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Mewburn. (2011). Lost in translation: Reconsidering reflective practice and design studio pedagogy. Arts and Humanities in Higher Education, 11(4), 363–379. https://doi.org/10.1177/1474022210393912
Document Version: Accepted Manuscript

Published Version: https://doi.org/10.1177/1474022210393912

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Citation:
Mewburn, I 2011, 'Lost in translation: Reconsidering reflective practice and design studio pedagogy', Arts and Humanities in Higher Education, vol. 11, no. 4, pp. 363-379.

Lost in Translation: reconsidering reflective practice and design studio pedagogy

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Abstract

Drawing on empirical research done in the early 1980s Donald Schön developed the theory of 'reflective practice, put forward the idea that the design studio teacher is a 'coach' who helps students align with disciplinary norms and to start to 'think like an architect'. Drawing on Actor Network Theory (ANT) as a tool of analysis and way of thinking, this paper then outlines an alternative, 'performative' account of design pedagogy which both challenges and adds to Schon's explanations of design teaching and learning. Close examination of teachers and students in action show the teacher is but one of a host of human and non human actors, all of whom work to assemble what we call a design studio. Learning to 'think like an architect' is but one possible outcome of this assembling process.

Introduction

Over the last 500 years or so, formal architectural design education has steadily become institutionalized. Prospective architects no longer learn on the job, either in building sites or in offices, they sit at tables in University rooms working on speculative design projects in classes we call 'design studios'. While there have been some radical changes to the way architects have learnt their craft since the discipline moved into the academy, architectural design education has always involved experienced designers working with less experienced ones on architectural problems.

The design studio is a popular format for architectural design education and has been taken up in many different countries over the last 20 or 30 years (Schön, 1985; Cuff, 1991; Dutton, 1987; Webster, 2008). The pedagogical core of the design studio is the 'desk crit', a collaborative activity where the teacher and the student do design work together, discussing and sketching possibilities and imagining the consequences of design choices. During desk crit interactions the design teacher works to understand what the student is trying to do with his or her design work, provides feedback on these ideas and works with the student to further develop them. The desk crit can be

thought of as an exercise in role play in which the student plays the ‘novice architect’, while the teacher takes on various other roles such as ‘experienced architect’, ‘client’ or ‘consultant’.

Debates in architectural pedagogy continue and are complicated by the power relations which haunt this role play. Within this performance lies always the possibility for replication of the old master/apprentice model which some argue is a powerful way of ‘disciplining’ undergraduate students into particular professional mores (Cuff, 1991; Webster, 2005 & 2007). Shifts in contemporary scholarship, in particular feminism and discourses of student centred learning, have impacted on thinking about the design studio format, which has been criticized on a number of fronts: as old fashioned (Webster, 2008); as harmful to student welfare (Anthony 1992) as reproducing and promoting inequity (Stevens, 1995) and of being full of unexamined and tacit assumptions and practices which adversely affect both the students and the profession as a whole (Dutton, 1998).

While education was located primarily in professional practice these power relations were considered benign; copying the master was an unquestioned pedagogical practice. However the location of the design studio inside the contemporary academy has shifted this ground. Pedagogical techniques and practices once considered internal professional matters are now exposed to an institutional and managerial gaze, exercised through tools such as performance metrics and student satisfaction surveys. There is a need to provide adequate theories for contemporary pedagogical practice so that design teachers can more clearly articulate what they do and why.

I will begin this work by unpacking and re-examining one key theory of design studio practice, Donald Schon’s ‘Reflective Practice’, chosen primarily because of its widespread influence[i] on many aspects of educational practice and theory, especially in architectural education (Webster, 2008). This unpacking will be informed by Actor-Network Theory, a body of theoretical work begun in science and technology studies in at about the same time that Schön was writing in the 1980s. ANT is a good way to approach understanding action in the design studio as materiality and practice are so densely entwined in architectural work.

An ANT researcher undertakes qualitative research using standard methods such as observation and interview, but attempts to explore the agency of non human as well as human actors. As a body of theory, ANT attempts to overcome the old sociological dilemma of structure and agency by positing that structure and agency arise together and are co-implicated in each other's production. The term actor-network is a placeholder which can be substituted with others like 'assemblage' or 'rhizome'. An actor network is not a diagram or a description but an *effect*, brought about by work performed by various actors.

The aim of an ANT investigation is to explore what work, by human and non human actors, produces what *effects* and how these effects made durable. Effects are often assumed to be facts: 'the profession of architecture' is one effect in this paper; 'reflective practice' and 'the design studio' are others; all can be thought of as actor networks arising from the work of people and things which perform certain realities into being. Resistance to being enrolled in a network is an ever present possibility for all actors, which means that order and stability of any effect is precarious and all the more interesting when it is found.

As these examples I have given above show, actor networks are not singular, but multiple and over lapping; there is not one singular 'architecture profession' which is real, but multiple practices and actions which assemble the profession differently, in different times and places. The researcher's task is to understand how this kind of assembling happens, therefore this paper asks: how are design studios be assembled? And what might an understanding of this these assembling practices mean for teachers of design?

Theorising the design studio

There have been relatively few in depth studies of design studio teaching and learning practices in action. The most extensive study of this kind is the 'Architectural Education Study' (AES) published in 1981. The study involved ethnographic observation of teachers and students in design studios located in the USA for a period of six months. It was from this field work that Donald Schön based his influential theories of reflective practice as way of understanding design teaching and learning in action.

Schön attacked what he saw as a tendency to apply “technical rationality” to problems common to the so called ‘weak disciplines’, such as town planning, counseling and architecture. His central claim was there was a mistaken assumption that “problem solving can be made rigorous by the application of scientific theory and technique” (1983, pg 21). Schön argued convincingly that professional work in disciplines like architecture is characterized by uncertainty, complexity, instability, uniqueness and value conflicts. Good practice, Schön argues, is a kind of ‘artistry’, which develops over a period of time spent in doing professional work. Schön calls this a kind of ‘tacit knowing’: a capacity for “intuitive and spontaneous performance” (1983, pg 21) when presented with design problems. The theory of reflective practice does acknowledge the role that materiality plays in the development of professional artistry. Tacit knowing is not just ‘in the head’; it is built into the knowing manipulation of the tools of practice. Representations, such as drawings and models are ways for the design scenario to ‘talk back’ and help the designer decide on the next steps to take. Schön calls this process of interaction with the tools of practice ‘reflection-in-action’.

If the aim of design teaching is to develop the capacity for tacit knowing in the student, than learning by actually doing design work – in the presence of those who have themselves developed artistry – is presumably the best way for a student to acquire artistry prior to actually going out into practice. Thus Schön positions the teacher as a ‘coach’ who demonstrates their own artistry to the student. Schön implies that the key problem in design teaching and learning is that the professional teacher’s ‘knowing in action’ is and remains tacit, therefore it can be difficult to articulate this knowledge for the benefit of a student because 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).

The strength of Schön’s work on design pedagogy stems from the fact that he takes seriously the idea that there is a rational epistemology of architectural design practice which can be found by observing it in action. However there are significant weaknesses too. Webster (2008) has criticised academics for becoming “besotted” with Schön’s theories, while failing to recognise their limitations and methodological errors. In particular she criticises Schön for asserting the authority of the teacher as knower which, she argues, renders the student as a passive observer, rather than an active learner. Although Schön does take into account the materiality of tools and representations,

there is an argument to be made that he doesn't go far enough in dealing with this important aspect of the design studio process. I would like to turn for a moment to the process by which Schön arrived at this position on design teaching in order to further this line of critique, particularly in relation to the role of materiality. I will start by asking in an ANTish way: how was the theory of reflective practice assembled?

Making the theory of Reflective Practice

Schön based much of his theoretical work on one transcript of an encounter between a teacher (Quist) and his student (Petra) captured by Roger Simmonds, an ethnographer working on the AES project. Simmonds' (1980) account of the interactions between thia teacher and his student differs from that offered in Schön's later book 'The Reflective Practitioner' (1983). Simmonds was a careful researcher who provides copious details of his methods; a comparison of the two researchers raises significant questions.

The class Simmonds studied and gathered data on was in a professional Masters Degree course in the USA. Due to the nature of the US system, only a few students had any previous architectural training. On the first page of his report Simmonds explains that one of the teachers, Quist, is an extremely "powerful and central" figure in the design studio. So much so, in fact, that Simmonds concentrates all his efforts on understanding the students' relationship with Quist, deliberately leaving out the other teachers in order to do so.

Simmonds illustrates Quist as a domineering teacher by giving us a 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 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 (Simmons in Kilbridge & Porter, 1981, pg 31)

Quist was a clearly a believer in the centrality of the design teacher to studio teaching; as he is quoted by Simmonds: "the best curriculum without personality wont work, while no curriculum with personality will" (Simmons in Kilbridge & Porter, 1981, pg 39). His teaching strategy was to

modeling new design processes for his students with the belief that this approach would help students to try out design practices, ones which might initially make them feel uncomfortable. Simmonds claimed that Quist expected his students to trust him uncritically and Quist expected that this trust would help students to start to exercise the same kinds of criticality in their own work.

Although Quist clearly was a dominating teacher, Simmonds does not put his teaching style forward as an exemplar for practice as Schön does in his later reworking of the AES material. Instead he works to present Quist's teaching using a reportage style relying on interviews and observational material. 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' (1933), which had been taken up within education circles at this time as a way towards a rational, forward thinking pedagogy. Quist believed that if students could be made to reflect on and recognise their own "operating habits" they could change them and develop new sets of skills. To this end, along with modeling design operations, Quist encouraged students to keep a notebook or diary to record a history of their approaches to problems set in the studio. The premise behind the journaling idea was that it would allow the students to review these past notes as a way towards reflecting on the development of their design practice (Simmons in Kilbridge & Porter, 1981, pg 39).

Simmonds tells us that one of the students, Petra, had a background as a high school math teacher. Petra 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. According to Simmonds, Petra used her skills as a teacher to turn herself into a capable and organized 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, mostly because she felt her background in mathematics did not give her any design expertise. Simmonds remarks that Petra found Quist's "rational design principles" helpful. 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. She tells Simmonds that she was finding Quist's teaching problematic because she realized that he was 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” (Kilbridge & Porter, 1983, p138). 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” (Kilbridge & Porter, 1983, p138). In turn Simmonds believed Quist was trying to get Petra to “adopt procedures which were quite anti-ethical to her math instincts”(Kilbridge & Porter, 1983, p144).

Much of the texture of Simmond’s ethnographic account is lost in translation when Donald Schön takes up Quist and Petra’s story in a famous and influential series of books and articles[ii] on professional education, where one interaction between them becomes an exemplar of good design studio practice in action. In Schön’s hands, Simmond’s careful, ethnographic picture of Quist’s teaching practice becomes simplified and put to work in service of the theory of reflective practice.

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 (in particular Schon, 1985), although parts of the dialogue occasionally surface. It is unclear in the published accounts whether or not Schön witnessed the exchange Simmonds describes, or to what extent he discussed the interaction with Simmonds and Quist or drew on the extant field notes. However Schön clearly claims responsibility for the analysis (Schon, 1985, pg 99) of the interaction between Quist and Petra.

This one transcription is all that Schön uses to underpin his later claims about architectural design teaching practice – on the face of it this is absurdly small and would not be acceptable in an ethnographic study. But perhaps we should not be too quick to judge Schon for this lack of evidence. There is a hint in the original AES document that the researchers’ had noted that gesture was also important, but this is left out of both Simmonds and Schöns’ account. We could speculate that this over reliance on a single incidence and lack of attention to non verbal aspects, such as gesture, might be due to the fact that video and sound recording equipment were expensive and bulky at the time. Processing filmed material frame by frame would only have been able to be done by skilled operators, which may have been prohibitively expensive. It is easy to forget how difficult this kind of research may have been even 20 years ago as widely available digital technology allows this kind of film processing to be done on the desk top. It is reasonable to assume that this one transcription may have been the only filmed material available to Schön at the time, but we are

not even sure whether it was a video recording or a sound recording with notes as Simmonds does not include a description of its collection in his methods section.

In his analysis of this single case Schön *translates* the story that Simmonds tells in order to enroll it into his overall project, which Webster (2008) has called a “generic epistemology of practice”. Schön does this by selectively reconstructing this one conversation between Petra and Quist and treating it to an in-depth re-telling focusing on the language and drawings which are produced. Schön puts this desk crit interaction forward as an example of Quist engaging in “reflection on reflection in action” for the benefit of the student and calls the interaction a “performance” of what he calls the “the language of design”, which consists of both words and drawings.

Close examination of Schon’s version compared to the parts which surface in Simmonds telling show that Schon had to create a lot of bridging text and commentary in order to maintain flow and comprehensibility. In this translation process Schon uncritically takes up Quist’s domineering teaching method and seems unconcerned with preserving the student’s role in the dialogue. Schön leaves out most of Petra’s explanation of her project and tells us how Quist takes over Petra’s explanation of the design problem problem and provides a demonstration of a design process he thinks Petra should be carrying out; punctuating his demonstration of design “artistry” using a “drawing / talking language of designing” (1985, pg 54).

By choosing a single incidence, rewriting the dialogue, and inserting his commentary on the moves, Schon smooths away Petra’s contribution to the dialogue. 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 or holding her teacher to account. It would be fair to say that Petra becomes a cypher in Schön’s account – an absent presence who only surfaces through the occasional request for direction from the teacher. In short, Schön’s ‘storying’ figures Quist as an expert, in whose demonstration that Petra, the model student, trusts uncritically.

Schon holds up Quist’s model for design teaching and learning, theorises it and puts it forward as a generically transferable model of teaching and learning. The story of Quist and Petra is presented as an exemplar of how tacit knowledge from an experienced designer can be communicated to the (passive) novice through the vehicle of a “reflective” demonstration. Quist’s method of teaching by

modeling behaviour can be un-problematically put forward as a fully transferable model of design teaching because it ignores the localised, situated nature of the original dialogue. Schön argues that this teaching model 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.

This positioning of the teacher as expect and ‘gatekeeper’ to the acquisition of knowledge has generally been seen by scholars of the design studio as problematic. Webster (2008) argues that in Schön promotes an inadequate idea of design learning as a mostly passive process of observation and replication in which the teacher’s main role is to ‘correct’ the student’s work, rather than helping them to develop or hone their skills. Schon’s account can be criticized on a number of grounds. The notion of a coach is a deeply problematic one, which has already been noted by Webster (2008), who criticizes Schön for putting forward a narrow conception of design learning which fails to recognize the other cognitive, affective and corporeal dimensions of the learning experience and the student’s potential to be an active learner. Webster’s criticism resonates with an earlier critic Laura Willenbrock (in Dutton, 1991), 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.

While Schön’s treatment of Quist and Petra elides the influence of time it also does away with the design studio environment in which they are operating, rendering Petra speechless and both teacher and student body-less. By leaving out the texture and detail 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. Schön only gives us a single example of design teaching and learning from which to work, so this progression is not captured or given the attention it deserves. Might Petra have become more assertive as time progressed? Simmond’s description of her approach to her own learning certainly suggests that she may have.

Despite repeated criticism, the theory of reflective practice is remarkably durable. In the image below, taken from a recent article in “Design Issues”, Donald Schön’s work is represented as a ‘full stop’ or lens from which other pedagogical theorisations emerge:

Figure 1 about here

There is no room here to further explore the assembling of the subsequent theorizations shown in this interesting diagram. Instead we might ask: what *work* does the theory of reflective practice do for architectural pedagogy? How did it come to be seen as a full stop?

It could be argued that the design teaching profession became 'besotted' with Schön because his theory of reflection on action and its role in practitioner training does important work to legitimate designerly teaching and learning practices. In the theory of reflective practice Schön provides a sophisticated rationale for the master/ student relationship which is built into the design studio role play. In addition it can be argued that Schön's reflective practice theory is powerful because it resonates with the embodied experience of architectural practitioners, whose practice rests on externalizing ideas in the form of representations and having a 'dialogue' with them. The theory of reflective practice neatly captures these messy, tacit and experimental processes of architectural design practice. Therefore the insights Schön offers should not be dismissed.

However as an all encompassing theory for teaching and learning practice, reflective practice and the idea of teaching as 'coaching' is clearly inadequate; in fact doubts must remain about whether an overall theory for design teaching practice is even possible. Instead it might be more useful to ask, how do different actors – peoples, policies, tools, representations, learning environments and the rest - make possible different teaching and learning practices? What implications might such understandings have for how we think and make our own teaching practices?

As a provisional answer to these questions I offer a series of vignettes drawn from a three year observational study of design studio activities (Mewburn, 2009). By presenting more examples of design practice to put alongside Schon's single case we can start to unpack the notion of the design studio teacher as coach and move towards a more supple theory of pedagogical action, one which can encompass the performative dimension which Schön only begins to sketch out. The first story is a first person account from my own field notes taken while working as a design teacher.

The mile high cultural centre

It's 2006 and I am working in a team of four tutors with a very large 2nd year student cohort at a prestigious Australian University. We sit at large white tables in a big, north facing room with white walls and dark, corporate quality carpet and standard office chairs. Throughout the morning a seemingly endless parade of students come and take the seat next to me. They show me the design work they have completed during the previous 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.

I have been reading Schön's work just before class as was struck by the similarity between the account of Quist and Petra and what I was now doing. The desk crit activity seemed as familiar as breathing after some 9 years of working with architecture students. After each student had told me about their proposed design we would start talking; occasionally one or the other of us will start drawing with a HB pencil over the drawings or printouts. Sometimes we would switch to manipulating 3-D models on computer screens or hold up physical models to eye level, highlighting certain features with a pencil or a finger. At the end I would usually recommend a book or an architect they can look at, they would gather up their materials and go away.

Late in the afternoon a student presents me with a mile high tower design. I tell him this response is a bit strange 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. The student 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 admit that there are indeed massive towers being built in Dubai, but that I can't imagine a client wanting a tower even close to one mile high as a cultural centre in this case because the economics don't make sense.

He then asks me why he can't speculate such a crazy 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? Why was a design teacher, of all people, trying to stifle his creativity? Shouldn't I be encouraging him? For a moment I was struck by 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 student into alignment with disciplinary norms.

I carefully explained what the disciplinary norms in this case (to consider the urban location, the client's brief and the future occupants and so on), but he just looked at me skeptically and repeated that it was an imaginary project so he was free to make them up. I reached again for Schön's wisdom. Schön said that the design teacher's role was to 'coach artistry' through demonstrating his or her own approach to solving design problems. Maybe the problem with this student was that I wasn't being a very good coach; I was explaining rather than demonstrating. So I took out a piece of paper and started to translate some of the ideas from the student's 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 my explanation of an architect's 'real work' made it crystal clear this was the only chance he was going to get to design without constraint. While he gathered up his materials I tried to explain that design was all about working productively with such constraints but I doubt he heard. Later I wondered: how was I going to be his coach for the rest of the semester if he wasn't going to play the same game as me?

Reflecting on this experience raised some important questions. Based on the experiences of all the tutors in the room that day, Schön seems to be right in his claim that students new to the study of architecture might look for guidance and authority from a teacher, such as that offered by Quist. But, as most students progress through their studies, we would expect the kinds of interactions they have with teachers to change. As can be demonstrated in the story above, students may be very active, questioning learners from the very beginning and coaching may not work. Is it possible

to be an effective design teacher if you don't try to coach at all? This second story is drawn from observational work in just such a teacher's design studio.

Teacher as choreographer

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 the students 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.

This scene is a typical instance of Peter Corrigan's teaching method and demands some background explanation, which will unfortunately have to be truncated here. Corrigan's studio has been running the same way for the 30 or so years at RMIT University and continues to garner critical acclaim from his peers and students (for a good over view of this refer to Mitsogianni, 2003). During the observations[iii] it became clear that, rather than act as a coach. Corrigan set up his studio semester to mimic conditions of professional architectural practice. This created a form of experiential learning which immersed students in an enactment of 'professional conduct' which was not centred around the figure of the teacher.

Corrigan had a number of well developed strategies to foster this unique form of experiential learning. He insisted on holding the studio in his own office (see images below) so, he claimed, that students could leave their 'academic detritus' behind in the university spaces. The students would meet around the office conference table in the cramped hallway, often talking about their work while a radio was blaring and people working in the room beyond. It is presumed that Corrigan did this because such distractions to serious design conversations would be commonplace in a working office.

While many design studios are shaped around supporting an individual student at work on a design brief, Corrigan required his students to work in groups of two or three which were reshuffled each week. Students were left to negotiate how the design work will be done and what their contribution will be. This type of negotiation would be common in a small, collaborative architectural practice.

In contrast to other design studios, where the site and the brief tend to be set early on and the students work to develop a single design concept, Corrigan encourages his students to work fast

through many different design activities and many versions of the same building program. These design exercises are treated as a series of formal experiments which the students present to each other for peer critique in each session (as described in the story above).

Figure 2 about here

Corrigan deliberately set an extreme pace and workload and coupled this with high expectations about the student's ability to complete the number of tasks[iv]. He also recognised that time spent together outside of the classroom could also be an opportunity to learn about design and being a designer. Each week he would set 'excursions'; students were asked to visit the theatre, exhibitions, football matches and professional lectures as a group and to report on their activities there. When questioned about the value of these excursions Corrigan claimed it helped students to learn to find inspiration in the cultural and social life of the city.

Most interestingly, in an entirely opposite manner to Quist and myself, Corrigan did not participate directly in guiding the students to a formal realization of their ideas. Instead he set up a 'round table' peer to peer critique process. The table in Corrigan's office was used for this purpose and became the clear focus of the student's studio experience and the highlight of their week. Through this 'tabling' of their work students are encouraged to find their own critical voice and start to rely more on the opinions of their peers. Corrigan called this "The talking cure" after Freud.

Corrigan still exerted tight control over the class conversation by calling on students to talk, cutting them off mid sentence 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. The sighs 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. In this way Corrigan encouraged self discipline by non verbally asking the student to think about their performance of critique *as* they performed it.

While in Schön's account learning is transmissive: from the master to the apprentice, the kind of learning we see here is contingent on the nature and circumstances of the performance that takes place and the network of human and non humans which produces it. Corrigan's design studio does not set out to teach students how to think like an architect, instead he plays a part in manufacturing experiences designed to provoke the visceral subjectivity – that of the struggling young architect in their own practice – Corrigan coaxes learning from an assemblage of non human (models, the table, galleries, theatres and sports stadiums) in addition to the interactions between students and the teacher. In Corrigan's studio learning to design is shifted from Quist's cognitive learning theory ('think like an architect'); to a *process*. Here learning depends on actions and presence as much as beliefs, intentions or cognitive processes. This account of Corrigan's practice further unsettles the idea of the studio as solely occupied by students and teachers engaged in a set of 'reflective practices'. Let's look at one final example of humans and non humans making the design studio together.

Being affected

In this transcription of video data from a design studio called 'The Bio-spatial workshop'. In it a 4th year architecture student (Scott) can be seen showing a physical cardboard model he has made to his teacher (Pia). The model consists of a number of linked foldable boxes arranged in a grid pattern. Scott has produced this model as a prototype for a parametric model he is planning to build in the computer[v]. 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 and thus changes the nature of the surface, making it more or less rigid. A picture of the model is shown below.

Figure 3 about here

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. This explains, somewhat, why the model looks a bit like a piece of cloth rather than a building. As we watch we can see the model is an important actor in this desk crit interaction. 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).

Just before the action shown below I sit at right angles to Pia and Scott at the table with my camera, 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 gesture at the model as he talks.

Figure 4 about here

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. In frame one below Pia (seated to the left of the student) asks "Can we play with that?" pointing at the model (frame 1).

Figure 5 about here

The student replies with an affirmative grunt, reaching over to pick it up (frame 2) 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 2).

Figure 6 about here

Her gaze direction clearly invites him to share in her delighted response to the appearance of the model, 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 3):

Figure7 about here

From this point Pia can be seen to subject the model to what Goodwin (1994) called ‘professional vision’: “socially organised ways of seeing and understanding events that are answerable to the distinctive interests of a particular social group” (Goodwin, 1994, pg 606). Pia’s inspection is designerly; simultaneously tactile and visual as she manipulates the model to see what formal configurations are possible. The way she holds the model is strategic; by keeping her arms stretched out towards Scott she creates and 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 performance of professional vision: looking and feeling out the model’s potentials.

Pia 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 4). During 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. Meanwhile Scott keeps his gaze on Pia’s hands and the model, holding his hands in his lap and refraining from speaking.

Figure 8 about here

Although Pia is not talking in frame 4 the model is making a peculiar rustling sound as the cardboard parts rub together. This is a dimension that would be entirely missing in a computer model and is, unfortunately, missing from this text. The sound contributes significantly 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 5). 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[vi] as they briefly recompose themselves into new positions (Frame 6):

Figure 9 about here

Pia then says “here let’s put it like this” (7) 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 and the quality of movement is a little unruly. Pia has determined two important things 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 8 below). 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.

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 (9). 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.

Figure 10 about here

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 9 and 10 shown below:

Figure 11 about here

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 10). It is interesting to note that Pia seems to credit the model with possessing its own form of agency 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-hmm” and a brief smile, while keeping his hand on his chin. A close up of this moment in frame 10 is shown below:

Figure 12 about here

The 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’. Perhaps 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 11), where 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 11).

Figure 13 about here

In this short exchange Schön's idea of a dialogue consisting of more than words can be seen in action, albeit with a model instead of a pencil. But there is a lot more going on here than a teacher demonstrating her design practice for the student. The quality of movement and the formal possibilities the model suggests to the teacher and student help them 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. This is a designerly conversation, not dissimilar to one which might go on in an office between two architects where one may have more experience than the other.

This interaction cannot be understood if we take it as a straightforward coaching demonstration. Pia is sharing with Scott the act of 'playing with' the model, rather than, for instance, telling him what to do with it; in this way she implicitly treats him as a member of her professional community. While she is clearly a knower, she does not seek to give a correct 'answer' through a demonstration like Quist does. This student is not just a learner who consumes a set of known facts or watches and learns like Petra, but a producer of design artefacts who can 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').

Again the actors are not just human. With the proper encouragement, the model is a mediator in this design process. Latour (2005) defines mediators as being able to "transform, translate, distort and modify the meanings or elements they are supposed to carry" (Latour, 2005, pg 39); mediators "might have some relations with one another, relation of such a sort that they make others do unexpected things"[1]. In this case the model does more than just convey meaning by looking like a building, the model makes possible this moment of shared professional behaviour by allowing Pia and Scott to act on it and change it. By provoking affect and being affected it does its own kind of

[1] Ibid. pg 106

work and assembles relations. This desk crit moment would be very different if the model only looked like the design Scott had in mind and was not so desirable, flexible, fun and interesting.

Conclusion

As a place of creative 'doings' the architectural design studio does not easily fit within the tradition of inquiry and empirical discovery, let alone the processes of examination that adheres in other disciplines within the academy, such as law or medicine. Teachers within an institutional framework such as this are called to account for their practices: this can be difficult. Schön's theories may explain to teachers their own, internal, experience of designing, but they are not that helpful to the practice of teaching, especially of students who are beyond the novice stage. The theory of reflective practice is too simple and design studios as learning environments are too complex.

The master-disciple mode of transmission was considered unproblematic while architects learnt on the job and only spent part of their time in the academy. At that time, the figure of the working practitioner was seen as a mode of correct practice legitimately available for students to copy. The figure of the working practitioner was transformed by Schon into a coach, but this formulation, under the influence of discourses such as feminism and student centred learning, has come to lack legitimacy. The student centred approach would suggest that too much guidance, like that offered by Quist, represses students and turns them into passive consumers rather than active participants. But the student centred discourses could in turn be questioned as reinforcing an unhelpful binary view of power, positioning it as always oppressive. Criticising the design studio teacher and playing students as victims of oppressive effects of power (see Anthony, 1992) polarizes debates about the design studio and aggravates teacher practitioners, who could point out that they are just trying to do their job. What is a teacher to do?

The design studio, and all the possible artefacts and spaces that can be enrolled into it, is an elaborate way of enabling the enactment of professional behaviours. 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'.

This ‘performative’ take on the pedagogical practices of the design studio suggests that the design teacher is not always a coach as Schön suggests, but one of the actors. In fact, the teacher is not always be the lead actor, as my feeble attempts to align the student with disciplinary norms in the first story suggests. As choreographers, or as actors, teachers are never going to be entirely in control of any performance. They may however set up conditions to enable learning to emerge, such as to knowingly enter into performance of professional behaviour with their students like Pia or to arrange a group excursion like Corrigan. Some of the time the performance of the all seeing, all knowing coach might be appropriate, or sometimes it might be best to step back from the performance as Mr Corrigan does.

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. However it is to their advantage to strive to better understand their practice and much can be learnt by examining the practices of design teachers in action such as happened here. However by being reluctant to engage in comforting theory making this paper leaves us, both as scholars and as teachers, in a difficult position. It is clear that materiality, knowledge, power and identity are complexly intertwined in any design studio, which leads us 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). Staying with the feeling of the post modern, ‘post human’ view of design pedagogy put here is not easy. However this ANT turn does ask us to be more responsive and attentive to what is going on *as* we act and to look closely at our assembling practices in order to ask – could it be other?

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Figure 1

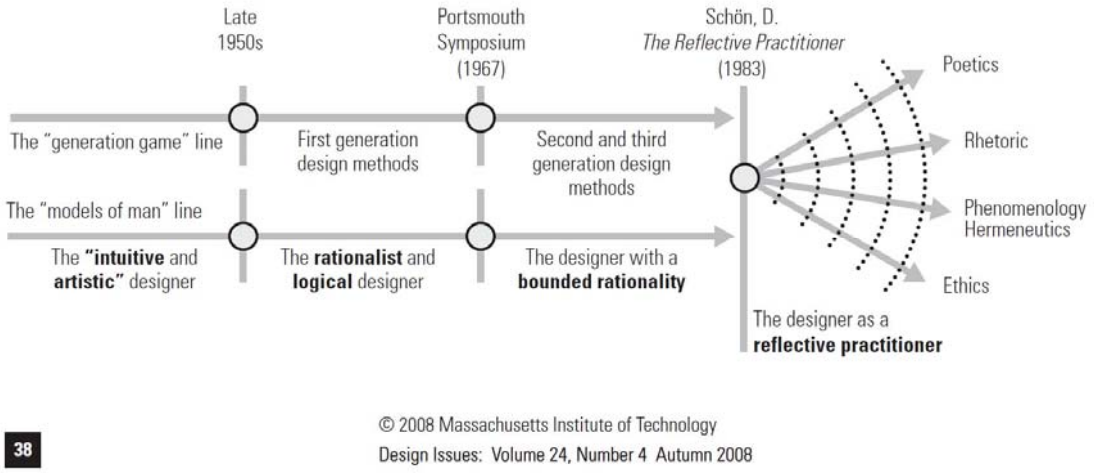

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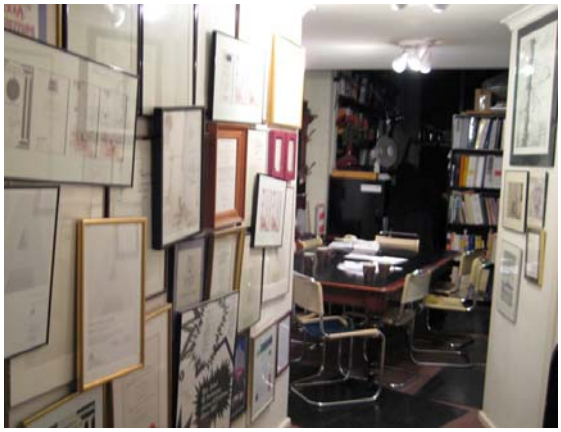
Figure Two



The table at the end of the corridor in the Edmond Corrigan Office where the 'round

The end of semester presentation of Corrigan's students' work. A collection of

robin' student discussion was always held. The rest of the office studio space is behind the bookshelf adjacent to the table. the balsa models is on the table in the centre and the design jury is looking at work pinned on the wall at the far right

Figure 3

The flexible model in action

Figure 4

Figure 5

Frame 1

7 secs

Pia:Is it (0.2) Can we play with [points]

Scott: [hm up]

Frame 2

14.5 secs

Scott: = I've taken (0.4) I took some photos in the photo lab (.) of it

Figure 6

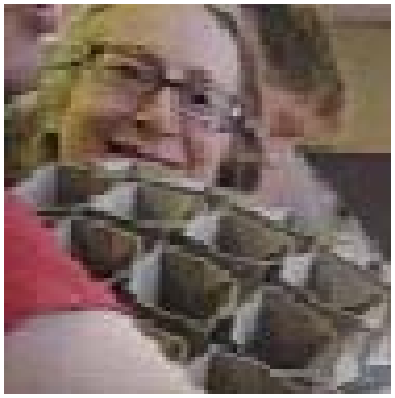


Figure: Close up of Pia smiling in frame 2

Figure 7

Frame 3

20.6 secs

Scott: “I did some stuff (0.4) I should probably take some more”

Figure 8

Frame 4

24.5 secs

(5.2) ((rustling sound of the model))

Frame 5

27 secs

Pia: Let’s turn it around …

gosh is it – can it [hold ( ) ?

[Yeah-ah]

Frame 6

33.4 secs

((model is rearranged))

Researcher: It looks a::mazing

Figure 9

Frame 7

36.9 secs

Pia: Here (.) let's put it like this

Figure 10

Frame 8

42.3 secs

Pia: I'm wondering about (.)the nature of the va[ria[tion]

Scott: [uh-hah}

Frame 9

48.1 secs

Pia: What this gives you (.) is a way of curving the surface so they're <more> (0.6)

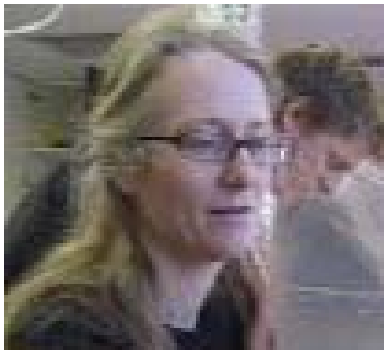
Frame 10

50 secs

Pia: =Oh (0.2) it's great isn't it? The way they do [that?]

Scott: [mm-hmm]

Figure 11



At 49.2 secs – between frame 9 and 10 above. Pia raises her eyebrows

Figure 12

Frame 10 – close up to see Pia's expression

Figure 13

Frame 11

55 secs

=the way they sort of open up (0.4) get pushed open (0.2) So it's sort of like an issue of curvature that you're playing with (0.6)

Frame 12

59.4 secs

=is that how you're thinking about it? (0.6) [or?"

[yeah] (.)yeah (.) Yeah"

[i] On 28/08/2010 a citation search in Google Scholar on the book “The reflective practitioner: How professionals think in action” (Basic Books, 1983) turned up 13565 citations and 101 related articles based on similarity to the terms used in Schon’s work.

[ii] There are quite a few publications by schon that include Quist and Petra in some guise or other, these include:Schön, D. (1983). The Reflective Practitioner: how professionals think in action. New York, Basic Books, Schön, D. (1984). "The Architectural Studio as an Exemplar of education for Reflection-in-action." Journal of Architectural Education **38**(1): pp. 2 - 9 , Schön, D. (1985). The Design Studio: An exploration of its traditions and potentials. London, RIBA Publications for the RIBA Building Trust. And Schön, D. (1987). Educating the Reflective Practitioner. San Francisco, Jossey-Bass.

[iii] I sat in as a PhD researcher on all but 3 of the 20 some sessions in one particular semester and coupled with this with interviews with former students.

[iv] After initially setting a crippling workload, Corrigan doubled it as soon as he saw them “getting comfortable”. He was observed to ask students to leave straight away if they did not table the expected amount of work at each lesson; failing to produce the required work because a source of public shame – and pride as students teased each other about feeling the “wrath of Corrigan”.

[v] It is parametric because any manipulation to part of the model’s surface will affect the whole form. 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.

[vi] 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 Pia was given this ‘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 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