublished) pg 1

\textsuperscript{126} Simmonds notes that there are 48 students enrolled in this three year Masters degree course, which draws students with ‘good academic backgrounds’ from various disciplines as diverse as Law, Psychology and Latin Studies. Six of these students already had an architecture degree under their belt and 40% of the student intake was composed of women. This ‘open’ attitude to the student’s previous background and experience was put as an example of the School’s ‘rational’ admissions policy.Porter and Kilbridge, “Architecture Education Study.” pg 21

\textsuperscript{127} His outline of methods in the AES documentation is excellent; in chapter two of the AES documentation he lays out his methods and states that he attended and observed about half of the lessons between Quist and his student cohort, taking approximately 50 hours of
On the first page of his report Simmonds explains that one of the teachers, Quist, is so “powerful and central”\textsuperscript{129} a figure in his design studio that he will focus his study on how the students have adapted themselves to his architectural ideas and teaching style. Simmonds makes no bones about the fact that Quist was a domineering teacher. He gives us a very revealing anecdote from his field notes of one student presentation session:

The atmosphere, as often, was light hearted, though Quist, as usual, had dominated the discussion of the last building. The presentation of a new building flashed onto the screen\textsuperscript{130} and, while everyone was thinking of something to say, John asked – “do we or do we not like this one?” Everyone laughed uproariously, presumably because they too felt Quist has been co-opting them into his own perspectives all morning\textsuperscript{131}.

Simmonds suggests that Quist sends the students “messages” about his own deeply held beliefs about architecture and it’s “deep structure” through his handouts, task design, speech and teaching style and claims that all the students changed after their contact with Quist and his messages. However Simmonds is careful to note that the nature of the change seemed to depend on each student’s “attitude” as well as their “bad habits and unexamined stances”\textsuperscript{132}.

Quist was a believer in the centrality of the design teacher to studio teaching. He is quoted by Simmonds as stating that: “the best curriculum without personality wont work while no curriculum with personality will”\textsuperscript{133}. Quist’s own attitude to design teaching was clearly to take an “authoritative stance”\textsuperscript{134} which involved leading students into design practices with which they may feel discomfort by modelling the process for them with their own work. Simmonds claimed that in this process of doing design work with the students Quist expected them to trust him uncritically and yet, from watching how he did it, to start to exercise criticality in their approach to their work.

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\textsuperscript{128} Porter and Kilbridge, “Architecture Education Study.”, pg 31 and pg 26 Simmonds this space as a large room located on the 4th floor with windows on three sides. An entrance space to the room is created by means of a “large, 20ft long and 7ft high, freestanding partition about five feet from the wall” This partition is painted white and used to display student work.

\textsuperscript{129} Ibid. pg 9

\textsuperscript{130} Presumably Simmonds is describing a slide show as digital projectors were unknown at the time.

\textsuperscript{131} Porter and Kilbridge, “Architecture Education Study.”, pg 31. It is interesting that Simmonds uses an instance of laughter to convey the class dynamics and points again to the power of laughter as a ‘joining’ force (refer to Pia and Scott and their instance of mutual laughter).

\textsuperscript{132} Ibid., pg 10. In fact Simmond’s work on learning styles is very interesting but, unfortunately, seems to have been entirely neglected in subsequent work on design studio culture including this study.

\textsuperscript{133} Ibid. pg 39

\textsuperscript{134} Ibid. pg 39
Tellingly, Simmonds points out that Quist’s main claim to authoritarianism is “his intellectual claim that his design mode is “correct” in some fundamental sense”\textsuperscript{135}.

As Simmonds develops his account it becomes clear that Quist is influenced by the educational philosopher John Dewey’s early ideas of the ‘reflective practitioner’\textsuperscript{136} which had been taken up within progressive education and elsewhere as a way towards rational forward thinking pedagogy\textsuperscript{137}. Quist believed that if students could be made to recognise their “operating habits” they could change them and develop “new sets of skills”. To this end, along with modelling design operations for them, he encouraged students to keep a notebook or diary to record a history of their approaches to problems set in the studio\textsuperscript{138}.

Simmonds tells us that Petra had a background as a high school math teacher and was older than many of the other students which, Simmonds notes, seemed to help her to take an unusually assertive role with Quist’s dominating personality\textsuperscript{139}. Petra described herself as “a kind of social centre in the studio”\textsuperscript{140} and Simmonds supports this self assessment by describing her as being unusually respectful of the needs of others and having the ability to display an understanding of where their particular perspectives come from\textsuperscript{141}. Simmonds believed Petra was very capable of complex learning behaviour\textsuperscript{142} and emphasised that she developed the ability to push for explanations from her tutors. Simmonds reports she used her skills as a teacher to turn herself into a capable and organised student who took to keeping lists of things she wanted clarified in her desk crits and checking off the items as she went.

Petra may have pushed her teachers for explanations, but it seemed that she respected their authority in matters of design. Simmonds remarks that Petra found Quist’s classes on “rational design principles” helpful because she believed that “design is something that can be learned intellectually”\textsuperscript{143}. But, while she was full of praise for Quist as a critic, Petra was still, as Simmonds puts it, “troubled” by his autocratic style of teaching\textsuperscript{144}. She tells Simmonds that Quist’s teaching is

\textsuperscript{135} Ibid., pg 138
\textsuperscript{138} Porter and Kilbridge, ”Architecture Education Study.”, pg 37
\textsuperscript{139} Ibid. pg 17
\textsuperscript{140} Ibid. pg139
\textsuperscript{141} Ibid. pg 139
\textsuperscript{142} Ibid. pg 144
\textsuperscript{143} Schön, \textit{The Design Studio: An Exploration of Its Traditions and Potentials}. pg 136
\textsuperscript{144} Porter and Kilbridge, ”Architecture Education Study.” pg 137
problematic because he is giving her “very much one view” and that she found this to be “dangerous” because “without knowledge of any alternative approaches… I don’t even know the way I’m being shaped and that is a problem”\textsuperscript{145}.

Despite her doubts about the way she was being taught, Simmonds suggests that Petra “seemed anxious to play the role which she felt Quist was asking for”\textsuperscript{146} on the assumption that her maths background was not relevant to her learning as an architect. In turn Simmonds believed Quist was trying to get Petra to “adopt procedures which were quite anti-ethical to her math instincts”\textsuperscript{147}. When he is asked about his approach to teaching Petra, Quist: “saw his task as helping her to develop the ability he felt she had to think in a literary metaphor, to think in a visual metaphor\textsuperscript{148} and wanted to help her to see how discovery in the problem solving phase could be used as feedback to change the problem definition\textsuperscript{149}.

\textbf{Lost in Translation}

In Simmond’s work there is no full transcript of Quist and Petra discussing the design of a primary school which we find in Schön’s subsequent writings\textsuperscript{150}. Parts of the dialogue reproduced in Schön’s work surface throughout Simmond’s description of Petra as a student and how she develops in contact with Quist’s ideas\textsuperscript{151}. Later Schön claims that his material was drawn from Simmonds who “collected the protocol” but that Simmonds was “not responsible for my analysis of it”\textsuperscript{152}. It appears that Schön used a tape recording of the interaction for his analysis\textsuperscript{153} but it is unclear as to what extent he drew on Simmond’s field notes or whether he witnessed the exchange Simmonds describes.

Simmonds is not really interested in the teaching style of Quist per se. He states that his ethnographic account is an examination of what he calls the “learning styles” of the students in Quist’s class and how they respond to the “messages” their teacher is giving them. Although Quist clearly was a dominating teacher, Simmonds does not put his teaching style forward as an exemplar.

\textsuperscript{145} Ibid. pg 138
\textsuperscript{146} Ibid. pg 138
\textsuperscript{147} Schön, \textit{The Design Studio: An Exploration of Its Traditions and Potentials}. pg 144
\textsuperscript{148} Porter and Kilbridge, “Architecture Education Study.” pg 138
\textsuperscript{149} Ibid. pg 136
\textsuperscript{150} In particular Schön, \textit{The Design Studio: An Exploration of Its Traditions and Potentials}. pg 99
\textsuperscript{151} Reel to reel tape spools are the only recording medium listed in the archives of the project located at MIT university
for practice as Schön does in his later reworking of the material that Simmonds collected for the AES.

Much of the texture of Simmond’s account is lost when Donald Schön takes up Quist and Petra’s story in a famous and influential series of books and articles on professional education where their interaction becomes an exemplar of good design studio practice in action. Schön translates the story that Simmonds tells in order to enrol it into his overall project of what Webster describes as a “generic epistemology of practice”\textsuperscript{155}. Schön does this by selectively reconstructing the conversation between Petra and Quist and treating it to an in-depth analysis of the use of language and drawings that are produced as they talk about Petra’s project (which he calls “the language of design”). In Schön’s hands the message about teaching practice becomes simplified and put to work in service of his theory of reflective practice.

Schön takes seriously the idea that there is a rational epistemology of architectural design practice that can be found by observing it in action. In writing some 10 years after his initial published work on the design studio\textsuperscript{156} Schön is clear about the fact that his theory of reflective practice rests on John Dewey’s\textsuperscript{157} ideas, specifically that action and thought cannot be clearly separated in practice and that theory and doing in the professional’s world has a complex and dynamic relation.

At the time he was writing, Schön claimed that professional education was in crisis because it was formulated around the idea of applying “technical rationality”\textsuperscript{158} to problem solving under the mistaken assumption that “problem solving can be made rigorous by the application of scientific theory and technique”\textsuperscript{159} and argued that architects would fail in this endeavour because their work is characterized by problems which exhibit “uncertainty, complexity, instability, uniqueness and value conflicts”\textsuperscript{160}.

\textsuperscript{154} There are quite a few publications by schon that include Quist and Petra in some guise or other, these include: Schön, \textit{The Reflective Practitioner: How Professionals Think in Action}, Schön, “The Architectural Studio as an Exemplar of Education for Reflection-in-Action.”; Schön, \textit{The Design Studio: An Exploration of Its Traditions and Potentials}. And Schön, \textit{Educating the Reflective Practitioner}.\textsuperscript{155} Webster, “Architectural Education after Schon: Cracks, Blurs, Boundaries and Beyond.”\textsuperscript{156} His initial work was: Schön, \textit{The Reflective Practitioner: How Professionals Think in Action}. He reflects on this work in Schön, “The Theory of Inquiry: Dewey's Legacy to Education.”\textsuperscript{157} Put in John Dewey, \textit{Art as Experience} (New York: Perigee Trade, 2005), John Dewey, \textit{Experience and Education} (New York: The Macmillan company, 1938).\textsuperscript{158} Schön uses the phrase technical rationality to describe a body of scientific evidence or theory that is meant to ‘back up’ the practice of a profession.\textsuperscript{159} Schön, \textit{The Reflective Practitioner: How Professionals Think in Action}. Pg 21.\textsuperscript{160} ———, “The Architectural Studio as an Exemplar of Education for Reflection-in-Action.”
Schön points out that theoretical knowledge is not enough to solve design problems because the “artistry” of good architectural design practice depends on appropriate “problem setting” so that design solutions can be found. He argues that much of the professional “artistry” of dealing with the “swamp” of everyday professional practice lies in the performance of “knowing in action” which is mostly unspoken:

People have in their doing a tacit kind of knowing. They know more than they can say … It is this knowing in action, this capacity for intuitive and spontaneous performance, that comes into play in the uncertain, unique and conflict-laden situations. According to Schön, deploying tacit architectural knowledge depends on representations because they provide a way for the scenario the designer is developing to ‘talk back’; he calls this process ‘reflection-in-action’.

Schön goes on to claim that learning how design is best achieved by doing design in the presence of those who already know how to design and can guide the student in their doing. He describes the role of the teacher as helping students to ‘think like an architect’ and be able to deploy that particular kind of knowing in action to whatever task is at hand. This was a description of teaching un-problematically drawn from Quist’s practice.

According to Schön, the main way that teaching and learning happens is through a process of ‘reflection on reflection in action’ which takes the form in the Quist/Petra dialogue of the teacher talking through design moves he is drawing for his student. However he goes on to argue that many of the problems in teaching design is that there is often a difference between a teacher’s espoused theory (what they say they do) and their ‘theory in use’ (what they actually do). If much of a professional’s ‘knowing in action’ is and remains tacit it is difficult to articulate this knowledge for the benefit of a student. In his analysis of language used by Quist in the design studio Schön treats the Quist’s specialized use of language as a kind of ‘code’ in which tacit architectural knowledge is communicated to the student. Nowhere is there any mention of the possibility of the body as a way of producing or displaying knowledge and knowing.

The verbal transcription of the exchange between teacher and student on which he bases this claim requires Schön to create a lot of bridging text and commentary to maintain its flow and

161 ——-, The Reflective Practitioner: How Professionals Think in Action.
comprehensibility. In the act of rewriting the dialogue and inserting his commentary on the moves the teacher is making Schön deliberately smoothes away the figure of Petra and her participation in the action. Schön tells us how Quist takes over Petra’s explanation of her problem and provides a demonstration of a design process that he thinks Petra should be carrying out; punctuating his demonstration of design “artistry” using a “drawing / talking language of designing”\textsuperscript{162}. Schön puts this forward as an example of Quist engaging in “reflection on reflection in action” for the benefit of the student and seems relatively unconcerned with the student’s role in this dialogue\textsuperscript{163}.

It would be fair to say that Petra becomes a \textit{cypher} in Schön’s account – an absent presence only surfacing in the occasional request for direction from the teacher. Petra in Simmond’s original account is a very active learner, but never in Schön’s account do we hear about her habit of keeping a list and holding her teacher to account. Instead of an encounter between a domineering teacher and a student that, despite her ability to learn complexly and her doubts about the teacher’s methods, is “anxious” to play the role she is asked to, Schön puts forward the story of Quist and Petra as an exemplar of how tacit knowledge from an experienced designer can be communicated to the novice through the vehicle of a “reflective” demonstration. In Schön’s work, Quist’s method of modelling a demonstration is un-problematically put forward as a context free model of design teaching which ignores the localised, situated nature of the original dialogue.

Schön’s solution to the problem of teaching design is not unlike that of Blondel’s 18\textsuperscript{th} century Academy professor described in the previous chapter: students should take a passive role in relation to the teacher, trusting that what they are taught will eventually make sense, even if they do not understand why at the outset. This reduction of the role of the student allows Schön to figure the design teacher as an expert in whom the student must trust uncritically\textsuperscript{164}. Schön argues that this positioning is acceptable because many students, at least in their first year or two in architecture school, are ‘thoroughly confused’ about how to think like an architect or even what it is that the studio leader wants them to produce. From the student’s point of view, therefore, thinking like an architect is a ‘mastery mystery’.

As we saw in the previous chapter, this positioning of the teacher as expect and ‘gatekeeper’ to the acquisition of knowledge has been seen by scholars as problematic. Webster argues that in

\begin{footnotesize}
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\textsuperscript{162} & \textit{The Design Studio: An Exploration of Its Traditions and Potentials}. pg 54 \\
\textsuperscript{163} & Ibid. pg 54 \\
\textsuperscript{164} & Ibid.
\end{tabular}
\end{footnotesize}
this positioning of the teacher Schön promotes an inadequate idea of design learning that is a mostly passive process of observation and replication and that formulation of teacher as ‘coach’ suggests their main role is ‘correcting’ the student’s work rather than helping them to develop or hone their skills. This resonates with an earlier critic, Laura Willenbrock, who argues that Schön explicitly positions the student’s prior knowledge as ‘invalid’ to the task at hand and thereby perpetuates an abuse of power that is unhelpful to the development of architecture as a profession.

However Schön’s theory of reflection practice and its role in practitioner training does important work for designers apart from the legitimisation of their knowledge(s). Schön’s account of reflective practice neatly captures some of the messy, tacit and experimental process of design practices like architecture. As a way of describing the design experience it is powerful because it resonates with the embodied experience of architectural practitioners who understand that an idea needs to be tested through representation. But Schön’s treatment of Quist and Petra elides the design studio environment in which they are operating and renders Petra speechless and both teacher and student body-less. By leaving out the texture of Simmond’s original account Schön renders Quist and Petra as two dimensional figures and gives the way they use their tools, apart from the sketchpad, only cursory attention.

Ultimately although Schön produces a useful description of the experience of embodied design process, his rendering of the design studio is inadequate. The ‘Reflection on reflection in action’ model that he puts forward through the story of Quist and Petra assumes that good design teaching and learning consists of finding ways to make tacit knowledge and knowing explicit and thus a matter of making thought processes transparent. We need to look elsewhere for an account of design practice that is sensitive to the communicative potentials of the body in design studio activity. But first let us examine the idea of design as a form of thought and the development of this idea by other theorists.

**Design as a way of thinking?**

In the process of turning Simmond’s account into an ‘exemplar’ of architectural teaching practice, Schön made a series of ‘facts’ out of Simmond’s complex and textured account which he then shaped into a series of catch phrases. These are facts that will later be stabilized – treated as

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165 Webster, "Architectural Education after Schon: Cracks, Blurs, Boundaries and Beyond."
true and valid – by Schön himself and a company of others who later pick up and circulate his ideas. Consider for example the image below taken from a recent article in “Design Issues” where Donald Schön’s work is represented as a ‘full stop’ or lens from which other theorisations emerge:

Of particular resonance is Schön’s famous phrase about the design studio as a place to learn to “think like an architect”, which surfaces in later studies and commentary as noted at the start of this chapter. This tendency to treat the design process as a process of thinking that can be modeled for the benefit of others avoids the ‘body problem’ by locating design ability primarily residing ‘inside’ the individual and the process of teaching as working to ‘draw out’ this latent ability.

If learning to design is treated as a matter of learning to think in a certain way, what do scholars claim is the nature of this kind of thought? One of the places where design process in action is frequently studied is in professional offices. Many of these studies have resulted in maps and diagrams which divide design activity into a number of stages of discrete activities. In his book *How Designers Think* Bryan Lawson, a psychologist and architect, points out that such diagrams are overly tidy representations of what actually happens in practice and argues that, while architects generally have to gather information about problems, study the situation, devise solutions and draw them, this process does not have to happen in a particular order. Lawson questions the usefulness of such diagrams on the grounds that they are overly theoretical, prescriptive and not grounded in empirical observation.

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Through a series of experiments on both architects and scientists, Lawson attempts to explore whether designers develop recognisably consistent strategies when they approach design tasks. From this empirical evidence he claims that architects tend to focus on end results, rather than trying to discover the underlying rules and that they display simultaneous learning about the problem at hand as the solutions were devised, rather than in a separate problem analysis phase.

Lawson speculates that this tendency to preface the concrete over the abstract may be the result of the way students learn in the studio. He argues that design studios tend to proceed through example and practice with a focus on outcomes rather than a theoretical understanding of a set of rules or methods.

Lawson’s experimental work is useful at telling us something about how designers approach their work, at the same time that it highlights the problematic tendencies of the experimental method of studying designerly actions. In order to control for variables¹⁶⁸, the ‘design activities’ that the research subjects were asked to complete were a set of abstract tasks that bore little resemblance to actual design studio activity. While Lawson’s research findings tell something important about how designers think, it does not give us a way to relate this thought process to the design studio because the study is both abstract and ‘de-contextualised’.

Another difficulty is accounting for how thought occurs with or through representations. Schön acknowledges the power of the architectural representation to ‘talk back’ to the design and help them inform their design moves. Lawson emphasizes that the designers has always ‘externalised’ their thoughts in the form of representations which according to him “freeze and store spatial ideas which can then be evaluated and manipulated”¹⁶⁹. While recognising the importance of representations, throughout his book Lawson and Schön display little interest in exactly how representations are handled and manipulated. However in the final chapter, Designing with others, written by Cedric Green, the issue is taken up and explored further.

Green claims that design is a kind of ‘language’ and in a move similar to symbolic interactionalists like Herbert Blumer¹⁷⁰, argues that: “we do not only speak to each other in words

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¹⁶⁸ The performance of architecture students was being compared to science students, so the task could not be specifically ‘architectural’. The task involved manipulating a set of coloured blocks: Ibid. pg 30
¹⁶⁹ Ibid. pp 94 - 95
and gestures, but also with things”\textsuperscript{171}. In this work Green starts to develop a situated theory of design activity as a “social process”\textsuperscript{172}. Green argues that, by understanding design as operating in ‘language like’ ways, design activity be situated as an interpretive act reminiscent of playing a game. However he locates this ‘game play’ not in interactions with others but in the realm of expression and symbolic meaning:

Not every designer may be able to reconcile his own values, aspirations and expression with those of a particular client with divergent needs. The professional idea of service to his client may allow him to suppress his own needs, or he might enter a complex relationship with the client which is in many ways like a game. Almost every designer / client relationship goes through the “game” stage: it is a process whose purpose is to resolve potential conflicts and to settle in advance what is to be the balance of objectives that the designer will seek to achieve\textsuperscript{173}.

The “language of design” that Green describes is not about physical design activity. His ‘game’ is about finding the process of finding appropriately meaningful forms that satisfy both the designed and the client. When he goes on to talk about applying his game theory to design studios he takes the idea literally: as involving teaching students through playing games. He describes some charmingly antiquated computer simulations which were designed to teach students how to play games with form. In Green’s work design activity in the design studio is still primarily figured as a disembodied and dematerialized process.

The idea of design as a special form of thinking is taken up by other scholars working explicitly in the hermeneutical tradition. Hermeneutics is a philosophical tradition, most associated with the work of Hans-Georg Gadamer\textsuperscript{174} and is concerned with the process of interpretation of written, spoken or non verbal actions and materials to find meaning. For Gadamer the hermeneutical event is a “dialogical” process that is likened to a serious conversation which takes on a life of its own such that we “fall” into it. Interpretation occurs within a process Gadamer described as the “hermeneutical circle”, where any act of interpretation relies on some preconceived ‘prejudice’ about the situation. Adrian Snodgrass and Richard Coyne in their book ‘Interpretation in Architecture’ highlight that Gadamer is trying to “rehabilitate prejudice” and rescue it from the

\textsuperscript{171} Lawson, \textit{How Designers Think}. Pg 172
\textsuperscript{172} Ibid. pg 175
\textsuperscript{173} Ibid. pg 177
“Enlightenment prejudice about prejudice”175. Gadamer figures the act of prejudging as an intuitive leap and therefore argues that the hermeneutical process is primodial, a universal human attribute that is a “foundation for all rationality”176.

Snodgrass and Coyne point out that there are obvious connections with the way that Donald Schön describes designers working with representations that “talk back”. For these authors, the protocol studies of Schön demonstrate that the design process works “according to the dynamics of the hermeneutical circle”177:

Designers proceed by way of continuing inter-referencing of a projected whole and the particulars that make up the design situation… Understanding arises by a process of constant revisions178.

In this theoretical orientation representations provide an essential role, but as a background support for designerly activity. According to Snodgrass and Coyne, we can engage in a dialogue with things as much as people and objects can “ask questions” of the designer in a manner of a “spirited conversation” such that the designer loses a sense of the object being outside of themselves and become “carried in the flow”179. While this, again, may be a good description of the embodied sensation of designing, it is a theoretical rather than empirical argument which does not tell us much about the role that bodies play in design studio interactions and how these interactions lead to the generation of knowledge, meaning and the experiencing of an architectural subjectivity.

When it comes to describing the type of design interaction that is found in the studio and what is special about it, Snodgrass and Coyne have some useful observations about knowledge generation. They step through the idea of design as a style of thinking and reject the idea that creativity is a special kind of thought apart from action in the world. The idea of ‘flow’ that they put in their discussion of representation takes a similar position on cognition to Edwin Hutchins180 who studied the process of navigation aboard large Navy vessels. Hutchins made a compelling argument for cognition to be understood as “distributed” through both the ship’s environment and the people that inhabited it. Hutchins claimed that navigation was “performed into being” through the

176 Ibid. pg 44
177 Ibid. pg 45
178 Ibid. pp 45-46
179 Ibid. pg 48
interaction of the team of sailors, the arrangement of their respective physical locations (and ranks) and their strategic use of “material anchors” (tools, artefacts, found objects and representations).

This distributed theory of cognition that implies that knowledge is both performative and relies on forms of work by animate and inanimate actors to come into being. According to Hutchins, being able to do navigation in the large military vessels he studied depended on the collective work of the whole ship; not only the inhabitants, but tools, maps and the layout of rooms. In addition to the ship, other materials outside of it, such as the shoreline, landmarks and buoys were implicated in the ‘doing’ of navigation. Even other, more intangible, socio-material practices like military ranks and customs of hierarchy that inhered in the enactment of rank were necessary players. This act of ‘distributed cognition’ amongst the animate and the inanimate participants enables the sailors to know where they were and had been in space.

Without referring directly to Hutchins, Snodgrass and Coyne put a similar argument about the design studio as an ‘environment to think by’. They ask: “Are some environments more conducive to thoughtful and creative outcomes than others?”

They go on to argue that if cognition is distributed across the whole landscape of the workplace, then architects should concern themselves with “orchestration of suitably mnemonic and cognitive environments: rooms, public spaces, landscapes and technospheres by which to think.”

Although it is potentially a useful exercise, Snodgrass and Coyne do not extend their hermeneutical methods to observations of the interpretive processes at work within design studios. Their analysis of hermeneutical position of design thinking still puts an emphasis on language as the primary bearer of meaning and the focus for the interpretive act. There is little attention to the body as a communicative and interpretive resource in design activity. Likewise the effects of power relations are not given any attention which, as I noted in the introduction, is important in any analysis of an educational setting.

One of the most difficult things about an architectural education, from the point of view of both the students and the teachers, is communication. As Schön noted we often know more than we can ever say and a lot of our knowledge of design is tacit. Communicating tacit knowledge can be difficult because it can resist a discursive framework. However, the assumption often made about

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181 Snodgrass and Coyne, Interpretation in Architecture: Design as a Way of Thinking. Pg 82
182 Ibid. pg 82
tacit or embodied knowledge in the discourse around reflective practice is that in order to teach it that it has to become represented in words.

It is clear that neither cognitive science or hermeneutics offers a way to understand the materiality of the body in design studios without losing sight of the complexity of the studio as a protected social space or retreating into an analysis of speech alone as the main ‘transmission vector’ of knowledge. The evidence used to support the cognitive science model is drawn from lab based studies that have limited use in the task of understanding how design studios actually operate to produce knowledge and knowing, while the hermeneutical model privileges language and fails to grapple sufficiently with the problem of accounting for the operation power relations identified by previous critics of the design studio.

How might bodies and power relations be drawn into an account of design activity in the studio? In the next section the story of Peter Corrigan’s design studio is presented as an example of how ANT provides a way of regarding the studio that stays with the ‘mess’ in a productive way. Corrigan’s studio is interesting because it clearly demonstrates the idea presented in the last chapter that design studios are collaboratively made in such a way as to allow certain kinds of architectural subjectivity and knowing to emerge. Through a detour into Corrigan’s teaching method I will start to sketch out an actor network approach to the problem of the body in design studio teaching. In a departure from the previous theories which have been discussed, actor network theory offers a way of looking in which thinking, being and doing are not neatly separated out but strategically blurred.

(The story of the recalcitrant Photocopier)

It’s a cold Wednesday night In Melbourne and the students in Peter Corrigan’s studio are obviously tired. For several hours now they have been seated around a conference table in their teacher’s office taking it in turns to offer critique on the models that each have made for the class. The models are a series of fantastic confections of balsawood and paint that they have produced after going to see a play at a local theatre two nights before. A radio tuned to football commentary burbles away in the drawing room behind where I am seated, just to the side of the table. I hear the last staff member working in the drawing room packing up to leave for the night and note the time — it’s 9pm.

While individual students take their turn to talk, their teacher, whom they refer to respectfully as ‘Mr Corrigan’, has been sitting in silence on a stool placed in the open entrance to his small
kitchen with his hand held to his chin. He does not engage the student in conversation but stares at the ground; however is obviously listening because occasionally he issues loud, almost theatrical sighs. These signs of the teacher’s impatience with what is being said seem to inevitably unnerve which ever student is doing the speaking, but without being explicitly told to stop they carry on. Eventually however Corrigan will interrupt, usually when the student is in mid sentence to tell them to stop talking and point to another to ask them what they think. Sometimes he moves away to potter with the dishes in his kitchen but the activity around the table does not alter, that is until he steps into his library at the front of his office and returns with a book. He walks past the table where the students are sitting and goes to the photocopier located in the drawing room.

The students start to make significant eye contact with each other as the time that Corrigan spends at the photocopier lengthens and the copier starts to sound like it is in mechanical distress. The male student currently doing the talking is defending the model that he has made with another student, a young woman seated across the table. As he speaks he struggles not to smile at her. He averts his eyes but it’s too late, she starts giggling and muffled laughter starts to break out around the table as people realise he can’t carry on being serious. The laughter has a strained quality: most of the students clap their hands over their mouths and cast glances at the invisible teacher at the photocopier. The student speaking is finally affected and starts to laugh just as Corrigan returns to the table. Instantly the laughter of the whole group is stifled. In the silence that ensues Corrigan eyes the whole table and murmurs quietly “Alright. Settle down now”. He retakes his seat and points at another student and the process of critique continues as if nothing has happened.

Peter Corrigan’s studio

This story is resurrected from field notes, taken in semester two of 2006, when I was a participant observer in Peter Corrigan’s studio at RMIT University. Design teachers don’t have to study the work of Donald Schön, or in fact any educational theorist, in order to be allowed to teach and many don’t. But Peter Corrigan is an exception; he has a good understanding of these pedagogical ideas and indicated that he saw himself in a coaching role when asked about his teaching practice. However there was no evidence of ‘coaching artistry’ or ‘reflection on reflection in action’ in the way he runs his studio, at least in the way that Donald Schön described it. Yet the

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183 Refer to Appendix one: “Methodology” for details about how this observational work was carried out
studio has been running in the same way for the 30 or so years at RMIT University and continues to be very popular with students.

Corrigan’s architectural work and influence as an academic is celebrated by certain members of the local profession; RAIA chapter president Eli Gianini in her gold medal citation address of 2002 states:

As an academic and practitioner his teachings and work have been responsible for influencing several generations of architects from the 70's to the present day. It would be difficult to imagine the work of many of today's respected and awarded architects such as Ashton Raggatt McDougall, Norman Day, Lyons, Wood Marsh, Ivan Rijavec and others, without acknowledging the influence and critical edge that Peter Corrigan brought into the architectural debate of the 70's, 80's and 90's.184

In a tribute to Peter Corrigan, Melbourne Architect Ian McDougall wrote of Corrigan’s teaching methodology:

This is learning in the round, participatory and sometimes ruthless. Over a long period, Peter has taught us that it is necessary for architects to teach, to engage with the intellectual hot-house that is the school. Equally he showed how important it is for students to have contact with teaching practitioners. Both lead to a culture that is in touch with its consciousness and yet retains a pragmatic utilitarianism185.

Amongst the student cohort of the architecture and design school at RMIT Corrigan’s design studio semester has the status of a ‘rite of passage’; but one that, importantly, only a few are brave enough to attempt. Both Corrigan and his studio have taken on somewhat legendary, even iconic, status within the school over the years because the semester is well known to be both physically taxing and intellectually challenging. Vivian Mitsogiani, another veteran of Corrigan’s studio and staff member at RMIT University, writes of the longevity and value of Corrigan’s studio in a local magazine:

The Corrigan design studios at RMIT are the stuff of legend … there is about them an urgency, energy and theatre as up to fifteen (usually exhausted) students, negotiate three narrow flights of stairs, with their large drawings and larger models, and squeeze around the meeting room

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table, surrounded by the workings of the office and within easy reach of Peter’s awe inspiring library … The brief, however, is a minor part of the studio in which complex and difficult ideas are investigated and questioned, often in rapid succession – jolting people outside their comfort zone, shocking them out of complacency.\textsuperscript{186}

In the stories that circulate within RMIT and outside of it in the architecture community in Melbourne, Peter Corrigan’s personality is notoriously difficult to negotiate.\textsuperscript{187} The legend is no doubt fuelled by the way that veterans of the studio share their Corrigan experience with other students; as one student remarked:

I have had random contact with members of the profession during the semester. I feel a bit like I have joined a secret club. These people were directors and stuff, they didn’t really have any reason to talk to me, but when they found out that I was doing Corrigan’s studio they started to share their stories with me, of the things they did when they were in the studio and how it affected their lives.\textsuperscript{188}

This ‘cultural preparation’ means that most students ballot for this studio with an expectation of an exhausting and gruelling process to come. Some even described it in terms of a feeling of thrill-laced dread; as one veteran of the studio remarked to me “If you go to the amusement park you might as well ride the rollercoaster.”\textsuperscript{189} There is a certain type of romanticism that resides in the ‘Corrigan legend’ that attracts students to the studio, as one of them remarked to me:

I get caught up in the moment of being there and carried along with him. Here is this old man who is such a legend, Australia’s architectural superstar. You hear the stories of him, his drinking exploits … I think it’s a good thing that everyone in the studio wants to be there. I think we are all interested in architecture, as a profession I suppose, but as something that is better than that. He still believes in architecture.\textsuperscript{190}

Corrigan works to distinguish this class as different from other design studios which his students may already have done at RMIT. He insists on holding the studio in his office rather than

\textsuperscript{186} Vivian Mitsogianni, “The Laughter of Liberation/the Authority of Vision (a Tribute to Peter Corrigan’s Contribution to Architectural Education),” \textit{Architecture Australia} 2003.

\textsuperscript{187} I experienced nothing of this ‘side’ of the legend during my time in the studio and in subsequent occasions. Of course it is possible that he was on his best behaviour in my presence so, in an attempt to account for possible observer effects, I sent my fieldwork notes to students and talked to them outside of the studio environment. When I asked if Corrigan was different when I wasn’t there, they tended to reply “yes”, but were unable to point to any vastly different practices than those I observed. Students told me that Corrigan had more to say when I was not there than when I was, but that what he said was not qualitatively different.

\textsuperscript{188} Phone conversation between a student and the researcher, 6.10.06

\textsuperscript{189} Researcher conversation with an ex student at a bar, 23.08.06

\textsuperscript{190} Student, in a phone conversation with the researcher, 06.10.06
within a classroom\textsuperscript{191} and claims this is a way of effectively clearing away the “academic detritus”\textsuperscript{192} and engaging the students with the professional world.

This change in place also serves to immerse the students in Corrigan’s particular version of this professional world, his enactment of what an architect is, which starts as soon as students enter the foyer. The physical spaces of any architect’s office, particularly the public areas, are important because it is an opportunity for the practice to demonstrate a built version of the office’s ethos and approach to design to potential clients. In the case of Edmond and Corrigan, Peter Corrigan’s practice, the design atmosphere created is eccentric and quirky. The 3\textsuperscript{rd} floor office is reached by a set of stairs from a non-descript doorway located in a laneway opposite RMIT. It is divided into a library, with an upstairs mezzanine above, at one end and a double height studio space in the other. The two spaces are connected by a hallway which acts as the entry to the space.

The experience of being in the office is almost like being in someone’s home, complete with mess and personal clutter. Entering the office, one arrives in the hallway and is confronted with a wall holding a cluster of degrees of the partnership and awards won by the office. The degrees and awards are packed so tightly together that they have started to overlap each other in a haphazard way. This arrangement suggests not only that the office has received a plethora of awards (which it has) but, unlike other offices who display theirs individually and prominently in order to assert the authority that confer, the lack of care in this treatment seems to suggest that Edmond and Corrigan are less interested in this kind of distinction or where it derives its authority.

\textsuperscript{191} Which, ironically perhaps, are located in a building that his firm designed – see methodology section. Mitsogianni states this practice of holding the class in his office has been happening for approximately 16 years at the time of writing (Mitsogianni, “The Laughter of Liberation/the Authority of Vision (a Tribute to Peter Corrigan's Contribution to Architectural Education).”

\textsuperscript{192} Researcher conversation with Peter Corrigan, 27.07.06
Similarly the office does not seem to be concerned with affecting a polished 'designerly' image. A large, Georgian style, antique table occupies the end of this hallway surrounded by 1970s style rattan backed chairs. On the wall opposite the degrees and awards wall there is a selection of framed images ranging from an etching of fish to a replica of an Egyptian papyrus. The library is crammed with books on many subjects, including a collection of old and rare architectural plans and manuscripts. When classes were held at the conference table the employees were still present, working in the drawing room at the opposite end of the building from the library.

The sense of place of the office immediately sets this design studio apart from the anonymous institutional settings of most design studios at RMIT, but Peter Corrigan’s studio differed in other obvious ways, especially in terms of structure. This structure fostered the social dynamic in five key ways. Firstly students were required to work in groups of two or three with very little guidelines as to how to negotiate this team work or indication of how it would affect their assessment. Secondly, by way of contrast to other studios, where the site and the brief are set early on and the students work to produce more and more resolved designs, Corrigan encourages his students to work fast.

193 Image by the Author
194 Image by the Author
through many versions of the design, which are treated as a series of formal experiments. Third, Corrigan deliberately sets an extreme pace and workload and couples this with high expectations about the student's ability to complete the number of tasks. In addition to this, he makes these high expectations publicly known by sometimes asking students to leave if they do not turn up, on time, with the expected work in hand. Finally, he does not really participate directly in guiding the students to a formal realization of their ideas, setting up instead a 'round table' peer to peer critique process (or as he puts it: “Mr Freud’s talking cure”).

The group work is one of the most interesting features of the design studio structure. The students were usually placed in pairs or groups of three, by Corrigan, for the design task set for the week. Sometimes the pairings seemed to be very deliberate (such as coupling a weak student with a strong student or two strong students together), but at other times they seemed entirely random. The students invariably thought that Corrigan had ulterior motives for putting them with particular students, but when asked about this he claimed it was true “only some of the time”\(^1\). Occasionally students would be asked to work alone and usually Corrigan would frame this request for a solo project as punitive because he was cutting them off from the “comfort” of working with others and would state that it was important in some way for their personal development. Indeed many claimed that they found working alone more and more difficult because they had come to rely on working with others as the semester progressed.

There was a more practical reason for this discomfort as the overall workload the students were asked to undertake was significant. It was impossible for students to be able to do all the work for the class effectively without participating in the group work and sharing their knowledge of things like drawing or writing. For the first eight weeks of the semester the students completed an excursion, an extra task like a lettering assignment, the weekly model of a 30 storey tower and the ongoing site model build. After week eight additional classes were held, usually each Sunday where the same amount of work was set. Effectively this meant that, after the mid point of the semester, the students were required to do the same amount of work in half the time. After week three they were required to also produce drawings for the tower and Corrigan insisted on increasing complexity in these drawings as the weeks went on.

\(^1\) Researcher conversation with Peter Corrigan 23.08.06
The group design tasks that Corrigan set the students not only required a substantial amount of time, but had added social complications because of the way that the group work was arranged. Corrigan recognised that making the students work together in this way caused tensions, but was unapologetic about it, at one point telling his class:

"Keep a diary. You should keep notes on who you worked with and what you did, what a bloody nuisance they were and how they held back your creativity."

Although they valued working with others, the denial of control over whom they worked with certainly irritated the students and, at times, caused divisions:

"The good thing about this studio is that it creates a nice external social environment. You really get to meet your classmates and work with them… But groups have kind of formed within the group and when you are given certain people to partner it can become quite difficult. Some of us will work together in (another student)’s studio but other weeks you end up working with just that other person, who isn’t part of the group, and that can be a lonely week. You disagree all the time and end up working in uncomfortable silence, ending up with something that neither of you like."

Although some students preferred not to work with certain others, they claimed that they did not let this get in the way of work that had to be done and that working together helped them to ‘bond’. Corrigan’s tactic with the group work, as with most of the studio structure, seemed to be designed to replicate the social and financial conditions of practice and emphasize the appropriate ‘professional conduct’; preparation for, as Corrigan often put it, when the students became “grown up architects”.

Corrigan recognised that time spent outside of the classroom or design tasks could also be an opportunity to learn about design and being a designer. The structure of the studio included social activities as well as architectural ones. In addition to their design tasks the students would have an ‘excursion’ to complete each week. Corrigan did not discuss this aspect of the studio with me, but the excursions were observed to fulfil two important functions: to expose students to the broader public and to offer students the opportunity to work on projects outside of the studio.

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196 Corrigan, in conversation with the class, 09.08.06
197 Student, in a phone conversation with the researcher, 05.10.06
198 Something worth noting is that the terminology to refer to the various tasks of the class was replicated year after year. This part of the week was always known as ‘the excursion’ the other work that reoccurred was ‘brief’. I suppose this came about because students would chat to others in the course about the studio and the terminology became a kind of ‘meme’ that was transmitted across the years. What was extraordinary is even students who had done the studio up to 16 years ago would still use the same words to describe the various activities.
cultural life of the city and its citizenry and to help them bond as a group and take on an identity as ‘Corrigan students’. Sometimes the students would be asked to undertake individual excursions like visiting an art exhibition or looking at furniture in an antique shop. Other excursions involved the whole group: they twice attended a play as a group, once went to the cinema and once to the football at the Docklands stadium. Corrigan required them to produce a written report, a sketching exercise or a design task associated with the excursions. Some of these excursions involved the students attending events put on by, and for, the architectural profession such as lectures, exhibitions and information sessions. The students were instructed to go and take part in these events and ‘blend in’; Corrigan would remind them that they were fledgling members of the profession whose behaviour would be judged by others according to standards other than those that prevailed in the academy:

I want you to turn up this event (hands out flyers). And dress up a bit. Of course it’s not aimed at you, but I don’t want you turning up like something they just kicked off the Frankston train. You are allowed to have precisely one drink and one canapé each. No giggling or anything stupid.

The student’s workload was increased by one or two additional tasks set each week which would vary from drawing objects in exhibitions to scale, practicing lettering by reproducing poems and phrases or making ‘maquette’ models in colour. In addition the students worked collaboratively on two large model making projects which extended over several weeks that were not directly related to their own design work – these included a series of site models and a large precedent study. In addition to all this direct work the students were required to read a famous 20th century novel. As a consequence the students were always balancing their workload from the design task and negotiating their work with others at different scales of interaction.

Corrigan’s constant emphasis on time and time management reinforced the idea that students needed to develop modes of appropriate professional conduct in order to succeed as an architect. The tasks extraneous to the design work, such as visiting galleries or attending events, squeezed the amount of time available for design. These tasks mimicked the multiple requirements of office management, such as billing, meeting with consultants, site visits: in short number of ‘other’ things

199 Corrigan in conversation with the class, 13.09.06. The suburb of Frankston is on the outer suburban fringes of Melbourne and is characterized as being inhabited by those of lower socio-economic status
that an architect has to do to run a practice. As one ex-student, who did the studio in 1991 and now runs her own practice, remarked:

I constantly butted heads with him, but the one thing that really stayed with me from that studio was time management. I still draw on the strategies I learnt there, everyday, to manage the demands on me. I learnt how much work I was capable of doing and how little time I actually will have to do any design work.\(^{200}\)

Well developed time and people management and skills were not only necessary to complete the work; they were also required for the student’s attitude to attending the class. If students turned up late they risked being turned away, likewise if they turned up too early. Students who did not complete the work were treated with profound disapproval asked to submit the work, to the office, the next morning. One student remarked that they tried to avoid missing work after the second week as they realised how much this would put them behind. The group work also assisted with attendance and punctuality, a number of the students expressed the sentiment that they couldn’t quit and had to turn up because others were relying on them.

This intense workload and lack of sleep would have been a problem for the students as being the classes required their full attention. Contrary to most studios where the interaction with the teacher was primary, Corrigan did not have much direct interaction with the students regarding their work. On a subsequent visit with a critic panel his reasons became clearer when he stated: “I don’t bother to teach design – they have to teach themselves. I’m more concerned with character.”\(^{201}\)

The actual class time would involve the students sitting around the large boardroom table in the hallway of the extremely cramped office. They were required to present their work to the group and comment on each other’s work in turn for the entire two hour session. As he told his students:

I am trying to encourage you to find the words. Architecture is an elliptical discipline. I’m a great believer in Mr Freud’s talking cure. In here you will talk until you find out who you are and why you are in this course. Be brave with your opinions.\(^{202}\)

\(^{200}\) Casual conversation with practicing architect and teacher at RMIT University 06.09.06
\(^{201}\) A comment to a review panel discussion, 29.10.08
\(^{202}\) Corrigan in conversation with the class, 02.08.06
Corrigan did not participate very much in this group discussion except to prompt students to speak, tell them when to stop speaking and to occasionally to ask a question\textsuperscript{203}. By stepping back from the process of offering judgment, he encouraged the students to set their own standards for their work in a negotiation with the opinions of their peers. Corrigan would, for the most part, hold back his own opinions of the work, as he remarked to one student: “It’s not helpful for me to give my opinion. I don’t want to impose on you. I’m here to encourage the dynamic, not to beat you out of shape”\textsuperscript{204}. Some of the students found this aspect of his teaching frustrating, as one remarked to me: “It is bizarre that you don’t get any feedback on your work. It makes it difficult. Some students try to play into what they think he will like, but it doesn’t always work”\textsuperscript{205}.

Although his comment on the models would be brief, Corrigan would make more lengthy remarks to drawings – correcting errors and pointing out inconsistencies as well as commenting on drawing style. At times he would make a lengthy comment that would refer to an aspect of the work that was being discussed, but these comments were didactic in nature rather than directed at the individual’s work. All his soliloquies can be distinguished by being overtly pedagogical in tone\textsuperscript{206}.

\textsuperscript{203} Insight into this aspect of Corrigan’s teaching practice came from Ben Stakus and Eugene Chieng who taught Corrigan’s studio for a semester. They claimed Corrigan’s main instruction on how to run the class was to “keep your distance and keep the conversation flowing” (in conversation, 23.08.06). According to Stakus, the rationale behind this was never explicitly spelled out, but he thought it was a helpful technique as it enabled him to be tougher and more demanding of the students and to be objective about their capabilities.

\textsuperscript{204} Corrigan in conversation with the class, 02.08.06

\textsuperscript{205} Student, in a phone conversation with the researcher 05.10.06

\textsuperscript{206} Some referred to conditions of practice, such as this comment:
The students would maintain perfect silence during these speeches, but they tended to be brief: most of the time the talking would be done by the students.

During the round robin the students would speak until they were told to stop and, as time went on, seemed to become more confident to the point of being blunt in their assessment of whether they thought the work was good or not. In tandem with this honesty the reasons the students put forward for liking or disliking the work tended to become progressively more simple as they realised that in this relatively ‘safe space’ they did not have to fall into jargon to express their opinions. The whole process never degenerated into a shouting match, perhaps because it was given a strange air of formality by Corrigan’s insistence on “old fashioned forms of respect”. He always called the members of the class by their surnames with the prefix of ‘Mr’ or ‘Ms’ and the students returned this courtesy by always referring to him, at least in his presence, as ‘Mr Corrigan’. This use of the honorific form of address is unusual in contemporary educational settings and using it became a mark of ‘corriganality’ long after the studio finished.

As in the story at the start of this section, in direct opposition to Schön’s storying of Quist, for most of the class time Corrigan would stand or sit on a stool in the kitchen doorway adjoining the conference area. Sometimes he didn’t even pay overt attention to the discussion and instead pottered around inside the kitchen or at the photocopier in the studio space. After a few attempts to engage his attention, the students learnt to address their remarks to the model and the other students in the class. Although Corrigan occasionally increased the loudness of his voice to a student, he would never modulate the pitch. Much like the advice that parents are given to deal with rowdy toddlers, the rebukes tended to be delivered with a certain flatness and detachment, regardless of the content of the speech. Corrigan emphasized to his students the necessity to suppress displays of
their emotions; as he remarked to one student: “You must defend the work. Always - even if it’s rubbish. Then go outside and cry if you must, but you must learn to defend”\(^{208}\).

This is not to say that he did not tightly control the class conversation; this tended to happen by calling on students to talk, cutting them off mid sentence either to make a comment or to call on another student, asking questions or making loud sighs. In fact Corrigan’s sighs were one of the most interesting features of his teaching style as they were explicitly performative: he used his body to express frustration or boredom in a way that was designed to affect and direct the group dynamic. They were a potent device that inevitably unnerved whichever student was speaking and the group as a whole. Interestingly the sighs were not necessarily interpreted by the student as a signal to stop talking; they would tend to carry on, but with a palpable loss of confidence in what they were saying. Rather than taking direct responsibility for their utterances by speaking over or for the student, Corrigan encouraged self discipline by indirectly asking them to think about how they were shaping their performance as they performed\(^{209}\).

Corrigan’s studio could be described as an exercise in ‘affect engineering’\(^{210}\) because it manufactures experiences designed to provoke the visceral experience of a certain kind of subjectivity – that of the struggling young architect. The structure of his studio could be criticised for mimicking a certain kind of lifestyle that promotes a version of ‘being an architect’ which perpetuates a romantic image of artistic and financial struggle. However this criticism does not undermine his attention to the development of the student, in particular their ability to exercise ‘good judgement’ within a group of their peers.

**Corrigan studio as actor network**

The Corrigan studio is different to other design studios in that architectural knowledge and knowing is performed into being in locations other than just through the manipulation of architectural representations at desk crits and the presentation of projects for critique. Corrigan

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\(^{208}\) Corrigan in conversation with his class 09.08.06

\(^{209}\) This ‘hands off’ approach extended to the jury panel at the end of semester. Corrigan would sit in the corner of the room while the student presented their work to the jury in the form of a folder. The jury panel was less like a critique session than a job interview. One characteristic of these jury sessions was the prevalence of the ‘before and after’ stories that the students would tell. Since they could not really point to any one project as showcasing their skills, they would tend to start these presentation sessions by setting their semester of work in a relation to the rest of their design studio career. These remarks were a ‘reflective practice’ teacher’s dream. During these stories the students showed evidence of learning, critical thought and self reflection. Interestingly this learning was not the result of explicitly being asked to reflect in the safe space of a journal, but being forced to confront the patterns of their behaviour in relation to working with and talking with their peers and by being driven to the point of exhaustion in a working schedule that was almost impossible to maintain.

‘orchestrated’ this reality with the help of a crowd of things including his office, a conference table, a photocopier, a radio, a football stadium, a series of New York times articles and the city itself.

Actor network theory provides conceptual tools for understanding architectural knowledge, meaning and subjectivity as network effects that emerge from network relations. Corrigan’s studio can be described as a heterogeneous network of animate and inanimate actors who are co-implicated in producing the effect ‘Corrigan’s design studio’ at the same time as it evokes the subject positioning of ‘struggling young architect’ and architectural knowledge and knowing emerge.

But Corrigan’s studio is but one actor network in a host of many. The most radical claim of actor network theory is its relativist ontology: reality is not a pre-given ground but is performed into being. If Actor networks perform realities into being, and there are always multiple actor networks at work, there are always multiple realities being made. We can look at the incident at the beginning of the chapter — the minor photocopier breakdown and the outbreak of laughter — in this way. Without Corrigan’s immediate physical presence the students could not keep doing the Corrigan studio and another form of organisation started to emerge. Other actor networks, perhaps actor network that were more present in the times students spent together without their teacher, come to the surface. Students started to act towards each other more like they were at the pub or at work together in their studios — they laughed. The multiple networks interfered with each other until Corrigan returned and his body re-established one as more prominent than another and the laughter died away.

Schön’s idea that the teacher is the driving force in shaping of the student into disciplinary norms comes into question in this relativist ontology. If the enrolment of a student into any design studio actor network is only ever partial, so the exercise of power of the teacher ‘over’ the student can never be complete.

This idea of design studio as a collective accomplishment of human and non-humans is useful to this study because it helps us to rework the idea of agency. In Schön’s account of the design studio, the teacher is seen as having agency while the student is a passive recipient of their demonstration of design expertise. But according to actor network theorist Bruno Latour, an actor in an actor network can be anything — so long as it acts. As his alter ego, the (somewhat Socratic)
Professor argues: “If I want to have actors in my account, they have to do things, not be placeholders; if they do something they have to make a difference”\textsuperscript{211}. Corrigan’s body was one of the ‘actors’ among many along with, just to name a few: his table, his office foyer, a football stadium and the representations made by students who ‘do the design studio’ together.

Robin Usher and Richard Edwards\textsuperscript{212} argue that such an ANT stance to educational process repositions the learner as a ‘knowing location’ within a network of heterogeneous elements. In this formulation learning to design is shifted from being primarily a cognitive activity that happens ‘in the head’ to a process that takes place in the world and is therefore both contingent and uncertain. The studio does not teach students how to think like an architect, but certain ways of thinking can be considered as network effects. \textit{The way a design studio actor network is assembled will tend to make certain ways of thinking more possible than others}. What is learnt therefore depends more on actions and presence than beliefs, intentions or cognitive processes. This idea of design studio as actor network unsettles the idea of the studio as occupied by students and teachers engaged in a set of ‘reflective practices’ and instead puts attention back on the performance of the individual actors and what they produce through the work they do.

We are now in a position to reconsider the role of the body. The clearest demonstration of the importance of the work bodies can do in this example of an actor network is Corrigan’s sighs. Corrigan used his power of breath to affect the student in their telling of a design story, but this did not necessarily victimise a student, likewise it did nothing to ‘draw out’ their hidden potentials. Instead his sighs created the potential in which a student might find voice and have agency — or not. The outcome of the performance of any actor network is not predictable.

That an ANT approach allows the effects of Corrigan’s sighs to be detached from Corrigan the person in this way reminds us that a body does not always have to be regarded as a singular object, but can be seen as an assembly: of hands, arms, fingers, breath all of which are capable of different kinds of agency. The rest of this thesis is dedicated to the examination of what kind of actor gesture and the kind of work that it can do.

Chapter Three: what kind of ‘animal’ is gesture?

Apart from a very short time as infants, all bodies are socialised bodies. Physical behaviour is always shaped and modulated in a relation to other bodies and the world around us. In the previous chapters it has been argued that materiality, including the materiality of bodies, is important in performing the design studio into being. In this chapter the focus will move from the body to the specificity of gesture. As a pervasive behaviour, which has the potential to be shaped by inhabiting a social milieu, gesture is a particularly good location to study the role of the body in design studios.

The chapter begins with a story to demonstrate how ways of being and ways of knowing cannot be easily separated. This is followed by a brief outline of some of the scholarship around the topic of ‘the body’ that bears on the interests of this thesis. Following this is a survey of work from gesture studies which explores theories about the role of gesture in learning and cognition and the small amount of work that has already been done on the gesture behaviour of architects. The two types of research methodologies dominant in gesture studies are discussed and their relative strengths and weakness assessed. The chapter finishes with the question of how to examine gesture in such a way as to stay sensitive to the complexity of the design studio environment that was highlighted in the previous chapter.

Another prologue in the form of a story

A few years ago I approached my father-in-law, a builder then in his mid 50s, to ask for advice on renovating my bathroom. I had carefully over-documented the small job on five A3 sheets and compiled them into a small drawing set, orientated in landscape format with three evenly spaced staples down the left side.
When I handed the set to him I was immediately struck by the difference between my own ‘architect’ way of handling drawings and his ‘builders’ style. Sticking his builder’s pencil behind his ear, he carefully licked his thumb and then started to flick back and forth through the pages with a frown of concentration on his face. He did this page flipping quite impatiently, all the while holding the set open in front of him like he was reading a newspaper or magazine.

After a couple of minutes he stopped on a page, which he proceeded to fold in half, and then in half again. This turned out to be a very effective way of isolating the specific part of the drawing he was confused about; he held this part of the drawing up for me to see while pointing to the relevant bit of cabinetry in my existing bathroom with his extendable builder’s ruler. By this time one of the staples had come loose and my architectural sensibilities were suffering (quietly) at the rough way he was treating my drawings.

In the eight or so years I worked in professional practice I had never seen an architect handle a set of drawings like my father in law did on that occasion. Architects tended to lay the drawing set on a flat surface and then proceed to open one page at a time, usually with their thumb and forefinger, settling the pages carefully on top of each other as if they are looking through a photo album or art catalogue. They almost never folded over pages to isolate particular bits of information; they would use their finger, a ruler or a marker pen. I had never seen an architect lick their thumb (at least when someone else was looking); most just struggled while some used a specially designed rubber thimble to give them purchase on slippery pages.

These differences seemed to demand an explanation. My father in law’s hands seemed to be the site where his expertise as a carpenter and the social worlds where he practices his trade collided. The way he did the handling of my drawings was ‘builderly’; it spoke eloquently of his own long experience with the tools of his trade and at the same time told me something about what a drawing set means in his builder’s world. His handling seemed to suggest that a drawing set is a purely instrumental thing: something to be tucked in the back pocket of a pair of overalls because it

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213 Source: image by the author
is useful, much the way a hammer is. As a tool a drawing is not precious; it therefore may be treated quite roughly or even used as a make-shift coaster for a hot mug of tea.

For a person trained to be an architect like myself, a drawing is a material manifestation of the service the client is paying for and so speaks directly of the nature and value of the architect’s design skill. To an architect a drawing is an artifact, something crafted, not just a tool. As an atefact it has uses beyond the building site and the business of making a particular building. For example, drawings are one of the ways that architects can share design knowledge with others or a way of marketing their skills. Placed in exhibitions or magazines a drawing can be seen by potential clients and (perhaps more importantly) other architects. Therefore it should perhaps be no surprise that an architect may possess ‘designerly’ ways of handling drawings that are redolent of loving and reverent care.

Ways of being / ways of knowing

Over the last couple of decades ways of being and ways of knowing have come to be seen as closely intertwined. Much of this work has been carried out in studies of workplaces informed by the idea that there are valid practice based epistemologies which underpin networks of social practices, amongst humans and non humans, which tie communities together.

The two different ways of handling drawings that I have described – ‘builderly’ and ‘designerly’ are examples of ‘embodied knowings’214, knowings in and through practice, which are formed by being in the social world of each profession and acting as one of its members. These embodied knowings allow builders and architects to perform their roles socially as well as instrumentally; they are as much a part of being a builder or an architect as the ability to draw a straight line without a ruler or build a straight brick wall with the help of a stretched piece of string, but they are never written down because in their very nature they resist the written word.

‘The Body’ is complex and multifaceted subject of inquiry which ranges across several fields in the humanities, including sociology, anthropology and cultural studies as well as the sciences, in particular evolutionary biology and cognitive science. Some scholars are interested in how bodily behaviour is ‘disciplined’: modulated and shaped in the midst of everyday performance of actions.

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214 This term is appropriated from G Dall’Alba and R Barnacle, “Embodied Knowing in Online Environments,” Educational Philosophy and Theory 37, no. 5 (2005).
This theoretical orientation posits that we learn to behave and move in certain ways through process of imitation, or ‘mimesis’, which occurs below the level of conscious awareness.

In an early essay on the differences between physical behaviours in respective cultures, Marcel Mauss\textsuperscript{215} drew attention to what he called ‘techniques of the body’. In Mauss’s view the body is an ‘instrument’ that is capable of learning to perform different techniques, for different purposes and in different manners, according to the circumstance. Using examples such as swimming, trench digging and walking, Mauss discussed how even what we think of as ‘technical education’ is always caught up in cultural mores. Mauss used the word ‘habitus’ to describe how the interplay of personal habit and generally accepted custom might manifest in an individual’s use of their own body. However Mauss doesn’t distinguish between ‘culture’ on the one hand and ‘nature’ on the other. Using the example of the child who imitates the actions that have “been successfully performed by people in whom he has confidence and who have authority over him”\textsuperscript{216} he argues that the process of cultural imitation informs even what we think of as the most ‘natural’ body functions, like, for instance, defecating. The most powerful point that Mauss makes is that while acquiring such techniques of the body might be slow to acquire and changing them difficult, they are not necessarily fixed.

In a similar vein to Mauss, Erving Goffman’s work concerned how bodily behaviour assists in processes of social ordering through a series of books\textsuperscript{217}. Goffman described his own work as ‘dramaturgy’ because it framed social interaction as a form of real life ‘theatre’. He constantly used metaphors and aspects of theatre practice to describe observed behaviour; for instance drawing comparisons between the ‘back stage’ area of the theatre and the kitchen in a restaurant. Goffman draws attention to how much ‘limb management’ we take for granted in everyday life and how the pervasiveness of this kind of bodily conditioning is rarely noticed in everyday life. In his work on asylums\textsuperscript{218} Goffman describes the uninhibited displays and self touching of genitals by of female inmates and compares them with what one might expect of ‘normal’ female citizens in public places. In similar work\textsuperscript{219} he highlights that children, the disabled and the elderly are often treated as

\textsuperscript{216} Ibid. pg 75
\textsuperscript{218} E Goffman, \textit{Asylums : Essays on the Social Situation of Mental Patients and Other Inmates} (Chicago: Aldine, 1962).
\textsuperscript{219} Goffman, \textit{The Presentation of Self in Everyday Life}. 

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‘non persons’ in public because they have not yet developed the ability to, or are incapable of, mastering this kind of limb management.

Goffman’s examples highlight how the conditioning of the body is often most visible when it breaks down or fails to function; this speaks to the importance of bodies in processes of social ordering and foregrounds the issue of bodies and power relations. Mauss’s example of the child learning to perform techniques displayed by those within a position of trust or authority and Goffman’s reading of children as ‘non persons’ are poignant because they hint at how power is always implicated in processes of education.

Pierre Bourdieu’s work\textsuperscript{220} seeks to put the concept of habitus, modes of education and the issue of power relations together by working from a strongly informed Marxist perspective. Bourdieu argues that society is defined by competition and the struggle for power by both groups and individuals and while this struggle often exists in the form of money it can also take other symbolic forms. Symbolic power is problematic according to Bourdieu because its workings are easily rendered ‘invisible’ in everyday life. He argues that, just as economic power flows from possessing economic capital, symbolic power flows from possessing ‘cultural capital’. Bourdieu identifies symbolic capital as having four basic forms: institutionalized (such as degrees from universities), objectified (things), social (one’s professional and personal contacts) and embodied (the state of being a cultured person).

The concept of embodied capital is important for this thesis; a student’s ability to gesture well could be understood as a form of embodied cultural capital which they acquire in the course of their education. According to Bourdieu, one’s embodied cultural capital is shaped by one’s \textit{habitus}, a set of tendencies, dispositions and practices that gives each person a ‘feeling for the game’ that pervades each particular cultural field. It can be argued that the contemporary academy is the institution par excellence for shaping the appropriate architectural habitus because it currently acts as part of the gate keeping apparatus for those aspiring to enter the profession, in Australia and in many other parts of the world.

Bourdieu’s ideas about symbolic power are informed by a Marxist position and, while his fashioning of habitus is useful, he tends to frame power as necessarily oppressive. For the purposes of this thesis Foucault’s concepts of \textit{disciplinarity} and \textit{discourse} offer ways to think of power as

\textsuperscript{220} In particular Bourdieu, \textit{Distinction: A Social Critique of the Judgement of Taste}. 

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productive, at the same time as it represses or dominates. Knowledge, it was argued in the previous chapter, can never be separated from the issue of power relations because there is always some form of knowledge differential between the teacher and the student. For Foucault, who always hyphenated the two concepts as knowledge-power, was bound up in discursive regimes of truth. Generally the teacher is in the position of possessing greater knowledge and therefore is presumed to have the authority to speak, and enact, certain forms of power.

In Discipline and Punish: The Birth of the Prison Foucault traces how ‘techniques of the body’, like marching and drill parades, and ‘procedures of knowledge’, like time tables and categorisation charts, began to be used in the enlightenment to render bodies ‘docile’ at the same time as to increase their utility. Foucault argues that the school, as a space of enclosure, has disciplinary regimes of power at its heart because it seeks to normalise and increase the efficiency of its subjects (the students) by means of instruments like examinations and systems of grading. Such techniques of normalisation work on students “so that they might all be like one another” at the same time as it seeks to sort them into hierarchies such that punishment may be used to ’reduce gaps’ between them.

Central to Foucault’s idea of disciplinarity are systems of surveillance such as observing, case studies, inscriptions in tables and report writing. Foucault claimed that in the early modern state systems of surveillance became so pervasive and subtle that its subjects ‘internalised’ this all seeing gaze; because they never knew when they were being watched, they either exerted self discipline – or various forms of resistance in relation to it. Foucault described this kind of surveillance and its effect of self disciplining/resistance as “inscribed at the heart of the practice of teaching, not as an additional or adjacent part, but as a mechanism that is inherent to it and which increases its efficiency”. Surveillance is what “holds the whole together” enabling disciplinary power to be “absolutely indiscreet”, distributed everywhere throughout any given social formation, at the same time as it is “discreet, for it functions permanently and largely in silence”.

Like Mauss, Foucault does not distinguish between ‘nature’ and ‘culture’; rather he claimed that our bodies are caught up in discourse and discursive practices. According to Foucault discursive regimes of power are at their most powerful when they are so invisible they seem entirely

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221 Foucault, Discipline and Punish: The Birth of the Prison. Pg 182
222 Ibid. pg 176
223 Ibid. pg 177
natural’ such that we make ourselves subject to them without even noticing that we are doing so. This is the power of discourse which, according to Foucault, is a structure of meaning making whose major characteristic is its disciplinary and hence regulatory power. Discourse is not only what we say and do, but how we come to be empowered to act and not to act. A discourse is not a pre-given reality, but a set of practices, ways of speaking, ways of acting which in turn construct representations and shape actions, making possible different ways of knowing the world and of acting within it.

In the previous chapter the students fell silent every time Corrigan spoke and stopped laughing when he came back from the photocopier. The students were not asked, coerced or forced to do so – they enacted a form of self discipline over their bodies in relation to Corrigan’s actions, who in turn was discursively framed as the authority figure empowered to speak truth. Not only was he empowered to speak, their willingness to enact self discipline meant he could choose who else could speak and when. He was able to enact this position not only because he happened to hold a position in an institution as a teacher, but also because of the ‘myths’ which had been built around him and his studio. These myths were made through various material-semiotic practices: circulated not only by people sharing their ‘Corrigan stories’ but by technologies like magazines where words can be carried across bigger distances and awards certificates which could ‘speak’ his authority as an architect from their position on the wall next to where the students sat. Moments in Corrigan’s studio, such as the recalcitrant photocopier incident, eloquently demonstrate the power of bodies to shape knowledge practices.
The body of the architect

Figure Seventeen: Architect Daniel Libeskind attempts to explain his design for the world trade centre site to New York’s Mayor, Michael Bloomberg.  

Figure Eighteen: Architect Mies Van Der Rohe gesturing while holding a cigar.

There is evidence in the literature on architectural education that students rely on other aspects of ‘body work’ like gesture to make sense of what is happening in the design studio. Schön quotes an architecture student as commenting the “Kafkaesque situation” of his education: “where you really don’t know where you are and you have no basis for evaluation. You hang on the inflection of the tone of voice in your crit to discover if something is really wrong.”

It seems that this student was not alone in being awake to the way something is said, as much as the content of the actual speech. In his account of his education at the Bauhaus, Howard Dearstyn reveals that Mies Van Der Rohe was an exacting teacher, but not a very forthcoming one. He would require his students to repeat the same exercise over and over but offer no feedback about how to improve their work:

Time and time again, when I presented him with sketch plans which I thought had merit, he would say laconically “Versuchen Sie es wieder” (“Try it again”). We respected his judgment

225 Source: Archives of the University of Illinois
226 Schön, The Design Studio: An Exploration of Its Traditions and Potentials. Pg 55 (Quoting from field notes to the AES)
too much to argue with him. Little by little, we began to catch on, to develop a feeling for this new kind of architecture.\footnote{H Dearstyne, Inside the Bauhaus (New York: Rizzoli, 1986). pg 226}

In another quote Dearstyne signals that the character of the master, and his love of ‘order’, was also important to developing an understanding of thinking like a (modernist) architect. This aspect was most loudly spoken of through the expressive actions of Mies’s body:

… he invited some of us students in [to his house] to talk, one evening, and served us aquavit. It is strange how one frequently forgets big things and remembers only little ones. The only think I can remember about it, other than drinking aquavit for the first time, is Mies rising suddenly from his easy chair to adjust the full length window curtain which was somewhat disarranged. This had doubtless disturbed him for some time and his mounting uneasiness about it finally spurred him to action. I’m sure that Mies told us important things that evening, but this simple act is all I that I recall. Evidently it said something about order which impressed me; and after all, order in architecture was a subject on which Mies frequently discoursed.\footnote{Ibid. pg 230}

In a telling demonstration of the importance of bodies to the enactment of power relations, Martin Pawley draws attention to the toll that the critique process took out of one student of his acquaintance:

At one crit during my 4th year at the AA a student collapsed whilst his project was being energetically ridiculed by a visiting critic. The critic did not notice this event until a dreadful silence caused him to turn around some moments later.\footnote{Quoted in Anthony, Design Juries on Trial: The Renaissance of the Design Studio. pg 1}

What is particularly poignant about this story of student collapse is the implication that no one moved or spoke to draw the collapse to the critic’s attention. Silences can create powerful moments and language is relatively bad at communicating emotions. When words fail, bodies take over. The inadequacy of words alone and a tendency to fall back into the body, at least as a vehicle for communicating form, has been noted by some professional architects. Wolf Prix of the firm Coop Himelblau, talking about his working process with his partner, Helmut Swiczinsky, states:

Our architecture can be found where thoughts move faster than hands to grasp it. So the first drawing is immensely important for us, it is the first impression of a building. In the last 3 – 4 years we have begun to shorten even further this very rapid design process, which can best be
compared with coming close to the centre of an explosion. We simply started to replace the spoken language, with which we were accustomed to communicate about the projects, with the more rapid language of the body. That is, Helmut and I no longer talk; indications are enough, gestures\textsuperscript{230}.

Frank Werner, who had observed the designers in conversation, points out that this is a somewhat fanciful claim as when these designers work they are seen to talk to each other in a perfectly normal “professional way”. However what Coop Himmelblau may have been foregrounding in this statement is that they had come to a conscious recognition that, after years of working together, they do use their bodies to communicate with each other, as much as words, a kind of ‘designerly shorthand’ as the following quote makes clear:

> While we draw, architecture is expressed in words; the drawing is than narrated in a 3D model... In recent years, we’ve noticed that, slowly but surely, we’ve begun to emphasize verbal descriptions of our designs by means of gestures of our hands. Working on projects for Paris and Vienna, we found that it was body language which yielded the superior drawing and the first model\textsuperscript{231}.

Wolf Prix implies that much of what we think of as designerly ‘knowing’ can be transmitted from body to body in practice through gesture rather than language alone — a point which was noted in the previous chapter. Coop Himmelblau took the idea that their practice had a ‘logic of gesture’ one step further by including a ‘gesture language’ in their film \textit{Construire le ciel} made in 1993.

\textsuperscript{231} Ibid. pg 121
Wolf Prix’s observations of practice seem to suggest that gesture is of special significance to the practice of architecture, especially in relation to working with others and with representations. At a most basic level students and teachers can use gesture to point to, trace over and strategically highlight parts of representations as they are mobilised in design studio discourse.

The mimetic tendencies that Mauss discussed as being integral to the acquisition of ‘techniques of the body’ suggest that gesture can be shaped by the immersion in a set of cultural practices that is the design studio. Just as it can be argued that there are ‘architectural’ and ‘builderly’ ways of handling drawings, as those described at the start of the chapter, it can be argued that there is potential for the development of ‘architectural’ ways of gesturing – which of course would take localised and situated forms from their design studio habitat.

Architecture students could develop these architectural ways of doing gestures as part of their ‘habitus’, or feeling for the game of the design studio. Foucault’s tendency to hyphenate power-knowledge is surely well illustrated in gesture — for example gesture may help to organise who has the right to speak and not to speak and when (including helping representations to ‘speak’ in certain ways). Finally gesture provides a particularly useful location for the study of the importance of bodies to design studios and ‘disciplinary regimes of power’ because it seems to be a distinctly human capability that most people do without thinking. Therefore a focus on gesture as an object of

Figure Nineteen: Two stills from Coop Himmelblau’s ‘Construire le cell’

232 Ibid. pg 121
analysis does not automatically exclude some participants in the studio, or foreground some participants at the expense of others.

**What is Gesture?**

Gesture provides a convenient unit of analysis for a study of the role of the body in interactions between teachers and students partly because it has a rich history of associated research built over a long period of time. Gesture is a recognizable human behaviour which has been explored by scholars in a diverse range of disciplines from cognitive science and interaction design to anthropology and linguistics; it has also as a history as an area of study stretching back into antiquity. As a result there is a large body of available research with which to background this study and compare the results. Given the vast array of literature that is potentially available, this survey will concentrate on that which is most relevant to design teaching and learning.

Consulting any dictionary reveals an interesting cluster of meanings for the word ‘gesture’ which together suggests that there is an ambivalent stance towards gesture in the English speaking world. For example Princeton’s word-net\(^\text{233}\) describes gesture as:

1) motion of hands or body to emphasize or help to express a thought or feeling
2) the use of movements (especially of the hands) to communicate familiar or prearranged signals
3) something done as an indication of intention; "a political gesture"; "a gesture of defiance".

These meanings, particularly the last one, alert us to the fact that gesture is generally understood as a part of the expressive dimension of human communication, but one that is considered as relatively unimportant, perhaps even empty.

This tendency to downplay gesture does not represent the important place that gesture occupies in human communication. It allows us to add expressive ‘colour and flavour’ to speech, manage turn taking between participants and convey concepts that are not easily articulated through spoken language. It is perhaps for the semiotic processes that gesture enables, as much as for its expressive potential, that we, as a species, have maintained highly developed gesture skills, despite having sophisticated language abilities.

\(^{233}\) [http://wordnet.princeton.edu/perl/webwn?s=gesture](http://wordnet.princeton.edu/perl/webwn?s=gesture) accessed 14.03.08. Wordnet is a database constructed and maintained by the cognitive science laboratory at Princeton and is used for linguistic research.
Gesture is an amazingly ubiquitous phenomenon. Gestures of some sort or another are usually present in any sustained interaction between two or more people and have been observed to be closely interrelated with spoken language to the extent that almost all gestures in conversations are performed by speakers rather than listeners\textsuperscript{234}. Gesture has been found to be connected to narrative structure\textsuperscript{235}; this may be because as Susanne Goldin-Meadows, one of the most cited authors in this field, points out, gesture conveys ‘visuo-spatial’ information better than language alone\textsuperscript{236} (surely a reason why architecture students and teachers would benefit from having a highly developed facility for it). McNeill goes so far as to describe gesture as a way of mind reading explaining:

… I do not mean anything occult: I mean real mind reading. I mean noticing gestures with which speakers unwittingly reveal aspects of their inner mental processes and points of view towards events that are not articulated in speech. In gestures we are able to see the imagistic form of the speaker’s sentences. This imagistic form is not usually meant for public view, and the speaker him or her self may be unaware of or think that it has been well hidden; but it is visible to those who look at gestures\textsuperscript{237}.

Indeed the conviction that bodily movement can open a window into the speaker’s thought processes is so widespread that it has been used as the basis for constructing lie detector equipment which takes advantage of unconscious facial expressions produced during interrogations\textsuperscript{238}.

Gesture is a good way to study the intersection between ways of being and ways of knowing because there is evidence to suggest that the culture that one grows up in and occupies has an influence on the type of gestures that are produced. David Efron studied Jewish immigrants in New York in the 1960s and found characteristic gesture attitudes and symbols\textsuperscript{239}. Pointing seems to be a particularly culturally informed type of gesturing; Kendon describes characteristic pointing behaviour in Italy\textsuperscript{240} and John Havliand describes how to point in Zinacantan\textsuperscript{241}. Although gestures


\textsuperscript{235} McNeill, \textit{Hand and Mind: What Gestures Reveal About Thought}.


\textsuperscript{237} McNeill, \textit{Hand and Mind: What Gestures Reveal About Thought}. Pg 109

\textsuperscript{238} For example the ‘silent talker’ system developed at Manchester metropolitan University is a video system coupled with software that claims to be up to 80% accurate: J Rothwell et al., ‘Silent Talker: A New Computer Based System for the Analysis of Facial Cues to Deception,’ \textit{Applied Cognitive Psychology} 20 (2006).


like pointing might be culturally inflected, there is evidence that they are also informed by the nature of professional work\textsuperscript{242} — this will be discussed at more length later in the chapter.

As I have already noted, gesture has been largely ignored by design studio researchers; it is easy to disregard because it tends to operate below the threshold of conscious awareness. Drawing direct attention to gesture as it happens is one of the ways in which its smooth functioning can be interrupted. David Crystal suggests that gesture can be put in the category of ‘paralanguage’; the Greek prefix suggests notions of ‘alongside’ or ‘above and beyond’ spoken language\textsuperscript{243}. The tendency for researchers to ignore the human capacity to gesture is unfortunate. As well as acting as a vehicle for affective tone, gesture is one of the most important ways that we create mutual meaning and intelligibility during talk and help to create order through discursive practices.

Facility in gesture was formally accorded more importance in education of all sorts than it does today. Gesture was included in the study of rhetoric, central to a university education, from the 15\textsuperscript{th} to the 19\textsuperscript{th} centuries. Rules for the depiction of gesture were taught to actors and artists who used it to depict socio-economic class, certain social situations and gender. Adam Kendon describes how gestural techniques appropriate to the pulpit, the courtroom and other ceremonial occasions were routinely taught to young members of the nobility and sons of wealthy merchants because of the recognition that “how one conducted oneself in conversation and oratory was of great importance if one aspired to a position of influence in society.”\textsuperscript{244}

\textsuperscript{244} Adam Kendon, \textit{Gesture: Visible Action as Utterance} (Cambridge, New York, Port Melbourne, Madrid, Capetown: Cambridge University Press, 2004). Pg 33
Definitions of gesture in gesture research

As an analytic category ‘gesture’ has been used by researchers to describe facial expressions and broader body movements, but for the sake of simplicity most gesture researchers tend to confine their attention to the movement of hands and arms. In this thesis the emphasis will vary according to the communicative category rather than the gesture behaviour—therefore changes in posture, laughing and gaze direction will be selectively included (further discussion of this follows in the methodology section of this chapter).

One of the most popular taxonomies of gesture was developed by Kendon\(^{246}\) who proposed that gestural behaviour could best be expressed as a ‘spectrum’ from expressive to language like which proceeded from spontaneous ‘gesticulation’ to more stable language like gestures such as pantomime, ‘emblems’ (which have socially agreed on meanings such as the ‘ok’ sign) and finally to full blown sign language. The work of this thesis is concerned with the ‘gesticulation’ end of Kendon’s spectrum where gestures are idiosyncratic and the form they may take is not predictable. While there is a lot of research on the gestures in sign language (ASL) these have been left out of this discussion because the interest here is on the ‘language like’ gestures in the middle of Kendon’s spectrum.

\(^{245}\) Ibid.
Gestures on the ‘gesticulation’ end of Kendon’s spectrum are closely coupled with speech production in most cases; they tend to occur in ‘phrases’ that more or less accompany the rhythm of speech with a clear beginning and end. David McNeill describes this kind of gesture behaviour as broken up into ‘gesture units’, a moment of movement between which the limbs are held steady. A series of gesture units compose gesture ‘phrases’ with distinct phases which McNeill calls ‘preparation’, ‘peak’ and ‘return’.

Gestures occur in what McNeill calls ‘typical gesture spaces’ which are located mostly in front of the torso. He goes on to divide gesture types into various categories which forms a taxonomy that has been picked up and used by many subsequent researchers: **iconics** are gestures which are ‘pictorial’ in form and bear a close formal relation to the semantic speech; **Metaphorics** are also pictorial but illustrate abstract ideas and concepts rather than the literal content of the words; **Beats** which are movements up and down or in and out that serve to mark out particular words as having significance (not unlike ‘scare quotes’ in text) and, finally, **cohesives** which tie together concepts presented in speech.

Although McNeill’s taxonomy is well used by other researchers, an actor network theory view would be that such categorical methods produce realities of gesture at the same time that they describe them; Kendon acknowledges this when he warns throughout his writings that such taxonomies should be used with great care. By categorizing gesture we are encouraged to see it in a certain way. This does not mean that findings produced are necessarily ‘false’, but it does mean that the type of categorisation used should be appropriate to the kind of study that is being pursued. McNeill’s types would therefore be inappropriate to this study because they are designed to

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248 Ibid.
249 Kendon, *Gesture: Visible Action as Utterance.* Pg 85
investigate gesture behaviour related to narratives that people produce in response to films they have watched. The types of categorisation that have been developed for this study are outlined at more length in the next chapter on method.

The way that gesture is coupled with language has been an object of sustained study for the last half a century, at least since the invention of relatively inexpensive and portable video recording equipment. Some claim that gesture helps to facilitate language production\(^\text{250}\) or even that gesture is the origin of spoken language itself\(^\text{251}\). However Susan Goldin Meadows\(^\text{252}\) argues that gesture cannot be understood in the same way as a spoken language because it does not have an established lexicon or commonly established syntax. Verbal language is linear and sequential – words follow one after another. However this distinction between gesture and language does not quite hold as gestures can be delivered in sequential phrases that build on each other to make whole ‘sentences’ (this aspect of gesture will be explored at more length in chapters five and six).

**How do we interpret gesture?**

Although the ability to see gesture as meaningful seems to come to most people naturally, it is actually quite sophisticated and relatively under-explored in research in gesture to date. One of the clues as to this ease might reside in the two key characteristic of gestures of gesture that set it apart from speech: movement and visual form. The movement property gesture allows the fabrication of ‘virtual objects’ which are perceived as real and analogous to verbal explanations or pre-existing phenomena. The philosopher Susanne Langer suggests that the virtual is best understood as a non-sensuous perception, like a rainbow or a reflection in a mirror, available to feeling but not physically tangible\(^\text{253}\). Movement can be used to create virtual objects and affects. We can most clearly see this quality of movement through dancing. A philosopher who studied the virtual properties of movement in dancing is Susanne Langer. Langer is worth quoting at length on her answer to the question ‘what is the dance?’ She points out that this question cannot be adequately answered by the material stuff of which it is actually made: like the costumes, the sets, the lights or even the bodies of the dances themselves. She concludes that the dance is:


... an appearance, if you like, an apparition. It springs from what the dancers do, yet is something else. In watching a dance you do not see what is physically before you — people running around or twisting their bodies; what you see is a display of interacting forces by which the dance seems to be lifted, driven, drawn, closed or attenuated ... One human body may put the whole play of mysterious powers before you. But these powers, these forces that seem to operate in the dance, are not the physical forces of the dancer’s muscles which actually cause the movements taking place. The forces we seem to perceive most directly and convincingly are created for our perception and they exist only for it ... Anything that exists only for perception and plays no ordinary, passive part in nature as common objects so is a virtual entity. It is not unreal; where it confronts you, you really perceive it, you don’t dream or imagine you do²⁵⁴.

Empathy — the ability that humans possess to enter and comprehend the feelings of others as a kind of ‘feeling with’ — might be one way in which this kind of mapping of gesture form to concept through the creation of virtual objects can be explained. Way back in 1886, Heinrich Wolfflin wondered at the seeming ability of architectural form to express emotion. Wolfflin argued that ‘empathy’ for form underpins the human ability to perceive form as possessing certain emotive qualities and that this ability was based on the body's own proprioceptive abilities. Basically Wolfflin claimed that humans have a tendency to read their own animate being into all phenomena and proposed that we understand the expression of architectural forms only through possessing a body and being able to perform an ‘embodied’ mapping of form to affect:

We have carried loads and experienced pressure and counter pressure, we have collapsed to the ground when we no longer have the strength to resist the downward pull of our own bodies, and that is why we can appreciate the noble serenity of a column and understand the tendency of all matter to spread out formlessly on the ground²⁵⁵.

Wolfflin implies that architectural form does not have the ability to directly imitate the emotional moods of the body; rather that it is capable of sharing its affects – heaviness, lightness, balance, hardness and so on. Wolfflin’s theories seem to be backed up to some extent by contemporary research into sensory processing in the brain. Visual input can be shown to be occasionally experienced through our sense of touch, smell and hearing. The most extreme version of this phenomenon is clinical synaesthesia, where people experience the literal ‘cross wiring’ of

²⁵⁴ Ibid. Pg 341 - 342
²⁵⁵ Heinrich Wolfflin, “Prolegomena to a Psychology of Architecture (1886),” in “Empathy, Form and Space, Problems in German Aesthetics” Ed. H Mallgrave (Santa Monica: Getty centre for the history of art and the humanities, 1994).
the senses such that they might ‘hear colours’ or ‘see sounds’. Vilaynur Ramachandran points to the convergence of certain brain structures to do with perception as underlying this ability, specifically the angular gyrus which is concerned with abstract number processing. In the ‘strategic placement’ of the parietal lobe, temporal lobe and the occipital lobe (concerned with touch and proprioception, hearing and vision respectively) sense modalities are able to mingle and create “abstract, modality
free representations of things around us”\(^{256}\). Ramachandran claims that this ability to generate ‘modality free’ representations accounts for the tendency for visual properties of form to be suggestive of certain sounds. He gives an example of experiments where people are asked to couple nonsense names with 2D shapes; in these experiments people tend to overwhelmingly link the sound ‘kiki’ with the shape on the left, rather than the one on the right (see below):

![Figure Twenty-two: two suggestive shape sound trigger diagrams\(^{257}\)](image)

Logically [a] jagged shape and the sound 'ki ki' have nothing in common: the shape comprises photons hitting the retina in parallel; the sound is a sharp air disturbance hitting the hair cells of the inner ear sequentially. But the brain abstracts the common denominator – the property of jaggedness\(^{258}\).

Another way to account for the mapping of the shape of a gesture to an idea or concept is Fauconnier and Turner’s theory of ‘conceptual blending’\(^{259}\) which seeks to explain some of our most common mental abilities such as abilities to form and use analogy, metaphor, correspondence, familiarity in thinking and in communication with others. Although seemingly simple, the intricacy of these processes has been revealed by the difficulty experienced when an attempt is made to mimic them with computer models. For instance, the recognition of ‘sameness’ across qualitatively different phenomena, such as the idea of ‘dilatation’ and a opening/closing gesture with the hands,

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\(^{256}\) Vilaynur Ramachandran, \textit{The Emerging Mind} (Profile books, 2003).
\(^{257}\) Source: Ibid.
\(^{258}\) Source: Ibid. pg 118
is a ‘blend’ that happens so fast its operation is transparent to us; all we experience is the quality of sameness. Fauconnier and Turner claim the ability to create conceptual blends as imaginative achievements and the underpinning of human creativity. They argue for the role of environmental and physical ‘affordances’ in the creation of conceptual blends giving the example of a ski instructor telling one of the authors to hold a downhill racing pose like he was “a waiter in a Parisian café carrying a tray with champagne and croissants on it”\textsuperscript{260}. They argue that the power of the analogy not in suggesting that the skier act like the waiter but that there are similarities between them in terms of direction of gaze, position of the body and overall motion such that “under the conditions afforded by the environment (the snowy slope), the desired motion will be emergent”\textsuperscript{261}. A further discussion of conceptual blending is too detailed for inclusion here – but the theory does have merit as an explanatory framework for the connection between thinking and gesture more generally.

**Gesture as an object of research**

Kendon notes that there has been an interest in gesture stretching back to antiquity, but before the 19\textsuperscript{th} century this work could not be described as ‘research’ as we might understand it today\textsuperscript{262}. It is significant for this study that most of the early authors interested in gesture that Kendon identifies produced taxonomies of gesture for the purposes of training painters, actors and students of Rhetoric. Knowledge of gesture, for these authors, was understood as a means to portray membership of different social classes or as an instruction manual for the appropriate forms of expression in different types of public speaking or debate.

Another dimension of early gesture research pertinent to the design studio is the work of Wilhelm Wundt with regard to affect. Kendon\textsuperscript{263} identifies Wundt as the first to write systematically about gesture within an experimental research framework. Wundt claimed that gesture was a way of expressing internal affective states so that they could be shared by others (thus serving as a basis for empathy). In addition Wundt claimed that gesture offered a way of coupling these internal affective states with conceptualizations.

\textsuperscript{260} Ibid. pg 21
\textsuperscript{261} Ibid.pg 21
\textsuperscript{262} As in the collection of data towards the testing of hypotheses
\textsuperscript{263} Kendon, *Gesture: Visible Action as Utterance*. 

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Gesture continues to be a very active area of research; given extra impetus by changes in technology. Kendon notes that there was a decline in the interest in gesture in the first half of the 20th century and credits the invention of sophisticated audio-visual recording equipment as being partially responsible for the resurgence of interest in gesture from the 1950s onwards. The wide variety of gesture studies that have been conducted since the 1970s has yielded insights into many facets of the phenomenon, particularly in relation to communication and learning.

Kendon highlights in particular the work of Gregory Bateson and Margaret Mead whose films illustrated how much non-verbal behaviour existed in the communication context to help people understand and interact with each other. This is the most interesting aspect of their work with respect to this thesis. By slowing down and watching people as they communicate, researchers have shown the richness of gestural behaviour and how it acts to co-ordinate and orientate people as they interact. But is gesture a form of thinking? Are students and teachers are ‘thinking on their feet’ (or with their hands?) when they produce gestures in design studio interactions?

Research into gesture in the previous decades has revealed and attempted to explain many interesting facets of the phenomena of human gesturing, especially in relation to cognition and learning. There are several competing theories about how gesture production relates to language and thought and why humans still use gesture so much when we have developed such sophisticated language skills. Jan Peter De Ruiter categorises these theories into three different ‘architectures’ which attempt to explain the relationship between gesture, speech and presents three different processing models for gesture production and expression. These three processing models provide a useful way of summarising the current ideas and hypotheses about how and why gesture production occurs in humans (even though no consensus exists in the field at the time of writing about which one is the most accurate). For the purposes of this thesis then, the discoveries of researchers working under each of the frameworks will be considered equally valid hypotheses.

In the Window Architecture view, most famously outlined by McNeill, gesture is assumed to come ‘straight out of the mind’ and able to ‘make thought visible’, therefore giving the observer privileged access into the processes or results of cognition. One of the implications of the Window Architecture is that gestures may reveal knowledge that the gesturer did not know they had, or may

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264 Ibid.
not have intended to reveal. In this architecture, gesture is assumed to be part of the process leading up to speech, which would make it available to facilitate verbal production. A consequence of this assumption is that gesture could be a simpler way to express thought than speech and therefore becomes the channel used when people are lost for words, or struggling to communicate a complex idea.

In *Language Architecture*, gestures and speech arise together, but are functionally separated; both modes are ‘designed’ by the speaker toward the same communicative end and delivered simultaneously. This model is good for describing how gesture can be influenced and shaped by the structure of the language being employed because it is assumed that gesture production occurs within a process of ‘negotiation’ with speech. This research suggests that the body ‘acts out’ a concept through gesture, perhaps as a way of focusing the speaker’s attention to the salient features of what they are attempting to describe and to hold them present as they while they try to find the right words. This process can be influenced by the type of language the speaker is using, for example, there is some evidence that speakers of Japanese have a tendency to express the same concept in gesture a different way to speakers of English and that this difference is influenced by syntax. In short, the *Language Architecture* implies that gesture is more regulated and inflected by speech than the *Window Architecture* suggests.

The final category that De Ruiter suggests is *Post Card Architecture*, which he describes as being similar to the *Language Architecture* in that it assumes that gesture production is a more complex process than it is portrayed in Window Architecture. In *Post Card Architecture*, gesture and language are assumed to arise together; they are not functionally separated but part of the same process that allows a speaker to deliver a ‘coherent multimodal message’. The implication of *Post Card Architecture* is that, although not all gesture is under conscious control, both it and speech are intended for communication and are used interchangeably by the speaker. De Ruiter claims that this architecture results in a ‘distribution of labour’ between speech and gesture and cites the work of Melinger and Levelt\(^{267}\) to support this assertion. These two researchers found that speech produced with gesture was less explicit than speech produced without gesture so gesture was acting to share the communicative load. De Ruiter states that *Post Card Architecture* implies that speakers can be

\(^{267}\) A. Melinger and W. J. M. Levelt, “Gesture and the Communicative Intention of the Speaker,” *Gesture* 4, no. 2 (2004). These two researchers found that speech produced with gesture was less explicit than speech produced without gesture (a finding that is supported by data presented later in this thesis)
understood as being highly selective as to which aspects will be packaged into gesture and which will be expressed in speech.

This last model of gesture production implies that the way space is being conceptualised by both students and teachers will influence, shape or inflect, the gestures produced. However, all these models of gesture production tend to ignore one key ingredient of gesture production – the material world that we inhabit while gesturing. If designing is a form of ‘distributed cognition’ or material semiotic process; objects are manipulated to fabricate meanings of various kinds therefore gesture behaviour in the design studio should not really be considered apart from material objects and tools.

This aspect of gesture behaviour has been studied by researchers working in the research tradition of symbolic interactionism. Herbert Blumer\textsuperscript{268}, who developed the theoretical backbone of symbolic interactionism, wrote in some detail about the way that people act towards things in relation to the symbolic meanings they attach to them. According to Blumer, the meanings conferred on things are not just derived from within the individual, but draw on social interaction which promotes the circulation of symbolic meanings in human culture. Further he argues that it is essential for humans to possess a wide range of skills with regard to symbolism in order to participate fully in culture, taking up and interpreting meanings through their actions with things and each other.

This link between action and meaning making is key to designers working together. Jurgen Streeck points out that what counts as “meaning” or “information” is often distributed — for example over speech, gesture, places and systems of representation. Streeck wants to go further than suggesting that meaning is “contextualised” by the material environment, stating that “the environment, through the interpretive use the participants make of it in their situated activities, becomes a \textit{component} of the process of communication”\textsuperscript{269}. In Streeck’s view it is not useful to separate out the material world if we want to understand the process of gesture production; without the embodied experience of action in the world to draw upon and act as a way to fabricate meaning, Streeck claims, all gesture would be “mere hand waving”. These observations are all pertinent to

\textsuperscript{268} Herbert Blumer, \textit{Symbolic Interactionism: Perspective and Method}.
learning because it depends on meaning making processes that make sense within a social order composed of both things and people acting relationally\textsuperscript{270}.

**Gesture and learning**

A focus on gesture and materiality implies that a shift from thinking and learning being conceptualised as located ‘inside the head’, to a process that arises in social world (which actor network theory reminds us includes the material as well as the human) that is bound together by the visceral, sensing body. This bears directly on the idea of learning as being a socially situated and embodied process. Following an ANT position, it is not that the context the learner is in makes particular learning happen, but rather that both learner and context are co-implicated in the emergence of learning.

Some research has been conducted into the role of gesture in children’s learning that suggests that gesture and cognitive development are somehow linked together. Goldin-Meadows and her team asked children to do sums at a whiteboard and describe the mathematical procedure used to the researcher. They observed that specific gesture ‘shapes’ tended to be produced to describe certain operations. Later they observed the students at work with their teachers and concluded that gesture conveys ‘task relevant information’ between teachers and students that is not contained in speech\textsuperscript{271}. Goldin-Meadows claims that, at certain stages of learning, ‘only the hands know for sure’; at certain points in their development of knowledge of mathematical concepts students “know” things that can only be expressed in gesture, only later are these processes converted to speech\textsuperscript{272}. Goldin-Meadows makes four main claims for gesture in relation to children’s learning: that it reveals information not present in speech, that some knowledge emerges in gesture before speech, that gesture is the “leading edge” where new learning can be observed and gesture is the site where changes in knowledge are made visible\textsuperscript{273}.

Goldin-Meadows’ research suggests that knowledge can be ‘packed into’ gesture and interpreted by others, such as teachers, without ever being represented in speech. It also suggests that ideas in learning situations tend to ‘stick’ better when they are expressed in both speech and

\textsuperscript{270} Usher and Edwards, *Lifelong Learning: Signs, Discourses, Practices*. Pg 9
\textsuperscript{271} Children were shown to respond to concepts that are conveyed to them by teacher only in gesture; likewise teachers are shown to respond to information that is ‘given off’ in students’ gesture, but not expressed verbally. A good selection of Goldin’s work is in Goldin-Meadow, *Hearing Gesture: How Our Hands Help Us Think*. And Goldin-Meadow, “Beyond Words: The Importance of Gesture to Researchers and Learners.”
\textsuperscript{272} Part of her theory rests how ‘mismatches’ between gesture and speech may be a way for the student to indicate to their teachers that they are ready to learn new concepts in mathematics.
\textsuperscript{273} Goldin-Meadow, “Beyond Words: The Importance of Gesture to Researchers and Learners.”
gesture. However this research suffers from a lack of orientation towards materiality, for instance there is no suggestion as to how the whiteboard that the students used to demonstrate their understanding shaped the gestures that they produced and care should be exercised in transferring the findings of research into children’s learning into an adult education scenario like the design studio.

Other gesture researchers have focused on the description tasks that are common in teaching work of all kinds. This research suggests that gesture plays an important role in helping people to interpret what others are saying. Graham and Argyle274 found that listeners were able to more accurately draw the figures that were described to them when gesturing of the person describing the figures was not suppressed275. Lozano and Tversky276 claimed that when gestures used in descriptions of assembling 3-D objects, people performed better at these assembly tasks. Interestingly they claimed the gestures seemed to help the communicator to explain difficult spatial concepts to themselves as they explained them to others.

Gesture occurring in interactions between professionals in their workplaces seemed to perform similar roles in relation to helping interlocutors understand each other and stay together in their meaning making with objects as they performed certain tasks. J. Lemke demonstrated how scientists use gesture to depict phenomena and concepts that were not easy to describe in words277. Using this research and his own into students in science classrooms, Wolff Michael Roth speculates that students learn ‘scientific modes of discourse’ more quickly when they are in an environment that supports gestures because gesturing in helps to lower the student’s cognitive load in complex explanations with artefacts. For Roth, gesture offers a way for scientific discourse to ‘piggy back’ into student speech, and acts to ‘glue’ concepts to “perceptually accessible entitites” (like representations). Roth notes that gestures: “seem to play a crucial role in the emergence of student’s coherent theory talk”278 as they point to and trace over diagrams representing concepts from physics. This kind of pointing and tracing is similar to architecture student’s use of representations to support their descriptions of their proposals.

275 Ibid.
278 Ibid. pg 376
Gesture and disciplinary thinking and knowing

There is other research that supports the idea of specific disciplinary practices in gesture and the mutually entwined nature of gesture and representations. Two particularly relevant comparisons are medical training, which can be usefully compared with architecture as a problem based instructional setting and archeology. The comparison is useful by virtue of the fact that training in these disciplines, like architecture, involves complex negotiations between tools and representations.

Koschmann, LeBaron et al\textsuperscript{279} studied the gestures of surgeons while they were training surgical interns in the operating theatre. The researchers noted that surgeons mimicked anatomy within the patient with their hands as a way to help identify the relevant area on a representation on a screen, such as a camera view of the interior of the body. They describe these gestures as ‘didactic’ because they tended to be produced by the instructing surgeon who varied the orientation of the gesture according to who they were talking to\textsuperscript{280}. The instructing surgeon’s hands provided different ways for the trainee surgeon to ‘see’ the inside of the patient’s body.

This work on the strategic nature of the ‘seeing’ of surgeons is similar to the ‘professional vision’ that Charles Goodwin\textsuperscript{281} describes in his studies of archeologists and lawyers while they worked with the materials of their disciplines. He begins this detailed account by pointing out that many professionals, including academics, use highlighters and pens to mark out and highlight portions of texts so that the information relevant to their own work is made salient. He transfers this same idea to archeology and shows how professional archeologists use tools like trowels to work the dirt in coded ways on dig sites to signal the presence of artefacts to others. Goodwin argues that this turns seeing into a public and shared event. He then goes on to show in detail how talk and body work is used between a teacher and a student as they make a diagrammatic representation of the area under examination.

In Goodwin’s description, the representation that is being made complements the talk about the practice and is used to organise the interaction in ‘archeological ways’. The process that

\textsuperscript{279} T Koschmann et al., "Formulating the Triangle of Doom," *Gesture* 7, no. 1 (2007).

\textsuperscript{280} The researcher’s descriptions of surgeon’s behaviour vary substantially from the depictions of surgeons in television dramas such as ‘Greys Anatomy’ which is set in a teaching hospital. While highly complex medical jargon is clearly researched to convey authenticity, no corresponding detail is provided for gesture. This highlights again the ‘transparent’ nature of gesture and its relegation to a secondary role in relation to speech. It also hints at the role of gesture in disciplinary specific meaning construction processes – to the untrained surgeon its lack does not detract from the simulated realism of the action.

\textsuperscript{281} Goodwin, “Professional Vision.” Pg 611
Goodwin is describing is similar to the story at the start of this chapter about architectural and builderly ways of handling drawings, surgeon’s ways of describing spaces of the interiors of bodies and Roth and Lemke’s observation of scientists and science students. Gesture is always implicated in professional doings; by performing gesture with certain kinds of representations the gestures become packets of information designed to be legible in specific kinds of disciplinary modalities.

The only previous research into architectural ways of gesturing in design studios, as opposed to studies in professional offices\(^{282}\), appears in a paper by Streeck and LeBaron\(^{283}\). The ethnographic work portrayed in this paper was carried out by LeBaron as part of his PhD Dissertation\(^{284}\). The authors use this data to further develop a position in relation to the material basis of gesture production, its role in knowledge production and collaborative knowledge building. The authors claim that “the formation of a symbol (in gesture) is a defining moment in the fabrication of shared knowledge because it allows the participants to focus on and re-invoke previously shared experiences and to plan and conduct shared activities in their wake”\(^{285}\). In the process of producing gestural signs, the authors claim, communal knowledge is “incorporated, stored and organised” then distributed in communities of practice\(^{286}\). Since this paper bears directly on this thesis topic, the content will be described at some length and then discussed.

The authors start with a discussion of a trainer teaching a group how to install ‘sheetrock’ (a kind of plasterboard) and note that his verbal descriptions become imprecise after gesture ‘signs’ are formed that ‘index’ real world objects, using the example of a gesture that becomes a ‘sign’ for a scraper through mimicking its “pattern of movement”. They note that deploying this same gesture sign in various ways allows the teacher to become less explicit in his talk but still maintaining coherence in his explanation. Once a sign like this has been established it can then be ‘folded back on itself’ to “denote manners, possible mistakes or more elaborate lines of action”\(^{287}\). The authors then move on to talk about an architecture professor discussing cardboard models with his students.

\(^{282}\) A similar study by Keith Murphy was carried out in a 6 month ethnographic study of work in an architect’s office and documented in K Murphy, "Imagination as Joint Activity: The Case of Architectural Interaction," *Mind, Culture and Activity* 11, no. 4 (2004). Murphy’s findings differ from LeBaron and Streeck because they are not in the context of didactic instruction.


\(^{284}\) C LeBaron, "Building Communication: Architectural Gestures and the Embodiment of New Ideas" (University of Austin Texas, 1998). A copy of this previous thesis was unfortunately not able to be discovered during the writing of this thesis.

\(^{285}\) LeBaron and Streeck, "Gestures, Knowledge and the World." Pg 119

\(^{286}\) Ibid. Pg 119

\(^{287}\) Ibid. pg 124
They describe the teacher “silently” exploring a model’s three dimensional properties before he talks about it:

… he leans forward and over the model to look inside; he moves his body to see the sides; he then touches it, lifts it, and slowly turns it in midair, observing it from various angles… at the same time feeling with his fingers the architectural shapes created by the student’s hands.288

They describe this as a “primary stage of knowledge formation” that is a necessary stage of further symbolic action. This professor’s lived experience of touching, they point out, is a shared experience. They note that the professor’s position in the middle of the group makes his own experience: “an object of attention, a public performance, a potentially vicarious experience” and that these actions “are a form of social practice as he intersects with the material world … his hands mediate between thing and thought.”289 In the description of the classroom action, as the architecture professor begins to talk his exploration starts to incorporate types of pointing that direct student’s attention to certain features. He runs his fingers over the model in a way that “informs the students how to see the model” and at the same time “may be teaching the students how to see his hand – not just the shape of the model”290 (my italics).

This primary mode of tactile exploration then becomes more demonstrative. They note that over a ten minute period the professor’s hands touch the model less as the tactile exploration is coupled with reproductions of the shapes he is highlighting on the model’s surface. A “‘long bent” shape is uttered in his speech as it is traced on the model and then a gesture mimicking this shape is performed in the air above the model. In this way, the authors claim: ”the gesture emerges as a natural extension and an incipient feature of practical actions upon an object”291. The practical action that is translated to gesture thus becomes a “new convention” which “is shared, understood by those participating (perhaps vicariously) in the hands on activity”292. They go on to explain how the model acts as a “springboard” to couple the model with an “imagined experience” of being inside the proposed building as the professor brings up his arm to make a ‘larger’ version of the shape in which he can place his whole body as: “he talks himself along the hallway that he imagines and motions, using present tense language to describe architectural details as they spatially and

288 Ibid. pg 125
289 Ibid. pg 125
290 Ibid. pg 126
291 Ibid. pg 126
292 Ibid. pg 126
temporally unfold”. The authors then go on to an example of the student picking up on his teacher’s use of this arm position and using it to make a description of his own about the nature of the imagined space of the model.

Streeck and Lebaron make some important points at the end of this discussion about the nature and role of representation. They note that an architectural representation is very different from a tool like a scraper and so the gestures that are produced in relation to it are qualitatively different. While the architecture professor explores the miniature representation of a proposed building like “an entity is with properties to be discovered”, the sheetrock instructor abstracts the movement of the scraper as an index to it and then later redeployes the sign as an imitation of it. In addition, the architecture professor is shown to orient himself in relation to the model as if it was a fixed building that has a ‘ground’ underneath it. The gestures that emerge from his exploration of the model have ‘noun like’ and ‘verb like’ properties, whereas the teacher’s action with the scraper could only be described as ‘verb-like’ as the scraper sign is used like the tool itself.

The authors claim that, compared to the teacher instructing on the installation of sheetrock, the architecture teacher’s gestures are “large and semantically complex” and the gestures that convey a person’s movement through the proposed building are “a rather high level abstraction”. They conclude that the professor’s gestures serve as a “heuristic device” that translates the properties of the model into a full sized experience of the space with which to make his critique. At the same time the gestures serve as a “teaching device” that helps the students to “read the cardboard model as a representation of an embodied experience vicariously lived and experienced”. Rather than describing gesture as a heuristic device, it would be more accurate to say that the professor’s gestures ‘translate’ the model into a larger scale experience and students learn both some architectural ways of talking and thinking about such spaces as well as a gestural way of translating experience from representations – the mimicking that follows the professor’s use of this gesture makes this second point clear.

293 Ibid. pg 129
294 Ibid. pg 130
295 Ibid. pg 130
296 Ibid. pg 130
Gesture does knowledge work

This survey of the literature shows that a study of gesture within design studio interaction has untapped potential for helping us to understand not only the role of the body but the nature of design knowledge production as well as the mutual manufacturing of architectural meaning in interactions in the studio. The research into gesture presented so far in this chapter suggests that knowledge is enacted into being through gesture, speech and representation in various ways.

The examples given so far: Corrigan’s studio, my father in law’s hands and the work of surgeons, scientists and students highlight that bodily action, of which gesture is a part, is always caught up in the production of discourse and regimes of power. Gesture is one of the ways in which we act together — and think together — with material objects in the spaces of professional work. Gesture does more than ‘bridge’ between representations, tools and speech to help conversations along. It is performative; the particular ways of doing gesture are adjusted to the disciplinary setting and help create that setting as well as fulfill a meaningful and instrumental role in it. Gesture helps to give such spaces form and order such that they become intelligible and produce both learning and knowing.

In short: gesture does important work. The way bodies and representations are mobilised in design studios is integral to the generation of design knowledge and knowing. In order to better understand this special role of gesture in the design studio it must be studied in its natural habitat. In the previous chapter Schön was seen to single out the ‘desk crit’ as the locus of his study. This study occupies the same location because it seems to be an unusually rich location of gesture activity.

The content of each design studio is as different as the person who teaches it, but one aspect remains constant: teaching and learning occurs primarily through talk and the manipulation of architectural representations and representational tools. Previously I have called this type of design story telling a process of talk with things. Design story telling occurs during ‘desk crits’ when students attempt to account for their architectural form-making to their teacher(s) and those of their classmates who are paying attention. An important feature of design story telling is the use of ‘props’, which include bodies, representations, tools and other things in the surrounding environment such as tables and walls.
The interest in gesture here is less concerned with what is said, than how this talk is done and how this involves the action of objects as well as people. If the gesturing of teachers and students are indeed of a certain type, as the literature on gesture seems to suggest, then it follows that they may be treated like a species of animal in the wild: subjected to observation and strategies of documentation in order to establish their habits and thereby build a better picture of the ‘species’. The next part of this chapter deals with the appropriate methods for observing gesture in design studios in order to determine the work it does.
Chapter Four: Method

The empirical work in this thesis is a study of the ethnomethodology, with a particular emphasis of gesture, of three architecture teachers and their students studying at the University of Melbourne and RMIT University in Melbourne, Australia in 2006 – 2007 supported by a case study of one other architecture teacher (Peter Corrigan) observed at work in late 2006.

Since interest here is in observing gesture within design studio action, this study is not constructed along experimental lines. Instead it is a systematic and in depth study of the phenomena of gesture in a specific disciplinary context, at two particular locations and at a certain point in time.

The data for this thesis consists of field notes, interviews (both informal and semi-structured), photos, video footage and some miscellaneous material collected from the design classrooms which were visited and the online websites and documents distributed to students. The data was collected through a process of participant observation in various design studio classrooms, within the two different institutions in Melbourne, Australia, over a two year period.

The rest of this chapter is dedicated to a description of the conduct of the study and participants which would potentially allow it to be replicated in another location. The rest of this chapter has four parts: theoretical framing, data collection, research participants, and analysis and interpretation.

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297 Source: image by the author
299 Participant observation, as a technique, involves different levels of engagement; from an action research model, where the researcher is fully participating as a member of a class (such as a teacher researching their own design studio practice) to more unobtrusive methods of participant observation, where there is minimal contact between the research participants and the researcher. This research was conducted at this minimal end of the spectrum meaning that most of the time I tried to remain as unobtrusive as possible. At the beginning of this study an action research model was tested in two studios I was teaching into, but abandoned after one semester because filming was impossible to carry out properly while teaching.
The chapter begins with a theoretical framing of the methods and some of the assumptions that underpin them. A section on data collection follows. Instruments used to collect the data are described and the conduct of the observation is outlined. Some problems encountered in the field are then briefly discussed. A section on research participants follows, which includes a description of the student and teacher cohort and how they were briefed for participation in the study, teacher biographies, the rationale for the selection of participants and researcher construction. Finally an explanation of the data analysis and interpretation begins with an outline of the case study selection strategy. Two methods of analysis and interpretation were used on the data generated for this study; the rationale for this choice is outlined and the relative strengths and weaknesses of each mode of analysis are discussed. Each process is then outlined in detail, along with the measures taken to ensure validity and reliability.

**Theoretical Framing**

This research owes an obvious debt to the field of interaction studies, in particular Harold Garfinkel’s work in the development of ethnomethodology. Garfinkel claimed that the sense of order and meaning that we experience in interactions with others in our everyday life is achieved through the more or less continuous ‘work’. Participants in any given community collectively evolve their ‘methods’ of dealing with the task of interacting with each other; hence his term ethnomethodology. Garfinkel did not think that society has fixed ‘rules’ which members must learn and follow in order to be mutually intelligible to each other, but that various methods existed which both enabled us to construct orderliness out of the situations in which we find ourselves, and, in turn, constitute these situations. Here gesture is presumed to be one of these ‘methods’.

In addition, this study draws on insights about the role of things in interaction from the field of symbolic interaction, described initially by Herbert Blumer. Symbolic interactionalists would claim that designers act towards things, such as representations, according to the meanings that they have for them and, in turn, that meanings arise within the process of interaction and the interpretive process that people engage in during interaction. In other words: in design studios meanings are ‘made’ or fashioned in talk and manipulation of representations.

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**Notes**

300 ‘Ethno’ refers to members of a social or cultural group and ‘methods’ refers to those things that the members routinely do to create recognizable social actions or practices. Refer to: Garfinkel, *Studies in Ethnomethodology*.

301 Blumer, *Symbolic Interactionism: Perspective and Method.*
It is in pursuit of a more nuanced understanding of the agency of things that this thesis employs actor network theory as part of its methodological approach. As I have already noted, ANT is more of an approach to method and analysis than a theory as such, but it does carry with it certain assumptions. Put simply, ANT claims that things can have agency, but different kinds of agency than people and that agency is not linear (a matter of cause and effect) but emergent in the enactment of network relations. The most radical proposition in ANT is that one assumes that nothing has “reality or form” outside this enactment of an assemblage of socio-technological relations\(^\text{302}\). The ANT researcher puzzles over the distinctions that are often made between the material world and the human world and troubles these categories as a starting point for an investigation.

ANT privileges narrative and stories as a mode of analysis; some stories have already been used in earlier chapters. The ANT approach is most fully deployed in chapter six where inanimate things found in the design studio landscape are treated as if they have agency. The assumption that is made is that things, such as design representations, are more than accompaniments to comprehensible talk (ethnomethodology) or vehicles for mutual meaning making (symbolic interactionism) but active in giving shape to practices and the knowledge that is produced through those practices. Tools and representations are not just neutral objects designed for purely instrumental action but are integral to the kind of knowledge that can be produced in the first place.

**Research Participants**

Although time was spent in nine studios during the course of this fieldwork\(^\text{303}\), only four studios were studied in detail. In all studios bar one filming took place; the exception was Peter Corrigan’s studio at RMIT University, which has already been discussed. Two of the remaining three studio classes were run at RMIT University and one at the University of Melbourne. There were two female teachers and two male teachers (including Peter Corrigan). All teachers gave permission for their real names to be used in this thesis.

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\(^{302}\) Law, “Actor Network Theory and Material Semiotics.”

\(^{303}\) Time was spent in three other studios while the research was being conducted, but the visits were too infrequent to gather together a good data picture of how they operated. Whether or not the teacher was happy to grant me access to their classes also greatly affected the choice of participants. Although many teachers expressed willingness to participate in the abstract, when observations started they expressed uneasiness about being observed teaching. Others expressed a concern that the institutions in question would have a record of their teaching activities that could potentially be used against them.
The two female teachers, Dr Pia Ednie-Brown and Anna Johnson, were employed fulltime by RMIT University and had approximately 10 years of teaching experience each; the male teacher, Simon Wollan, was teaching his first design class. The fourth teacher, Peter Corrigan, who has already been described in Chapter Two, allowed observation of his classes but did not permit any video footage to be collected and so couldn’t be included in the gesture analysis that follows. All the teachers approached expressed some concern at how the presence of a researcher might affect their interaction with the students, so methods had to be found to minimise the impact on classroom activities\textsuperscript{304} (see \textit{Instruments} below).

**The student participants**

The students that participated in this study were those in the classes attached to the four teachers I studied in most depth. No classes exceeded 17 in size initially; counts of attendances revealed that the number of students present in each class declined as the semester went on and students either stopped attending or only came to present their work and then left. Both students and teachers were briefed about the project, given a plain language statement and asked to sign consent forms according to the ethical guidelines of the University of Melbourne. The consent forms and plain language statement indicated that I was interested in non verbal communication but did not specifically mention gesture as the focus of enquiry. All students consented to being observed and a minority took the further option of having their face obscured in the publication of results. Only one student was asked to be referred to by name and gave his consent; the others remain unnamed. Some of these students who asked for their faces to be obscured appear in the background of the footage collected, so the original footage is not submitted with this thesis. The teachers, through their contact with me as the study developed, knew that gesture was the primary interest of the study.

**The teacher participants**

Pia had trained at the University of Western Australia then worked in practice for a number of years. She had been at RMIT just over 10 years when this research was conducted. Pia has a PhD in design research which she completed while this study was underway; her thesis was titled “The Aesthetics of Emergence” which used “radical empiricist frameworks to generate a new model of

\textsuperscript{304} It quickly became clear that a relationship with the research participants based on trust was clearly a necessary prerequisite of this work, so teachers with whom the researcher had a previous friendship were chosen for filming purposes, in full awareness of some of the problems of validity that an existing relationship can provoke (see \textit{Researcher Construction} below).
composition related to contemporary design process and its relations emergence theory, aesthetics, ethics, embodiment and affect.” Pia’s research orientation tended to attract students who were comfortable with and/or interested in working with digital technology. Pia usually listened carefully to the students while they explained their progress and gave them mainly verbal feedback. She would draw very occasionally; sometimes using the student’s own drawings to overlay her suggestions. In addition she would communicate with her students by either email or collaborative class wikis or blogs.

The other female teacher was Anna Johnson, who had worked at RMIT for approximately 10 years when this thesis was underway. Anna did beautiful, architecturally suggestive drawings during her undergraduate degree and had been co-opted by the school into design teaching soon after she graduated from her RMIT degree in 1997. Anna had an exceptional ability to communicate with a diverse range of students; she was given the position of International Student support officer in addition to her teaching duties. Over the last decade she had carved out a second career as an architectural journalist and critic; in addition to publishing two books on Australian domestic architecture she wrote regularly for local magazines. Anna taught over all levels of the architecture course, from first year to major project, but did not supervise post graduate students. At the time of writing Anna was mid way through her Masters degree where she was exploring her own drawing techniques in relation to new digital technology.

Anna loved to draw and did so almost continuously while teaching; her preferred teaching style was characterized by listening carefully to the students then drawing and talking simultaneously as she gave them feedback. These drawings became a record of the conversation on which she would write notes, names of architectural precedent and suggestions for further work. The students would collect her drawings and keep them as a record of the conversations, sometimes bringing them out in subsequent classes for discussion.

The male teacher other than Peter Corrigan was Simon Wollan. At the time of writing he was employed as a research assistant in the Faculty of Architecture, Building and Planning at The

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305 From Pia’s online biography at [http://www.sial.rmit.edu.au/People/pednie.php](http://www.sial.rmit.edu.au/People/pednie.php) accessed 03/10/03
306 Anna was employed on a permanent contract for her work with international students but did design teaching on a series of casual contracts. Even though she had an office and was treated by other staff as a full member of the faculty, her employment arrangements were not as regular. It should be noted that her ‘haphazard’ route into academia was not uncommon. Both schools in the mid 1990s tended recruit students with good technical and design abilities to perform teaching roles soon after, or even before, they graduated. I was recruited to teach a semester before I graduated in 1996 because I possessed skills with digital technology that faculty staff members had not developed.
Simon has graduated from the University of Melbourne (MU) and did some extra teaching as these duties allowed. Simon had graduated from MU a year before he participated in this class. While he was a relatively inexperienced teacher in comparison to both Pia and Anna, he had significant building industry experience as he had worked for a period of 2 years fulltime in architecture offices, both in Melbourne and in China.

Simon was at the beginning of his academic career at the time of writing but had a wide variety of research interests which were being further shaped by his work as a research assistant in projects dealing with space and place in areas of urban concentration. Simon participated in the teacher training workshops that were offered to all casual teachers and had educational professionals visit him during the semester that is recorded here and give him advice as to manage his classes. He described this support as helpful in sharpening his technique and giving him ideas for varying the class activities, but not adequate preparation for teaching without his own prior experience of the format of design studios.

Simon’s teaching style was also based on careful listening. In contrast to the other two teachers he more actively reframed student’s verbalizations of their ideas into more ‘architectural’ language. Like Pia he would occasionally draw over student’s drawings when he discussed proposals, but only rarely did he make separate drawings like Anna. Like the other two teachers Simon had a broad knowledge of architectural precedent, but would point out similarities to other projects and suggest other relevant architects students could explore more often than Pia and Anna.

**Researcher Construction**

I drew heavily on my own experience as a design teacher to make sense of the data I was gathering. Some biographical information is therefore included in this chapter and used to account for researcher construction.

I completed my undergraduate and masters degrees in Architecture at RMIT University before I undertook study towards a PhD at the University of Melbourne (MU) so I have been immersed in the cultural life of both institutions. As an undergraduate I participated in 10 design studios including my final major project; I did well in design studio classes throughout my degree. Like Anna I started teaching in the School of Architecture and design at RMIT as a teacher’s aide soon after graduating and continued to teach through to the first semester of this research (2006), when I temporarily retired from design teaching to engage in research full time.
I have never been a full time staff member of an architecture school. As a design teacher I have always been employed casually and on part time contracts at the same time as I worked in practice. I have not worked in architectural practices since 2001 and the birth of my first child. During my time as a teacher I taught across the range of architectural subjects and in a range of other architecture and related courses at other institutions, at first specializing in digital representation and construction studies (1996), then to theory (2001) and finally to design in 2002.

I ceased working for the school of Architecture and Design at RMIT University in 2005 when I took up a position as a research fellow in the Research Training Group, also at RMIT. This unit was located outside of all the schools and worked in a multi-disciplinary way across the whole university to provide professional development for research candidates.

Despite this break in my working relationship with the school of architecture and design at RMIT, I still consider myself to be far more of an ‘insider’ at RMIT than MU. I have ongoing professional and personal relationships with many RMIT graduates and staff members. When I first started to teach design studios at RMIT I co-taught with Anna, whose teaching biography I gave above. My long history as a teacher at RMIT had built up some good will which helped to gain the confidence of both the students and the teachers who were approached to participate in this study.

After one semester acting purely as an observer I realized that it required a great deal of work to construct an effective researcher identity both in the classroom and outside it. Although the goal of the study of ethnomethodology is to ‘go native’, there were limits on the kind of native I could be with respect to the students. It was inevitable, because of my age and personal relationships with their teachers, that the students would regard me more as ‘one of them’ (a teacher) than ‘one of us’ (a student).

Since I could never be ‘one of them’ I tried to consciously position myself as a helpful, friendly presence in the classroom, for example talking if asked and answering questions as well as chatting to students in their ‘downtime’ in the classroom.

I had not taught any of the students individually before and very publicly refrained from taking part in any marking procedures. I was careful to maintain as ‘neutral’ a stance as possible in the classroom, for example sitting with the students, rather than with the guest panels, during formal

307 In addition to teaching at RMIT and Melbourne Universities I also spent time at Swinburne University teaching interior designers and Monash University teaching computer game designers.
critiques and spending some time outside of class talking with students in their studios and at local bars and private studio working spaces. I believe this approach was successful in positioning me as more of a researcher than a teacher. Early in the semester, when students would run into me outside of class and on campus they would seek feedback and advice. Later in the semester they would stop asking about their projects and instead start to spontaneously give me their opinion on the class, the teacher and visiting critics or the design studio as a concept.

Inside the class students tended to make fun of my silent lurking in the corner and my habit of continuous writing. I took this teasing as a sign that the students had come to regard me if not as ‘one of them’ at least as a fellow traveler of some sort. Many would ask about the nature of my research and respond positively to the idea of studying architectural education in action.

I found that remaining silent when in the classroom made me overly conspicuous. although I sought to remain ‘in the background’ as much as I could, being silent and un-reactive is unnatural in the design studio, which is more often than not a place full of furious conversation. All the students expected me to have an opinion of their work as they knew I had formally been a design teacher. The teachers themselves treated me as a colleague to whom they would turn for another opinion. They would do this by spontaneously asking me to help them remember a reference to an architect’s work that they had forgotten or occasionally checking some detail of their advice with me. As the teachers were presented with the results of the research more details emerged about how they had to make a conscious effort to ‘bracket me out’ so that they wouldn’t ‘screw up the research’. It was a pity that I hadn’t been more clear in communicating the reflexivity of my stance towards method so that they might have felt more comfortable with my presence, but I don’t think this overly affected the results.

Despite the difficulties, the position of ‘insider’ was a strength in this study as it helped me to gain access to the research sites and negotiate the sometimes tricky terrain of student teacher relationships. In addition my disciplinary background allowed me to understand often fractured conversations that overflowed with architect’s jargon. This was particularly helpful in the analysis.

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When approached in this fashion I was careful to avoid positioning myself as an alternative teacher – attempting at all times to turn them back to their teacher for advice either by suggesting architects they could look at. I was careful to make sure told the teachers in question of the details of these conversations so that I didn’t become in ‘intermediary’ between the student and the teacher.

There was much less personal interest in what I was up to and how I was spending my time. This was probably more to do with the fact that the potential for academic gossip about me was higher at RMIT than at the University of Melbourne because I was a staff member.
phase, as my depth of experience allowed me to view the gestures from the perspective of a teacher, a practitioner and a gesture observer.

**Data collection techniques and instruments**

The procedure for collecting data in classrooms was developed during a pilot study conducted in early 2006. I attended most of the classes of each of the four design studios I studied in detail. For the first five weeks of the observation, although I would occasionally take photographs and film action with a small digital camera and draw, most of the time I just sat in on the class and recorded my observations in the form of field notes. Apart from recording the time and date, these described, in as much detail as was possible, what I saw going on around me and what I heard people say.

As soon as possible after class these field notes would be transcribed into word processing documents which would contain moments of analysis and interpretation, particularly of how the students and the teachers were interacting. These proved valuable as records of how interpretation changed over time as I got to know the members of the studio and how the individual teachers practiced. This initial period of note taking helped me to understand what was going on and develop a working relationship with the participants. I continued to take notes as I started the filming process.

An initial hand sketch would be made of the disposition of the classroom — its furniture, the tools and materials the students bought with them and the location of the students and teachers within the room. As these arrangements were shuffled around (which happened frequently) a fresh sketch would be made and a note of the time the sketch was made recorded. These appear in this document, but have been redrawn for the purposes of legibility.

Although I spent some time filming in all the studios during the first few weeks, I started collecting films of desk crit interactions in earnest after week five in most instances. This seemed to be the point at which the studio members had developed their design proposals sufficiently to start engaging in desk crits most of the time. It also had the added benefit that they seemed to have largely accustomed themselves to my presence such that I was treated just like another, albeit somewhat peculiar, participant in the class. My filming activity centered on the ‘design story

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310 Where I didn’t attend a class I discussed what happened in the previous week with the teacher and/or the students.
telling’ activities, described in the previous chapter, where the student seeks to account for the forms they have generated and the teacher gives them critical feedback on their work and they discuss ideas for future.

This selection strategy, specifically the location of the desk crit and the later production of transcripts for analysis, was informed by the work of Adam Kendon and his famous study of shopkeepers and people in market places in Naples, Italy. Kendon grouped the instances of gesture he recorded in relation to the type of task the gesture was being called on to perform. By holding the gesture task steady, Kendon was able to make useful comparisons between each instance of gesture use, drawing out the particular and general characteristics.

Filming was done with a small, hand held digital camera (a canon digital ‘ixus’). This device enabled me to film continuous segments up to 30 minutes or so in length and to move about the classroom to record the action from several points of view. The camera included a built in microphone which reduced the amount of equipment I had to carry (although the sound quality could be compromised if the filming was taking place in a very noisy environment). The advantage of this device, apart from its maneuverability, was that it was relatively quiet and unobtrusive.

The yoking of the camera to my body, rather than say, fixing on a stand, shaped the kind of data that could be collected. A stand offers a more ‘impartial’ sampling, but the fixity of view would have occluded most of the classroom action because teachers and students were highly mobile in the way they occupied space. Teachers would move around the room to talk to different students and students would shift objects and drawings into and out of conversations.

Not many people could be included in the frame of the video without losing digital resolution; as it is the images that appear in the following chapters are very low in resolution. This meant that the nature of legitimate peripheral participation – an important feature of design classrooms – was not able to be explored to any great extent. A mixture of both fixed and mobile cameras may have offered a better solution, but limitations in resources (both human and material) and time prevented me from exploring this option. However, all of these ‘omissions’ present possible lines of enquiry for other researchers.

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Kendon, Gesture: Visible Action as Utterance.
I was fully cognizant of the ‘shaping’ power of the position of the camera; as Goodwin puts it: “any camera position constitutes a theory about what is relevant in a scene – one that will have enormous consequences for what can be seen in it later”\textsuperscript{312}. Despite being aware of these cautions, and taking steps to sample the same students in multiple situations, it became apparent that this shaping is just inevitable and can only be accounted for, not removed. I had to make decisions on the fly as to when to turn the camera on and off. Usually the moments I did capture displayed rich gesture behaviour; clearly I tended to ignore moments where relatively little body movement was occurring. The task of finding patterns in the gesture behaviour captured on video was helped by being able to compare many, similar instances rather than lots of different ones so the fact that all the video showed lots of gesture was helpful. However it became clear that there would have been value in building what Bent Flyvbjerg calls ‘deviant cases’\textsuperscript{313} which may have illuminated other aspects of the gesture phenomena. Although I sought to comb through the data to rectify this, there was relatively little data with which to build a picture of these possibilities. Again this represents an opportunity for another study to explore this aspect of design studio gesture behaviour.

**Data assemblage**

Although approximately 26 hours of video footage was captured, not all of this video data was deemed useable. Data was discarded for several reasons: the sound quality was too poor to perform a proper transcription, the whole of the desk crit interaction between the teacher and the student was not captured, parts of the film were too jerky and/or out of focus or there were low light conditions that made the picture quality too poor to see the gestures in enough detail.

The film segments that were salvaged were then dissected into smaller sections so that just those segments where ‘design story telling’ was in progress were preserved. From these film segments a number of transcripts were prepared. The rest of each film segment which did not directly concern discussion of a design proposition was kept to preserve the sense of the encounter and help to put the discussion in some sort of context.

These segments were reassembled into a set of 20 transcripts and compared using the ‘maximum variation strategy’. Bent Flyvberg\textsuperscript{314} describes this method as the act of putting together

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\textsuperscript{312} Goodwin, “Professional Vision.” Pg 607
\textsuperscript{314} Reference here
many similar cases that vary along different dimensions. In this case the similarity was the desk crit location and the ‘design story telling’ activity; the dimension that varies is the type representation mainly being used during the discussion — paper drawings, digital technology or physical models. This was done in order to see in what ways different representational media might affect the gesturing that was produced.

In total, there were six transcripts of students and teachers talking with computers – two where the conversation is happening in relation to the screen itself and four large scale projections. Six show conversations with drawings, ranging from a discussion between a teacher and a student with a set of drawings that the student has produced to an example of a teacher sketching design ideas for a student. There are two examples of teachers and students talking to presentation drawings pinned up on the wall in front of an audience of their teacher and peers. Finally there are eight examples of teachers and students talking about and manipulating cardboard models.

Although cardboard models were a popular method of representation for the students in this data set, digital equipment was the most common representational tool being used in the studio to display representations, with 78 mins and 49 seconds of data available for analysis compared to 57 minutes and 35 seconds of data for models. When computers were being used it was rare to find any other representational media being mobilised to any noticeable extent; but drawings and digital models and images were often used to supplement discussions occurring with cardboard models.

Due to the ubiquity of digital equipment and physical models in the design studio environment, it was rare to encounter drawings being used as the primary mode of representation. The total amount of transcription featuring drawing as the main representational medium after the data was cleaned was only 10 mins and 35 seconds. With such a small amount it is difficult to have as high a level of confidence about the findings in relation to drawings as to other media. Plenty of paper was observed to be carried into the studio; drawings were often shown to teachers and then used to make notes, but rarely was a discussion about a design proposition only carried out with drawings.

The exception to this trend was Anna’s classes, where digital technology was rarely used. This was because these students were in their first year and had not yet developed the requisite technical skills. Drawings were commonly pinned on the wall during these classes and the teacher herself primarily communicated through drawing. However, despite this more drawing intensive environment, most conversations captured during Anna’s classes relied to a large extent on
cardboard models. However, despite this more drawing intensive environment, most conversations captured during Anna’s classes relied to a large extent on cardboard models. The fact that the use of paper, as the sole means of representation, was relatively rare is perhaps an artefact of the way that design studios are conducted in Australia where most of the production work is done by the students in their own time. It is probably not correct to assume that drawing skills are no longer important in totality of design education, but it should be noted that the development of students’ facility across a number of media is expected as they progress through their courses.

Data Analysis and interpretation

The analysis proceeded using a method sketched out by Heath and Hindmarsh called ‘video ethnography’\(^{315}\). This is a modified form of conversational analysis that produces transcriptions that can be used in further stages of analysis. The transcription takes the form of a series of frames from the video illustrating each gesture ‘phrase’ presented with the accompanying speech phrases underneath. Each of these transcriptions includes within it relevant ethnographic detail as appropriate, such as excerpts from field notes, sketches and photos. This additional ethnographic description helps to ‘set the scene’ for each segment; it includes such information as what was happening immediately prior to the interaction shown and how the audience (the non participating students and myself) were arranged in relation to the people being filmed.

The interest in this thesis is the kind of gesture ‘work’ that is occurring in design studios. Given this focus, it seemed logical to follow Kendon’s\(^{316}\) suggestion that the analytical eye should be on the role gesture is performing, rather than the exact form it takes\(^{317}\). Therefore, rather than look for and count instances of gesture forms that conform to a pre-established taxonomy of gesture (such as the commonly used categories generated by McNeill described in the previous chapter\(^{318}\)), the transcriptions were then subjected to a content analysis with the aim of grouping similar types of gesture behaviour together and coming up with a set of ‘gesture work’ categories. These gesture work categories could then be treated like ‘themes’ and ‘sub-themes’ in a standard grounded theory analysis content analysis as outlined by Brian Glaser\(^{319}\). The gesture work categories were applied

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317 By ‘form’ I refer to analytical tools such as McNeill’s taxonomy of gesture, discussed in the previous chapter. The classification of this data to a pre-existing taxonomy was deemed to have limited value in this case as it would not help to answer the primary research question.
back against the transcriptions in order to identify and compile a set of similar instances of gesture work that could be used to produce a detailed description of the gesture work category as a whole.

I was assisted in this stage of the process by two of the teacher participants (Anna and Simon) who were asked to look at the data of themselves and others in action and comment on what they thought the gesture behaviour was achieving in the interaction. Through this process instances of gesture behaviour were sorted according to what kind of ‘job’ gesture appeared to be doing in the interaction and a series of initial descriptive categories were generated.

The three provisional ‘gesture work’ categories that were developed were then presented back to all three teacher participants for further comment. At this point it was considered desirable to subject the data analysis to further outside scrutiny. Two other experienced design teachers, both of at least 10 years experience, were recruited to form an expert panel. These two teachers were presented with the original films and the transcripts and asked to provide feedback and commentary on the gesture category descriptions that had been developed. They then replicated the coding on a transcript. This validation procedure resulted in the emergence of one further category of gesture. This appeared to be a ‘meta-category’ that incorporated the other three categories.

In addition to this scrutiny by the research participants and the panel, selected film segments, transcriptions and the coding procedure were subjected to the expert scrutiny of others in a number of other public presentations. Two of these public presentations were internal faculty workshops with audiences composed of design teachers, lecturers and post graduate students. These audience members were asked to watch three of the films and fill in a short questionnaire asking them about the gesture behaviour they saw. A paper was prepared and peer reviewed before being presented at an international conference on the design studio and informal feedback was sought from audience members. Finally, work in progress was presented to the actor network theory discussion group at the University of Melbourne. These public forums were a useful source of ideas and feedback on the data analysis and increased confidence in the findings.

In addition I enrolled a series of ‘outsiders’ to the process. Most of these were casual acquaintences and fellow PhD candidates who were willing to spend time watching and discussing
data. In particular, my sister, a graphic designer and professor of an online design school[^21], was a valuable sounding board. She could understand the interaction type, if not all the jargon. She watched the films, looked over the transcriptions and discussed with me the developing ideas about what ‘gesture work’ was going on and provided insights into the experience of online design teaching.

The difficulty of categorising certain gestures and the emergence of the fourth ‘meta category’ of gesture work in the data analysis alerted me to the fact that by representing gesture in a certain way it was also producing a ‘gesture reality’ that was somewhat one dimensional. While this had proved useful it was decided that a second data analysis method was needed to capture the situated nature of the gesture phenomenon and the role of representation. To perform a second analysis a couple of longer segments of film were selected from the transcription set and analysed using ‘thick description’, a method which was described by Clifford Geetz[^22] as a way of interpreting the action of participants within an interaction within an overall understanding of the culture in which it takes place. The findings of this thick description are incorporated into chapter six.

**Presentation of the data in this thesis**

The film footage cannot be included in their raw form on accompanying media as ethics procedures at the University of Melbourne placed limits on who could have access to the original data[^23]. Sample transcriptions are included in the appendix to provide other researchers with a template if they wished to replicate this aspect of the study. Transcription markup was modified from the work of Gail Jefferson[^24] as sketched out in West and Zimmerman. As the emphasis is on gesture, rather than speech intonations, those changes in pitch and tone other than questions were not noted. Codes used in markup are as follows:

- [ ] Overlapping speech
- = Latched speech and continuation of talk between frames

[^21]: The Academy of Art located in San Francisco.
[^22]: Clifford Geetz, "Thick Description: Toward an Interpretive Theory of Culture.". Geetz states that he drew his understanding of this method from Gilbert Ryle.
[^23]: In addition, the committee responsible for ethics clearance suggested that student participants be given the option of having their faces obscured digitally to conceal their identity. In the data transcripts, two of the students are treated in this way. Time constraints meant that it was impossible to treat all the film footage in this way, so only still images could be used.
(0.5) Pauses in speech (expressed in tenths of a second)
(.) Micro-pauses in speech (less than 0.2 of a second)
:: Stretching of the sound preceding the mark
Word Stress or emphasis on word
° Soft speech
>word< Compressed speech
<word> Slow or drawn out speech
hh Hearable aspiration (breath)
(hh) Breathing or laughter in speech
.h Breathing apart from the sound of the word
((transcribers description of events))
(word) Best guess at a muffled word
( ) In audible – no best guess available for word

The next chapter contains the results of the conversational/content analysis of the video data and the gesture work categories that were developed. This chapter is split into three sections, one for each of the three gesture work categories being described. The reader should bear in mind that the categories offered in chapter five are ‘working instruments’ towards two specific aims: to assist in developing teaching strategies and to make the data available in a useful format for future researchers. Unless and until these gesture categories are tested in another site, the types of gesture identified in what follows should only be considered valid for this data set and generalisations should be made with care. That being said, the author considers this method to be robust and the differences in education technique between architecture schools (at least those in the West) to be slight enough, to assert that these categories can be approached and appropriated with confidence by other researchers.

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325 Kendon, Gesture: Visible Action as Utterance, pg 85
In Chapter Six, ‘thick description’ is employed to explore gesture at work within a selected number of interactions. The aim of this chapter is to put gesture back into the ‘flow’ of classroom interaction and address the fourth category that emerged from the analysis as well as provide closer attention to the work of inanimate objects in an actor network theory mode.

The two modes of analysis presented in the following two chapters might appear to the reader to sit somewhat uneasily together. The abstraction of the conversational / content analysis put in chapter five renders gesture in discrete ‘bites’ of information, perhaps leading to the impression that gesture conforms to ‘rules’ in design studios. But students and teachers obviously do not work their gestures from a repertoire of fixed types. The beauty of gesture is its improvisational character: it can take many forms depending on the speaker, the circumstance in which they are speaking and the other forms of expression that are available to hand. The thick descriptions in chapter six portray gesture in the flow classroom activity; the clear categories that have been set up in the previous chapter are seen to dissolve into this flow. While the conversational and content analysis allows us to see gesture in terms of patterns which perform certain kinds of knowledge work, the thick description method helps us to see how gesture is always, already entangled in material-semiotic practices. If a single method was used this productive ambiguity would be avoided at the expense of a richer picture of the gesture phenomena.
Chapter Five: “Three gesture performers (captured live on location)”

In this chapter, the three gesture work categories found through the analysis of transcripts of class conversations are presented through a series of examples. It starts with a breakdown of the numbers of gestures found in relation to each representational medium found in the design studios studied: drawings, physical models and digital technology. Then each of the gesture work categories is explained through the presentation of parts of the transcripts of the video data with an accompanying commentary, diagrams and other images where appropriate. The gesture movement that occurs between the frames is marked up in red on the images. As highlighted at the end of the previous chapter, the gesture work categories put forward here are categories of convenience used for analytic purposes. They are not designed to capture all of the gesture behaviour that was observed and recorded during the fieldwork, but to organise it in a way that enables some conclusions to be drawn about the nature of gesture work in action.

Gesture and representational media

Although cardboard models were a popular method of representation for the students in this data set, digital equipment was the most common representational tool being used in the studio to display representations in these transcripts, with 78 mins and 49 seconds of data compiled compared to 57 minutes and 35 seconds of data with models. The digital equipment included laptops and large projection screens; there was a more or less even split between the two types of screens. When computers were being used it was rare to find any other representational media being mobilised to any noticeable extent; but drawings and digital models and images were often used to supplement discussions occurring with cardboard models.

Due to the ubiquity of digital equipment and physical models in the design studio environment, it was rare to encounter drawings being used as the primary mode of representation. The total length of transcripts featuring drawing as the main representational medium being mobilised was only 10 mins and 35 seconds. With such a small amount of data it is difficult to have as high a level of confidence about the findings in relation to drawings as to other media.

The most common of the gesture work categories in the transcripts were mediating gestures; out of the 973 discrete gesture phrases identified and categorised. It should be noted that the
percentage of mediating gestures in the transcripts would have been significantly higher if the
movements of mouse cursors had been included as ‘gesture’. Unfortunately it wasn’t until late in
this research that I realised the importance of the cursor object on the screen and its function as a
‘hand replacement’ that satisfies the need to ‘touch’ a representation in order to make the
accompanying speech so no film exists in this data set that shows the motions on the screen in
relation to the speech that was being delivered.

Of the rest 49% (or 482) were mediating gestures, 38% (or 366) were compositional gestures
and the remaining 13% (or 125) were qualitative gestures. No further analysis of these numbers will
be attempted as this is not a statistical study, but a summary of all the gesture behaviour recorded in
transcripts in table form appears below:

<table>
<thead>
<tr>
<th>Representational Media</th>
<th>Number of Compositional gestures</th>
<th>Number of Mediating gestures</th>
<th>Number of Qualitative gestures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Models</td>
<td>122</td>
<td>288</td>
<td>32</td>
</tr>
<tr>
<td>57 mins 35 secs of transcriptions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Equipment</td>
<td>151</td>
<td>133</td>
<td>81</td>
</tr>
<tr>
<td>(laptops, keyboards and or projection screens)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78 mins 49 secs of transcriptions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drawings</td>
<td>93</td>
<td>61</td>
<td>12</td>
</tr>
<tr>
<td>10 mins and 35 secs of transcriptions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table One: number of gesture types observed in relation to representation media used*
Part One: Performing space

Compositional Gestures

When architecture students begin their studies and are unfamiliar with the mores of representation that pertain to the profession, their design propositions can be hard to describe. Conveying the disposition of parts and their arrangement in relation to each other is simply done with gestures, while it may be hard won in speech or in other representational mediums.

The term ‘compositional gestures’ has been chosen to describe gestures that ‘performed space’, in other words, gesture which expressed the students’ proposed architectural forms. These were gestures that conveyed size, shape, orientation and the distance of one thing from another. Gestures used to describe ‘compositional actions’ performed on architectural forms were included in this category as they were performing similar kinds of work in the talk about architectural composition. Teachers and students seemed to use a lot of compositional gestures, despite having access to multiple, high quality representations. Of all the gesture phrases counted in the videos (973), 38% could be classified as compositional gestures of one kind or another.

These compositional gestures seemed to be designed by the gesturer to operate with other forms of representation present in the studio environment, including speech. To borrow a turn of phrase from Kendon326, gesture, speech and representation relied on each other to become a comprehensible architectural ‘utterance’. These utterances were parlayed in the interaction between teachers and students such that knowledge and meanings emerged.

Compositional gestures seemed to be the means by which teachers and students could start to fabricate ‘virtual objects and spaces’. As noted in Chapter Three, the philosopher Susanne Langer suggests that the virtual is best understood as a non-sensuous perception, like a rainbow or a reflection in a mirror, available to feeling but not physically tangible327. The word virtual is here used here not as describing a space opposite to ‘real’ space, but as a way of describing an intangible potential space or object. The virtual spaces and objects summoned up by gesture were network effects, summoned up through the collaboration of gesture, speech and other representations. This

326 Ibid.
327 Langer, The Problems of Art: Ten Philosophical Lectures.
section of the chapter shows some examples of these virtual objects and how they can be deployed in design studio interaction to help to convey provisional meanings which can then be parlayed into the ongoing discussion. This chapter starts to explore how movement is used to create perceptions of physical surfaces and the actions of various architectural components.

**Some instances of compositional gesture work**

Even a simple modelling of shape in gesture could be repeated in slightly different ways and thereby take on nuance in practice, depending on how and where the gesture was performed. The simplest type of compositional gesture was a straightforward modelling of a shape or form of the design proposal being described with the hands and arms. Sometimes the resemblance between the shape of the thing and the shape of the gesture was not explicit because the gesture was coupled closely with an architectural representation. In this example, a student (seated on the left) is using a physical model to describe an idea for a complex ‘roof-scape’ to her teacher Simon (seated on the right, holding the model).

In the first frame the student rotates her wrist and uses her pen to briefly touch her sketch model and then pulls it back slightly, at an angle from the model, as she says “angle up”. This gesture acts to ‘trace’ the shape of the roof extending out from the physical confines of the model. She then quickly tucks her pen into the palm of her hand and forms a surface, with her palm, at the same angle (frame 2) so the trace becomes a 3-D surface. Preserving this angle, she brings her hand down to touch the model at the same time that she says “pro::trude”, the gesture timed with the stress on the word. In frame 3 she pulls the virtual object of ‘roof’ she has made from gesture back to her forehead, circulating it slightly as she says “can go everywhere”. 
The gesture that most resembles a skillion roof only appears briefly in frame 2 for approx 0.5 secs, but two other gestures performing different aspects of the physical composition of the roof bracket its appearance: “the angle” of the roof is performed just before frame 2 with the pen, but the student switches to her whole palm when she wants to perform the idea of a ‘protruding roof’, a three dimensional plane that overhangs the wall of the building. The intention of making a complex ‘roofscape’ of protruding roofs is then performed by detaching the virtual object from the representation (pulling the hand back to the face) then letting go of the gesture form while saying “go anywhere”. In this gesture move the ‘virtual roof’ stops being related to a specific part of a model and becomes a non specific roof like ‘thing’ that can be deployed “everywhere”.

In the following example we can see this same ‘roof-scape’ idea being performed another way; this time the student is using a drawing instead of a model and takes the opportunity to ‘place herself’ inside the proposed space. The student (seated on the left) is explaining her idea for the interior of a theatre to her teacher, Simon (seated on the right). Only the arms are shown in the frame. The theatre space sits under the slanted ‘roofscape’ being performed in the previous example.

In the first frame (4) the student is talking about the view of this roofscape from the outside; she begins by lifting her hands from where they have rested on the drawing surface and then quickly forms a ‘floor’ with her left palm orientated towards the roof. With her right hand she performs a slanted up and down ‘zig zag’ motion over the left palm which mimics the roof shapes of the previous model (which is not present). The phrase “mine go like that” gives the gesture a context and calls up the idea of the previous model for the teacher. The pen that she has been using prior to this segment to point at her drawing is gripped in her right hand and orientated in the same ‘diagonal’ direction of the hand movements.
While performing the gesture shown in frame 4 the student holds both her hands at quite a distance from the drawing, perhaps to indicate that the roof forms she is talking about are located on the top floor of her proposed, multistorey, design. However the actual gesture is performed just below eye height so that she positions herself and her teacher ‘above’ or ‘on the outside’ of the roof. This placing of the first gesture is significant as it helps her move from talking about the outside roof, to inside the theatre without explaining the shift, or confusing her tutor when she incorrectly uses the word ‘roof’ instead of ‘ceiling’ as the explanation moves along.

In frame 5 the student says “I wanted to have”; keeping her left hand in the ‘floor’ position and reaches up with her right hand to perform the roof (out of frame). The gesture performs the “roof” (ceiling) as flat shape, formed with a bent wrist and moved parallel across her upturned left hand (the ‘floor’) which is then finished off on the elongation of the word “ro::of” in frame 6. The gesture is performed in front of her forehead, above her eyes, positioning the rest of her body ‘inside’ the space. Her arm and palm configuration allows the palm to be ‘ceiling’ while the arm is now ‘wall’ completing the transition of the student’s explanation from ‘outside roof’ to ‘inside roof’ without explicit mention in speech of the shift. The pen is smoothly rotated 180 degrees during this movement so that it is now lying flat on the underside of her palm and not disturbing the flat surface. This ‘straight’ movement of palm and pen contrasts with her previous ‘slanted’ movement, non verbally suggesting that the inside space is different to the outside.

In Frame 7 (below) she adds to the concept of difference between the inside and the outside of her roof by further clarifying the nature of the inside space. She pauses for a moment (not shown) while saying “You know – like um. A bit like the Capitol Theatre?” The teacher overlays the end of
this sentence with “mm-hmm” indicating that he understands which building she is referring to. The Capital Theatre was designed by Walter Burley Griffin and is shown below. The student adds “the one with the crazy…” adjusting her right hand so that she can use her pen to trace out an erratic profile in the air:

Frame 7
1 min 28 secs
Student: You know (0.5) like. You know like (1.2) um. A bit like the [Capitol theatre]?
Teacher: [mm :: hmmm]

Student: =The one with [the crazy]
Teacher: >[beautiful space]<
Again she keeps her left hand held flat in the ‘floor’ position while she performs a gesture ‘section’ with the end of her pen; the word “crazy” is expressed and given form by the meandering movement of the pen. When we compare this gesture with a picture of the ‘crazy [ceiling]’ the student is referring to, the gesture (frame 7) is seen to model the expressive qualities of this interior space at the same it is suggestive of the form. In contrast to her gestures with the physical model in the previous example, which explicitly binds her into a spatial relation to the proposed building, the drawing / gesture coupling shown here allows her to move ‘outside’, ‘inside’ and ‘under’ the space she is describing.

Later in the same discussion the teacher uses gesture to perform the relationship between one form and another. In this case the teacher draws the student’s attention to the shape of the theatre space and how it might be experienced from other spaces within the building, such as the café (located below it). In frame 8 the teacher points to the centre of the theatre space drawn in plan and says: “I think that (.) that you might be …”.

After drawing the student’s attention to the theatre part of the scheme with the pointing gesture, the teacher then shifts his hand so that he forms a ‘volume’ to represent the theatre mass

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**Figure Twenty-four: The interior of the Capitol Theatre, Melbourne by architect Walter Burley Griffin, 1924**

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328 Source: from the RMIT University Website: www.rmit.edu.au
(frame 9). The mass is expressed with the right hand positioned in a downward facing pincer movement. Just after he forms this shape (just before frame 10) the teacher rests the tips of his fingers on the page then quickly lifts them off again as he utters “Maybe you’re trying to express something …”, moving his whole right hand slightly up and down in a vertical movement above the surface and tapping his finger tips lightly on the paper a few times as he speaks. In this movement he establishes the theatre as a presence; the movement suggests that it is a distinctive shape that is contained within a larger space, rather than seamlessly integrated with it. He clarifies this move in frame 10 where he adjusts the vertical up and down motion to a diagonal motion, performed at slightly different angles, before and after the words “wedged in?”. In this simple gesture the teacher creates a virtual 3-D volume that can be manipulated on the spot in order to show the student some of the formal possibilities that her scheme may contain. As the teacher continues speaking about the theatre volume he improvises this virtual 3-D space in a slightly different way according to what aspect of it he is talking about. In the next example he is talking about the material treatment of the outer surface of the theatre volume and the gestures change according to the verbal emphasis of the accompanying speech.

This example highlights how the categories developed for this thesis, although very useful, are artificial. Some gestures were had to categorise with this system because, on occasion, it was not supple enough to encompass the nuance contained in the gesture action. In the case of compositional gestures the quality of movement might suggest something about the character or material treatment of a form, while the shape of the hands might model the form and its relationship to other forms. In frame 11 the teacher says “SO this – whatever the underside surface” while running his finger along the line representing a wall of the theatre drawn in plan.

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When one of the other teacher participants, Anna, was shown this footage she commented that this gesture was unlike her own ways of mobilising 3D space with drawings as she normally drew 3D spaces as she talked rather than summoning them up in gesture. She speculated that perhaps the difference in their gesture style may be due to the fact that Simon was younger than her and of the generation who had used the computer from the beginning of their training and thus tended to ‘see’ architectural drawings as innately 3D. When Simon was presented with this interpretation he tentatively agreed, commenting that when he looked at drawings he tended to imagine the spaces they described as floating 3D forms like images of digital models on computer screens.
The tracing gesture on the page effectively anchors his speech and draws the student’s attention to the location he is describing. He then rotates his hand (frame 12) so that his forefinger now lies along the line he has previously traced out and spreads his fingers wide as he and says “wraps up”. In frame 13 he ends his utterance with “around”, sweeping his palm up and over the page in a ‘wave’ shape that suggests an outwardly curving wall surface ‘wrapping’ over the theatre volume, timing the gesture so it ends with his speech. This gesture could also be considered as falling into the category of a qualitative gesture (see Part Three of this chapter) because he is not modelling the form, but, through the quality of movement, picking up and suggesting the ‘smoothness’ implied in the word ‘homogenous’.

While language is useful to convey absolute dimensions, it can be imprecise in conveying relationships between one form and another, a very important part of discussions about architectural composition. The following episode demonstrates this dilemma. The student (seated to the right of the frame) is using a laptop to show a series of images to the teacher (seated in the middle of the frame) and the class (mostly out of frame, to the left). A diagram appears on the next page:
Figure Twenty-five: layout of the room in which this action is taking place

The student’s images are projected, somewhat awkwardly, onto a wall that is out of frame on the far left. The image he is talking to in this segment is a picture of a ceiling in a palace in Istanbul, artistically blurred so that all that can be easily perceived is a field of contrasting light and shadow – the student is proposing to mimic this ceiling in the walls of his design for a house. The student is attempting to explain the composition of the ceiling and uses gesture to model the relationship between one part of the material composition of the ceiling and another:
In frame 14 the student starts to bring up his right hand from his lap as he says “of the baths?” he is seen to be orientating it at the screen on the far wall and on the word “like” he shakes it, fingers orientated toward the screen. This gesture has the effect of ‘pinning’ his speech to the image on the screen. He then starts to draw his left hand backwards slightly, as if he is ‘pulling out’ an object from the screen. He then rapidly brings up his left hand to join his right hand as he says “just plaster with” (frame 15). This has the effect of conveying the idea that what has been pulled out of the screen is the surface of the ‘plaster’. As he utters “these little glass bulbs” he, very rapidly, swings his right hand down from the previous position until his palm cupped up to form the image of a ‘bowl’ or indentation; simultaneously he brings his left hand up to form a virtual ‘bulb’ held over the top (frame 16). He then moves the ‘bulb’ slightly up and down as he finishes the speech, timing this gesture to end on the word “bulbs”. In speech the only relevant information we have as to the physical nature of the ceiling he is describing is ‘plaster’ and ‘little glass bulbs’, but the gestures he employs manage to convey the nature of the spatial relationship of the two types of objects, i.e. one kind of object (“little glass bulbs”) is inserted into another type of material surface (“just plaster”).

Up to this point the examples given have highlighted how gestures are usually designed to be coupled objects ready to hand: such as paper, models and pens. Direct coupling is absent in this instance just described because the gesture is performed in a space in front of a projection screen. Although it is orientated in relation to the screen, the relationship is more tenuous that the student performing her roofscape with the physical model.

This coupling of gesture and bits of the environment to hand enabled students and teachers to assemble ad hoc ‘architectural assemblies’; not quite architectural representations, but hybrid ‘virtual objects’ made of hands, movement and inanimate things. This strategy can be seen again in the following example where the teacher (nearest the camera so only his arms are shown) uses a left over piece of modelling card to improvise a building floor in order to clarify his understanding of a space that the student (seated next to him) has drawn on the computer.

330 ‘like’ is used here as a ‘filler’ word; fillers are defined in conversational analysis as words that are not purposeful or semantically meaningful in conversation.
After talking some time in relation to an image on the computer screen, the teacher becomes frustrated and picks up a piece of card that another student has left on the table:

![Frame 17](image1.jpg) ![Frame 18](image2.jpg) ![Frame 19](image3.jpg)

(Teacher) >so you’ve got this< =>series of boxes< (with a staircase coming up?)
((student nods)) [Yup]

He holds this up between himself and the student, orienting it horizontally so it suggests a ‘floor slab’. Accustomed to the language of model making, the student accepts his make-over of a random piece of card into a floor slab without comment, enabling them both to get on with the interaction. The teacher begins his seeking of clarification by stating “So you’ve got this series of boxes” (frame 17 and 18). In frame 18, as he says ‘boxes’, he shifts his hand down and makes a pincer shape and waggles it slightly. In this gesture he establishes the idea of ‘boxes’ and their relationship to the floor slab. There is a clear separation between his hand and the card so that we get the idea that the boxes are suspended underneath the slab, but do not touch it (something he has established with his student during the talk leading up to this moment).

He does not wait for the student’s reply to this gesture speech coupling (relying on their previously established understanding) and moves on to “and a staircase coming up?” (frame 19). He begins this gesture phrase by touching the left side of the card slightly and then moving his palm up at a slight diagonal, suggestive of the angle of a set of stairs and also an upwards movement. This gesture seems primarily designed to check his understanding of the form of the stairway with the student as he pauses slightly for her to say “yup” before moving on to his next gesture.
In frame 19a and 20, as he says “and there was that – that space as well”, he begins and completes a gesture that describes an arc in the air above the floor slab. The movement gives the impression of a large space located at the top of the stairs. This gesture is much less elaborate than the previous ones and acts as an unspoken invitation for her to start to articulate this space for him. The student does this by displaying a compositional gesture that mimics his, using her right hand, held palm up, to form the ‘floor slab’ and cupping her left hand over it with fingers splayed. Although she is not directly looking at the teacher when she starts to form the gesture, by the time she finishes it she has briefly made eye contact with him and turned her gaze to his hands. This is a ‘return gesture’ \(^{331}\) that serves to inform the teacher that she is ‘staying with’ his explanation instead of saying ‘Yup’ again and perhaps also as a way of asking for recognition from him that she is ‘getting it’. As he moves on to say “that’s sort of like ambiguous” (frame 21) he picks up on her return gesture and splays his fingers also, but at the same time starts to oscillate his hand back over the ‘floor slab’. This gesture repeats the previous one, but the ‘wavering’ suggests uncertainty. This whole exchange is a good example of the value of gesture in talk about composition – it allows the teacher and student to establish a mutual ground for understanding as well as identifying and finding ways towards talking about what might not yet be known. The gesture is able to mobilise bits of the surroundings (like pieces of card) and give them provisional meanings – these temporary architectural assemblies serve as ‘place holders’ which can be ‘loaded’ with meaning through the use of compositional gesture. In doing this the teacher can leverage other resources

other than what the student has bought with them into the dialogue; thereby enabling, clarifying and extending the dialogue about formal composition between teacher and student. At the same time he is showing her a strategy that is useful in talk between architects when representations are either not present or not sufficient to ‘hold together’ the conversation.

The task of talking about architectural compositions becomes more complex when the space is composed of both static and moving parts. In the transcripts, gestures were often used to show how parts might be moving through a building fabric, or have movement pass through them. This can be seen in the following example where gesture is used to portray the function of a service component in addition to its shape and location within an overall architectural composition. Here a student (on the right) is explaining how he intends to place the air intake ducts in his building to his teacher (seated at the end of the couch – refer to diagram above) and the rest of the class who are located around the rest of the room out of frame. The student holds a laptop computer on his lap. It displays an image that is also projected on a wall to his left (out of frame). In frame 22 the student holds up a gesture coinciding with the utterance “an opening on the roof” with a half open hand shaping a ‘cylinder’ raised over his left shoulder; the posture of his hand recalls the opening to a piece of ducting.

As he says “brings the air down” he brings his hand down in a gentle sweep while maintaining his hand shape; the word “down” is elongated to time with the end of the gesture. This is a good visual demonstration of the common type of flexible ducting employed in domestic architecture as well as a way of demonstrating the movement of air through it. It is also a physically active gesture. The student moves his whole body in the direction of the ‘swoop’, while
simultaneously tilting his head in the opposite direction. The size of the gesture and its location in relation to the rest of his body is also important as it simultaneously describes various characteristics of the form. The gesture begins above his head and ends under his chin. The tilting of his head has the effect of accentuating the ‘swoop’ by making the movement more dynamic. The student has previously talked of wanting to get fresh air from above the roof rather than the conventional locations of such ducts on the walls. This is mimicked in the starting and ending positions of his gesture – from above his head to under his chin. This is important detail as the student later suggests that he wishes these ducts to help make his design a “very windy place”. The dynamism of his movement implies a speedy flow of air as well as the locations of the ends of the ducting and its overall shape. In the final part of his explanation (frame 24) he ends with his ‘cylinder’ shape at right angles to the direction it was shown in frame 22; the ‘duct’ has now come to rest ‘inside’ the house. The ‘termination’ is signalled again by a slight up and down motion that is timed to coincide with the ending of the speech. The orientation of the student’s hand in frame 24 is suggestive of the action of ‘tamping’ the end of a duct to the underside of a floor.

As well as movement ‘through’, gesture was used to describe movement of building parts in relation to each other. The following is a good example of how extra information about the architectural form might expressed in gesture movement:

In this example the teacher (seated on the left) is talking to a student (on the right, holding a pen), about the same design proposal that was being discussed at the beginning of the chapter. The teacher has been talking about how to represent the services in the drawing the student has made and moves on to talk about adding specialised stage rigging that she hasn’t yet included. In frame 25 the teacher’s right hand is shown at rest while he completes his previous sentence (“air
conditioners and all the other stuff”). In frame 26 he draws his hands together and moves them
down as he prepares to say “rigs and whatever” (frame 27) where his hands move dramatically
upwards. The “rigs” are not explained in any detail after this moment, but other, relevant
information about their configuration and movement appears in the gesture. The configuration
of the teacher’s thumbs and palms in frame 26 suggest ‘cables’ on which ‘flats’, conveyed by the back
of his palms facing the student, are suspended. The descending motion of the flats onto the stage is
pantomimed in frame 26, as the gesture is formed and ‘placed’ in front of the teacher’s body and
then slightly lowered. He then maintains his hands in this position as he performs the up and down
motion that demonstrates the movement of the rig.

Gestures like this serve to mobilise the “knowledge outside the design problem”\(^{332}\) that the
teacher has at their disposal into their ongoing dialogue with the student. Knowledge about how rigs
work is packed into the gesture but, importantly, the teacher performs the spatial relation of the rig
to the stage/backstage area in relation to the student’s point of view rather like his torso is
performing the ‘stage’. When compositional gestures are deliberately orientated to be best
appreciated from the student’s point of view they are not only representing the object of speech, but
performing a pedagogical purpose. This explicitly pedagogical use of gesture has been observed in
other contexts, such as the work of the surgeons in operating theatres captured in Koschmann et
al\(^ {333}\). By modelling the shape of certain interior body parts and changing the orientation of their
gestures so that they might better correspond to the student’s point of view, the teachers helped the
novice surgeons ‘see’ the interior of the body in a certain way. These researchers speculated that the
orientation of the gesture was designed to help the interns to navigate the complexity of the interior
of the body as they performed their surgical cuts. The gesture located in this example of talk about
theatre design is a similar instance of helpful gesturing, but in an architectural context. By orienting
his hands the way he does, in front of his body, the teacher improvises the ‘back stage’ area of the
auditorium with his torso, positioning the student in the ‘audience’ of a virtual ‘theatre’. In the final
frame of this sequence, the ‘rig’ the teacher has made with his hands ‘disappears’ in front of his
face as he lets his hands go, fingers pointing upwards. From the point of view of an audience seated
in an auditorium, rigs ‘disappear’ when they are raised above the proscenium arch.

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\(^{333}\) Koschmann et al., “Formulating the Triangle of Doom.”
The ‘moves’ the student intends to make to compose the building’s form(s), rather than the forms themselves could be expressed in compositional gestures. These were also counted as compositional gestures in this analysis because of the role they are performing. In the next example the pantomime of an act of architectural composition becomes a “gloss”. A “gloss” is a gesture form that is coupled with an idea within dialogue. When the gesture image is repeated later in the same interaction it can be interpreted by the gesturer and the recipients to stand in for, or represent, the same, earlier idea. In the first part of this dialogue the student shown in the previous example of the ducting is using a compositional gesture to show the relationship between a building and its site. The student (seated on the left with the computer in his lap) has talked to his teacher, Pia, about the fact that the house that he is re-building currently occupies the “middle” of the land contained within the property boundaries which he has earlier said he finds “kind of strange”. During the gesture sequence shown here he establishes a gesture ‘gloss’ for the idea of “the house” using his left hand to hold and deploy a ‘pincer’ pose (frame 28):

In this instance the “house” is orientated and moved towards an imaginary ground plane located just below his chin (the action is strongly reminiscent of placing a monopoly house on a game board). In Frame 29 he rotates his hand slightly, reorienting his pincer shaped “house” gloss vertically and moving it up and down slightly. The orientation of his forefinger upwards in relation to rest of his hand, in its symmetry, suggests the idea of “middle”, the slight shaking of his hand is the gesture ‘filler’ accompanying his verbal “um”. In frame 30 he utters “piece of land” and

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334 Ibid. Surgeons were shown to make gestures to represent body parts. Once a gesture was established and linked to a physical feature inside the body it would be repeated in subsequent discourse without necessarily requiring the speech component.
reorients his house gloss back towards the screen. He then starts to ‘let go’ of the “house” shape so that he can point to the screen in frame 31.

Frame 31  
1 min 32.2 secs  
=and I um (.)

Frame 32  
1 min 32.7 secs  
=would like to erm (.)

Frame 33  
1 min 33 secs  
=invert it?

The pointing movement is in the direction of the representation (which can also be seen on his laptop screen) on the projection screen in the far left corner of the room (out of frame). His pointing is not a static movement as his hand never ‘rests’ in the pointing position. In frame 32, as he says “would like to” he draws his hand back from the outstretched pointing position to reform the “house” gloss, which he holds still for a brief moment (approximately 0.3 seconds) before saying “invert it”. This utterance is a question/statement that is accompanied by a deft twisting action of his hand. If we understand his pincer pose as ‘holding’ the idea of the “house” as his hand twists, and his forefinger and thumb move apart, the action of ‘inverting’ is overlaid. In a way this gesture acts a bit like parentheses in sentences (and aside to the main body of the speech). However in his gesture he also confers the “invert it” to the house/land relationship, otherwise we might be at a loss to understand what “it” is.

It is significant that the teacher, seated in the middle of the frame, looks at the student as he performs the last “invert it” part of his gesture phrase. Her change of focus seems to be actively contrived by the student after his failure to get her attention by making eye contact in frame 32. The teacher is alerted by the shift of ‘scale’ in his body movement, both in terms of motion and form between frame 31, where he is leaning slightly forward and doing ‘active pointing’ at full extension, and frame 32 where he leans back slightly and performs a static, small and precise movement of the “house” gloss”. By this use of contrast he captures her attention from the representation back to himself for the key moment of his performance of “invert it”.

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The reader has probably noticed that the previous examples demonstrate how the three different types of gesture work outlined in this chapter are actually cunningly entangled by participants in practice. Often a number of compositional gesture strategies were put together within a storytelling segment, for example students might combine modelling a compositional ‘action’ with the expressive ‘character’ of the form that results from this action. In the following example a student (nearest to the camera) has worked up a cardboard version of an earlier model which was built in parametric software and is now presenting it to his teacher, Pia (seated in the background). The cardboard model is a grid of boxes, folded in an origami-like manner, that are all linked together. The student is explaining the structural properties of the model and how it behaves when manipulated by hand.

In frame 34 the student points briefly at the model while saying “when you start”, establishing that his next gesture will relate to it. In Frame 35 he lifts both hands up, with palms facing and performs a twisting motion as he says “spiralling this” (this gesture is suggestive of the action of taking the lid off a jar). In frame 36 he reorients his hands so that they are held horizontally instead of vertically and holds them briefly at rest as he says “hold itself up a bit”. In frame 35 we get an idea of a compositional action and in frame 36 we get the result of this action in the ‘bracing’ pose, where his hands convey a sense of static structural integrity.

Finally gesture can make mobile physical objects like models to establish the orientation and location of the proposed design in relation to other objects and conditions of the site or surrounding environment. A simple example of this kind of behaviour is found further along in the exchange begun in the example above. In this case, the model, which is not a very standard kind of
architectural representation, resembling as it does more a piece of cloth than a building\textsuperscript{335}, is put in context of the surrounding environment by the teacher, who summons it up through a series of gestures performed around the model. In frame 37 she starts with “If this is the sky” keeping her left hand resting under the model and holding her right hand high above it, palm held parallel to the flat surface of the model. Her stretching pose also acts to locate the sky above the student and the teacher as well as the model itself.

In frame 38 Pia uses her left hand, currently holding the model, to lift up a corner of it so she can slide her other hand underneath with the palm orientated upwards, parallel to the bottom surface of the model but not touching it. As she utters “and this is the house” she lifts her palm and down slightly so that the model becomes a separate object that acts as a barrier between “house” and “sky”. In the final frame (39) she moves her right hand to the top surface of the model and starts to manipulate it, pinching one of the linked boxes together as she says: “whether you could use that point – sort of like a funnel”. Having set up the relationship between ‘outside’ and ‘inside’ through her gestures her manipulations of the surfaces can be clearly understood by the student as suggestions about how the two might be mediated by the building fabric.

**Summary of Compositional Gesture**

Through simple modeling of hand shape, compositional gestures performed architectural space in various ways. They portrayed the size, shape, orientation of forms and illustrated the relationships between different forms or parts of buildings or their material composition. The

\textsuperscript{335} This moment of interaction will be described in more detail in chapter six where the reason this model looks like cloth will be discussed.
movement capacity of gesture seemed to be used to convey the nature or character of the relationship between one part and another, as in Simon’s explanation of theatrical rigs.

The word ‘composition’ in architectural parlance is used as both a noun and a verb. Therefore it is not surprising that it was common to encounter gestures that pantomimed an action performed on a form, rather than the form itself. Words like ‘twist’, ‘invert’, ‘cut’ were often employed to describe how forms were arrived at; these words were often accompanied by gestures which were suggestive of these actions or qualified them in some way.

The improvisational quality of compositional gestures was important to the flow of classroom action. Gesture was used to create virtual 3-D spaces and objects which could then be shared with others: as can be seen in the foregoing where pens could emphasise aspects of form or hands could ‘make over’ random pieces of cardboard into architectural components. These ‘hybrid representations’ or ‘architectural assemblies’ moved the interaction along, allowing the student and teacher to craft joint understandings out of the work done by both gesture and architectural representations. The flexibility of these virtual spaces and objects enabled them to be changed or reconfigured to hold multiple or provisional meanings in a way that a standard architectural representation cannot.

Compositional gestures were also good for describing the relationships between one part of a composition and another, the relations between buildings and adjoining buildings or the position of buildings on a given site, as in the case of the student describing the location of a house on a site. In these cases the movement component of gesture became a useful tool for expressing the type of relationship the forms might have with each other. In this kind of task the movement possibilities of gesture became particularly important as they were an expressive tool to describe the aesthetic affects of forms. A good example in the above was the instance of the student describing a piece of ducting where the gesture he employed managed to simultaneously suggest the shape of the duct, the planned method of installation, relation of the duct to the roof and floor and the airflow through it.

The evidence presented so far in this chapter suggests that compositional gesture occupies a powerful and important role in current design studio practice. It was clear that compositional gestures used representations as ‘anchors’, an aspect of gesture that will be explored at length in the next section.
Part Two: Performing connection

Mediating Gestures

The second type of gesture work category has been called ‘mediating gestures’. By using gesture to make parts of their representations salient in particular ways, students and teachers worked to frame the way representations were to be read and understood by others. The term ‘mediating gestures’ has been chosen because to mediate is to negotiate between two different, even conflicting parties. This term is also offered with Bruno Latour’s definition of a mediator in actor-network theory in mind, in order to deepen and enrich the concept. Latour describes the action of mediators as being able to: “transform, translate, distort and modify the meaning or elements that they are meant to carry”336.

Most of the gestures featured in this section are some form or other of elaborated pointing which has previously been described as a simultaneously biological, cultural and situated activity337. Pointing acts as a resource that all participants in the design studio can use to make sense of ongoing collaborative activity – either a conversation or a task that they may be engaged in doing together. Forms of pointing have been shown to differ between areas and cultural groups338, therefore the interest in this part of the chapter is on the material-semiotic processes that inform how pointing is interpreted and understood between students and teachers in this data set. Is there evidence of an ‘architectural’ way of pointing?

Kita describes pointing, at its simplest, as “a communicative body movement that projects a vector from a body part”339, but he draws attention to pointing as a surprisingly complex phenomenon, despite the fact that it is seemingly easily and transparently interpreted by others. Goodwin340 highlights that pointing does not necessarily mean that interactions are simplified, or that speech and other resources in the environment are not required to make the speaker’s meaning understood by others. People may point at something concrete, like a representation or an object; or

337 An array of papers dealing with pointing can be found in Kita, ed., *Pointing: Where Language, Culture and Cognition Meet*.
339 Kita, ed., *Pointing: Where Language, Culture and Cognition Meet*. Pg 1. Humans seem to be biologically ‘programmed’ to point, with most infants developing the ability to point meaningfully at around 18 months.
340 Goodwin, “Professional Vision.”
they may point at empty space as a way to ‘locate’ an idea or concept that may not be physically present ‘inside’ a dialogue. Pointing at empty space acts to ‘tag’ locale as a reference point for an idea or concept that may be pointed at later on in the same speech to summon up that idea or concept (much as the ‘gloss’ gesture discussed earlier in this chapter).

Goodwin lists a set of preconditions for pointing to be considered a mutually meaningful interactional act and defines two theoretical concepts that encompass these: the activity framework and the participation framework. An activity framework endows certain features of the environment as relevant to the activity that the conversation is carried out in. An activity framework can be present in several different material forms, such as physical markings (for example a basketball court) or representations like maps and graphs. In the case of the Design studio, representations such as drawings, models and computer screens act as activity frameworks for the participants as they tell and listen to design stories. A participation framework determines how the students and teachers attend to each other and the ‘things’ (including activity frameworks) in their environment that are relevant to the activity in which they are engaged. In this chapter the activity framework is the design studio. It can be described as a landscape populated with people and things. The participation framework is design activity, which involves using architectural representations to have discussions about design potentials. We would therefore expect pointing in the design studio to be different to, for example, the pointing that might occur when people are admiring a view from a lookout.

In the previous section of this chapter we saw how the architectural representations, speech and gesture worked together help the process of talk along by distributing meaning making processes throughout the immediate environment and the bodies of the people interacting in it. Models and other representations might be described as ‘material anchors’, drawing on Edwin Hutchins’ work (which was discussed in Chapter Two). But there is a difference between architectural representations and the tools, such as maps and rulers that Hutchins describes in his account of navigating large ships. Architectural representations are not like maps; they are ‘epistemic objects’ that communicate design ideas. In this sense they are provisional and open to being ‘inscribed’ with meanings, through pointing and drawing. Drawing and pointing are related

342 Hutchins, Cognition in the Wild.
activities, both work to overlay meaning, either with the tip of a pen or the tip of a finger. The differences between drawing and pointing will be further explored in this section.

**Some instances of mediating gesture work**

On a simple level, mediating gestures act to ‘stick’ the meanings given in speech to drawings, models and projections. The first example is a very simple instance of this; Simon is explaining to a second year student what services need to be included in her representation of a theatre auditorium. The student has drawn a section and plan drawings on a series of yellow trace sheets (a type of transparent paper used by architects and designers) which she is showing to the teacher. Her section includes a space for services (plumbing, heating and cooling etc), but she is not sure how big to make this space and how to represent it. The teacher describes the method of representation to use in words and gestures that are ‘stuck’ to the drawing through a pointing gesture:\footnote{343 Words in brackets in the following transcription refer to dialog before the frame was captured}

![Frame 1](image1) Frame 1 59.3 secs >then just<

![Frame 2](image2) Frame 2 59.8 secs =<hatch>

![Frame 3](image3) Frame 3 1 min 0.6 secs =the space

In frame 1 the teacher points briefly at the blank section of the drawing and says “then just-“ then finishes his utterance in frame 2 with “hatch” as he plays out the action of a pen doing this kind of drawing (ie: /////). Both the action and the effect of ‘hatching’ are played out in his slanting up and down finger motions. This hatching gesture continues beyond this segment as he continues to talk about what items should and shouldn’t be included in this ‘hatched’ area of the drawing including “air-conditioning”, “ducts” and “servicing” (not included in transcription here). The continuation of the gesture serves to tie in all the things he mentions as being ‘contained in’ the space which is represented as hatched in the drawing. Because the hatching gesture is preceded by the pointing gesture it is ‘tied’ to a specific point in the drawing. The teacher therefore doesn’t have
to qualify exactly where the hatching is, relying on the representation to carry the contextual meaning of his utterance. This is an important, yet perhaps under-appreciated example of how mediating gestures remove a lot of ‘verbal clutter’ from descriptions and let the student and teacher proceed more rapidly through their work.

In the next short segment the same teacher and student are discussing an existing building, ‘Storey Hall’ which the student is using as a precedent to inform her work. This building becomes an ‘absent presence’ in the conversation by virtue of gesture’s ability to mark out locations in space as ‘place holders’ for virtual objects.

The concept of Storey Hall as a relevant precedent is initially brought into the conversation by using a mediating gesture to point to an empty space outside of the drawing that refers to or ‘calls up’ this absent building. Qualities of this absent building are then transposed into the design story the teacher is telling, through the activity framework provided by the representation on the yellow trace:

In frame 4 the teacher shakes his hand briefly over the drawing while he says “You’ve been to”. His index finger and thumb form a u-shape facing the page; this is a variation of a pointing gesture that effectively ‘frames’ the student’s view of the part of the page under discussion. Next the teacher points off into the distance (frame 5), through a south facing window while saying “Storey Hall”. Although the pointing gesture is designed to make the space adjacent to the drawing into a referent for this absent building it also corresponds, roughly, to the actual location of this building (about a kilometre south of the MU building where the teacher and student are currently sitting). In the next part of his dialogue the teacher animates some of the qualities of “Storey Hall” over the top of the drawing and links this animation to a section of the drawing. In frame 6 he rolls
his hand, inscribing a series of horizontal circles over the drawing surface while he says “so you can go through that kind of”. Although the circling corresponds to his rhythm of his speech, the orientation of his hand, with fingers outstretched towards the student, results in a gesture that resembles the ‘cave like’ entrance of Storey Hall:

Figure Twenty-six: Storey Hall, Melbourne by Architects Aston Raggatt McDougall, 1995.  

He continues this sentence in frame 7: “That series of spaces”. In this part of the dialogue the teacher is referring to a series of spaces that a person passes through inside Storey Hall to get to the auditorium. This series of spaces is pantomimed in Frame 7 by the teacher by holding his left hand steady and ‘marking’ out the ‘series of spaces’ by moving his right hand progressively further away from his left while ‘beating’ the air slightly. Each ‘beat’ is performed to time with the words:

Frame 7
10.5 secs
=>series of spaces< as w::ell (1.0)

Frame 8
12.3 secs
=that could have very different

Frame 9
15.7 secs
= um (0.4) lighting treatment (0.4) material treatment (0.4) logic”

In frame 8 the teacher returns to the page and uses both hands to mark out this idea of ‘entry spaces’ on the student’s drawing by inscribing it with gesture attached to the surface of the student’s drawing. This gesture starts with the teacher holding his left hand at the ‘base’ of a rectangle that gets ‘drawn’ with the thumb and forefinger of his right hand (frame 8). In this way the drawing, as an activity framework, provides a provisional space that is virtually inscribed with the qualities from architectural precedents. In frame 9 the teacher finishes his demonstration by lifting his hands off the drawing surface and circling the right one in the air timed to the utterance of “lighting treatment, material treatment …logic”.

But studio participants did not only use pens to point, they often used convenient objects to enact mediating gestures, as the following examples demonstrate:

Frame 10
Pia is shown pointing at a projection screen with the tip of a plug, attached to the end of her computer cord

Frame 11
Simon points out features of a digital image on a laptop screen with the corner of a handy model

Frame 12
Pointing with pens was extremely common – in this instance a student talks to a model while pointing strategically with his pen tip

This kind of pointing was taken to its logical conclusion in drawing where the difference between gesture and actually making marks was often strategically blurred. One of the teachers, Anna, would often actively sketch while talking to her students. This kind of sketching was a common feature of design classroom interaction (first described in detail in Schön’s famous example of Petra and Quist and used to develop his theory of ‘reflective conversation with the situation’). The drawings produced by Anna could be thought of as a trace or ‘inscribed recording’ of the mediating gestures produced during talk that were ‘translated’ through the pen. Anna would also point at her drawing as she drew it, sometimes tracing over the top of existing lines with her pen while not actually touching the paper. Looking closely at the drawings that resulted revealed the
record of the mediating gestures which appeared as a series of dots and over tracings, as can be seen in the image below:

Figure Twenty-seven: One of Anna’s sketches made while talking to a student. A closer examination of the drawing reveals the marks made by her pen:

Figure Twenty-eight: Close up of one of Anna’s sketches

Often the difference between what we should consider as ‘gesture’ and what was ‘sketching’ was not clear; both activities seemed to exist on a spectrum where elements of one were implicated
in the other. In Anna’s ‘instructional drawings’, the kind of pen being used and the size of the paper constrained the area of the drawing and the play of gesture within it. Occasionally Anna would find the constraints of the drawing frustrating because it was unable to continue to ‘hold’ her expressive intent. In these moments her hands would leap free of the sketch and gestures would occur over the top of the paper (often too quickly to be caught on film as the camera was usually tightly focussed on the paper). During Anna’s acts of sketching, the pen can be thought of as a kind of ‘mediating tool’ activated by her gestures and through which the gestures are able to be channelled. The paper acts as a repository for her gestures so that previous gestures can be called up and reworked into later speech. In addition the pen does more than just draw – it is also a very good, precise, pointing tool that serves to emphasize and clarify speech.

In a gesture/drawing coupling, the **timing** and **rhythm** of the performance was the crucial element. The importance of rhythm to speech and gesture couplings has been much noted, beginning with Efron’s famous work on the Jewish immigrants in New York and the description of ‘beats’ as a reflection of ‘mental locomotion’.\(^{345}\) Daniel Loehr notes that stressed syllables often align with gestures and that this tendency to work the body in rhythm even extends to the timing of eyblinks\(^ {346}\). He outlines previous work on the hierarchy of body movements in which smaller parts of the body move faster but in synchrony with the rest of the body, including speech. For example: “the more slowly changing movements of the head may align with larger spoken units, such as phrases, while the more rapid movements of the wrist and finger may align with syllables”\(^ {347}\). By timing speech and performing the gesture/sketch to fit into pauses and silences, the whole utterance can be shaped to fit in and resonate with the speaker’s rhetorical intentions.

In the following example Anna’s gesture/drawing performance is designed to answer a question in words and in images. The timing of the drawing, speech and gesture helps tie the two modes together. In frame 13 Anna is shown to have just finished drawing a long thin rectangle to represent an existing wall on the site (the drawing is reproduced as a diagram below the relevant frame). The drawing is produced as an answer to a question the student has asked; he wants to know why she has suggested that he should make the distance between his new building and the old one smaller. While pointing to the two different parts on this plan view pinned on the wall (not shown) he asks: “But how does making the building bigger, and that space smaller, make it more useable?...
you see what I’m saying?” In frame 13, as she draws a representation of the existing wall in plan, Anna states: “I’m saying you are designing the space. Because you’re creating a tension between-

In frame 13 the word ‘between’ is elongated in order to time it with the strokes of her pen. In the second frame she completes her sentence with “and your architecture”, but the diagram of the two architectural components remains unfinished as a partial rectangle. Significantly she completes the final two sides of the rectangle (“your architecture”) while remaining silent, allowing the pen to ‘speak’ (its strokes can be clearly heard as she completes the drawing (frame 15). The pause serves to amplify and mark off her speech. The student does not ask his next question until the drawing is complete, although he is clearly unsatisfied by her answer. We could speculate that this is because
he does not exactly understand her use of the word “tension”, but does not say so. He seeks further clarification with: “But why do it? Why make the, the …” in frame 16. Anna speaks over his inarticulate question, overlaying the end of his utterance with “because at the moment …”, while lifting her pen up and pointing it at the student’s torso (out of frame):

She moves her pen back down towards the paper. As she utters “the whole” (frame 17) she makes a rapid circular motion with the pen tip at right angles to the paper and in the general direction of the drawings the student has pinned up on the wall. This is an example of the drawing being unable to ‘hold’ her expressive gesture. She then returns to drawing to complete her explanation. Diagrams of the progression of drawings are shown with the accompanying speech transcription, but without images, starting with a repeat of the speech from frame 19 “the whole usable space is between”. During this utterance she is drawing another rectangle to mark out the ‘between space’ in her drawing (shown as a green line). She then says: “It actually goes into your building” (frame 20) while tracing over this “Between” rectangle with her pen to give it more emphasis (the trace is shown in red in frame 20):
because the whole <useable space> is between actually goes ::into your building (0.2) =and here

In frame 21, she completes this drawing/gesture ‘phrase’ by drawing a line with an arrow at each end while saying “and here”. This final drawing/gesture act could be seen as the equivalent of an emblematic gesture as the double headed arrow is recognisable architectural ‘code’. Throughout this masterful sketching performance Anna may not have convinced the student of the value of the suggestion to make the space narrower, but she is able to convey it with precision and emphasis using a minimum of words.

Mediating gestures appeared very often in conjunction with models, seeming to serve a number of useful functions. In some cases they were used to link together models with other kinds of representational media in order to mobilise both, simultaneously, into a conversation or to draw together different representations of the same thing.

In the next example Simon is talking about a student’s scheme using both a laptop screen and a physical model. Prior to this moment Simon has been talking with the student while viewing a series of images the student has made on the laptop screen. He now starts to bring the model into their conversation; in frame 22, Simon points at the screen to reference the image of an interior perspective while saying “the space that’s inside there”
The ah (.) space that's inside there =is going to give you a <clue> (but you really need to start(.)) cutting(. more(. sections"

In frame 23 he continues his sentence while pointing to the part of the model that corresponds with the image on the screen. As he speaks he sticks his finger inside the relevant part of the model and drags it around the interior ‘walls’. This dragging action emphasizes his word “inside”, so rather than just pointing to the location on the model he is dovetailing the character of his pointing gesture with the concept he is discussing: “inside”.

In frame 24 he shifts from talking about the “inside” to making a suggestion to the student about exploring the “clue” offered by his interior perspectives through performing a series of section drawings. He performs the word ‘section’ with a chopping action over the model which is orientated over and through the room that is being discussed. (In fact the use of this ‘chopping’ action to indicate the activity of making a section drawing was so commonly observed in the data that it could be said to be an ‘emblematic gesture’ that is commonly understood within this context). His speech stresses a gap between each word as the chopping action is performed. The whole time that Simon is handling this sketch model he locates it with the ‘ground’ always orientated in the proper direction (i.e.: parallel to the floor) and in a line with his torso. Although the model is implicitly treated like a building by its orientation, he does not hold it at eye level and places himself ‘within’ it as he is seen to do with another of the student’s models earlier in the conversation:
Figure Twenty-nine: Simon in two different model handling modes

The two different positions he adopts in relation to the model reflects both the different conversational intentions and different ways of ‘looking’ at the model. Here the teacher is performing a ‘framing’ of the model for the student’s benefit. In the image to the left he is framing a certain space in the model for the student to think about the type of material finish that it might be covered with; his hand is held over the specific part of the model, cupping the walls and floor that he is referring to in the frame on the right Simon is asking the student to “cut some sections” and orientates his hand in a ‘chopping’ action over the model in the direction that he wishes the sections to be drawn.

Some weeks later the student has produces another, more finished version of the same model that allowed Simon to use more precise mediating gestures to have a more detailed conversation about the proposed design. In this segment Simon both makes salient and animates, certain sections of the model as he speaks. The first thing to note about the way that Simon handles this model is that he holds it up in the space between himself and the student so that it is almost at eye level. Again, as he talks, he keeps the model orientated so that the ‘ground’ of the model corresponds to the actual ground, but by locating the model higher than the previous one he puts himself and the student ‘inside’ its space, rather than hovering above it. As he talks he marks out parts of the model in a way that shows the student where the design can be further developed.

In frame 25 he states: “It’s great that you’ve worked out that this is where the circulation starts” as he points to one of the grey colour coded boxes in the model. His gesture phrase starts with holding his thumb and forefinger in a pincer shape next to the ‘floor’ of the part of the model
and then traces out a circle over the top of it while saying “circulation”. The gesture closely matches the word but this time he performs the circling gesture outside of the model rather than inside the space created by the box. In this gesture he is making this part of the model salient and treating the rest for the moment as background.

In frame 26 he says “like where your orientation starts” while switching to hold his left hand over the same part of the model and rotating his hand back and forth as if he is turning a tap on and off. Both this gesture and the one before animate the dynamism of the idea ‘circulation’ over the appropriate part of the model. In the next gesture he starts to ‘locate’ his talk in relation to the individual parts that bear on how this ‘orientation’ might happen in the building. He starts by saying “but you need to work out” (frame 27) while lightly touching several locations on the floors of the various boxes that make up the model. As he talks he traces along the edge of some of the floor slabs and lightly touches the locations where the boxes join up or overlap. It becomes clear that this gestural emphasis on slabs and joins between spaces is a precursor to starting a discussion about stairs, which he begins by saying “How far back” (frame 28) and making a pincer with his thumb and forefinger, locating his forefinger just below the ‘floor slab’ of the “orientation space” and his thumb halfway between the ‘floor slab’ and the ‘ground’ of the model. In this gesture he neatly captures the idea of calculating a vertical space for the stairs to occupy:
In frame 29 he gestures the horizontal run of the stairs, rotating his hand 90 degrees and laying it flat against the ‘ground’ of the model while completing his implied question with “does the stair need to start?” He completes his questioning about the stair with “How do you get to it?” by rotating his hand back to the original position shown in frame 30 and squeezing his thumb and forefinger closer together. As he says “How do you get to it?” he draws this hand shape along from the left to the right with his thumb resting on the ‘ground’ of the model. In this gesture he neatly summons up a ‘virtual person’ walking from one end of the building to the other; the space between his thumb and forefinger is a reasonable approximation of the size of a person in relation to the scale of the model. In this clever set of gestures he has ‘packed’ a series of bits of architectural knowing, such as how to measure and work out a stair and how to imagine a person and their movement in relation to the stairs and the other elements of the building. Another kind of knowing emerges: how the person will move through such a space.

The following segment of film illustrates more complex pointing behaviour where objects and spaces, present and absent, are ‘loaded’ into the dialogue and manipulated. This example, like the second one in this section, demonstrates how the ‘presence’ of absent objects can be managed with pointing. It also highlights that multiple, non-present items can be juggled and how much body work there is involved in ‘managing’ these ‘virtual others’. The student (seated on the right) has an interesting descriptive task to manage because he is located ‘on site’, inside the house that is represented in the drawing that he is talking to. He is attempting to describe to his teacher, Pia, how he plans to incorporate a corridor into his redesign of the existing house. Prior to the beginning of this segment the student has talked about the general problem of corridors in domestic houses as ‘useless spaces’ and something you therefore “want to avoid”. During this speech about corridors the student holds his hands up, with his palms facing together, in a compositional gesture form that
represents a corridor (frame 31, below). Like in the previous section on compositional gestures where a student was talking about the location of his house on the site, this ‘corridor’ gesture can be understood as a ‘gloss’ that is established in the conversation in order to be later ‘called up’ to represent the same idea. A picture of the student performing this corridor gloss is shown below:

Frame 31
2 mins 31 secs

The existing corridor the student is talking about in the next segment lies just to his left and behind him, as can be seen in the image on the next page:
In what follows the student uses a series of precise pointing gestures to make meaningful connections between the existing corridor and its representation and the corridor of his own house. What is significant about this moment is that this usually extremely articulate student finds himself having trouble finding words to convey his meaning because he is trying to switch between the virtual representation of the corridor, the physically present one and another that is located some miles distant as well as the abstract idea of corridors. This is a highly complex task, but the student’s adept pointing behaviour carries him through the difficulty by orientating, locating and ‘fusing’ representations in speech and in images with the physical space he is located in:
In frame 32 the student points at the projection screen and moves the end of his finger up and down, ‘tracing over’ the ‘corridor’ part of his drawing\textsuperscript{348} while saying “um…in” before rotating his wrist slightly and tracing with a horizontal movement in line with the wall immediately next to the screen. By pointing and ‘tracing’ the corridor on the projection with his index finger he makes the corridor part of his representation salient to Pia and the rest of the class without actually repeating the word ‘corridor’. The slight switch in orientation to ‘trace’ over the wall next to the image then yokes the ‘real house’ to the ‘virtual’ house on the screen. Both physical and virtual are now “this house”.

After making this connection the student works to shift the attention of the class and teacher from the representation of the corridor on the screen, to the real one situated just behind him to his left. To do this he stays in his ‘corridor pose’ but swings the tip of his finger around to point in the direction of the front door saying: “this is what we walk through in the front thing” (frame 34). He keeps the ‘yoking’ of representation with object present by maintaining his gaze on the screen; in effect he is ‘pointing’ one way with his eyes and the other with his hand. In contrast to his first tracing in frame 32, this last gesture is at the scale of the actual space the class is sitting in, rather than at the scale of a representation or projection.

\footnote{Most students were observed pointing with the same hand they wrote with, in this case the student is left handed and does indeed perform his pointing with this hand.}
In frame 35 he says “the idea of opening that up” and we know that the “that” in the sentence refers to the real corridor space because he has established this with the large pointing gesture. Perhaps because he has already established a reference point for “that” with the pointing motion in frame 34, he chooses to gesture another part of his utterance in frame 35 where we see him perform an up and down chopping motion with his hand that is timed with the utterance of the word “open”. This compositional gesture is suggestive of a wall being demolished or lifted away.

The student then points back down to the end of the corridor as he says “So that both…” and then pauses with his hand pointing towards the front door. In what seems like a decision to change his explanation strategy, the student then reorients his body back to the teacher and asks: “Because I think these terraces are mirrors of each other?”\(^{349}\). In an earlier paper\(^{350}\), Goodwin describes how questions can strategically allow displays of ‘forgetting’ to become a participation framework; i.e. appearing to forget invites other people to participate in speaking. In this case the question about the ‘mirroring’ of the terraces in the street in which the house is located marks the status of the existing corridor in relation to the adjoining house in a problematic way, inviting Pia to enter the dialog to confirm whether or not they are actually “mirrors” which she does by turning her attention from the screen to his face and nodding.

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\(^{349}\) A terrace house is a semi-detached dwelling that consists of one or more houses which share adjoining ‘party’ walls. Terrace houses are often ‘mirror images’ of each other.

In the next part of the dialogue the student starts to bring his own, absent house into the conversation as a signifier for the concept of ‘terrace house’ and activates the space immediately in front of his body as a piece of territory in which he can ‘place’ the virtual object. In frame 38 he says “This is identical to the house that I live in”, while using both fingers to point to the ground between his feet. Both the idea of terrace house and a specific terrace house (his own) have been placed over the existing terrace house that he is sitting in. Following his strategic forgetting earlier in frame 37, Pia clearly still considers herself as invited into the conversation. She continues to look at him, nodding and saying “right”. Then, through a brief transitional gesture that immediately follows with no speech attached to it (frame 39), the student lifts both hands up and ‘places’ the gloss of the corridor in the position he has just marked out as ‘terrace house(s)’. The corridor gloss ‘imports’ the corridor as a generic concept back into the conversation and places it in the space marked as containing the idea ‘terrace house(s). In this gesture the meaning of the ‘corridor’ gloss shifts a bit so that it signifies the ‘terrace house corridor’ of his actual house, which is not physically present.

Having marked out the space clearly in this way the student can now use this physical location as a resource in his ongoing dialogue. In frame 40 he lifts up his right hand, leans slightly to the left and points at a position in space that is located just over the edge of his left hand while saying: “The house next door to me – yeah?”. Having established the location of his own ‘virtual house’ he can locate a virtual “house next door to me” in its proper spatial arrangement. The teacher’s corresponding “yep” answers his rising question intonation on “yeah?” Again this is not really a question the student is asking, but a request for confirmation from Pia that she understands what he is saying as the dialogue increases in complexity.
In frame 39 the student successfully placed the virtual ‘house next door’ in relation to his ‘virtual house’. He now shifts the corridor gloss back from being a specific corridor to the general concept of corridor by reusing it frame 41 when he says “their corridor is”, while moving both hands to form a ‘corridor’ just to the left of his previous corridor object. In frame 42 he finishes his sentence with “Where our corridor is”, keeping the corridor gloss intact but moving it back to the previous position that he established in his two finger point as belonging to the house he lives in. This sequence of pointing and gesturing has perhaps become untenable as a mode for communicating the idea as in the next frame (43) he only says “It’s like” and then carefully places an open, palm up gesture at the end of the sentence in a moment of silence. The gesture, although mute, strongly suggests something like “can’t you see?” The open palm gesture also serves to ‘drop away’ the spatial referents and locales he has built up over the last ten seconds. He returns his hands to his knees and holds them there while he says “that… that you can definitely utilise” (frame 44).
The gap makes it ‘safe’ to bring another gesture back into the charged space in front of his body without causing confusion, so he brings his left hand up in a pincer shape (frame 45) as a compositional gesture indicating “the space between”. This gesture is located roughly between the two spaces from the previous section of the dialogue.

In this complex sequence a number of pointing strategies are employed by the student. First he manages to bring the class and the teacher’s attention to the problem of the corridor and link the representation to the real thing. Then he proceeds to place the ‘corridor’ in front of him as a virtual object so that he does not have to keep pointing to the actual corridor and breaking eye contact with the teacher. This move then establishes a spatial locale which is inhabited by a series of other compositional gestures that refer first to his own house and then to his neighbour’s house in order to talk about the spatial configuration of the house that he is currently sitting in. Finally he breaks the connection between the location, briefly, in order to make a rhetorical point (the unspoken “can’t you see?” in frame 43) before placing another gesture back in that links the two spaces together. The pointing, in conjunction with the compositional gesture gloss served to cut significantly the number of words the student had to rely on to carry the conversational intent. Although gesture is able to present different aspects simultaneously; here it can be seen to be working in the same sort of linear mode as speech, presenting one concept clearly after another with breaks between to maintain legibility.

It was relatively rare to find such a rich and complex set of mediating gestures, especially in relation to large scale digital projection screens. Most of the time when students and teachers talked with such screens they would perform compositional or qualitative gestures in front of their bodies and use the mouse and its corresponding cursor to perform the pointing and mediating gestures in the virtual space of the screen. The following is a good example of typical behaviour observed with a large screen. In this case, the communication is eased considerably by the use of a wireless keyboard and mouse on the table which allows both the student and the teacher to move ‘in’ and ‘out’ of digital spaces while they talk.

In frame 46 the student (seated on the left) is saying “anyway this is like, this is like” while using the mouse to make circling motions with the cursor over a section drawing which is displayed on the screen (out of frame to the left). His teacher, Pia, sits on the right in one of her preferred
‘listening’ poses, right arm folded along the edge of the table and left hand held in a fist shape over her mouth:\footnote{Every teacher had a series of habitual ‘listening’ poses and each were slightly different.}:

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figs/frames.png}
\caption{Frames showing the student's gestures.}
\end{figure}

In frame 47 the student calls up a previous image (“that, that previous”) by raising his left hand and pointing it at the screen, then making a short ‘flicking’ motion to his left. Understood in relation to the direction of writing in English, and the relationship of their bodies to the screen, this movement implies ‘going back’, rather than ‘going forward’. This gesture is performed in the space halfway between himself and his teacher; much like he is flicking a page in a book they are both reading. He finishes the sentence with “two blocks” while reorienting his left finger and thumb back towards the screen like he is grasping an object (the “two blocks”). This time the gesture is moved back into the space in front of his body and oriented in relation to the drawing on the screen. Directly after performing this grasping movement the student returns his hand to the mouse, as we see him in frame 46, and continues talking, while continuously moving the cursor around the screen (not shown). In this short exchange the ‘gesture space’ is moved smoothly from ‘inside’ the screen, to the front of his body, their shared bodies and back again without any interruption in speech.

In ‘doing’ pointing with a mouse and cursor instead of a finger or hand, the student transitions the gesture from the cursor in the space of the screen to his hands in the actual space in front of his body. This kind of behaviour seemed to be highly naturalised amongst all the students observed. Most of the students and all of the teachers displayed proficiency at this kind of ‘mode
switching’ with other forms of representation. Many would move from talking to drawing and back again, using gestures to help them to incorporate the multiple and distributed meanings generated in each medium into their conversational ‘flow’. This mode switching enabled the speaker to make different parts of the representations salient and thus, as Goodwin puts it, “shape the perceptions of others” who might be in their extended ‘community of competent practitioners’.

When students are beginning their studies they are not yet competent in the established ‘ways of doing’ that are common to it. Mediating gestures were sometimes used in conjunction with representations to situate the context for questioning or clear up misunderstandings that result when new members are participating in the practices of their community, as in the following example. Here, a teacher, Anna, (seated on the left) is asking a student (seated to the far right, out of frame) to account for the distribution of buildings across a site. A teacher’s aide is holding the model on her lap (her left hand can be seen in the frame). In this exchange Anna’s gestures activate the model as a ‘prop’ to anchor a virtual ‘landscape’ that she builds around the model. This virtual landscape acts to situate her questions about composition and ‘do’ interaction ‘repair work’. This virtual landscape is not unlike that made by the student with the corridor problem earlier who needed to carefully place items in the space around him to manage the complexity of his conversational task.

We come into this exchange just after Anna has spent some time questioning why the student is “cramming” everything on the middle of the site and “ignoring” the edges of the site and the short entry road. The site and the location of the proposed design are shown in frame 49 (below). The red shading covers the part of the model that contains the proposed new building, the green shading represents the existing buildings on the site and an arrow shows the location of the entry that the teacher wishes the student to reconsider:

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[352] Goodwin, "Professional Vision." Pg 615
The teacher wants to suggest to a student that she moves her building slightly, or adds some more, so that it occupies the entry point and engages with the existing buildings as well as the rest of the site. Instead of saying this clearly, however, she frames the suggestion as a question, which temporarily confuses the student who is in first year and is relatively inexperienced at this type of questioning mode where the teacher adopts the role of a critic, or ‘devil’s advocate’, and asks the student to rehearse a possible defence. By adopting, temporarily, the tone and role of a critic through a ‘didactic’ question, Anna attempts to encourage the student to use the desk crit form as a ‘safe space’ to rehearse a possible defence and to think about why she does one thing and not another in her design work. But since this gambit fails here, Anna is forced to clarify her questioning and ‘repair’ the interaction. In this interaction Anna can be seen to ‘work’ the model with her speech and gesture phrases in a dynamic coupling that both grounds her speech and provides a participation framework for the student to respond to her didactic questioning method.

Anna was very helpful in clarifying this segment of film and suggesting the concept of the desk crit as a ‘safe space’.
Just before frame 50 Anna has asked the student “Where is the entry to the site?” and then asks: “For instance is it . . .” she brings her hand out in a pincer gesture that serves to ‘mark out’ some extra territory outside of the confines of the physical model. As she asks “is it there?” she moves her hand back over to the entry point to the site (frame 51), briefly ‘dropping’ a virtual ‘building’ between the modelled representation of the existing site buildings. The pointing action, a mediating gesture which is linked to “here” in her speech, is performed with a whole hand, instead of an index finger, which reinforces the suggestion that she is ‘dropping’ something. She goes on to ask “and why is there no building there?” (frame 52) moving her hand back into the position she has made in frame 50. In this move she traces over and reinforces her previous ‘territory’ and returns her hand to the original position.

Through this gesture/model coupling the teacher is implicitly asking her student how she intends to architecturally respond to the entry to the site, using the gestures and the model to pose an (unspoken) question: “Why don’t you put a building there?” The teacher continues to hold her previous pose with her left hand while she waits for the student’s response. It is clear in what follows that the student misconstrues her teacher’s questioning; answering it not as a challenge of her design strategy, but as a misunderstanding of what physical structures are on the site. She replies “There’s no building is there? On the site there’s not” (frame 53, below), pointing to the place where the teacher has just ‘plopped’ her building:

In this action she signals that she has entirely missed Anna’s implicit enquiry packed into the question: “Why is there no building there”. Anna is really asking something like: “Why are you not
‘touching’ the edges of the site? What about the entry point to the site? Should some of your building be there instead of packed into the middle?” Instead the student assumes that Anna doesn’t understand the arrangement of existing buildings on the site and seeks to clarify whether or not there are buildings already in the entry point to the site. The student’s return question, specifically because it is coupled with the location of her pointing, alerts Anna that the student has misinterpreted her previous question. She does quick ‘repair’ work in frame 54 starting with “No, no – but um” (frame 54).

As she utters this ‘filler’ sentence Anna swaps her right hand for her left (between frames 53 and 54) so the hand that was previously tucked under her chin holding a pen is used to gesture. With the switch of hands she also performs a switch of fingers so that she is now using her index and little finger instead of her thumb and forefinger. We might wonder why she changes hands at this point. One possible interpretation is that her left hand has been the ‘questioning hand’ and she is following this up with more of a statement (although she inflects it as a question, it is clearly rhetorical) and needs a different hand to mark the shift in style; the statement is articulated with her right hand which is also the one she writes with and therefore her ‘dominant’ hand. But there seems no clear reason why she switches hands. It could equally be part of the ‘rephrasing’ of the question, i.e. she doesn’t want to ‘repeat’ the gesture, but clarify it so she changes the hand she is using. This time her gesture formation with index and little finger looks like a ‘plough’ which she uses to trace the ‘virtual territory’ already established and re-emphasize this as the site for the questioning. She performs the ploughing action over the words “Your site comes back to here right?” (frame 55). She ends the gesture by quickly flipping her hand so that the back of her fingers are orientated parallel to the edge of the model (frame 56) as a visual stop or barrier wall. They conclude the first part of the repair with “yep” from the student and a responding “yeah” from Anna.
The teacher now uses the model to restate her question more explicitly; drawing out the first word as “Sooo”. If someone said why are you sitting it here – what’s your response?” (frame 59) Her question is now clearly framed as a potential question by a critic and the gesture is likewise more explicit. She lifts her right hand up and points down at the model with her index finger and middle finger formed into a downwards facing ‘V’ shape timed to ‘land’ on the utterance of “here”. She then moves her hand back to the ‘barrier’ position and waits for an answer.

From this point the student understands what the question is for and answers it using the model and the drawings she has pinned up on the wall next to her. Some of this is now shown. She starts by explaining her balcony location: “I put the balcony there because” (frame 60) and points to the balcony with her whole left hand, slightly curling the middle finger under so that it points at exactly the spot in the model where the balcony is located. The student’s pointing is clever because the spread out hand seems to indicate that the statement is about a relationship to the whole site, not just the small part of the building she is referring to directly (the balcony) which she ‘tags’ with the index finger.
In frame 61 the student shifts gesture mode from a mediating to a qualitative gesture as she says “because a lot of light came through there” (this moment is discussed further in the next section on qualitative gestures). She concludes the first part of this explanation with “and I wanted a place where people could sit and eat” beating her hand in the air above the model for a moment (not shown). When the teacher responds with “which is right there?” (frame 62) pointing to the balcony part of the model with her pen tip the student reorients her hand to follow the direction of the point and says “yep”.

The repair work is now done and the student and teacher have re-established their conversational ‘flow’. What has just happened here? Goodwin argues that talk and gesture “mutually elaborate on each other”354 when archaeology teachers and students are seen at work in the field and that this is part of a “process of socialisation” through which “growth in intersubjectivity occurs as domains of ignorance that prevent the successful accomplishment of collaborative action are revealed and transformed into practical knowledge”355. According to Goodwin, the role of the teacher is to guide the student in her socialisation through a set of material semiotic practices which she shares with the student; i.e. the student learns from what Anna says as she does. The repair work between Anna and her student reveals some of the role of mediating gesture in this process of socialisation; Anna used speech, gesture and the model to guide the

355 Ibid. pg 614
student back and help her to start to give an “appropriate and competent response to her request”\(^{356}\). The student and the teacher both worked the model as a mutual ground for developing understanding as to what was relevant to the conversational task at hand.

However, the previous example of misunderstanding was unusual; many of the students observed had participated in many years of this kind of ‘socialisation with things’ and were therefore already well ‘en-cultured’ in ways of seeing, categorising and manipulating the representational world essential to the process of becoming a competent member of the professional architectural community. In this last example, the student is shown navigating his teacher through a complex explanation amongst a tangle of paper, pens. In this interaction the student switches between these representational strategies, using gesture to yoke them together.

The student with the corridor problem from earlier is shown talking to his teacher, Pia, about a model he has made that is capable of performing a range of movement. This explanation of the way his model works is essential for preparing them both for a process of mutual speculation (this will be covered at more length in the next Chapter). In order to properly describe the movement, he needs to move between a range of resources in his immediate environment including pen and paper, the model and gesture. The model itself is a series of linked boxes that are folded a bit like origami. In frame 63 the student is describing the way the boxes can be compressed saying “a lot of them squash down” while performing a compositional gesture by holding his two hands up and placing his finger tips together (frame 61):

\(^{356}\) Ibid. pg 614
The student picks up the pen and starts to draw on the page in front of him as he says “um...so the..” he then points briefly at a part of the model with his pen tip (frame 64) saying “square ends”. The pen tip point was timed with the utterance of “square ends” which acts to register the location of ‘square ends’ on the model. He then moves his left hand (with which he writes) to point to the part of the sketch he has just drawn and traces a line down over the sketch while saying “obviously these are” (frame 65). In this action his finger tip takes the role of the pen that highlights and makes salient the part of the sketch that relates to the ‘square ends’ and in frame 66 gathers up both the model and the sketch in the phrase “all the same length”.

Now the student has established the first point about the mechanics of the movement he can go on to elaborate on it. The conversation above has been truncated slightly with a view of the student using a compositional gesture in frame 67 (“but they compact”) and then an actual manipulation of the model in frame 68, where he is showing the movement on the model while saying “in this direction”, while Pia looks on with her head held on one side. This exchange shows the student taking a confident leading role in the explanation – the exchange will be dealt with at length in the following chapter so this is where we will leave mediating gestures and move onto the final category qualitative gestures.

**Summary of mediating gestures**

Is there an architectural way of gesturing? The answer appears to be yes, but the complexity of the mediating gestures shown in the descriptions above makes identifying such a ‘language’ as a set of ‘rules’ difficult, if not impossible. Mediating gestures appeared plentifully throughout the data and, at least initially, sifting through the data for mediating gestures was relatively easy. All pointing with fingers was classed as mediating, so the decision rested less on the speech component
than the other categories. However, on subsequent passes through the data with the help of the expert panel and others, more gestures were swept into this category as they seemed to perform pointing-like roles, even if not performed with the finger or even the hand.

Mediating gestures needed representations in order to become meaningful as they do not usually present as a ‘picture like’ image as compositional gestures were seen to. One of the most important features of architectural representations is that, as Schön pointed out, they act as ‘virtual worlds’ in which new design possibilities can be tested. Architectural representations are manipulable; drawings are able to be ‘over drawn’ with pencils; 3-D Models can be (to a certain extent) disassembled and reassembled. However these are relatively drastic acts, so in the design studio gesture offers a way to ‘virtually inscribe’ representations so that different meanings or ways of looking can be generated without changing the representational ‘ground’. When these findings were communicated to teacher practitioners they pointed out that the ‘inscribing’ with gesture was a less violent way of treating a drawing that a student may have laboured many hours over.

The pointing gestures observed in this data ‘highlighted’ specific parts of architectural representations and so made them salient to teachers and students within the context of their discussion. The way the pointing was performed often shaped how the representation should be seen, or what was most important about it at that moment. One recurrent feature of this highlighting activity was the way that mediating gestures were used to ‘inscribe’ or ‘overlay’ contents of speech onto a static representation in such a way that the representation ‘opened up’ and became a vehicle for other design possibilities. The first example of Simon and his student talking with yellow trace about Story Hall shows how pointing can act as a way to ‘import’ absent things into the current conversation. This type of pointing and placing can help manage complex description tasks such as the one where a student is attempting to explain his idea for a corridor by importing and overlaying other, non present, corridors. He does this by pointing to bring in and allocate specific locations in front of his body as ‘placeholders’ these ideas. By later pointing to the location where the object was ‘placed’ it could be ‘called up’ as necessary throughout his explanation. This instance was a good example of mediating gestures being almost ‘speech-like’ in that they are presented sequentially rather than ‘all at once’ as other researchers have claimed.357

357 For instance Susan Goldin Meadows (Goldin-Meadow, Hearing Gesture: How Our Hands Help Us Think, who claims that gesture is profoundly different to speech and doesn’t follow its sequential ordering.
Understanding appropriate ways to manipulate and share representations is one of architecture’s most important knowledge practices and the mediating gestures performed in the design studio form an important part of this ‘toolkit’. Mediating gestures in the design studio worked complexes of representations, spaces and bodies. They both frame and are framed by these other elements and act to help to generate, share and mobilise design knowledge and knowing.
Part Three: Performing Feeling

Qualitative Gestures

In the transcriptions, gesture was observed to play a role in conveying qualities of architectural space that are not easily captured in static representations or speech. Gestures of this kind are called ‘qualitative’ in this thesis because they were employed to convey qualities such as the passage of time, the effect of light, decay of materials or the movement of people. Architecture teachers and students in the two institutions studied have had access to high quality animation software for some time. Despite this, animation was not a common method for portraying these kinds of qualities or to illustrate the experience of moving through a proposed space. In fact, students were observed to use animation in only one of the class sessions and this was only because it was set as a specific task that was being assessed. This suggests that qualitative gestures play an important role with regard to conveying these dimensions of architectural compositions.

Despite the important role that they play, qualitative gestures were the least common of the three types of gesture that were developed for this thesis, representing only 13% (or 125) of the total gestures identified in the transcripts. This relative rarity might be explained by the fact the recorded conversations, as a whole, tended to focus on the physicality of the forms that the student had come up with, rather than other mutable qualities and affects. Teachers and students generally spent their time together in discussing how forms were derived and aspects of the composition such as feasibility, appropriateness, precedent and structural integrity. The experience of moving through these proposed spaces, or what it would be like to inhabit them, featured in conversations, but the nature of the discussions were often abstract, not specifically about the proposal under discussion. Likewise subjects such as the passing of time and the decay of building materials were discussed infrequently.

Teachers and students used gesture ‘images’ composed of shape and expressive movement to convey a broad range of ephemeral qualities. The effectiveness of the gestures depended on the mapping of the form (shape) and quality of movement (speed, range etc) of the hands onto the specific phenomena that was being discussed. ‘Mapping’ is used here in the sense of creating a

358 This observation has the potential to be the object of further research, but is beyond the scope of the current research. At the time of writing there were two theses under preparation at the University of Melbourne that looked into this aspect of studio discourse in more detail; they are authored by Beatriz Maturana and Jaune Morton.
correspondence between one thing and another as was discussed in Chapter Three. The following instance is a good example of this type of mapping relation. In it the student is describing a flexible architectural surface that has holes in it which can ‘dilate’:

In frame 1 the student holds up his right hand, orientated towards his body, in a ‘claw’ shape with fingers bent in towards his palm to form a ‘hole’. His left hand is held over this claw ensemble as a kind of loose ‘cover’. As he says “di-a-late” both his hands open out, the left hand ‘cover’ shape springs up from its position covering the ‘hole’ to form a flat surface with fingers splayed out. Simultaneously his right hand opens, but maintains it’s basic ‘claw’ orientation. The movement is only brief as his hands quickly return to the starting position in frame 3. The whole movement lasts only .08 of a second, but, by the time he has finished uttering the word, the student has shown how the wall might ‘flare out’ and close again. The key to the success of this gesture is the ‘anchoring’ that the right hand performs. It represents the ‘hole’ which opens and closes while the left hand that covers it is suggestive of the quality of movement of opening up or relaxing, which is portrayed here through the contrast between the clenched, closed starting position and the splaying of the fingers in frame 2. Interestingly the gesture is performed with the ‘hole’ facing towards the student and away from the majority of his audience who are seated in front of him (mostly out of view).

We can see this as an instance of the ‘conceptual blends’ discussed in Chapter Three. The coupling of an idea and the intention is achieved through the movement which ‘carries’ the sameness through the word and the gesture:
Once a ‘blend’ of the two disparate phenomena has been achieved it can be manipulated, expanded and improvised on by deploying the gesture strategically in the conversation.

When the topics such as inhabitation, light, movement or decay were discussed without the immediate presence of representations, they were not often accompanied by recognisably imagistic gestures. Although most qualitative gestures produced with representations were imagistic in character, they were differentiated from compositional gestures by being, for the most part, to use McNeill’s phrase, ‘metaphoric’, rather than iconic. In other words, they seemed designed to represent and convey an idea or concept rather than express a formal correspondence through mimicking an architectural shape directly.

Some instances of qualitative gesture work

The qualitative gestures encountered in the transcriptions, as with compositional gestures, tended for the most part to relate to and illustrate the contents of speech. In doing so they may, or may not, add much in the way of expressive nuance to the speech. The following is an example of a gesture that stays close to the verbal component and does not offer much in the way of extra information. In this instance a first year student is explaining to her teacher, Anna, the orientation of the balconies in her scheme, represented in a cardboard model.
In frame 5 the student points to the part of the model in order to attach or ‘stick’ her sentence “I put the balconies there” to the relevant part. In the second frame she lifts her hand up above the model to approximate the position of the sun as she says “because a lot of light” (frame 6). In the final frame (7) she swings the tips of her fingers down towards the balcony in her model as she utters “came through here”, mimicking the rays of the sun in relation to the orientation of her building on the site. In the shape of the gesture we get an image picture of ‘rays of light’ hitting the balcony floor.

With their dependence on metaphor, the qualitative gestures observed in the data were good for conveying environmental processes involving some form of movement such as the rays of the sun, rain, wind and growth. In the following example, a fourth year student is describing an interior watering scheme that is designed to water plants and to help improve interior air quality. During the exchange of gestures with his teacher he is helped to find the exact word to convey the type of water movement he is referring to. In frame 8 he begins with “I think it should work that way that the water” while holding his left hand up with his palm orientated to the ground. The orientation of his hand suggests there is a ‘ceiling’ from which the water can drop. His fingers are waggled slightly to suggest the movement of water:
In frame 9 he shifts from performing the qualities of water in conjunction with the architectural form to performing the movement of water alone. While saying “like little water drops” he forms a pincer movement with the thumb and forefinger of his left hand, drawing his hand down slightly as he talks to suggest movement of a single water droplet. A different aspect of the movement of the water is then again expressed in frame 10, where he lifts his left hand up again and spreads his fingers out and waggles them slightly as he brings it down in front of his face while saying “should fall down”. However, as the interaction unfolds further, it becomes clear that the student (who is not speaking his native language), is struggling to express exactly what he means about how the water is deployed. The teacher, perceiving his difficulty, comes to the rescue with another, more appropriate word and accompanying qualitative gesture. This rescue attempt is prefaced by the following exchange of talk:

Student: should fall d::own (0.4) in some [way]
Teacher: [So] (0.4) Kindof a misting?

Student: = Misting?
Teacher: (1.0) Very (. ) very fine drops (0.6) [not actually] (0.2)
Student [Yeah yeah ] yeah, Not rain (. )
As the student starts to rephrase his earlier statement he says “more the kind of dusting” (frame 11) and brings both hands up in front of his face and holds them there with fingers splayed out. He pauses in this pose for a moment (1.2 seconds) and then admits “I don’t know how to say it” (frame 12) while dropping both hands to his side and shrugging his shoulders. Slightly overlapping the end of this sentence the teacher starts in with “It’s more kind of a –” and brings both hands up in front of her face. She forms a fist with her left hand and pulls her right hand back behind, almost reminiscent of pulling a bow and arrow. She tightens her left hand a few times as if she is working a pump spray pack. In the next frame (13) she utters the word “spray” as she touches her right hand briefly to her left fist and then pushes it towards the screen, splaying her fingers out at the last moment. This is a very graphic demonstration of the word spray that draws on the imagery of a spray bottle, like those used to dispense cleaning fluids. The student finds this a more adequate word and answers “yeah yeah”. We could speculate that the gesture made the unfamiliar word clear enough for the student who is obviously keen to talk with some precision about his design concept.

Qualitative gestures were useful for describing modes of inhabitation: how people would live and work in the spaces that students are imagining. Some of these gestures involved mimicking the form of human movement as could be seen in the previous section where Simon mimicked the size of a person walking along a floor plate. In the following instance a student is demonstrating the quality of movement through a corridor — its experiential dimension from the point of view of a person. In its form the gesture hovers between representing the architectural form and the movement of the person. While it is a simple mapping, it is performed in a relatively sophisticated way, showing the perspective of a person moving through the proposed space. In this instance a

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359 This is a classic ‘emblem’ gesture for “I don’t know”.
second year student (seated on the left) is explaining to the teacher, Simon (seated opposite) the idea she has for the corridors in her building, which is a performing arts centre for magicians. In frame 14 she is shown with her hands upraised on either side of her head, performing forming a ‘corridor view’, as she says “I wanted to mis-direct people”:

As she performs the corridor view she shakes her hands back and forth along an imaginary ‘axis’ between the model and the sides of her head, creating a sense that her hands are moving ‘walls’ and that her head is the viewpoint of a person moving between them. By frame 16 however she adjusts the point of view she is performing to a static one, saying “so they think they are going to walk down there” and drawing both hands out towards the model and holding them fully extended from her body for a brief moment. We now get a sense that a person is standing still and regarding a ‘view’ down the length of a corridor. In the final frame (16) the student pantomimes the puzzlement she expects people to feel saying “and you’re like oh – it’s around the corner” while shifting her head to the right and crouching down slightly as if looking around a corner. Her hands follow the movement of the ‘gaze’, the right hand performing a bend in the corridor while the left hand is raised to suggest a wall or surface that is blocking the view. This set of gestures could also be classed as compositional, but are included here because the dynamic use of movement and the subject of the speech are more closely aligned with the category of qualitative gestures. Again this emphasizes how the distinction between the types of gestures that have been set up for this analysis is not always clear cut (this ‘blurring’ will be dealt with at more length in the next chapter).

Many of the qualitative gestures encountered in the video data are attempts to represent the ‘character’ of certain forms. The word character is used here much as Wordnet describes it: a
“quality: a characteristic property that defines the apparent individual nature of something”\(^\text{360}\). Qualitative gesture was suited to this task because it could yoke together form and movement timed with speech to rhetorical effect.

In the following example gesture operates in a significant pause in speech. A fourth year student has just finished telling his teacher about his idea for a ‘flexible wall’ with a “soft, moving surface” that would be mounted between two zones of his building such that people can press into it and be seen on the other side. In the first frame the teacher is responding to his idea and putting it into her own words, starting with “(there might be times where) the sense of people’s hands on the wall” (frame 17):

Frame 17
25 mins 59.7 secs
there might be times where
(0.4) the sense of people’s hands on the wall

Frame 18
26 mins 1.1 secs
(1.2)

Frame 19
26 mins 2.2 secs
=of each other (0.6) that could become quite (.) poignant

She accompanies this phrase with the start of a gesture set that illustrates the idea of the wall that the student has described, starting with both her hands upraised as if they are pressed against a vertical surface. As she utters the sentence she alternates pressing each of her hands forward slightly, almost like she is ‘kneading’ the surface. She performs this gesture to the large hanging screen which is positioned out of frame to the left of the student and at a right angle to herself. The movement of her hands conveys how the “sense of people’s hands” might affect the surface of the wall, creating a moving, bulging shape. In frame 18 she pauses in her speech and turns her right hand, palm up towards the student. Although pointing at the student with her left palm might

\(^{360}\) wordnet.princeton.edu/perl/webwn – for further information on this source refer to note on word net in chapter one of this thesis.
indicate that she is inviting him into her speech act, her left palm remains upraised in the previous position, indicating that she has not yet finished talking. The pause in both speech and gesture movement actually acts as a bodily registration of the grammar of her sentence; performing a ‘semi colon’ which enables the two separated utterances to be ‘read’ in the right relation, i.e: “the sense of people’s hands on the wall … of each other”. The pause is performed to stress a rhetorical moment where she invites the student to imagine the wall with her.

The student remains in the same pose, elbow extended towards her and waits for her to finish her statement. As the teacher continues in frame 19 with “of each other” she rotates her right hand palm back towards her body and then back to the student, indicating there is a two-way visual connection through the wall which is still ‘signed’ into being by her upraised left palm. This is a good example of the simultaneous rather than linear nature of gesture as a communication medium. It should be noted that the gesture is performed in an orientation towards the representation on the screen but at a ‘one to one’ scale, just like she is actually pressing into this imagined wall, whereas in the previous example the gesture is performed on a relatively small scale in relation to the model that it is coupled with.

During her performance of the previous gesture phrase, the teacher is speaking about the actions of people inhabiting the space, but performing the architectural outcomes with her body. In what follows she switches smoothly from performing the architectural form, to performing the point of view of a person inhabiting the form, and back again:

Frame 20
26 mins 10.6 secs
Otherwise (.) you want to explore how the sense of <adjacency> operates (1.2) through (.) like (.)

Frame 21
26 mins 11.3 secs
=the volume (0.6)

Frame 22
26 mins 12.2 secs
=looking down (0.6)
Frame 20 is prefaced by a short stretch of speech “otherwise you want to explore how the sense of adjacency operates”, which she accompanies some manipulation of the mouse and the keyboard. This manipulation allows the teacher to shift the image to a sectional view of the proposed wall. She starts the next gesture phrase with “through like” (frame 20) posing her hands so that the left hand is held higher than her right with both palms facing her torso. The position of her hands performs the two floor levels that the student has shown in the section. As the teacher utters “the volume” her hands shift position slightly so they appear to be ‘cupping’ two separate volumes in the space in front of her body – the ‘top floor’ and the ‘bottom floor’ (frame 21). In the next frame (22) she can be seen saying “looking down” and performing the line of sight from the top floor to the ‘bottom floor’ beneath, with a pointing finger on her left hand. Simultaneously she rotates her right hand so that her right palm is facing the table. Her left thumb is pointed towards her eyes. The phrase “looking down” is thus performed as a ‘vector’ that connects an imaginary gaze from one space into another. In frame 23 she shifts her perspective. As she says “looking up” she lifts her right hand:

While she performs this move she keeps her palm facing the table but shifts her hand slightly so she is performing a pincer grip with her forefinger and her thumb, the rest of her fingers lifted slightly. This gesture is orientated at the section drawing shown on the screen, so that we can imagine she is ‘gripping’ the thickness of the floor slab that is drawn there with her right hand. Her left hand drops down below the right, but she maintains her ‘pointing’ position so that the point of
view from the ‘bottom floor’ has shifted to this hand. This gesture is in transition, with one hand performing the architectural form while the other performs the direction of gaze of a person within the space. In frame 24 she continues talking, saying “looking through” while bringing both hands together in front of her and orientating her palms at the student. During this move she has shifted her hands slightly away from the screen so that they now create a ‘wall’ between her body and the student’s, through which she is looking at him. This gesture completes the shift back into performing architectural form which is finished in the final frame (25) where she deploys (what seems to be in this data) a ‘standard’ compositional gesture to indicate a ‘wall’ that might be “very thin” – her hands pressed close together pick up on this aspect. In this discrete series of moves the teacher is performing a series of quite complex manoeuvres that link her speech to the concepts and the representations as well as mobilising the spaces between her body and the student’s to communicative effect.

The previous example was a good example of when the architectural ‘character’ that a student or teacher is attempting to describe might be quite abstract and ‘slippery’, forcing the gesturer to abstract the imagery used in speech. Interestingly, it seemed that the more abstract the metaphor in speech became, the more the image presented in gesture was simplified. The following example can be compared to the first where the student is pantomiming a corridor. In the previous example the connection of the gesture to the speech is somewhat tangential. Because the verbal explanation was not complex, extra complexity could be packed into gesture. The reverse is the case here where Simon (seated in the foreground) is talking to a student (seated to his left and obscured from this camera angle) about the formal possibilities of her computer model while they are sitting in front of a laptop.

Some explanation of the type of architectural process that the student is engaged with will give this gesture phrase some context. Along with her classmates, the student started with tracing parts of a 2-D image which were then lofted into 3-D shapes. This type of experimental digital form making was a common practice at both the University of Melbourne and RMIT where

Lofting is a process of extruding 2D lines into 3D. In this case the lofting operation was carried out in 3D Studio Max, a common architectural modelling program at the time. In 3D studio further operations can be performed on the extrusions; they can be twisted or morphed into different shapes. In this case the student has performed one of these twisting manoeuvres and then overlaid it with a series of ‘columns’
teachers and students were interested in the artistic properties of computer modelling and its ability to generate unexpected forms.

During this conversation the student has expressed her confusion about the forms that she has produced and how to “make them into architecture”. Simon is trying to help her to ‘see’ potential architectural forms on the screen. In the first frame (26) Simon is shown with hands slightly flexed in front of the screen; the shape of his hands mimic the shape of the image on the screen. As he holds his hands in this position Simon says: “You’ve got something here – now you’re starting to-“. (This sentence is perhaps designed to give the student some reassurance because she has expressed her frustration with this mode of formal exploration):

In frame 27 he points to the laptop screen with both forefingers, directing the student’s attention to the image that he has paused on the screen. In frame 28 he pulls both hands back from the screen and holds them out like claws as he suggests “bear’s claws or something”. This is a good example of a metaphorical speech and gesture coupling; ‘bear claws’ would not be a common speech picture for an architecture studio (although animals are occasionally mentioned, there is no other instance of a reference of this type in the recorded data). Here the verbal metaphor in an architectural context is abstract and the gesture that accompanies it works to clarify or reinforce rather than add another dimension.

There is a lot of literature which deals with this type of form making, but an author of particular note is Greg Lynn who has published several books and papers on the topic of experimental form making with digital technology, see: Greg Lynn, *Animate Form* (New York: Princeton University Press, 1997).
In the following example this trend is seen again. The student (in the middle holding a model) is attempting to describe the relationship between ‘services’ (plumbing, lighting, heating) and the childcare centre in her scheme. The intention is to have a ‘loose fit’ (my term) of the services to her various buildings across the site, which the student conceptualises as a ‘network’ of services that are distributed throughout the site which her proposed buildings can ‘plug in’ to. The student finds this idea of a ‘loose fit’ of services a somewhat slippery idea to articulate and, in this moment, shifts from using descriptive terms such as ‘network’ to a series of verbal metaphors to try to convey the idea. With the shift in verbal story-telling mode her gestures likewise shift into a metaphoric mode and act to ‘shore up’ the speech. We come into this moment as the student uses the word ‘circulating’ to describe how the services are relating to the proposed building fabric and the site. She begins by inscribing a counter clockwise circle in the air above her model:

The student places her ‘circulating’ gesture over the whole model (frames 29 – 31), suggesting that the ‘circulating’ services exist across the entire site. Her speech is carefully timed to exaggerate the expressive potential of the gesture. She elongates the articulation of the word ‘circulating’ in order to time the completion of this word with the completion of a 360° arc over the model and then speeds up the words “through it” so that she can ‘squeeze’ this verbal component into this first part of the gesture phrase. She adds further nuance to her “circulating” gesture by a morphing of hand shape; at the beginning of the “circulating” gesture her hand is clenched into a downward facing ‘claw’ shape, as she moves through the arc her fingers splay out suggesting some sort of ‘dispersal’.

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363 Ideas from experimental 1960s work like that done by ‘Archigram’ were being investigated in this studio.
364 Difficult to see in these images due to the resolution of the video segment.
The context of her speech allows us to ascertain that she is using the word ‘circulating’ in its architectural sense, describing a ‘traffic flow’ of people or things. However, the student is clearly not satisfied with “circulating” as a description and shifts into a more abstract metaphor. As she begins the next gesture phrase with “or” (frame 32), she ‘beats’ the air above the model gently (giving this word slight emphasis) and then lifts her hand dramatically in front of her face, orienting the palm towards the teacher (standing just out of frame). As she utters “dribbling” (frames 33 – 34) she slides her hand down in front of her body so that the palm remains in the original orientation but waggles her fingers as she brings her hand down. This gesture vividly captures the idea of water flowing down a flat surface. Finally, in frame 34, we see her hand at rest over the top of the model with fingers splayed out. The word ‘dribbling’, usually of limited use in a discussion about architecture, is coupled with a gesture which attempts to anchor the word back to the function of the service element she is describing (water reticulation). In doing so the student brings in the expressive qualities of water (its rippling or flowing) to describe, metaphorically, her concept for service delivery.

Sometimes the compositional gestures describing the shape of a space were accompanied by a qualitative gesture to give it context or meaning; acting much like an adjective in speech. Qualitative gestures tended to appear in gaps and pauses in conversations either for dramatic or rhetorical reasons, such as in the previous instance of Pia talking about the soft wall, or when the right word cannot be found (as in the student talking about rain/mist/spray earlier). In this next case the qualitative gesture is a representation of rain which is inserted to give coherence to the narrative about the composition and help to retrieve the student’s speech from a slight verbal stumble. The student, seated on the far right at the table, is from a non-English speaking background; to the left,
seated on the couch is a group of three teachers reviewing her work at the mid semester point. She is attempting to describe the reticulation of rain water from the roof to “water the plants inside” her house design:

Before frame 35 the student has been describing her idea with a slight verbal stubble; when attempting to say ‘outside’ she accidently uses the literal translation of the German ‘outland’. In the next sentence she nearly repeats the error: “And then maybe you can use the rain water from the outside … and from the outland to the inl … to inside.” Realising that she should say ‘inside’ rather than follow with another literal German translation (‘inland’) she pauses and instead ‘draws’ rain in the air with a raised index finger (frame 35). The ‘rain’ gesture is in one sense a gesture repair as it serves as ‘filler’ bringing the pause between ‘inl…’ to “inside”. The use of the gesture, however, seems to help her keep the content of her speech focused on the main descriptive task. In frame 36 she attempts to explain how she will make a feature of this water system by making a ‘cut’ into the side of the building, which is also illustrated in a sectional drawing. Information about how the water articulation works is only partially present in each modality, speech, gesture and drawing — but taken together they make sense. As she mimes the cut by forming a loose pincer shape with her hand and moving it horizontally across her face as she says “Like you’ve got a cut into” she links the ‘cut’ in the drawing with the act of catching rain water, because the shape of her hand is similar to the representation in the sectional drawing. The audience is invited to link the gesture and the words to the picture. This linking, such that the gestures start to act as ‘signifiers’, continues in the

365 This occasion is an ‘interim crit’ where critics are invited to watch not to give summative assessment, but a formative one where the student can seek feedback about her work from outsiders. This instance was counted as a desk crit because of the informal nature of the occasion.
next gesture (frame 37) where she keeps her hand in the pincer shape but raises it up to the former position where she mimicked ‘rain’ and repeats the ‘rain’ movement with the ‘cut’ form.

Occasionally some indication of material composition was packed into compositional gestures. This seemed to be the most under-utilised aspect of qualitative gesturing, but again this could be an artefact of the types of conversations that were occurring in the studio where form was mentioned far more than surface treatment. In the following, Simon (seated on the right) uses a metaphorical gesture image to talk about the kinds of material that the student should use in her project. Up until this point he has been working on a plan with the student (seated on the left) on a plan and discussing various parts such as stairs and doorways; talking, pointing and using other mediating gestures to keep the discussion moving along. In Frame 38 he draws back from this level of detail and refocuses the talk on the whole building, using his right hand to point at the middle of the page while saying “I would hate to see” and hovering his left hand over the plan drawing that he and the student are discussing:

I (. ) would hate to see (0.4) =this <one> hom::ogen ous

In the first gesture pose the whole drawing is implicated in the statement; in frame 39 the qualitative gesture is applied over the whole drawing surface. As the teacher says “this one homogenous” he orientates his left palm back to a more vertical position and rotates his right hand so that it is pointed, palm down, at the paper surface. During the utterance of “homogenous” he makes a back and forth sweeping motion with his palm, much as if he was wiping a bench top. The gesture is suggestive of a smoothing over or wiping clean. Towards the end of the gesture movement (frame 40) he brings both his hands back to the edge of the paper and hovers them,
orientated slightly towards the student as he finishes with “material treatment”. This is a good example of gesture movement mapping an idea or object.

In the following example, material treatment is discussed more explicitly, this time in a gesture/sketch hybrid where the tip of a pen illustrates the ideas the teacher, Anna, is putting forward to her student. In ‘design-speak’, drawings of a looser and more expressive quality are occasionally described as ‘gestural’. The truth of this comparison can be seen in the following example where Anna is talking to a student about the different possibilities for putting a roof over an outside area in his scheme using two different ‘gesture sketches’ to make her point – one which picks up on the physical properties and the other which uses a more direct illustration.

In frame 41 she draws a horizontal rectangle shape to represent the roof in cross section, adjacent to a vertical rectangle that she has already drawn to represent a wall, while saying “some sort of new” (a reproduction of the appearance of the drawing at each time point is shown below each frame on the next page):
In frame 42, while saying “some sort of transparent thing” she draws a series of diagonal lines through the horizontal rectangle that suggest rays of light passing through the roof. As she continues with “or, you could think about putting… Herzog and De Meuron would put a big print, a repeating print on there” she draws a further rectangle below and places some rough circular shapes on it. In this drawing she has flipped the view of the ‘roof’ from section to plan view. An example of such a Herzog and De Mueron treatment is shown below:
The diagonal lines are a simple mapping of the idea of light ‘passing through’ that is not dissimilar to the movement of the student’s hand describing light hitting the balcony of her building shown earlier. The drawings of the ‘big print’ are not an attempt to make a precise reproduction of an original Herzog and De Meuron print, but are suggestive of the idea.

In this case both the drawings could be viewed as the visible traces of a gesture act.

Lastly, qualitative gestures might be used to indicate the affect of materials and architectural form on the beholder moving through the proposed building. In the following example a student has been talking to her teacher, Simon, about the relationship between a theatre space and the café in her project. The café is located directly underneath her theatre and the student is asking the teacher whether or not she should also apply the same material treatment to both. In frame 44 she uses a mediating gesture, hovering her pen and making circular motions above the café plan drawing saying “what do you think about the café?”, while looking at the teacher’s face. He is poised with his hand on his chin in his accustomed ‘listening’ pose, uttering “ahhh - umm” just as she comes to the end of her sentence.

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367 Each of the teachers had a repertoire of listening poses. Simon seemed to prefer to place his hand on his chin in a fist shape while listening to students talk about their work. This seemed to work well, as the semester progressed students began to respond to his hand to chin movement by starting talk without being otherwise explicitly invited to do so.
She takes his non-committal utterance as a signal to keep on with her question, saying “Or should I leave it so that when you come into it…” (frame 45). As this statement is being produced she starts to bring both her hands up from the page, with her fingertips orientated towards each other. The shape is suggestive of a volume that is held in front of her torso. She follows immediately with “it’s like…” (frame 46) and rotates both palms so that they face upwards in a dramatic ‘reveal’. This gesture makes sense in the context of the earlier conversation about the roof of the theatre. She is asking whether the café should give any hints as to the grandeur of the theatre space she is proposing. Her question in frame 45, “so that you come into it”, refers to coming into the proposed theatre space. Earlier she has described this theatre as being similar to the interior of the Capitol Theatre in central Melbourne; presented earlier in this chapter, which has a dramatically sculptural and lit ceiling:
Her final gesture summons up the idea of seeing the underside of this ceiling as a kind of ‘revealing’, which the teacher can understand because they have established earlier in the conversation that they both had knowledge of this space and consider it to be “crazy” and “a beautiful space” (refer to the other segment of this conversation which is outlined in the section on compositional gestures). Her lack of accompanying description, instead uttering a simple “it’s like…”, transfers the attention of the teacher from her verbal speech to her hands; the upturned hands suggest not only the underside of a ceiling but a variation of an emblematic gesture of a ‘I don’t know’ shrug. The pause in her speech and her gesture both signal the idea of the affect of the space that is revealed in the theatre would be somehow ‘beyond words’ and revealed to the visitor in a way that would make them literally “stop in their tracks”.

Summary of Qualitative Gestures

Many qualitative gestures were similar to McNeill’s metaphoric gestures (described in Chapter Three) in that they used a visual image to represent an idea or concept rather than exhibiting a purely formal correspondence. Qualitative gestures made virtual objects that could be apprehended as ‘feeling images’ rather than as images. In this way qualitative gestures functioned as way of performing the feeling of spaces, surfaces and even ideas. Qualitative gestures were the least common of all the gesture types that were generated for this thesis. Their most important role was in capturing the experiential and dynamic qualities of proposed architectural spaces, aspects
that were difficult to represent in other mediums. Their relative lack of frequency is perhaps tied to the amount that these experiential dimensions are talked about in the desk crit stage. Although this aspect was not explicitly researched, a review of the field notes performed after this analysis it revealed that discussion of experiential dimensions was more commonly observed in jury presentations than in desk crits. The notes suggest that desk crit conversations on the whole tended to focussed on formal and compositional concerns, but obviously there would have to be some more research to substantiate this claim.\(^{368}\)

Qualitative gestures were often used with other gestures as a kind of ‘adjective’ – adding flavour and colour to an utterance. The position of the gesture in relation to the body was important – especially in ‘calling up’ imagined points of view when pantomiming movement through imagined spaces. Like mediating gestures, qualitative gestures could be presented sequentially to help ‘tell the story’; this was especially powerful when these gestures were used to illustrate the experience of an inhabitant’s (moving) point of view. Qualitative gestures therefore played an important role in conveying the phenomenal experience of proposed architectural spaces.

Similarly to compositional gestures, movement was the key to the success of a qualitative gesture; the shape, speed, range and path of the movement could be mapped onto qualities such as hard and soft, loose and tight, textured and smooth. The teacher who showed the most facility with qualitative gestures was Pia who would use them to strong rhetorical affect in her discussions with students. It was interesting that Pia’s qualitative gestures were particularly effective because her language was more elaborate than the other two teachers (this is perhaps because she was mostly dealing with students who were more progressed in their studies).

Although this analysis suggests ways in which gesture is socially organised, it is an account which is abstracted from the flow of action in the classroom which, I have noted, may make it appear to more intentional than it is. Much of the power of gesture is its subtlety. Teachers are startled when they are alerted to its ubiquity and seemingly logical structuring. This conversational content analysis allows us to see gesture in terms of patterns which perform certain kinds of knowledge work. In the next Chapter I will deal with how these patterns appear to dissolve in the experience of everyday action in the design studio and what the implications of this might be.

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\(^{368}\) A thesis on the linguistics of the design studio is being prepared by Janne Morton in the Faculty of Architecture, Building and Planning at the University of Melbourne the time of writing
Chapter Six: Gesture as knowing in motion

This chapter investigates how gestures work, along with representation and speech design knowledge practices, such that designerly actions can never really be functionally separated from designerly knowing and designerly being.

I noted in Chapter Two that ways of being and ways of knowing have come to be seen as intertwined. Throughout the history of architectural education, students have been doing ‘identity work’ along with their development of design skills. This identity work consists of taking on and enacting different kinds of subjectivities. Earlier, Peter Corrigan’s studio was discussed as an example. Through using his table, football stadiums and a radio amongst other things, Corrigan orchestrated the performance of a design studio which produced a certain kind of subjectivity – that of the struggling young practitioner. I have mentioned already how Corrigan’s sighs were one of the most interesting features of his teaching style. These sighs were produced during the round robin critique that the students undertook at the boardroom table. The sighs were explicitly performative. I called them a “potent device”, not because they stopped a student from speaking, but because it affected their performance of speech. By signaling his frustration, but not speaking over, or for, the student, Corrigan was able to affect their confidence in what they were saying, perhaps causing them to shape their verbal performance more carefully.

Foucault claimed that subjectification occurs through this kind of ‘disciplining’ of the body. When talking about the process of turning out students with good handwriting, Foucault points out that this process depends on the development of a whole body posture and that: “A disciplined body is the prerequisite of an efficient gesture”. Foucault goes on to document in great detail the ways in which schools were arranged helped to bring about such efficient gesture. He then turns this observation onto the relations we have with inanimate objects like tools and claims that forms of discipline can shape the relations that bodies have with objects, citing certain kinds of military training where rifles were handled in particular ways, such that: “Over the whole surface of contact between the body and the object it handles, power is introduced, fastening them one to another”. Through the coupling of body and object, disciplinary regimes of power can arrange a “positive...

369 Foucault, Discipline and Punish: The Birth of the Prison. Pg 152
370 Ibid. pg
economy” through the production of ordering processes. This chapter is interested in how gesture and the handling of representations can expose such ‘ordering processes’ of the design studio in action. Foucault may have called this a study of the ‘micro-physics of power’ that operate in design studios.

**Gesture and normative classroom practices**

This chapter investigates a puzzling problem that appeared when the data analysis for the previous chapter was shown to and discussed with the expert panel and others. The descriptions of different types of gesture work that emerged from this conversational content analysis provided ways of thinking about gesture, of regarding the work it does, but they were not the end of the story. For a long time, there was another category called ‘ordering gestures’ sitting in this analysis apparatus because gesture often seemed to act as way of creating and/or maintaining classroom ‘orderliness’.

A close study of the video data collected for this thesis showed how gesture played a role in helping people in the studio speak, inviting people to speak and, occasionally preventing people from speaking at all. For example, students and teachers tended to ‘freeze’ their bodies into a characteristic set of ‘listening poses’ when they were not talking. Below are several examples of one of the listening poses Pia would tend to assume:

*Pia shown in three variations of one of her characteristic ‘listening’ poses*

However, when listening to an answer to a question, teachers would tend not to assume a standard listening pose but would often ‘freeze’ in the pose they had been holding while asking the question, regardless of whether the pose appeared to be uncomfortable or unnatural. The series of images below is a good example. Just before the film starts, Simon has been holding a model at eye level while asking the student a series of questions. The camera was turned on just as the student decides to show him something on the computer as part of his answer:
In frame 1 Simon is shown holding the model in the same pose he was holding it during his ‘question’ segment while the student tinkers around with his computer (9.6 seconds). Perhaps holding the model with one hand becomes uncomfortable because, without speaking, Simon eventually lowers it to the table (frame 3), but continues to keep his hand on the model in the same place he was grasping it throughout the rest of the student’s answer (a further 25 seconds or so) and only lets it go to perform a gesture phrase as he answers the student’s question.

There were many other similar moments in the films where it seemed that students and teachers worked to keep their body as ‘quiet’ as their voice as a way of clearly ceding the ‘floor’ to another to speak. Occasionally this pause or ‘body silence’ would be used to a more rhetorical or expressive effect. Pia was particularly good at designing dramatic pauses in her talk as can be seen in the following example where she is observed extending on the architectural implications of a student’s idea, using gesture as a method to improvise a ‘virtual object’ she can manipulate as she speaks. In this case the student has proposed a malleable, soft wall to divide the space occupied by “children” from that of “old people” in a domestic house. Pia has picked up on this idea and is describing her reaction to it back to the student.
In frame 2 Pia is shown performing the ‘softness’ of the wall with both hands raised and alternately ‘pushing’ on an imaginary surface. In frame 3 she pauses in her movements, with her left hand still upraised to form the “wall”. She is saying nothing but has extended her right hand palm up to the student (1.2 secs).

The pause is brief but the student’s lack of response, both in speech and movement, needed to be accounted for. The expert panel pointed out that he is often shown moving or speaking to fill shorter pauses during this film. Pointing with the palm of the hand, as Pia is doing here, is generally understood as being more ‘polite’ than pointing with a finger; it can operate as an invitation or ‘handover’ that signals another’s turn to speak\(^\text{371}\), but in this case shown here it is not taken as such.

The student stays still in a listening pose; he seems to understand she is making a rhetorical flourish, perhaps because her other hand is still raised to signal that her utterance about “wall” is still underway. She then slides her right hand back towards her left as if directing his attention back to the idea of “wall” and linking the “sense of people’s hands” to her next utterance “of each other” (frame 4). This moment is particularly effective as she is ‘loading up’ the “wall” gesture with an idea of affect or ‘intersubjectivity’ through speech and her pause in speech and movement invites him into this moment of silent contemplation of the architectural implications with her. Numerous gesture phrases similar (but often not as accomplished) as this one were observed in all films.

However these sorts of gesture phrases initially presented me with a problem because they were hard to categorise. Should they be called ‘qualitative’ because they pantomime dynamic properties, or are they strictly speaking ‘compositional’ because they mimic architectural form? For a while Pia’s ‘wall imagining invitation’ sat in the provisional category of ‘ordering gestures’. But, over time, far too many gestures ended up in this category. All gesture seemed to play some sort of a role in ‘ordering’ the talk and shaping the interaction in the classroom. The following instance is a good example of how the three different gesture types can be enrolled into a design story-telling performance with things to produce an ‘ordering effect’. In this film segment a student (Scott) is describing his design proposal while he is physically located on the site in question (inside a domestic house in Suburban Melbourne). A diagram of the room layout is below:

Since he is physically located in the space his representations describe, Scott can be observed enrolling the physical space, his representation of it, and the space in front of his body during his story telling performance. He begins by giving a description of his overall aim for the project starting in frame one where he is shown leaning back with his left hand on his knee. His elbow is pointing away from his body and he is directing his gaze at the screen; as is Pia who is seated on the end of the couch.
He begins in frame 5 by shifting his hand up off his leg and performing an open hand pointing gesture at the screen while saying “this thing’s ah…” Pia looks towards him as he utters “how to create something that’s” (frame 6). He responds to her shift of attention by turning his head to meet her gaze so that, by frame 7 they are facing each other. Scott then orients his left hand so that his palm is held facing towards the ceiling and performs an up and down motion on the words “exponentially beneficial” (frame 7). This could be described as a qualitative gesture that uses the upward movement as a metaphor for ‘growth’. Pia leans in towards him slightly as he performs this gesture, fiddling with the plug on the end of a spare computer cord.

Scott continues to talk briefly about this idea of ‘exponential growth’ while they are looking at each other. In the next sequence he smoothly directs her attention back to the screen, beginning with “So I was looking at the Nefarious House? The common wall?” (frame 8)

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372 Whether movement is up or down bears on the meaning of gesture; in McNeill’s extensive studies of people performing gesture while describing fairy tales to an audience he found no instance of a movement ‘down’ with a verbal description that involved ‘up’ or ‘more’. For further on these studies refer to: McNeill, Hand and Mind: What Gestures Reveal About Thought.
On the word “wall” he lifts his hand up in a ‘wall’ shape, with palm turned to face his body. This is a compositional gesture that slides into a mediating gesture; Pia continues to ‘track’ his hand as he drops it down and orientates towards the screen. She is shown looking at the screen again in frame 10. Thus Scott uses the resources at his disposal to keep her engaged and with him throughout his explanation so she can make an informed response to his story.

As time went on, it was more and more difficult to capture and define ‘Ordering gestures’ as a category at all. This caused the researcher no small amount of anxiety as these moments were clearly vitally important to design studio interaction. Eventually it became apparent that ‘ordering’ was too generalised a phenomena for the conversational analysis and content analysis method to adequately capture or explain it. While the method had helped to generate clear descriptions of gesture behaviour, it tended to smooth out these affective and rhetorical dimensions. So ‘ordering gestures’ was scratched as a category altogether, but nagging questions remained. What is the nature of the ‘order’ that was being produced here? How does gesture help to create order from which certain kinds of subjectivities, meanings and knowings might emerge?

Another method was required to explore these normative knowledge practices in the design studio whereby assemblages of people and things helped each other to make sense of what was going on. To engage with this sort of enquiry a different kind of scrutiny was applied to the transcriptions following the advice of Bruno Latour’s (somewhat) Socratic professor: “Don’t break it down first into neat little pots; try to follow the link they make among those elements that would
have looked completely incommensurable if you had followed normal academic categories. This is an actor-network way of looking that just attempts to “… describe the state of affairs at hand”.

This exercise was useful because, on close examination, what appeared to be an ‘ordering process’ enacted by gesture was more like ‘ordering work’ that was performed between gesture, representation and speech – and not just the actions of humans. The discussion of the results of this analysis forms the rest of this chapter.

Ordering Gestures?

There is a cluster of definitions around the word ‘order’ ranging from a description of a religious community to a command given by a superior officer to a subordinate. All the definitions however have the character of regularity, repetition and predictability and imply that this condition is imposed by either a person or a set of rules or procedures. While the classroom ‘orderliness’ observed in these films had something of the character of regularity and predictability, it was not usually in the form of a command or rule. Although power relations were implicated in some way, they were not clearly organised in a hierarchy — often-times students appeared to be more ‘in charge’ than the teacher. If there were rules here, they were implicit rather than explicit.

One way that order is created through implicit rules that are never spoken is via ritual, a ‘customary practice or procedure’. The desk crits captured in this observational study can certainly be understood as a form of ritualised event because neither the teacher nor the students needed explicit instruction as to what needed to be done. Other researchers have noted the ‘ritualised’ nature of aspects of design studio education, particularly in relation to the assessment of students by design juries and the ‘bootcamp’ habits of design studio production. Webster argues that the design jury has a ritualised ‘staged’ quality that is visible in the material arrangements of the rooms. She gives the example of the ‘line up’ of jury chairs in front of a student’s pinned up work and how they help to promote asymmetrical power relations. The occupants of these chairs can take up the power they are accorded to speak at any time; but these jury chair lines ‘turn their backs’ on the student audience gathered behind. The implicit rule is that

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373 Bruno Latour, "A Prologue in Form of a Dialog between a Student and His (Somewhat) Socratic Professor," (2003), http://www.bruno-latour.fr/articles/article9090.html. Accessed 30.10.08
374 Ibid.
375 Examples from wordnet.princeton.edu/perl/webwn
376 Definition from wordnet.princeton.edu/perl/webwn
377 See for example Cuff, Architecture: The Story of Practice.
those in back seats cannot be easily recognised by the jury in the front seats who are accorded the power to speak and to make others speak; thus the audience is effectively silenced. Through descriptions of these kinds of practices, Webster highlights the tensions inherent in the design studio as simultaneously a site of ‘student centred learning’ and as an exercise of ‘coercive practices’ that seek to impose hegemonic skills and values.

However the kind of ordering practices shown in the film excerpts above seemed to be qualitatively different from the rituals Webster criticises. The orderliness produced by the strategic gestures, pauses and body movements in these moments seems more improvised and event like. Coercion, if it could be said to be happening, is certainly more subtle than that which operates through a line up of jury chairs.

The temptation is to think of this orderliness as being produced by the design studio as a ‘context’ in which action takes place, but Bruno Latour warns that ‘context’ is a problematic notion. Latour would prefer to do away with the idea of ‘context’ altogether as he maintains that what is positioned as ‘the outside’ (for example: the institutional location) is not a context ‘made up of’ social forces and it doesn’t ‘determine’ the inside. This statement resonates with Emanuel Schegloff’s claims that conversational context is made of at least two parts; one is the setting in which the interaction occurs such as ‘hospital’, ‘factory’, ‘town hall’ or ‘design studio’ and the other is the ‘intra-interactional’ context that is formed during the interaction itself. What Schegloff means by this is that participants tend to conduct themselves according to what ‘genre’ of interaction they are in (ie: ‘buying’, ‘selling’, ‘design storytelling’ and so on) and the identity they are taking up and enacting in this interactional moment. Schegloff emphasizes that this identity formation should not be taken for granted. Just because an individual is designated as ‘student’ in the design studio does not mean that they always ‘act’ as such while there – there are other identities that are possible in design studio moments, such as ‘friend’ (or even ‘nuisance’).

Returning to the earlier instance of Pia and her student talking about the ‘flexible’ wall, a diagram of the space in which the interaction occurred is set up below to help explain some of the other actors in the scene who might not be immediately obvious from the frames presented already:

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383 Similarly the fields of ecological psychology and social psychologists describe them as ‘occasions’, ‘events’ or ‘situations’
The SIAL lab space helps to shape classroom interaction in certain ways. The hanging projection screen in the middle of the room forms a surface that helps this design studio organise itself in digital space as well as in physical space. Unlike a laptop screen, this projection screen is the size of a dividing wall; it is so large that the whole class can see it at once. The table for students and teachers to sit at is positioned in front of the screen; the moveable keyboard and mouse on the table turn this configuration into a giant desktop computer that anyone at the table can manipulate. Therefore the collaborative class blogs and wikis can be viewed and edited while the class is running and models and images can be manipulated, copied and shared in full view of everyone. The digital space of these blogs and wikis was very active during this semester; here the students shared ideas and worked co-operatively. In fact the projection screen is so important to how this class operates, so present, that it could be argued to act almost like another member of the class sitting at the table; it has agency that is different in kind, but not necessarily in effect, to the other, human members of the class. This agency is constituted in time and space; at this moment, when Pia holds up her right hand, she is orienting it at another ‘member’ of the class who should be treated as part of the conversation, not waving it randomly in space.
This lends the gesture more gravitas than might otherwise be suspected on casual inspection of just the visual data. In this moment we can see a joint imagining of design possibilities which is a ‘network effect’; to produce this moment of joint imagining the screen does ‘work’, the room ‘works’, the mouse and keyboard ‘work’ as does Pia’s gesture and speech and the student’s silence. Gesture is the way that Pia is able to ‘tell’ her student to stay silent and pay attention to what she is saying about the digital member of the class (the representation on the screen).

This could be called an ‘orderly’ design studio moment because architectural knowledge and meaning is clearly being produced through the work that is being performed by animate and inanimate actors working together. Is the student being ‘oppressed’ by Pia and her point of view because he is, for the moment lacking voice? What else might be going on here? Can looking closely at gesture and associated ‘body work’ offer another way to think about power, knowledge and bodies in the design studio without retreating into such sterile oppositions?

A promiscuous model

This next segment of film was captured in week 9 of the participant observation work which I performed in the ‘Biospatial workshop’ run by Pia Ednie Brown. There is no room here to do justice to the full interaction, so I will concentrate instead on several moments of classroom interaction and explore what kind of classroom ‘order’ is being produced and the role of gesture — and body work more generally — in it. By sharing the experience of ‘playing with’ a cardboard

384 This term is taken up from words the teacher uses in the following transcript. ‘Playing’ is a term often encountered in the studio to describe design work; the term might be usefully contrasted with the idea of design as a serious ‘problem solving’ activity. This takes on extra resonance through Usher and Edwards insights into ‘play’ and postmodernism: ‘— ‘Serious’ modern culture aims to give a ‘truthful’ representation of reality and thus educate people into viewing the world into viewing the world in particular ways conducive to
model the teacher and the student are able to ‘stay together’ during this moment of design story
telling and producing architectural meaning, knowing and subjectivity. As the interaction unfolds a
different kind of order emerges – one that operates through affect rather than asymmetrical
enactment of power relations such as those discussed by Stevens\textsuperscript{385}, Cuff\textsuperscript{386}, Anthony\textsuperscript{387} and other
critics in Chapter One. Through being affected, and producing displays of affect, the teacher, model
and student are enrolled in a designerly actor-network which produces knowledge and different
forms of subjectivity.

In this segment, one of the students (Scott) can be seen showing a physical cardboard model
he has made to his teacher (Pia). The model consists of a number of linked boxes, a little like joined
pieces of origami, arranged in a grid pattern. The model is an analogue mock up of the way a digital
parametric model might work; in fact Scott has produced it as a prototype for a parametric model he
is planning to build\textsuperscript{388}. It is parametric because any manipulation to part of the model’s surface will
affect the whole form. The boxes are ‘open’ in their relaxed state, but pinching the corners of a box
together, or bending the grid, causes all the boxes to react (to a greater or less extent) and thus
changes the nature of the surface, making it more or less rigid. A picture of the model is shown
below.

The Bio-spatial workshop was an interdisciplinary design studio where architecture students
had been working with fashion students and environmental science students during the semester.

\textsuperscript{386} Cuff, \textit{Architecture: The Story of Practice}.
\textsuperscript{387} Anthony, \textit{Design Juries on Trial: The Renaissance of the Design Studio}.
\textsuperscript{388} Scott developed this model after the class were asked to design a flexible, ‘field based system’ over a number of short exercises. The
idea of a field based system is a system that moves without a central control mechanism and was able to be influenced by multiple inputs.
This model develops the idea we saw the student put forward in the previous chapter where Scott was talking about a surface that
‘dilates’.
The fact that the model looks a bit like a piece of cloth rather than a building is probably not that surprising, unlike the model’s animate quality of movement and responsiveness to touch. By being flexible and offering itself up to a large range of manipulations (without breaking), it seduces its designer and his teacher to spend time in exploring its potentials (it even lures me, the watching researcher, who cannot resist the desire to touch it when the teacher and student are finished their work). It is this quality of movement and the formal possibilities it suggests that helps the teacher and student decide what it is they can know about it, explore its potentials, share how they feel about it and decide whether the potential it offers will go on to be more concretely actualised in a student’s design proposition. What makes this model a powerful player in this performance is its promiscuity[^389].

At the start of this exchange, Pia and Scott are seated at a table within a big room on level 3 of building 91 at RMIT University. The building is corporate, 80’s style; its lobby is polished granite. Here, upstairs, the walls have been recently repainted – white with a highlight of lime green – the carpet is industrial dark grey. It is the new home of ‘The Design Institute’, a recently formed research cluster at the university. I sit at right angles to Pia and Scott, close to the action, while the model lies, quiescent, on the window sill in front of us. For the moment there is no other student paying attention; they are either working on their own projects or having quiet conversations. Prior to me turning the camera on, Pia and Scott had been talking about Scott’s design progress and the model he has made. When the camera is turned on, the quality of this initial talk is still very composed; both teacher and student move between placing their hands on their chins and folding their arms on the table as they talk, although Scott does perform some mediating and compositional gestures representing the movement the model is capable of without actually using the model itself.

[^389]: Thanks to Lyn Campbell, member of the Actor Network Theory discussion group at the University of Melbourne, for pointing this appropriate word: personal communication, August 8, 2008
With the exception of the pen, which the student picks up and puts down as he talks, there has been no engagement with the architectural tools in the immediate vicinity which includes drawings on paper, straight edges and a variety of pens and pencils. Seven seconds into this transcript Pia (seated to the left of the student) asks “Can we play with that?” pointing at the model (frame 11).

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Pia and Scott sit at the table with his drawings and equipment.

The model is just out of sight about here

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Scott performs some compositional gestures after pointing at the model

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Frame 11
7 secs
Is it (0.2) Can we play with [that?]"

[hm up]

Frame 12
14.5 secs
"I’ve taken (0.4) I took some photos in the photo lab (.) of it

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Pia’s talk is rendered in Arial, Scott’s in Baskerville Old face and mine in Century gothic. = indicates over talking, … indicates a pause of more than 0.5 seconds.
The student replies with an affirmative grunt, reaching over to pick it up and starting to spread it out on the surface in front of her saying “I’ve taken … I took some photos in the lab”. Pia’s pleased smile can be seen overlaying this talk in frame two; it is first directed at the model and then at Scott’s face (frame 12).

![Figure: Close up of Pia smiling in frame 12](image)

Her gaze direction clearly invites him to share in her response, but Scott misses this moment because he is busy rearranging tools on the table to give them some room to “play” with the model. When control of the model is handed over to Pia however, the smile slips from her face and she can be seen regarding the model with a thoughtful gaze (frame 13):
I did some stuff (0.4) I should probably take some more

From this point we could describe Pia as being in the process of subjecting the model to her own version of an architect’s ‘professional vision’. As I have already mentioned, Goodwin describes professional vision as “socially organised ways of seeing and understanding events that are answerable to the distinctive interests of a particular social group” 391. Pia is exploring the model like an architect might, in this case directed at exploring how the model can be deformed in order to make new forms. This inspection is simultaneously tactile and visual as she manipulates the model to see what formal configurations it is capable of performing. She begins by holding it up in front of her with both hands like it is a piece of cloth. This holding is strategic; by keeping her arms stretched out towards Scott she mobilises a shared model inspection space on the table between them. The model helps create this space by hanging like an inert piece of cloth for a moment, creating a static point of focus for their gaze. This shared space, created by the teacher and the model, helps to keep Scott included and invited into Pia’s act of looking and feeling.

She pauses without speaking for a moment, then lays the model flat on the table and moves her hand underneath the surface, beginning to test out its response to her actions (frame 14). During

391 Goodwin, "Professional Vision." Pg 606
this first manipulation she still tacitly includes Scott by locating the action in the model inspection space. The model flexes slightly during this gentle touching, it is not yet extended into the full range of movement it is capable of because Pia is being careful – this model is a bit of an unknown entity at this point because it is animate where most cardboard models are static. Meanwhile Scott keeps his gaze on Pia’s hands and the model, holding his hands in his lap and refraining from speaking.

Although Pia is not talking (frame 14) the model is making a peculiar rustling sound which is produced by the cardboard parts rubbing together. This is a dimension that would be entirely missing in a silently moving computer model and is, unfortunately, missing from this text. The sound contributes to the interaction; when Pia starts to turn the model over the rustling noise increases sharply in volume, which is perhaps why she asks slightly anxiously if it will “hold” (frame 15). Scott responds “Yeah-ah”; a descending inflection in his tone which asserts his confidence in his crafting of the model.

As Pia turns the model to place it on the table I utter “It looks amazing.” Pia and Scott both completely ignore my comment as they briefly recompose themselves into new positions (frame 16):

As outlined in the methodology, it was my habit while observing to still express my responses to the work I saw if I felt moved to do so. In this case, my utterance was a result of the excitement I felt at the quality of movement possessed by the model – it almost felt like it was alive. When she was Pia was given this chapter of ‘thick description’ she noticed that I had put forward this moment as evidence that I had successfully become a ‘fly on the wall’ researcher because they seem to have stopped noticing me. She put forward a counter
Pia then says “here let’s put it like this” (frame 17) as Scott shuffles some papers about and she lays the model down flat on the table again. The model has now been put through some of its preliminary paces. What begins to become apparent, as we all watch, is that the actions that Pia is performing on the model do not have entirely predictable results – movements in one area are registered over a larger area of the surface. Cause and effect are more loosely joined in this model than one would normally expect and as a result its movement is a little unruly. Pia has determined two important things about it from the model’s response to her: specifically its quality of movement and its durability. She now returns it to its flattened state, back on the table and upside down from its original orientation. She starts speaking again while focusing her attention on the opposite corner of the model from Scott and continuing to manipulate the surface: “I’m wondering about the nature of the variation” (frame 18). She is now outside of the shared model inspection space and seems to direct her statement to the model as much as Scott, bending her head and keeping her gaze on the model as she manipulates it.

explanation and claimed that, contrary to my assumption; she was constantly aware of my presence but made a conscious attempt to treat me and my camera as “background”. She noted that this had taken an effort to learn and that the students had learn to do so as well. She further explained that, since I had been doing this observation work for nearly a year at the point this film was taken she didn’t feel that she was acting ‘unnaturally’ as a result of me watching, but that if I had been without my camera and not in my assumed researcher role she probably would have invited me into this moment as a fellow designer and long time colleague. Scott merely commented that it was strange to see his reactions noted in such minute detail.
After making this statement she relocates her inspection back into the shared space; putting both hands under the model so that it is draped over her left forearm and pushing up with her right hand, watching how this different kind of action registers in the movement (frame 19). Under her hands the surface undulates luxuriously and the boxes on the top of the moving ‘hill’ that she makes with her forearm and hand stretch wide open. This different kind of appearance, produced when the model is starting to reach its full range of movement, provokes a moment of aesthetic pleasure for both designers. This pleasure is shared through verbal and body cues, which Pia begins with: “What it gives you is this way of curving the surface so they’re more –” The sentence remains incomplete because she interrupts herself as she catches sight of the way the surface undulates, raises her eyebrows and widens her eyes slightly; perhaps unconsciously echoing the movement of the model as we can see in this intervening frame, between 19 and 20 shown below:
This time she turns to share her reaction to the model with Scott more explicitly, squeezing her eyebrows as she says “Oh - it’s great isn’t it? The way they do that?” (frame 20). It is interesting to note that Pia seems to credit the model with possessing its own form of agency, apart from her manipulations in the way she phrases this question. The pleased expression that accompanies this statement is brief, but she faces Scott fully as she performs it, inviting his response. He acknowledges and enters into her response with his utterance of “mm-hmmm” and a brief smile, while keeping his hand on his chin. A close up of this moment in frame 20 is shown below:

The affect of aesthetic pleasure provoked by the movement of the model is tightly managed by both designers: although it is allowed into the interaction, it is not allowed to take over for too long (approximately five seconds). They do not allow it to ‘carry them away’. If it seduces them fully they risk becoming ‘unprofessional’, lost in admiration, entranced by the model’s aesthetic effects. Instead they work to stifle this affect and regain the critical register established earlier. Despite his smile and answering “mmm-hmmm”, Scott maintains his ‘composed’ listening pose, notably echoing Pia’s early hand on chin pose, and, within a few seconds, Pia has resumed her former demeanour and redirects her attention from his face back to the model (frame 21). In addition she ‘brackets’ her previous excited reaction “the way they do that” by explaining the results of her action and putting it back in the context of their discussion: “… the way they sort of open up – get pushed open. So it’s sort of like an issue of curvature that you’re playing with” (frame 21). She then pauses and ends performing the big movements with the model, eventually returning her attention to the corner away from Scott (frame 22). With less energy being put into the manipulations the model quietens down and begins to resemble a flat, less affective, surface again.
Pia is not ‘modelling’ professional behaviour. This is not a didactic performance designed to instruct. This is an example of knowledge in motion — a performance of the body as of the voice in which architectural meaning gets ‘done’. It is helpful to first make a distinction between knowledge that someone has and ‘knowledge generation’. Pia and Scott both have ‘architectural’ knowledge that is declarative (knowledge of) and tacit (knowledge how). In this case their knowledge ‘of’ and knowledge ‘how’ is put to work to generate action that will (presumably) lead to the ‘knowing’ Scott needs to go on designing. This knowledge generation is a process (‘talk with things’). As a process it is potentially endless and does not clearly fall into the cognitive, embodied or material realm.

Significantly Pia is sharing with Scott this performance through the act of ‘playing with’ the model, rather than for instance telling him what to do with it, she implicitly treats him as a member of her professional community. The kinds of subjectivities that can emerge in design studios are different from what we might see at work in other classrooms, for example, in an undergraduate maths class. The design teacher is a knower who does not give a correct ‘answer’ but, amongst other things, asks the right kind of questions of the architectural representations she is presented with. The student is not a learner who consumes a set of known facts, but a producer of design artefacts. Scott has ably demonstrated his competence to Pia by producing such an exciting model and entering into a functional critical discussion about it which includes displaying appropriate ways of acting, ways of looking, ways of touching models and drawings as well as its ways of
experiencing pleasure in architectural things (being affected and managing that affect – not getting too ‘carried away’).

How membership is done here, in this design studio actor network, is different to how it might be done elsewhere. Competency as a member of this professional community is a relational network effect; what skills and behaviours might be signed as membership competence are both contingent and localised. Here signs of Scott’s competence are in the way he can smoothly take part in this model play. The signs may well be different outside the studio. For example, in a workplace, what might count as competence could be correctly rolling a drawing set for posting (or remembering how the boss likes to take his or her coffee).

The fact that Scott can display competence in the ways of being in the studio is evident in the way he and Pia smoothly exchange ‘leadership’ in the exploration of the model. Up until this point Pia has led the exploration, now Scott begins to take over. Pia begins the ‘handover’ in frame 22 by offering her assessment: “the way they sort of open up – get pushed open. So it’s sort of like an issue of curvature that you’re playing with”. She then verbally invites him to take the lead by asking: “Is that how you’re thinking about it? – or?” (frame 22). He responds by uttering “yeah-yeah. Yeah” and responds to her invitation by beginning to gather up his tools of pen and paper. While he organises himself, Pia moves her attention back to exploring the model on her own, again working away from the shared model inspection space she had created earlier (frame 23).
Pia accepts his take over of the model by removing her hands and leaning over to view his action, keeping her arms crossed over her body (frame 24). In frame 25, after a little more explanation from Scott (which includes him making a brief sketch on the paper) both can be seen actively engaged in pinching and manipulating the model in the way Scott has shown.

Pia then wants to know what the limits of the movement might be – how far the model is capable of being twisted. Scott starts to explain by talking about angles that can be produced and pointing with his pen end to the middle of the boxes and posing his answer as a question: “A flat line?” (frame 26) to which Pia answers “Yeah”. He then drags his pen along the line between two vertices and finishes “between here and here”. From this point his verbal description becomes relatively obscure because the model is doing so much of the explanatory work. In frame 27 he is captured saying “like in terms of this geometric thing” while pinching some of the boxes together and using his pen to point strategically at the intersections that he is making:

He then switches to dragging his pen along the edge (frame 28) and says “so just this line would be 180 [degrees]”. Between these two moves Pia adjusts herself from leaning back to leaning over. Her body movement follows the tip of his pen; her view is not really obstructed, but the sympathetic movement perhaps indicates that she is ‘staying with’ his somewhat confusing explanation. She nods slightly in frame 29 but draws her brows together as she does so — this suggests that she is puzzled, but she does not interrupt him.

Realising that the model cannot quite ‘hold’ the explanation of this aspect of its formal potential, Scott uses his hands and the tools on the table to shift between modes of explanation and
help Pia ‘see’ what he is describing. In frame 30 he begins to explain how the model can take on structural properties by forming what I called in the last chapter a ‘compositional gesture’ while saying “When you start spiralling this…so it can sort of hold itself up a bit” (frame 30) and pantomiming the word “spiral” with his hands, much like he is opening up a jam jar:

He then switches to a sketch while continuing to speak (Frame 31), but doesn’t bother explaining what he is drawing, presumably because he assumes that Pia can read it unassisted. Instead he continues to talk about the morphology of the boxes. He then returns his hands to the model to demonstrate the sketch saying “in this direction” (frame 32). He concludes his explanation of the geometry at this point after Pia leans back slightly from her watching pose and says “oh. Mm-hmm” (frame 33).
Again this segment shows affect management in action: Pia shares her affect (puzzlement) with Scott through a series of facial expressions and poses and Scott works his explanation until she understands, using her bodily cues to judge when his explanation has been successful.

Now that Pia understands the mechanics of the situation, Scott uses the model itself to take the structural form he has been describing in geometric language. He rearranges the model to take the form he has been describing while moving his verbal explanation on to the problems of transferring this model back into digital form in frame 34 (“modelling that is another big issue”). In frame 20 he can be seen shifting the model into a pose to demonstrate his earlier point that it can “hold itself up a bit”. In frame 35, a little further along again in his dialogue, he can be seen using his hands to make salient the formal aspect he considers to be of most interest in this new arrangement. As he utters “you can see this line…” in frame 35 he uses both hands in a sweeping mediating gesture which traces over the relevant part of the model. Pia places her hand over her mouth as she says “yeah” which, along with the tilt of her head, seems to express her thinking about the result of Scott’s manipulation.
Pia takes the lead in the interaction again, now shifting into a questioning mode. In frame 36 she asks “So are you planning to… use it? In this kind of way”. This question is posed in response to the shape that the model holds on the table in front of her. As she speaks she, traces a finger over the line he has just highlighted on the surface. The student leans back in his chair as he thinks about his response for a moment and then tips forward again saying “Yeah, ah… I dunno”. His laugh at the end of the sentence (frame 37) is perhaps as he realises that he can’t answer this important question in any adequate way, unlike his previous smooth responses. Laughter serves many important functions in conversational maintenance. Here it seems to both indicate his embarrassment and serve as an invitation to Pia into sharing his momentary discomfort. Pia smiles slightly in response to his laugh and then leans forward to say: “Yeah – you’ve got a real struggle because you’ve got something, um – quite beautiful as well” (frame 38). She then laughs as well – perhaps in acknowledgement of the inherent contradiction in this statement.

These two moments of laughter are interesting because, like in Corrigan’s studio, laughter is playing a role in organising social relations. Scientific studies have shown that laughter increases certain brain chemicals that play a role in the experience of social affiliation, such as familial bonds. Laughing together can be a very specific way of way of being with others, as Jack

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Katz points out both ‘do’ laughter and are ‘done by’ it. It is a common observation that we find laughter contagious and relaxing. Katz points out that one reason why we find laughter so relaxing is that we are able to do it in a “decorously fitting way” as a way of staying with others. This instance of ‘return’ laughter might be just such an occasion of decorous laughter: Scott’s laughter demanded some sort of return laughter, but it could not be in that moment as it would be inappropriate for her to laugh at him – but she smiles to ease his laughter into the conversation. Her comment about the ‘problem of beauty’ is almost an oxymoron, which then gives her license to ‘do laughter’ at her self and close the laughter invitation circle.

**Affect Work**

This interaction between Pia and Scott shows us that one of the most important things about representations in the design studio is not so much how they look, but how they act. With the proper encouragement, representations can act as good *mediators* in the design storytelling process. Latour defines mediators as being able to ‘transform, translate, distort and modify the meanings or elements they are supposed to carry’; mediators “might have some relations with one another, relation of such a sort that they make others do unexpected things.” In this case one of the ways that the model ‘makes’ Pia and Scott act on it is through being desirable, flexible, fun and interesting – by provoking affect and being affected it does affect work.

The design studio requires students to produce representations that can collude with designers, helping in the process of design improvisation by being open to the possibility of ‘becoming other’. What is or isn’t a ‘good enough’ representation is a network effect; its agency will be contingent on the network in which it is placed. Not unlike Scott’s competence as a student, what might be a good representation in one place will not be in another. From this analysis we can see that the representation which Scott has made is certainly ‘good enough’ to work effectively in the joint imagining which is going on here with his teacher, which in turn helps to constitute Scott himself as a ‘good student’ in this studio.

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395 Ibid. pg 114
396 Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory*.
397 Ibid. pg 39
398 Ibid. pg 106
Affects are feeling processes, which are deeply rooted in, and enacted by, our bodies and therefore not always under our conscious control (consider contagious effects of blushing or laughing\(^{399}\)). Nigel Thrift describes affect as a form of ‘entainment’\(^{400}\) assisted by such processes as hormonal fluxes, body language and shared rhythms\(^{401}\). Being affected — finding pleasure, un-pleasure — is obviously important in how Pia and Scott are working together. In this case the delightful performance of the model is providing fertile ground for the teacher and the student to imagine new design potentials.

In fact what stands out most clearly in the interaction described above is the extraordinary quality of the model. It is a good example of Pia’s own research interests in creating representations that are “puppets that the designer guides, but with enough in-built character to take a part in leading or guiding the way”\(^{402}\). Earlier this model was described as ‘promiscuous’, because, in addition to being tantalisingly strange, it is pliant and responsive to touch. It’s ‘desire-ability’ can be attested to by myself, a not so disinterested researcher, who could not resist picking it up when both designers were finished talking and having a play with it myself. Through opening itself to being felt, moved by and between the bodies of the designers (and the visiting researcher) it affects as it is affected.

By entering into a state of affecting and being affected, Pia, Scott and the model (and myself) engage in a ‘network of affect’ which has certain outcomes. Firstly Scott, as a novice member of an architectural community, is helped in his work of ‘becoming architect’ by experiencing a certain kind of architectural subjectivity. As I highlighted in Chapter Two, through experiences in the design studio and outside of it, students have the potential to ‘feel like an architect’, ‘see like an architect’ and ‘be like an architect’. The subjectivity being experienced by Scott here is different than the subjectivity we saw emerging in Corrigan’s studio. It is more like ‘junior designer in an architectural practice’ than ‘struggling practitioner’. The emergent subjectivity is different because the assemblage that is acting to bring it into being is different.

Secondly, this affect work helps the two designers to operate in socially legible ways. Here both of the participants can be seen to practise good affect management as they move through their


\(^{400}\) A term from chemistry which describes the ‘carrying along’ of a particle within a current or air flow in which it is mixed

\(^{401}\) Thrift, *Non-Representational Theory: Space, Politics, Affect*. Pg 235

work with the model which provokes certain affects in them: pleasure and puzzlement. The state of being affected is never allowed to take control for too long, but when they appear they are shown to be used to help the process of designer talk along.

**Knowledge as performance**

Representations performing some kind of work — whether it be affect work as we saw above, or some other kind — is perhaps what Schön had in mind when he described the design scenario ‘talking back’, although he left the process relatively unexamined in his accounts of design studio action⁴⁰³.

Meaning and knowledge produced in this interaction *exceeds* the model itself and the two designers. Meaning and knowing are not merely “contextualised” but are effects of the actor network which is composed of bodies, cardboard, classroom and tools. Let’s take a closer look at one of these ‘knowledge in action moments’ from earlier in the transcription:

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This image nicely captures architectural knowledge making in action. Pia and Scott are both in similar bodily attitudes, working the model, which obligingly responds to their actions. Scott is talking to Pia as he manipulates the model with her.

Schön certainly recognised that talk is the major ingredient of studio practice, describing ‘the language of design’ at length in his book *The Design Studio: An exploration of its traditions and potentials*. Schön made a fairly comprehensive, systematic outline of the different topics that this talk tends to dwell on, but he left out the bodies, the tools and the physical context in which this talk is situated. As a consequence his taxonomy of talk, not unlike the taxonomy of gesture produced in the last chapter, does not give us the whole picture of what is going on when architect students and teachers get together to do design work and tell design stories. Looking at this picture closely reminds us that the nature of the talk that happens in the studio (whether it is superficial or intensive, boring or creative, serious or playful, identity changing or identity affirming) hinges
around bodies, spaces and tools as much as the vocabulary that the students and teachers have or the brief they are discussing.

Architectural knowledge and knowing in the design studio is not in the language, but in and of the doing of language with things and so is performative. Rather than instructing or correcting, both Pia and Scott perform competent designerly behaviour within the bounds of the situation at hand and are able to engage in productive work together. This performance includes both of the designers finding ways of acting on design materials, showing each other how they feel about them and exploring their possibilities. In the image above, humans and model are caught doing a particular kind of design knowledge practice together: finding out new formal possibilities. Here model, teacher and designer/student are co-implicated in the architectural knowledge(s), meaning(s) and subjectivities that emerge. They do this with another range of actors who might not be visible but are still exerting influence, such as the university actor network which has regulations and procedures to guide Pia in how to act as a teacher. Through the working of this RMIT university actor network (at the moment figured as a ‘blackbox’ for our purposes), certain ‘teacherly’ practices are more likely than others and the architectural profession (another black box) who, as we saw in Chapter One, play a significant part in determining the shape of educational spaces in the academy.

These performative knowledge practices act as a way to organise and frame the perceptions of others so are thus always, already political as well as instrumental and pragmatic. Hitherto the co-implication of speech, gesture, representations, bodies and power relations has gone largely unnoticed by scholars of the design studio as much of the bodily action happens beneath our conscious awareness. In the case of Pia and Scott, the student is nearing the end of his education and is obviously able to participate in this design collaboration as a more or less fully competent member of this architectural community. If he were a less experienced student, Pia would probably have to make more moves to invite him in to ‘doing the design studio’ with her.

This shift in the positioning of the teacher allows us to move away from human centred accounts of design studio practice where the teacher always dominates or oppresses the student, to ones which are more sensitive and attentive to process, affect and the role of materiality — and less

404 A technical term from engineering, sometimes picked up by actor network theorists to describe an actor whose inner workings are not, for the moment, in the process of being explored. A black box is a system, device, machine or object which is described only in terms of inputs and outputs.

405 See the earlier note about competency – in another community his abilities may not be counted as signs of competency.
concerned with the negative effects of power. Pia is not operating as coach, with the corrective aspects of this role that Webster highlights and criticises, nor is she a ‘gatekeeper’. Her role is almost Socratic; by asking the student a series of questions as they work through some of the model’s potentials as well as performing the ‘knowledge moves’ with him.

Just as the model is a special kind of actor (‘a puppet that guides the way’), which can do certain kinds of work, then so too is gesture an actor that does knowledge work. According to Latour, an actor in an actor network is an entity in a field that undergoes a changed status. As his alter ego, the (somewhat Socratic) Professor argues: “If I want to have actors in my account, they have to do things, not be placeholders; if they do something they have to make a difference.” The assembly of actors here comprises Pia, Scott, the model, the University, but also gesture, arms, hands, fingers, pens, faces and so on and on. The design knowledge (and knowing) that is experienced by the designers emerges as a relational effect of the agency of all the parts of the network; therefore the knowledge would be different if the actors were changed, for example if the model was located on a digital screen, or if Pia had invited me in to participate. Most importantly, the knowledge and knowing that would emerge would be different if there were no hands to gesture.

The reader might wish to recall to mind at this point that in the methods section of this thesis it was argued that the mode of analysis employed in the previous chapter and in this one (grounded theory and ANT) were employed in such a way that two different ‘realities’ of gesture are produced. This is a post-modern move which is grounded in the ontological position that multiple realities can co-exist and be considered as equally valid. Grounded theory produces categories, where gesture stands out clearly from the background activity, ANT blurs this clear cut account of gesture by bringing what is usually considered ‘background’ (in this case the model) into the foreground. Moments of the clarity produced by the grounded theory method emerge when we see the occasional ‘compositional gesture’ or a ‘mediating gesture’ performed, but it is clear that the real power of gesture in the design studio lies in its ability to fall into the background and become an inseparable part of the flow. The previous chapter might seem to suggest that gesture is intentional – an act of communication. But really, it’s more like speech which just pours, stumbles, falls out, often without us experiencing a conscious intention to use the words as we do.

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406 Webster, “Architectural Education after Schon: Cracks, Blurs, Boundaries and Beyond.”
407 Latour, Reassembling the Social: An Introduction to Actor-Network-Theory, pg 143
Gesture then is an integral part of these knowledge making practices and these practices would be different without its presence. However, without examining an instance in which gesture is entirely absent, we cannot be sure of the exact nature of this difference. This is one of the weaknesses of actor network theory, which is good at explaining matters at hand, but not at predicting how they might be if circumstances change. I will return to the implications of this observation in the next chapter, which concludes this thesis where the findings about gesture are summarized and the implications of these findings are explored.
Chapter Seven: Conclusions, recommendations and suggestions for further work

At the start of this thesis I claimed that the process of knowledge creation in the design studio was not well understood because the role of the body was under explored. The work of this thesis enables us to now reassess the role of the body in design studio and state a number of ways in which the work of gesture contributes to design knowledge practice through the work it does. The teachers involved in this study, when presented with the foregoing analysis, expressed great surprise at how much gesturing was going on and how little the speech component of the transcript seemed to make sense on its own. The fact that so much of the classroom interaction was operating below the level of their conscious awareness makes it all the more remarkable.

In chapter five gesture behaviour in the design studio’s observed was broken into three broad categories through the mode of analysis performed.

Compositional gestures helped students and teachers talk about key properties of the architectural spaces being imagined in representations: size, shape, orientation and so on. Representations, speech and compositional gestures collaborate to make a ‘virtual world’ which designers can play in and surface meanings. These meanings and knowings may be fleeting, provisional, uncertain but are vital to the experimental processes of designerly collaboration with representations.

Other gestures performed ‘connections’; by strategically ‘gluing’ speech to architectural representations or transposing meanings from one representation to another. These mediating gestures worked to short cut spoken explanations at the same time as they helped to keep teachers and students ‘tuned in’ to the architectural meanings that were being created. By helping to make salient certain features of representations during the conversation and import ideas, concepts as ‘absent presences’ mediating gestures helped teachers and students make meaning from representations by framing how they should be looked at and understood. Through mediating gestures representations become ‘animated’; in certain instances this enables the representations to ‘talk back’ in interesting ways and help to create design possibilities. Significantly the fact that gesture can operate on, but not change the representational ground and ‘do violence’ to a student’s drawings, means that gesture is an important part of a teacher’s repertoire.
Finally gesture was used to capture and describe aspects about architecture that might elude other modes of representation: time, light, the movement of people and so on. These qualitative gesture virtual effects can then be mobilised into other representational forms so they are no longer static, objective renderings, but virtual phenomenological objects. These gestures conveyed the affective and embodied dimensions of architectural experience.

The findings here both support and extend on the findings in Lebaron and Streeck, which were outlined in Chapter Two. Lebaron and Streeck describe their architecture professor’s gestures as both a heuristic device that translates the properties of representations into ‘full sized’ experiences of spaces. These ‘phenomenal objects’ are used as teaching devices allowing didactic demonstrations to be performed: demonstrations of how to look and explore forms ‘like an architect’. The various gesture types acted with speech and representation to produce architectural meaning and knowledge, which is captured in the diagram below.

*LeBaron and Streeck, "Gestures, Knowledge and the World."*
Gestures ‘speak’ architectural composition in another mode which is entirely other than describing in speech, drawing or modelling. In the image above gesture can be seen performing spaces and affects in a way that cannot be separated meaningfully from the materials at hand — the drawings — or the memories, ideas and experiences of the designers themselves. In the example given above gesture in concert with speech and drawn representation produces virtual representations of ‘Capitol Theatre’ which designers can then manipulate and explore together. Through the complex interaction of bodies, tools, representations, specific kinds of architectural meaning and learning are produced. Therefore gesture as a knowledge practice is therefore inseparable from the making of meaning and learning in the design studio and needs to be considered carefully in any move away from this format.

This thesis adds considerable flesh on the bones of Lebaron and Streeck’s propositions about gesture, knowledge and the world. It puts us in the position to draw out how gesture contributes to the knowing-in-practice of architecture teachers and students and gives us insights into a previously unrecognized type of knowledge work of the architectural profession. What sort of architectural knowledge practice is gesture?

When looked at using the technique of thick description, and with an actor network sensibility, gesture did not primarily work to ‘scaffold’ the understanding of others, but to create a shared space in which design work could be done. Architectural knowledge and knowing in the design studio was seen to be performative – it relied on work of both human and non human things. Representations were seen to shape gesture, just as gesture worked to shape the looking, feeling and thinking of designers as they worked. Students learned from teacher’s doing as they are saying, and by participating in this doing and saying with the teacher. Thus, as a knowledge practice, gesture serves to mobilise design ideas in and through other representational practices. In the empirical observation work of the previous chapters, a claim can be made for the ability to ‘do gesture’ in particular, skilful ways to be considered a specific form of architectural knowledge. Students and teachers were shown to be highly creative in the way they adapted their gestures to the materials to hand. In the hands of experienced architect-teachers, such as those featured in this thesis gesturing and improvising the arrangement of materials in relation to speech is literally an un-remarked upon feat – attention is never drawn to it.

The key difference between gesture from other modes of architectural representation in use in the design studio — speech and drawings or models — was movement. Movement lent gesture the
ability to convey shape at the same time as other formal or physical properties and affects. One example of this is Simon creating a virtual 3-D shape in conjunction with a smooth motion to accompany the word ‘homogenous’ in a discussion with his student about possible material treatment in her project. The quality of movement of his hands described the aesthetic quality of the material treatment along with the shape and mobilised these qualities into the conversation. Gesture movement could be dynamic or slow, jagged or smooth, exaggerated in scale or intimate – all of which offered the gesturer a way to link the affective properties of movement to the aesthetic effects that were imagined or desired. The value of movement as an expressive resource is important to studio talk, which is often directed to making educated guesses about how something might look or feel to an inhabitant of a building.

The timing of gesture and speech seemed to work towards creating ‘legibility’ across the two modes — most of the time one mode did not make sense without the other. In fact most of the gestures observed in this data accompanied speech and the representations so well that they seemed to be designed to operate together; gesture and language was clearly connected, as has been persistently shown in many other studies. In their orientation, movement, shape and size, gestures illustrated, clarified or extended on the contents of speech, but they should not be seen as being subservient to speech or necessarily always work to create clarity and mutual understanding. The two modes could not be meaningfully separated without the architectural sense of the utterance being destroyed. If gesture was delivered in sequential units, it seemed to help keep verbal ‘clutter’ to a minimum and give explanations more precision. But this observation should not be read as making the mistake of attributing conscious intentionality to the act of gesture production. It does suggest however that ‘good gesturers’ had more facility with making precise, appropriately formed and sequenced gesture that acted to scaffold their spoken utterance.

Gesture helped students and teachers to navigate through conversations that are simultaneously verbally and visually complex. At a very basic level, bringing attention to one part of a representation by pointing at it the complex visual field made it more comprehensible to others. In this way gestures served a pragmatic function in that they helped to create a focus of mutual attention between teachers and their students, either on a concept, shape, form or a representation. They were used to make ‘virtual objects’, anchor speech on representations, ‘tie’ different representations together, or link representations to other parts of the surrounding environment in a meaningful way. This ability might be used to help clear up misunderstandings as, for example, in Anna’s interaction with the student who didn’t understand her switch to a ‘critic’ questioning mode.
in Chapter Five, where gesture served to make important distinctions between what was known and
not known about the site and the design proposition under discussion.

This mediating function of gesture was even more important in how it worked representations
in very specific ways. In the design studio representations made by students are treated as
provisional, a starting point for a discussion, and thus act in a very different way than they do in, for
example, a magazine. A magazine offers a way for the architectural community to share knowledge
by circulating representations outside of their immediate point of origin. However, in the studio,
architectural representations act as a way for teachers and students to negotiate design meanings and
strategies ‘on the fly’. Gesture seemed implicated in the acts of ‘mutual imagining’ that went on in the design story telling
with things that formed the bulk of the interactions between

teachers and students.

In this mutual imagining, gestures allowed teachers
and students to *improvise* and to *perform* design proposals
into new, speculative forms. Being able to improvise and perform ideas into being is an essential
part of being able to design with others in a collaborative setting. Gesture was a supple enough
medium to keep up with twists and turns of the design possibilities as they emerged, without
changing the original drawing on which this action was taking place. Imagining design propositions
with gesture helped students and teachers mobilise concepts and ideas into ‘virtual objects’ which
could then copied, redeployed, modified and otherwise shared as if they were real as the
conversation moved on. Through the work of gesture therefore, representations in the design studio
can be treated as provisional ‘place holders’ for the building proposal under development, inscribed
with meanings, loaded with affect and thus always open always to ‘becoming other’. Thus gesture
offers a way of temporarily ‘escaping’ representational bondage, while preserving the sense making
role that representations serve within architectural design practice. Through gesture, representations
and other objects were mobilised into shared *fluid ‘activity spaces’* [409], a zone where virtual objects
could be made and placed in meaningful relationships with each other. In these activity spaces the
scale and placement of gesture became important. By locating themselves in relation to the virtual
objects and spaces that were being made, students and teachers were able to ‘place’ virtual
architectural ideas and concepts and use their bodies as a reference point and as an expressive

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medium. A good example of this is the student who gestured the form of a ‘duct’, as well as the air flow through it, and its proposed location in the building, by using his body as a reference point. In this act the space in front of the screen could become an activity space that could ‘hold’ ideas and concepts expressed as virtual objects. Gesture worked to ‘import’ absent things, such as air and flexible ducting, as virtual objects and place them meaningfully in the act of story telling. With skillful use of gesture like this, complex ideas could be managed and put into meaningful relationships with each other. Another key example of this kind of action is the example of Scott negotiating a drawn corridor, an actual corridor, a distant corridor and the abstract idea of ‘corridors’ all in the one utterance.

Pointing and gesturing was, as Goodwin\textsuperscript{410} has observed, a way of helping to create specific ways of seeing and therefore possibilities for certain kinds of action. Highlighting and foregrounding parts of representations through some or other form of pointing was one of the most important gesture activities. In fact the work presented here could support a claim that gesture is crucial to ‘architectural’ ways of seeing, doing and acting. Pia’s thoughtful gaze on the model in chapter Six was supported by the way she held and handled the model. This ‘doing of gesture’ was important to Scott’s learning as it enabled him to enter into a performance with her of an architectural way of working.

Pointing well, however, seemed an art that students had more or less facility with. Good pointing seemed to consist of not only touching but coupling the touching with a gesture that conveyed some kind of information or affect. A good example is Simon’s mimicking of the progress of a person through his student’s building in such a way as to common up the idea of the scale of the human figure in relation to the representation he was performing with. Touching was therefore, as Lebaron and Streeck noted, important to the understanding of a representation. It didn’t seem to matter if the pointing and touching was performed in actual space or digital space as the cursor acted as a satisfactory ‘virtual hand’ which satisfied the need for the speaker to ‘touch’ the thing they were talking about.

\textsuperscript{410} Ibid.
Pointing was taken to its logical conclusion in Anna’s classes. Her explanatory drawings were really gesture/drawing ‘hybrids’, where pointing gestures could be translated through the tip of the pen and recorded permanently on the page. Anna’s sketching which mobilised expressive gestures into the ‘virtual paper space’ where they may or may not result in more permanent marks. By selectively over tracing and pointing with the pen, Anna could build a sketch that was as much a ‘gesture record’ that hovered somewhere between being a diagram and a representation of the student’s design proposal, with her ‘commentary’ overlaid on it in the form of expressive marks. Sometimes the sketches could no longer ‘hold’ the expressive gestures which would then be performed in clear air over the paper. Anna’s drawing could be described as a gesture/sketch hybrid that operated to ‘hold’ her verbal and drawn narrative together.

Generally the legibility of representations was enhanced by tracing over parts, with fingers or pens and this process helped to shape the ‘looking of others’411, but not always so. On occasion, the coupling served to smooth over potential misunderstandings with the gesture carrying intent, even if the wrong word, or a series of imprecise words, was employed. For instance, the difference between ‘roof’ and ‘ceiling’ in the student’s description of her theatre interior to Simon early in Chapter Five was elided by the appropriate shift in gesture.

The human body and the physical constraints of the world acted as a reference points for the performance of gestures. Similarly to the observations of Lebaron and Streeck412, virtual and physical models were held so that table tops and other surfaces were figured as a ‘ground’ (ie: they were held as if they were real buildings, not upside down and only rarely at an angle). By making gestures and offering representations at different heights and varying the orientation and scale of the gestures they produced, both students and teachers could locate their own bodies or the bodies of imaginary others ‘inside’, ‘outside’ or ‘in front’ of proposed building forms. Such gestures were effective interactional strategies; students and teachers were observed to form gestures for the interlocutor’s point of view, such as in the case of Simon performing a theatre rig for his student where his torso appeared in a cameo part as ‘stage’. Students and teachers delivered gestures that were ‘tuned’ with respect to their execution in relation to architectural representations and ‘attuned’ to the interactional context in which they found themselves.

411 Compare with similar examples from archaeology fieldwork in Ibid.
412 LeBaron and Streeck, “Gestures, Knowledge and the World.”
When this research began it was assumed that gestures would occur more frequently with digital representations than with other, more tangible, mediums. However, as far as this qualitative methodology allows such claims to be made, it seemed it was the topic of conversation that shaped the types of gestures that were produced more than the media being used. If anything, digital media appeared to suppress gesture behaviour. Further study using other research methods would have to be deployed to make the relationship clear, as there is reason to believe that this appearance is an artefact of the data analysis due to the fact that mouse and cursor movements were not included as gestures in their own right — which they certainly are. Perhaps the relative lack of gesture production other than mouse movement surfaced because the desire to touch a digital model could be satisfied by ‘touching’ with a mouse cursor.

As eluded to in the story in chapter two where builders and architects were found to have very different styles of handling drawings, gesture was implicated in the identity work that happens simultaneously with the learning of design technique in the studio. Through performing design work with their students, or not, teachers could encourage them to take on different kinds of subjectivities such as ‘junior designer’ or ‘struggling young practitioner’. Doing gesture in certain ways could be signed as ‘competency’ in such performances. When interruptions to these competent performances ‘broke’ — such as misunderstanding a teacher’s questioning style, saying the ‘wrong thing’ or failing to show pleasure — teachers in particular were seen to work with both body and voice, even sighs, to pull the actor network back together.

We can understand gesture as an actor that does instrumental, pragmatic and poetic work in design story telling and making meaning with material objects. This gives us a basis on which to mount an argument that gesture performs useful knowledge work within architectural design teaching and learning settings. But it also presents us with difficulties in making recommendations for teachers based on these findings. Drawing attention to gesture, especially as it is happening, is one of the surest ways to interrupt its smooth functioning. On the face of it at least, it this would seem to make mobilising the knowledge of gesture work an impossible task. Despite this some ideas for using this knowledge are outlined below.

Sometimes ideas were expressed in gesture that were not directly ‘given voice’, this included the tell tale revealing of how architecture students ‘placed themselves’ spatially when they imagined their designs into being. A student who consistently gestures spaces as if they are hovering above them should probably be ‘pulled down to earth’ by their teachers and asked to
describe how their buildings might appear from street level. Accordingly, the student that always places themselves ‘inside’ might be over focusing on detail or interior aspects and should be encouraged to adopt a different approach, such as a planning exercise so that they deal with a different scale of the design problem to hand.

We saw that gesture served as a way of making ‘architectural assemblies’ out of the material immediately to hand within the learning environment. These ‘representational hybrids’ acted as vehicles for mutual exploration, discovery and imagining. In other words, gesture enabled representations to become a site of creative ‘play’ that helped designers to actualize the virtual design potential of representations. This insight could help teachers to find alternative ways to explore architectural design ideas. ‘Seeding’ the immediate learning environment with bits and pieces of card that can serve as temporary walls or sticks that might be columns might be an interesting way of leveraging this tendency to make meaning using gesture and extant representations into more formal discussions. These ‘ad hoc’ bits of extra representational artefacts would not have to be too specific as gesture is capable of helping to create meaning and coherence without the need for verisimilitude in form.

Some of the difficulty of design teaching comes from the fact that many students have relatively under-developed graphic skills and may not have acquired the full range of specialist vocabulary. As a consequence they often have to work very hard to make their design propositions understood by others. For the teacher, gesture might provide a ground for establishing preverbal understanding with the student, which can then serve as a scaffold for more sophisticated verbal and graphic skills to develop. Students who are struggling to express themselves in the appropriate language could probably be given some relief by being asked to show the teacher in gesture because it clearly can act as an alternative means of representation in addition to speech and artefact. Since we know that gesturing provokes gesturing in others, mimicking gestures and modifying gestures already made by the student and accompanying them with speech can be a way for teachers to provoke more gesture production in their students.

However we should approach the idea that gesture always creates clarity with caution. If gesture, knowing and identity are always mixed up together we may do students a disservice by viewing gesture as the ‘poor cousin’ to speech. Likewise doing gesture well and skillfully in the design studio is difficult and some students seem to have more facility with it than others. The reader cannot have failed to notice that the same students appeared again and again in the accounts;
this was because they tended to produce elaborate and cleverly timed gestures. It is probably no coincidence that all the students featured most in this thesis were also high achievers in relation to their grades. Just as we encourage students to use sophisticated, specialised language they obviously need to develop specialised skills in gesture. Hopefully this thesis will give teachers a way to know and recognise a fluent architectural gesturer in their class. By drawing student’s attention to the way that others in their class are performing gesture well the potential for all students to develop more and better ‘gesture knowing’.

These previous points seem to suggest that physical presence is essential to the teaching and learning practices of architecture as we currently understand them. This is not to claim that teaching design online is impossible or hard to do well. One impediment that would have to be addressed in any serious online design studio is the matter of representational improvisation and the making of ‘hybrid’ representations.

It is difficult, but perhaps not impossible, to engage in this sort of improvisation with representation if two people are not working on the same representational artifact and cannot see or respond to the other’s actions. Without recourse to gesture students and teachers would be thrown back into verbal explanations alone. It is as simple as the fact that some, if not many, architectural representations are difficult to understand without the gestures which make salient the part of the representation that the speech is referring to. This difficulty would only be increased if the online design studio was asynchronous such that the teacher and student were not simultaneously present. It is important for us to undertake further study into online spaces and embodied practices. There is some urgency in this debate as educational institutions in Australia and elsewhere are increasingly insistent that course have an online presence. In addition the cost of maintaining staffing levels is physical facilities can often be used as lever to force change in teaching practices. In depth and considered research of the nature of design teaching in practice can contribute to thoughtful and useful teaching online. A study of online issues might include a discussion of how identity and subjectivity might be shaped differently in online environments and what might happen which these are translated in to a face to face situation.

Beyond the classroom there is scope to investigate this issue outside a pedagogical context. Such a study would be interesting for how it might illuminate the ever vexed issue of ‘efficiency’ in design practice — finding out how people work together might produce interesting results especially if the different kinds of mediation offered by digital technology were taken into account.
Cuff’s comprehensive study of professional practice in the USA in the early 1990s has yet to be replicated and this would be an interesting task given the change in technology in the intervening years. Such a study would benefit from insights into embodied practices that have been outlined here.

Finally I want to pay attention to what this study implies for an ethics of teaching practice. Giving students feedback on their work can be a more time consuming process when it is carried out online without the appropriate software or method of engagement. If the class is asynchronous – which is surely one of the key benefits of using online spaces as it allows flexible use of time – it is more difficult to use ‘Socratic’ questioning techniques, as seen in many of the exchanges in the observational data here. Without access to the type of ‘shared space’ seen in the exchange between Pia and Scott with the model, engaging in questioning mode of engagement with students would probably necessitate multiple exchanges of marked up files. As a result the process risks becoming very stilted and labour intensive. Without further study of this problem it would be hard to be sure, but I suspect the lack of real time correspondence between teacher and student the tendency would be for teachers to fall back into a ‘hegemonic overlord’ style of teaching. In order to cut down on overheads and potential confusion teachers may be tempted to become directive in their comments, rather than encouraging discussion and exploration of potential.

A close study of gesture and the role of bodies ‘lifts up’ the role of performance and subjectivity in design teaching and learning to view and makes us consider how both contribute to an emergent sense of architectural identity. Gesture was seen to contribute to the interactional partners’ ability to ‘do the design studio’ together and this suggested that gesture could be said to play a role in making ‘normative’ design studio practice. However, on closer examination, it was found that gesture did not do this ‘ordering work’ alone; a whole cohort of inanimate and animate actors were implicated in the ‘doing of the design studio’ which included the representations, the furniture arrangements and even institutional settings.

Paying close attention to these ordering processes yielded insights into the nature of architectural design teaching and learning as a form of knowledge making characterized by certain performative practices. Teachers were observed to perform architectural behaviours with their students and the associated non humans. Thus the category of ‘teacher’ and ‘student’ were collapsed into ‘members of the profession’; by ‘acting with’ the teachers encouraged the emergence of an ‘architectural subjectivity’ in the student. This raised an ethical dilemma – what is the ‘right
way to teach’ if most of the emergence of architectural subjectivity in the design studio is mostly sub-conscious?

For the most part I think it is right to claim that most architectural design teachers are aware of the potential for the position of teacher to involve an abuse of power. However they are perhaps less aware of how sensitive and constant the relations of power are within the design studio; ‘micro physics of power’ can be observed in the split second unfolding of conversational interaction. Student subjectivity is produced emergently and involves the actions of teachers as well as their words; even laughing is shown to be important. This is not unlike the dilemma of a parent who is advised that children do what you do, not what you say. The wrong way to approach these political dimensions of bodily practice is hyper vigilance. Attempting to control bodily reaction on the level some of these processes are seen to operate would be impossible as most non verbal communication is ‘rumbling under the surface’ and not under direction conscious control. Many teachers probably already closely watch the faces and bodies of their students so they can adjust their performance accordingly.

Obviously surveillance is not the answer to the problem of the ‘political body’ and we need to look elsewhere for an ethics of design teaching practice. The place to start I would suggest is not to treat it as a problem, but a starting point for an investigation of what an ‘ethics of design teacher practice’ might look like. In the previous chapter it was suggested that it was a mistake to attempt to eradicate the ‘messy’ conditions of practice Doing good teaching, with warmth, empathy and diligence and care it is a process that is both time consuming and potentially endless. This suggests that more of this kind of empirical ethnographic research should be engaged in so that we better understand those moments where student teacher relationships go ‘off the rails’ and confusion, anxiety reigns. I have not excluded such moments but nor have I focused on them to any great extent and there is certainly scope for such a study to be done.

There is a lesson here for design teachers; not just is it the case that poor teaching is a form of neglect, but also that endless choice is not helpful to a student who is not equipped to choose well. Teachers must provide ways for students to negotiate their own learning; this includes knowingly entering into performance of professional behaviour at the level an individual student is ready for. In a first year design studio a student may not be ready to engage in the sort of design exploration that Scott can carry out with Pia; a good teacher, like Anna, recognises this and adjusts herself in the interactional moment. Not all first years need to be ‘talked (or gestured) down to’ and have
complex matters explained to them — even those that clearly need this help should be encouraged to develop their abilities further. This is where the teacher can intervene and a good example is the way that Anna is seen to act differently with the model in chapter four when her student misunderstands her questioning mode. She uses the model and speech to adjusts her questioning so the student understands, then resumes the ‘critical’ register of the discussion. In doing this she clarifies understanding but continues to hold out to the student the opportunity to join in with her in a performance at a more sophisticated level.

This thesis helps us to see how a design teacher can understand themselves differently to the way that the literature may positions them now; they are not ‘teaching how to design’ but engaging with the professional development of the student as a whole person. Corrigan understands this when he states that he is more concerned with ‘character’ then the ability to design because students ‘teach themselves’. In this respect there is potential for further study of the body in the teaching and learning practices of other design disciplines, for example graphic design, industrial design and so on. Such studies could add to the external validity of this study and show how such practices might differ from or be similar to architectural practices. This study has come up with some useful suggestions that teachers can implement in their daily practice as well as shedding some light on issues to do with professional identity and its development.

So now I come to the Unfortunate Realisation that this ANTish post modern turn I have taken offers none of the cosy certainties of Schön (or his nifty catch phrases). I recognise that ‘staying with the feeling’ of being post modern and ‘post human’ is not easy. Despite this I put forward this idea of design studio as actor network up as an alternative to feminist or Marxist critiques of design studios, which tend to paint themselves into a metaphorical corner by characterising the studio as a site of asymmetrical power relations and therefore ‘bad’. However this ANT turn does ask us to be more responsive and attentive to what is going on as we act: if we are ‘doing reals’ we are also ‘doing goods’ – or ‘doing bads’. But I think it’s worthwhile to pursue understanding design studios this way because it means there’s enormous potential here for those who want to make change because, as John Law puts it, ‘reality is not destiny’.413

413 Law, “Actor Network Theory and Material Semiotics.”
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