

'EARLY CAREER ARCHITECTS' AND THE ACT OF DETAILED DESIGN IN ARCHITECTURAL PRACTICE: ESTABLISHING AN EFFECTIVE RESEARCH DESIGN.

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ABSTRACT: This paper discusses the research design for a PhD project that examines how 'early career architects' engage with detailed design in architectural practice. The literature on detailed design in architectural practice points to a dominant discourse of experience informing decision making in preference to other forms of information, such as written guidance and standards. The literature gives only brief glimpses of recent graduates who can be considered 'early career architects' in relation to this dominant discourse. The literature also identifies that these 'early career architects' are encountering architectural practice as a discourse that is distinctively different to the discourse of architecture school. This research considers how these 'early career architects' learn to operate in an experience dominated setting. The research adopts an ethnographic approach using observation, diaries and interviews with participants to build a picture of their every-day actions and interactions during detailed design. The ongoing pilot study highlights a number of issues that this approach has raised and how they are being addressed in a practical way.

Keywords – Detailed Design, Ethnography, Experience, Early Career Architects, Architectural Practice

1. INTRODUCTION

The work in this paper is based on the author's current PhD research project which will bring forward evidence relating to decision making around detailed design by 'early career architects' in architectural practice. This group has been largely overlooked in research to date but can offer an important insight into the way that trainees become accepted professional practitioners. The issue of detailed design methods has only been partially explored and much of this work pre-dates the implementation of digital systems in architectural practice. This paper considers the effectiveness of the research design for the project through a progress report on the pilot study for this research.

2. RESEARCH QUESTIONS

The PhD study will examine the key research question:

- a. How do 'early career architects' learn the act of detailed design in architectural practice?

This simple sentence captures a range of parameters and it is worth offering the definitions assumed in writing the question.

- i. '*Early career architects*' refers to graduates from RIBA part 2 accredited courses who have not completed an RIBA part 3 accredited course and newly qualified architects. The term *architect* is a legally protected title and can only be used by those on the Architects Registration Board (ARB) Register. Admission to the register requires qualifications meeting the Royal Institute of British Architects (RIBA) Parts 1, 2 & 3. The term 'early career architects' appears in quotation marks to indicate that the definition used here is wider than the legally protected title.

- ii. *Detailed design* is the act of translating the conceptual design for an architectural project into a set of information that can be used to construct the building, including specific choices for the materials, components and systems to be used.
- iii. *Architectural practice* is the workplace in which architects and architectural assistants operate. The size of these workplaces varies from just one person (sole practitioner) to multi-national organisations employing several thousand architects and architectural assistants. This parameter is critical because it differentiates the site of learning under scrutiny (architectural practice) from the other principal site of learning for architects (architecture school).

Additional questions that supplement the key question are:

- b. How do 'early career architects' carry out the act of detailed design in architectural practice?
- c. What knowledge of detailed design or strategies for detailed design do 'early career architects' bring with them to architectural practice.

This research will look at the processes, strategies and methods for detailed design evident in architectural practice. Much has been written about conceptual design methods in architecture (Darke, 1978; Lawson, 1994, 2006; Yaneva, 2009), little attention has been given to detailed design methods in architecture. Exceptions to this are the work of Margaret Mackinder (1980), Mackinder & Marvin (1982), Stephen Emmitt (1997, 2001, 2006) and Emmitt et al (2003; 2004; 2008). This work focused on the behaviour of designers in architectural practice during design and detailed design decision making processes. Their research gives a thorough and broad base for understanding the behaviour of architectural practitioners but gives only fleeting glimpses of the early career architects in those organisations. For example Mackinder (1980) interviewed 80 staff in architectural practice; only 9% of interviewees were identified as students or recent graduates compared to 66% of principals or senior staff. Emmitt (2006) gives a frank description of all his research subjects as "experienced professionals, male and aged between 30 and 40."

So why is it important to study early career architects? First, the author's own experience of trying to produce detailed design work at the beginning of thirteen years in architectural practice was traumatic. After demonstrating an ability to work through the conceptual and scheme design stages competently, the struggle to produce detailed design information was surprising and uncomfortable. How had this ability not been acquired during five years of full time education and two years of placement experience? Second, the teaching of technology in architectural education and its relationship to the needs of practice is constantly debated by the profession. Mackinder (1980) notes that, "Undergraduate education is always the first point of attack whenever it is deemed necessary to improve the performance of the building profession," and cites an article from *The Architect's Journal* on 14 April 1976 titled 'What can be done about architectural education'. Thirty-eight years later, Maria Smith writes in the *RIBA Journal* that "It is not good enough that the average graduate doesn't know the first thing about where wiring disappears to behind the light switch, or what a bending moment is, or which tools are used to work which materials" (Smith, 2014). This research has importance for both academia and practice. The outcomes can influence the way that architectural education teaches detailed design through a more informed view of practice. Crucially, there is an opportunity to understand more about the way that experience shapes the way detailed design decisions are made in practice and how the related processes are learned by 'early career architects'.

Architectural practice and the wider construction industry present a constantly shifting context within which the research will be undertaken. Practice has seen rapid changes due to information technology over the last twenty-five years with the arrival of the internet, computer aided design (CAD) and now building information modeling (BIM).

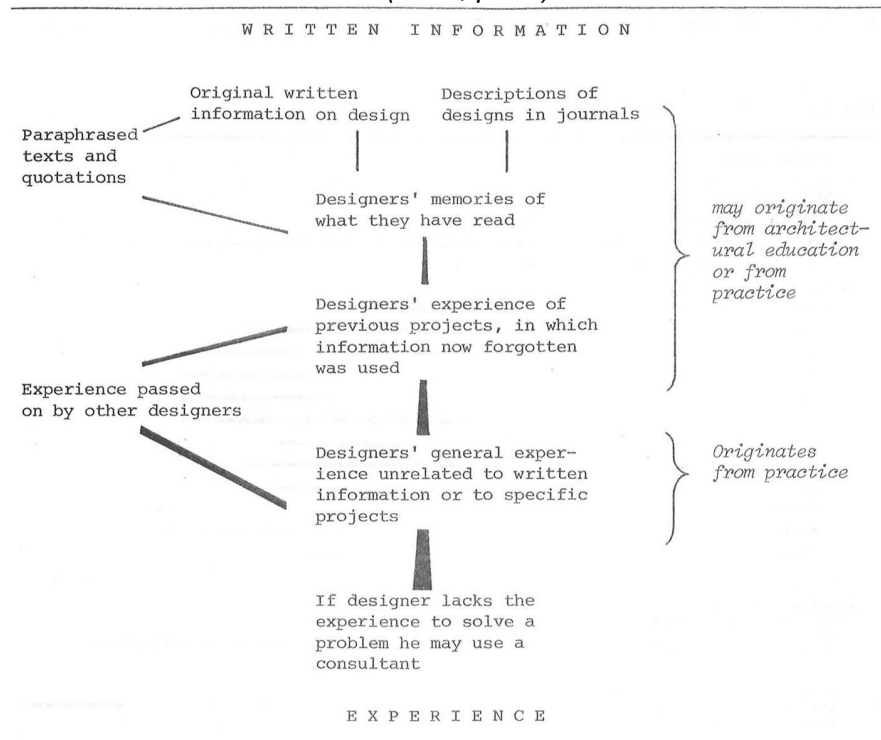
These changes have made a significant impact on the way that architects retrieve constantly updated information about construction products, regulations or standards and the way that design information is communicated through drawings, models and text. The technology of construction products and materials has continued to evolve towards a system of off-site manufacture with on-site assembly over the last twenty-five years, although the construction industry still demonstrates conservative tendencies despite encouragement over this period to adopt more precise and efficient methods from areas such as the automotive industry (Egan, 1998, 2002). This research draws on existing studies and publications by researchers in the fields of architectural practice and architectural education to locate the study within this shifting context. It also draws on research into wider issues of practice and education theory.

3. LITERATURE REVIEW

3.1 Experience and Written Information

Two authors are central to the existing body of knowledge for detail design in architecture: Margaret Mackinder and Stephen Emmitt. Mackinder (1980) presented a seminal piece of research that looked at the teaching of materials and construction in UK architecture schools and the way that architectural practitioners in the UK select materials and construction products for their projects. From the research with practitioners, Mackinder identified the key concept of 'experience' in the selection of materials and construction products. Crucially, she clarified what she believed practitioners meant by the term 'experience': "It became clear that the word 'experience' referred to experience of successful problem solving rather than experience of performance of a product" (Mackinder, 1980, p. 106). This understanding was further evidenced by Mackinder's subsequent work with Heather Marvin (Mackinder & Marvin, 1982), by Emmitt's more recent publications (Emmitt, 1997, 2001, 2006) and by Emmitt's publications with co-researchers (Emmitt & Heaton, 2003; Emmitt & Johnson, 2004; Emmitt & Yeomans, 2008). Mackinder (1980) and Mackinder & Marvin (1982) identified the overwhelming preference for using experience to make decisions in architectural practice over the use of written information. Mackinder & Marvin noted that "...designers seem to prefer experience as it appears to be a more readily available source, well suited to the climate in which design decisions are made" (1982, p. 11). Despite this statement the authors do not view experience and written information as two mutually exclusive aspects of architectural practice but see them as two ends of a continuum, developing a diagram to express their model (Fig.1).

Fig 1: The continuum between written information and experience.
Source: Mackinder & Marvin (1982, p. 17)



Mackinder's description of 'experience' chimes very closely with Donald Schön's description of the way that professional practitioners use tacit knowledge in their everyday work (Schön, 1983). Connecting 'experience' with tacit knowledge would allow Mackinder's work to be viewed in a wider discourse about theories of practice and education. Schön's work liberated theories of professional practice from '...the limits of Technical Rationality' (1983, p. 37) and still acts as a dominant theory about professional practice and professional education. This dominance has been significant for architectural education: Schön's theories were influenced by observations of studio teaching in architecture schools in the US and architectural education in the UK was happy to view itself as an exemplar of Schön's theories (Knowing-in-action, Reflection-in-action, Reflection-on-action).

3.2 Practice and Academia

Helena Webster's more recent work (2008) offers a critical perspective on Schön's theories. Webster argues that Schön's focus on the cognitive dimension of learning ignores the "affective and corporeal dimensions" (2008, p. 68). Webster identifies other important theories of learning, including 'Situated Learning' and 'Communities of Practice' (Lave & Wenger, 1991), that give vital perspectives on the way that students become architects during both academic and practice based periods of learning. She argues that architectural education acts to acculturate students into becoming architects through a hidden curriculum that teaches students to look and behave like architects just as much as the cognitive aspects teach students to think like architects. Webster reflects on a potential reason for Schön's limited focus on cognitive learning theory and notes that he was writing at a time when paradigms of teaching and learning were evolving (from enlightenment theories towards a post-enlightenment position), leading to an incomplete theoretical model rather than an incorrect model.

Judith Farren Bradley also identifies the early 1980's as a key watershed in the professional training of architects where "...the majority of registered architects entered the profession through a combination of five years of full-time education and a

minimum of two years of supervised practical training” (Farren Bradley, 2000, p. 153). She develops this shift in architectural education into a crucial idea that drives her thinking about the future opportunities for education: ‘The education practice schism’. She argues that the schism developed directly from the post-Oxford Conference changes and the assumption that “Theoretical work is best done in the schools, practical work in practice” as noted by Carolin’s paper for the RIBA’s 1992 *Strategic Study of the Profession* (cited in Farren Bradley, 2000). Mackinder (1980) identifies two clear modes of learning during architectural training: The academic mode and the practice mode. Mackinder argues that the impact of academic education may be small once a graduate enters architectural practice because practice is ‘experience’ orientated: “While practical skills are developed in the office, time presses on and the designer becomes involved in the strongly habit/experience orientated existence of the design office, where there is little or no time available to look at new methods or re-assess old ones” (Mackinder, 1980, p. 173). This clearly aligns with Lave & Wenger’s idea of ‘Situated Learning’ where trainees participate in a ‘Community of Practice’ and construct their knowledge through the activities they engage in and their interactions with the other participants (Lave & Wenger, 1991).

The ideas of practice based learning and construction of knowledge through social interaction imply a strong link to the culture of the organization that provides the setting for these to take place. Research into various aspects of the culture of architectural practice evidence the different ways that architects think about practice and the impact on the way that they act as a result. Dana Cuff looked at the myth of the lone creative genius that often sustains students through the rigors of architecture school compared to the culture of collective decision making that she observed in practice (Cuff, 1991). Cuff’s work exposed the essentially collaborative culture of architectural practice, where architects interact frequently with clients, consultants, local government officers and building contractors. Brown et al (2010) contrast the rhetoric of creative freedom espoused by one particular architectural practice with the observed culture of shared beliefs that developed a strong system of self-monitoring.

4. METHODOLOGY

Research into design methods in architecture has adopted a variety of methodologies. Lawson (2006) gives a useful overview of different approaches, citing four pieces of research that provide empirical data supporting his work on design methods in architecture. Lawson (1979) adopts a positivist/post-positivist paradigm to answer a question about the difference between the thinking styles for problem solving in architecture students and psychology students. The research design puts the students in a controlled setting (akin to the laboratory) and asks them to solve a problem unrelated to either discipline. The findings describe a general difference in the strategies adopted by the two groups of students, isolated from issues of context and discipline specific knowledge. A similar approach is evident in the work of Eastman (1970) who asked designers to respond to a discipline specific problem for a bathroom design. Again this was treated as a laboratory style experiment where the researcher is in total control of the context and nature of the problem, so appears to fit the positivist/post-positivist paradigm. Darke (1978) takes a different approach to Eastman and Lawson. Her work accepts a subjective view of the world and uses interviews with architects to establish their views on the design process as it is carried out in a practice setting. This moved research on design methods away from an approach based on theory that was subsequently tested through controlled experiment, towards an approach that developed theory based on knowledge constructed from interactions between the researcher and designers.

Darke and Mackinder published their work within two years of each other and adopted almost identical approaches to their research, using interviews with architects in

practices to build a picture of the way that they worked. This research (both in method and outcome) subsequently influenced the methods adopted by Rowe and later Emmitt in pursuing similar aspects of architectural practice, with one key difference: Rowe and Emmitt also used observation as part of their research methods. Participant observation offers a method of viewing the research context from the 'inside' and the work of Cuff (1991) exemplifies the ethnographic paradigm in an architectural practice setting. Cuff's work sought to write down the culture of architectural practice in its widest sense and the culture of negotiation between architect and client in particular. Cuff cites Clifford Geertz's classic text 'Interpretation of Cultures' (1973) in her definition of culture: "Customary actions, as they evolve, weave webs of meaning among a group of participants; these form the very basis of culture according to some definitions" (Cuff, 1991, p. 5). In relation to this research project Cuff offers another key definition: "My own career in architecture, as a teacher and consultant, provides rich data to augment what I have learned about others in the field and makes me an 'indigenous ethnographer' (see Clifford 1986 [Cuff is citing James Clifford's 'Introduction: Partial Truths' in *Writing Culture: The Poetics and Politics of Ethnography*])" (Cuff, 1991, p. 6). The author of this paper makes the same claim to the title 'indigenous ethnographer' based on his own experience in architectural practice.

Examination of other ethnographers working in architectural practice reveals a further layer of methodological pluralism. Recent research in the area of architectural practice has recognized the potential of ethnography as a mode of inquiry (Brown et al., 2010; Ewenstein & Whyte, 2007; Yaneva, 2009). Whilst all of these authors identify themselves as ethnographers, they each adopt a particular stance on the most appropriate theoretical framework for interpreting their data. Yaneva (2009) identifies Actor-Network-Theory (ANT) as the theoretical framework for her ethnographic research, citing the work of Bruno Latour. Ewenstein and Whyte (2007) use Grounded Theory based on the work of Glaser and Strauss. Brown et al (2010) cite Foucault's work on discourse as critical to their own approach. This range of approaches initially seems too varied for them all to be considered as ethnography but James Paul Gee provides a helpful note in his book 'An introduction to discourse analysis':

Note: The term "Discourse" (with a big "D") is meant to cover important aspects of what others have called: discourses (Foucault, 1966, 1969, 1973, 1977, 1978, 1980, 1984, 1985); communities of practice (Lave and Wenger 1991); cultural communities (Clark 1996); discourse communities (Berkenkotter and Huckin 1995; Miller 1984); distributed knowledge or distributed systems (Hutchins 1995; Lave 1988); thought collections (Fleck 1979); practices (Barton and Hamilton 1998; Bourdieu 1977, 1985, 1990a, b; Heidegger 1962); cultures (Geertz 1973, 1983); activity systems (Engstrom 1987, 1990; Leont'ev 1981; Wertsch 1998); actor-actant networks (Callon and Latour 1992; Latour 1987); and (one interpretation of) "forms of life" (Wittgenstein 1958). (Gee, 1999, p. 38)

This list ties Geertz and his definition of culture (cited by Cuff) to Latour's actor networks (cited by Yaneva) and Foucault's notion of discourse (cited by Brown et al). What emerges is a 'family' of theoretical models that operate in the realm of ethnography. The work of Foucault features first on Gee's list as it is a key influence in the development of his own work on discourse analysis. Whilst discourse analysis may appear to be primarily concerned with the use of language, Foucault's use of 'discourse' is much broader. Kendall and Wickham (1999) quote Hunter's unpublished paper 'Michel Foucault: Discourse versus Language' (n.d.), "Foucault's reformulation of the concept of discourse derives from his attempts to provide histories of knowledge which are not histories of what men and women thought...they are reconstructions of the *material conditions* of thought or 'knowledges'" (Kendall & Wickham, 1999, p. 35). In other words, Foucault is alert to what people do (in action and speech) as a way of defining a particular discourse. The note from Gee's own work above indicates

“Discourse” (with a big “D”) and this is a particular development from Foucault’s work. Gee uses discourse/Discourse to identify particular ideas that are important to his own theoretical framework: “When “little d” discourse (language-in-use) is melded integrally with non-language “stuff” to enact specific identities and activities, then, I say that “big D” Discourses are involved.” (Gee, 1999, p. 7). Gee’s ‘discourse analysis’ develops notions of ‘social language’, ‘situated meaning’ and ‘cultural models’ as tools of inquiry in researching a particular Discourse. The framework developed by Gee is practical and many ethnographers working in practice-based settings align themselves with this approach.

A range of practical research methods are adopted in ethnographic research and Table 1 summarises the proposed methods for this project.

Table 1. Summary of research methods.

	Method	Form of data
a.	Observation	Field notes, including diagrams, that describe the observed behavior of the participant and interactions with colleagues/other project team members
b.	Diaries	<ul style="list-style-type: none"> i. Quantitative data identifying time allocations for various different activities by the participant ii. Qualitative data describing various different activities by the participant iii. Qualitative data describing participant reflections on their activities
c.	Interviews	Transcripts of interviews with participants and their colleagues
d.	Questionnaire	Quantitative data about the participants that locates the case studies within a broader statistical picture

Direct observation of participants in practice is essential to confronting the issue that Cuff (and others) raise about working with architects: “To complicate matters, what architects say and what they do are often two very different systems.”(Cuff, 1991, p. 7). Critical issues may be overlooked in the participants’ own reporting due to over familiarity, so observation becomes a tool to capture common customs and practices within this setting. The status of the researcher within the practice setting and the potential for their presence to bias the data needs to be carefully considered. Diaries by the participants will provide key data that captures the participants’ reflections on their activities and gain an insight into their learning in practice. The diaries also perform an important task in this project where observation can only be carried out on one day per week due to the part-time study mode of the researcher: The participants own narrative provides essential data for tracking the way that they respond to continuously evolving issues over time. Whilst the participants’ reporting of their activities through interview may overlook critical issues, there is an opportunity to investigate motivations for particular decisions by the participants. Interviews with the participants’ colleagues will also be used in this project to investigate the broader culture of the organizations in which the participants operates.

5. PILOT STUDY

A pilot study is being used to assess the effectiveness of the research design prior to the main data collection period. The pilot study is broken down into three key phases: Recruitment of participants; Data gathering in architectural practice; Analysis and write up. At the time of publication the pilot study is ongoing and this paper reports on the recruitment of participants and the data gathering in architectural practice.

5.1 Recruiting participants

Two key issues of debate emerged during the development of an attitude towards participant recruitment: First, whether or not a single participant was adequate for the pilot study and, second, the potential bias arising from working with participants who had graduated from the school of architecture at which the author teaches.

An initial proposal to base the pilot study on a single participant was changed after a review with the author's supervision team. It was agreed that a wider pool of participants would mitigate against the potentially false picture that could emerge from a single participant (potentially an anomalous case).

An initial assumption that the pilot study would utilize graduates from Birmingham School of Architecture and Design was also challenged. The author would potentially have a pre-formed view of a Birmingham graduate's behaviour and they would have an existing relationship with the author as their ex-tutor. These issues could potentially bias the research and the preferred participant would be a graduate from another school of architecture. Consideration of ethical issues in the research design had identified that participants should be recruited directly, not via the practices that they worked for, to ensure that they would be genuine volunteers.

During May and June 2015 a concerted attempt was made to recruit participants from other schools of architecture using a variety of channels including the Architecture Students Network (ASN), the Royal Institute of British Architects (RIBA) West Midlands branch, the Architecture WM website and the Association of Professional Studies Advisors in Architecture (APSAA). None of this was successful. Reflection on this outcome suggested that a number of factors had potentially contributed to this lack of success: The author does not have an established research profile that potential participants could access to reassure themselves of the legitimacy of the project; Very little time had been allowed for participants to come forward; Participants had been sought at the busiest time of the academic year. However, the key factor related to the recruitment channels that had been chosen and it was concluded that future recruitment should target the schools of architecture, in particular the programme directors for RIBA part 2 and 3 courses, as they are closest to the participants that the project needs to recruit.

The lack of research participants also raised an urgent question: Should the pilot study be postponed (potentially for up to year) or could it proceed with participants drawn from graduates of Birmingham School of Architecture and Design? The key purpose of the pilot study is to assess the effectiveness of the research design before embarking on the main study, so postponement would have a critical impact on the overall timetable. The decision was taken to continue with the pilot study using graduates from Birmingham. Whilst the potential for bias from prior knowledge of the participants still existed, this could be acknowledged in the analysis of the data and clear limitations on the significance of the pilot study would be established. Crucially, participants would only be recruited once they had graduated to avoid the potential for any participant to gain a perceived advantage by volunteering.

5.2 Data Gathering

Two participants have been recruited and observed for the pilot study. Holly works in a small architecture practice in the West Midlands of the UK and Tom works in a medium sized practice in the South East of the UK. A third participant will be recruited from a practice in the West Midlands.

Data gathering with Holly began at the end of July 2015 and was carried out during eight days in the practice during July, August and September. The time in the practice was organised as a single day in July, three blocks of two days each in August and a single day in September. Data gathering with Tom took place in November and was carried out over four days (one day per week) in the practice over four consecutive weeks. Data was gathered through observation of the participants, the participants' own notebooks, reflections on each week's activities by the participants and interviews with the participants and directors of the practices. The issues encountered in data gathering with these participants are considered under four headings below.

- a. **Observation.** Prior to the observation it was envisaged that this method would generate data critical to understanding what was actually happening in each participant's decision making process, offering an important check on what was reported by the participant. As the observation proceeded it often appeared uneventful and to offer little of interest to the research. Much of this sense was attributable to the way that architects now work with a computer. Where previous research has been able to observe designers making use of printed regulations, printed product literature and speaking to product manufacturers by telephone (Emmitt, 1997), all these activities can now be done using digital downloads over the internet and communication via e-mail. It is possible for a participant to work for extended periods without leaving their desk or talking to anyone and this appears to make the observation uneventful. However, it became clear that the value of observation in the practice does not lie solely in recording the action and interactions of the participant but in evaluating the context of the practice itself. The label 'indigenous ethnographer' signals the benefits of carrying out the research with a knowledge of architectural practice from previous experience but also highlights the danger of being an 'insider'. Prior knowledge of the field of study is an advantage where it is useful to be able to decode professional jargon, understand professional relationships inside or outside the office and anticipate the expected outcomes of different project stages. However, in an ethnographic approach the researcher is the principal research instrument: Care is required to ensure that aspects of architectural practice that are considered commonplace by insiders (including the researcher) are not overlooked. Whilst ethnography asks some significant questions of the researcher, it offers an important way of building a picture of the discourse of architectural practice and how this discourse influences the detailed design decision making process.
- b. **Documents.** The computer based working evident in Holly's practice highlighted the opportunity to use digital project documentation, as well as physical documentation, to discover the way that decision making was informed. A strategy was adopted that focused on a key issue that appeared to be unresolved and extracted information from the project server and physical files to establish a timeline of events. This issue became identified as the 'contested detail' by the author and started to reveal the way that Holly had drawn on different types of information during the process, including written information and experience of colleagues and other consultants. This method highlighted the lack of consensus around the 'contested detail' and the resulting difficulty Holly experienced in agreeing a way forward with the other actors involved in that project. The notion of the 'contested detail' was observed again

in Tom's practice and proved a useful focus for the examination of project documentation.

- c. **Diary.** The diary was intended to capture the participants' daily activities in several ways including approximate timing of activities, descriptive information about those activities and reflections on those activities. Holly and Tom provided copies of their notebooks and these provided some information about how they divided their time, the conversations and meetings that took place as well as sketches of details that were in development. Holly had a thorough and particular approach to keeping a daily notebook (including colour coding) and no attempt was made to influence this. Holly produced a short piece of reflective text at the end of each week and the content of this was left entirely to the participant. This provided valuable commentary on actions that had been observed and an insight into the days during the week that were not directly observed. Based on the way that Holly provided her weekly reflections, Tom was given some guidance on maintaining a record of events that created a narrative in his own words including his reflections on events.
- d. **Interviews.** Two interviews were carried out during the data gathering at Holly's office: One with Holly and one with Holly's director. A formal semi-structured approach was adopted for both interviews, using the voice recorder and preparing a set of key themes for the questions before each interview. Whilst this seemed appropriate for the encounter with the director, it seemed less appropriate when dealing with the participant. This sense of awkwardness was also articulated by the participant. Advice from researcher colleagues indicated that a more relaxed approach could be more effective, including beginning interview sessions with informal conversation and using informal settings such as cafés. During the time spent in Tom's office this more informal approach helped to build a sense of trust over a series of lunchtime discussions.

CONCLUSION

The pilot study is primarily concerned with establishing the effectiveness of the research design. Issues identified during the pilot study process will inform subsequent participant recruitment, data gathering and data analysis for the research study.

Recruiting participants from outside the author's 'home' school of architecture is essential to the validity of the overall study and to minimize the potential bias from previous encounters between researcher and participant in an academic setting. Direct contact with programme directors for RIBA validated part 2 and part 3 courses in UK schools of architecture may be an effective form of participant recruitment. Seeking volunteer participants is a more ethically robust approach than seeking participants via architectural practices.

Observation of participants in their workplace provides an important way of engaging with the culture of the practice, perhaps more than the opportunity to observe detail design decision making in action. The notion of the 'contested detail' is a useful way to utilize project documentation, particularly in the computerized world of current architectural practice. The effectiveness of diary and interview methods can be optimized by tailoring them to the participants.

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