

MAKING CHANGES IN PRACTICE: AN ETHNOGRAPHIC STUDY OF A HOSPITAL PROJECT

Clare Shipton¹ and Will Hughes

School of Construction Management and Engineering, University of Reading, PO BOX 219, Reading, RG6 6AW, UK

Changes to client requirements are inevitable during the construction phase of a project. Dominant industry discourse is concerned with minimising and controlling changes. However, there is a lack of understanding about processes of making changes. In response to calls for more research to be undertaken into working practices, the aim is to explore how changes are made in a live project. An ethnographic study of a public hospital project was undertaken over an eight-month period in order to gain insights into these practices. It was found that there was a strong emphasis on following contract change control procedures, partly as a means of demonstrating best-practice and ensuring accountability, which was deemed to be important in the public sector project. However, it often overshadowed considerations about whether or not a change was required in terms of the functionality of the building. Drawing upon structuration theory, these practices were the product of, and reaffirmed, structures of legitimation in the construction industry and the public sector concerning change management. This representation of making changes highlights how contract procedures can be useful and insufficient and where attention can be focused to explore better change management practices.

Keywords: change, ethnography, practice, project management, structuration theory.

INTRODUCTION

The phenomenon of change in construction projects is widespread and familiar. Project changes are often regarded as inevitable (Cox *et al.* 1999, Stocks and Singh 1999, Sun and Meng 2009). Indeed, the presence of specific clauses in standard forms of construction contract endorses this stance (Cox *et al.* 1999) as they provide standardised mechanisms by which to manage project change. The contract provides an important benchmark with which to define and evaluate project changes when they occur. Changes occur for many reasons. For example, as a result of a client change to requirements, in response to changing material availability, or due to unforeseen ground conditions. Client changes to contract requirements during the construction phase are the focus of this research. There is a dominant discourse in the construction industry that changes are detrimental during this stage of a project due to the potential time and cost implications for the client. Moreover, the focus of existing construction management (CM) research highlight these concerns by focusing on the causes and effects of changes with the intention of reducing the likelihood of their occurrence, which perpetuates the discourse. From the literature, it would appear that there is

¹ c.shipton@pgr.reading.ac.uk

limited understanding of the process of making changes in a project. However, there is a growing body of CM literature adopting ethnographic approaches to understand the lived experiences and practices of people in project settings, which provide a highly immersed way in which to explore project change. Giddens' structuration theory provides a useful lens through which to relate observed patterns of practices to the structures in which they take place and are reproduced through ongoing action. The aim is to explore processes of making changes in a live project. This study provides theoretically informed insights into practices around making changes which challenge and reaffirm practical understandings about contract change control.

CHANGES ON CONSTRUCTION PROJECTS

A change refers to “an alteration to design, building work, project program or other project aspects caused by modifications to pre-existing conditions assumptions or requirements” (Sun and Meng 2009: 560). Changes are common, their causes are numerous and they are a frequent source of conflict (Love 2002). Nevertheless, projects with high change costs are still capable of coming in on time and budget (Love 2002), which highlights the importance of how changes are managed. Existing studies use quantitative analysis of actual changes on projects to produce taxonomies of the reasons for changes (Stocks and Singh 1999) and the effects of changes (Sun and Meng 2009). However, these approaches do not provide insights into the processes of making changes. The dominant discourse within the construction industry is that changes during construction are detrimental to a project and that changes should be minimised or, if unavoidable, tightly controlled. There are valid reasons for this view as changes often have time and cost implications. However, this industry discourse overwhelms alternative views of changes. Similarly, governance practices in the public sector are based on a discourse of demonstrating transparent change control and accountability. The discourses of PM best-practice and public sector governance are complementary and advocate strict change control.

EXPLORING PRACTICES

An alternative approach to the “technical rationalism” of much CM research advocates a need to explore formal and informal discourses and practices (Chan and Räsänen 2009: 907). A body of PM research calls for a better understanding of the ‘actuality’ of project based-working by focusing on the routine and complex lived experiences of practitioners in their local environments (Cicmil *et al.* 2006). This builds upon the so-called ‘practice-turn’ in the social sciences whereby phenomena such as human activity and social institutions are believed to occur with the ‘field of practices’. Practices help to understand the shaping of shared meanings: “practices are the source and carrier of meaning, language and normativity. The generation, maintenance, and transformation of these phenomena are achievements of extant practices that are realized in the public realm of actions [...] where these matters are conserved and novelty and transformation take their start” (Schatzki 2001: 12).

From an ontological perspective, by using practices as the focus of study, traditional dichotomies of agency and structure may be transcended. Giddens' structuration theory and the notion of ‘duality of structure’ posits that structure is both “the medium and outcome of the conduct it recursively organizes” (Giddens 1984: 374). Hence human action is influenced by structures; structures exist because they are produced and reproduced by knowledgeable agents. Structures are sets of “[r]ules and resources, recursively implicated in the reproduction of social systems” (Giddens 1984: 377). Giddens (1984: 5) posits that humans are knowledgeable agents who “routinely

monitor aspects, social and physical, of the contexts in which they move". In this respect, structuration theory is suited to understanding the minutia of everyday practices and how shared meanings are constructed by actors (Baert 1998). However, the representation of social meanings involves interpretation, which Giddens refers to as the 'double hermeneutic'. First, descriptions of social systems and action are bound by the frames of meaning of the actors being studied, and this requires the social scientist to interpret these meanings. Second, social scientists are also influenced by other frames of reference, particularly from their research discipline, which imposes additional meanings on the descriptions. Researchers overlay their own meanings on what they believe are the participants' meanings, thereby creating a double layer of interpretation. The concept of 'double hermeneutic' supports reflexive approaches to social science research, particularly ethnographic research, emphasising the need to consider the influence of researchers on meanings they induce from social settings.

Ethnography

Ethnography has "deep and diverse roots" (Atkinson *et al.* 2001: 4) and like other approaches to social research, it continues to develop across disciplines over time. As an intellectual pursuit, ethnography is rooted in early-twentieth century anthropology. From the 1920s onwards it was developed as an approach to sociological research and was widely used by the Chicago School. Classic anthropology studies typically documented the lives of native inhabitants in unfamiliar cultures, requiring the researcher to spend lengthy durations, sometimes several years, in the field. Sociologists using ethnographic methods have tended to study more localised settings but have often focused on understanding unfamiliar phenomena. Throughout the twentieth century there have been many developments in ethnographic research and it is increasingly used in a diverse range of fields. Despite differences in approaches, ethnographic research can be said to be "grounded in a commitment to the first-hand experience and exploration of a particular social or cultural setting on the basis of (though not exclusively by) participant observation" (Atkinson *et al.* 2001: 4). However, many commentators regard ethnography as a written representation of culture and the strategies used to produce this final textual product are an important part of the practice of ethnography (e.g. Clifford 1986, Van Maanen 1988). Hence there are ontological assumptions that underlie ethnography whereby "social reality is presented, not known" (Van Maanen 1988: 7). Central to the representation of social reality is the role of the ethnographer. Choices and biases which influence fieldwork and the writing of the ethnography shape this representation. This has been widely acknowledged within the 'reflexive turn' in ethnography with the recognition of "ethnographic truths" as "inherently *partial*" (Clifford 1986: 7, emphasis in original).

There are many different approaches and literary devices used in writing an ethnography. Differences in textual representation highlight some of the demarcations between ethnography traditions and different theoretical approaches to ethnographic research as an approach to understanding social reality. Van Maanen (1988) classifies approaches to writing ethnography into 'realist', 'confessional' and 'impressionist' tales, with 'impressionist' tales resembling the self-reflexive narratives and thick descriptions used in many contemporary ethnographies. The author of an ethnography represents the voices of those he or she has studied. As such, ethnographies are constructions and not direct reflections of the reality they seek to represent in that time and place. Ethnography is a way of investigating social life and there is no single way in which to undertake this investigation and represent its findings, but different approaches produce different kinds of knowledge (Pink *et al.* 2013: 11). It is highly

suited to gaining an understanding of the everyday practices of people on projects. As each project is affected by the context in which it takes place, practices are said to be embedded and must be understood within this context. Using naturally occurring data to describe how a phenomenon is “locally constituted” helps to unpack the character of a phenomenon (Silverman 2006: 43). There are many ethnographies of working practices in a range of fields and a growing body of CM studies, including Pink *et al.* (2010) and Sage and Dainty (2012). CM ethnographic research incorporate a range of approaches, from classic, long-term studies to contemporary studies in applied settings focusing on the co-production of knowledge (Pink *et al.* 2013). There is a range of representation styles, from extensive narrative descriptions (e.g. Fletcher and Watson 2007) to more targeted approaches (e.g. Sage and Dainty 2012). Nevertheless, ethnography is not widely used in CM research. As such, it is an innovative, highly immersed approach to exploring lived experiences of making changes on projects.

RESEARCH PROBLEM

Our interest is in the process of making changes to requirements on construction projects. The dominant PM and public sector discourses state that changes should be avoided or strictly and transparently controlled. However, changes may be required for many reasons, not all of which are detrimental to a project. For example, changing the specification to create something previously unforeseen that is more useful to the client is a positive step. Exploring practices using ethnography provides insights into the lived experiences of individuals in their local environments and how meanings are produced. Structuration theory goes further by considering how structures are both the medium and the outcome of these human actions. The aim of the research is to explore practices of making changes on a live project. This is important in order to gain insights into practices around how changes are instigated, developed and agreed, rejected or left unanswered, about which our understanding is limited. Understanding project changes remains important, as change clauses continue to be included in standard-form contracts while unchallenged discourses of minimising and controlling changes prevail. Therefore, it is meaningful to gain a better understanding about practices of making changes rather than a preoccupation with prevention and control.

RESEARCH DESIGN

The research was carried out by the first author, Clare Shipton, who composed the first-hand account of her experiences that follows. A new-build public sector hospital project was studied over a period of eight months, following ethical approval being obtained from the University of Reading in accordance with the established procedure. As I already had experience of managing changes in the construction industry, the culture was familiar to me and so a more contemporary ethnographic approach was adopted whereby I attended site several days a week over several months. At the start of the fieldwork the project was in the third month of a 34-month construction programme and it was being procured through a partnering framework that had a ‘design and build’ arrangement using an NEC3 contract. Data was collected through more than 200 hours of observations, 17 interviews and document study. Access to the project was gained through my contacts from my time spent working as a Project Manager for a consultancy firm. My previous experience in this role both influenced the particular choice of study and inevitably influenced approaches to fieldwork. The ‘key informant’ for the study was the Client Project Manager (PM) on the hospital project, whose position facilitated the initial access to the project. It also influenced some people’s attitudes towards me as some saw me as being closely associated with,

and even employed by, the PM's company, an impression that had to be corrected. The majority of the fieldwork was conducted at the Contracting Organisation's site offices, with some time spent at the client's offices. I mostly had a participant-observer role by attending and observing meetings, talking to people and generally being present when they were doing their daily work. With certain individuals, my role was more active and I became someone from whom updates could be requested about the progress of changes. Rapport-building was important and some people were more amenable than others. My age (24 at the time), 'student' status and presumed inexperience were beneficial in getting people to talk about their work. However, my status as a young, female novice meant that some topics were, perhaps, not discussed.

As time went on, it became easier to talk with different people involved in the project. As my knowledge of the changes grew, it provided shared topics of interest and a common language with which to discuss them. In addition, I became a familiar face amongst the project team and so it became easier to be included in, and instigate conversations, with humour playing a big part in signalling insider-status. There were many instances where my outsider-status was obvious, such as when doors were deliberately closed and hushed conversations were held when I was in earshot. These instances generally became fewer as time went on and I was included in more confidential conversations, from commercially sensitive ones to workplace politics and gossip. However, certain people, like subcontractors, remained off-limits. Hence, changes that were being instigated by the client, and were dealt with by the Contractor and their design team, were more visible than changes further down the supply chain between the Contractor and their subcontractors. As the study progressed, certain project changes became the focus of the fieldwork. This iterative process of data informing the ongoing research design is typical of ethnographic research. This approach has resulted in vast amounts of qualitative data about everyday practices which contribute to building an holistic picture of the setting. The data was collected and analysed following a mixture of emic and etic orientations, whereby these orientations are on a continuum rather than an either-or approach (Fetterman 1998). The focus of the study on making changes was informed by etic a priori assumptions based on the literature. During the study a more emic approach was adopted, whereby the making of changes was exploring based on the internal practices used by the people involved in the project. Nevertheless, there is no entirely emic data as the fieldwork was influenced by my experience on the project (professional experience, theoretical assumptions, personal relations and so on). Emic internal insights into a social setting cannot be divorced from the researcher's etic external assumptions. Instead, reflections on the researchers' role and stance can assist in highlighting some of the assumptions around which insights and findings are based.

Observation notes were coded in terms of events, people and changes. Specific changes were coded using emic terms routinely used by individuals in the project team. Each change provides a timeline of the process of making that change during the fieldwork period, based on the information that was available. Analysis was conducted following two approaches: first, the making of specific changes was tracked; second, a general thematic analysis of patterns of practices was undertaken across the study and in the making of specific changes. The findings that are presented in this paper are representative of the second type of analysis, which are one step removed from the field data. Within the constraints of this paper, the findings are presented in a way that highlights connections to the existing change literature and CM discourse in order to discuss practical and theoretical implications of the findings.

Representations of making changes using thick descriptions to unpack specific episodes observed in the fieldwork form part of my ongoing doctoral research.

DISCUSSION

Despite the construction phase being in its infancy at the start of the fieldwork, the contingency budget for the project was very small. Nevertheless, potential client changes were instigated from the start of the construction period and potential changes were abundant during my time on site. The majority of the changes encountered on the project were client design changes. The benchmark for evaluating the changes was the contract, comparing the potential new requirements against those that were designed, included and priced in the contract. Most of the changes required additional work or specification enhancements, resulting in additions to the contract sum.

Controlling changes: “You issue an RFQ, we’ll respond, *then* you issue the PMI”

The process of making a change on the project was largely based on the contract procedures of which I was aware based on my previous experience as a PM. However, timescales were often extended and there was a lot of upfront work gathering information to determine requirements before a Requests For Quotation (RFQs) for the change could be issued, following which the change could potentially be instructed using a Project Manager’s Instruction (PMI). The contract procedures start from a point where it is assumed that the proposed change has well-formulated requirements. In practice, RFQs were generally issued later in the process when information had been processed and the change had been discussed at length during the regular cycle of meetings that I attended. As a result, the change process was much longer in practice than what was set out in the contract procedures. Despite some of their shortcomings, there was an acceptance of using the contract procedures amongst the project team. Rather than the procedures being seen as contractual or adversarial, many of the project team members claimed that they preferred to work in this manner as it was easier to maintain a clear, auditable trail to follow the development of a change, although they also acknowledged the political nature of the processes. It became clear to me that accountability was seen to be very important to the people in the project team on this high-profile public sector project. They frequently referred to the need to be able to demonstrate how decisions had been made for audit purposes and in case anybody like end-users or people in the framework organisation questioned these decisions in the future. Therefore, following the contract procedures was one way of demonstrating accountability and best-practice in terms of making and rejecting potential changes. However, timescales for issuing information from the client-side were often slow, which was a source of frustration for the contracting team. There were also some individuals who did not adhere to these procedures when making changes. These individuals tended to be project stakeholders who were less familiar with the contract practices and who were not as involved in the project team where these routine practices were being used. Some end-users expressed their frustration at having to follow the procedures and communication channels set out by the contract rather than acquire information directly from people involved in making changes. However, it was not just maverick end-users that I observed bypassing the contract procedures. Frequently, the Client Representative would request proposals from the Contractor PM via email, often citing piecemeal, unclear and changeable information. This was a common example that the Contractor PM would hold up to me as a reason why he felt it was better to follow the contract procedures. Following the contract procedures provided a record of proposals and decisions with regards to

making changes for the Client and Contractor PM and the other people involved in making changes. However, I noted mixed reactions to this approach: for some people it was attractive as it helped to avoid some of the risks and uncertainties associated with informal communications; for others it posed obstacles to making changes.

Accountability and minimising changes: “We’ve said it’s compliant, what else do they want?!”

Sometimes the project team’s focus on following contract procedures meant that the process of making the change seemed more important than the content of the change and whether or not it was actually required in terms of the functionality of the building. Frequently, I did not understand, beyond a very superficial understanding, the technicalities of what a change entailed, and it appeared that I was not alone in this lack of knowledge. The individuals in the project team managing the process of making changes often did not have the technical knowledge to understand the technicalities a change and judge whether or not it should be accepted or rejected. Instead these individuals focused on what is required in their role on the project and the outcomes they needed to know, chiefly the time and cost implications of the change. Moreover, these individuals did not have the authority to make decisions. Instead they assembled information on which the Client Director, or Project Board, could make the ultimate decision. Changes were made against a political backdrop where demonstrating best-practice and accountability often resulted in the content of the change being overlooked. The concern with adhering to contract procedures and demonstrating accountability can be partly attributed to the dominant attitudes towards change. Attitudes towards project changes that I observed were generally negative, largely as they were associated with additional time and cost implications and design rework. Thus the focus of many people in the project team was largely on minimising and tightly controlling changes, and the contract procedures assisted them in this aim. On reflection, my own biases reflected the dominant discourse of the need to minimise and control changes and it was a challenge to set them aside during the fieldwork. It is impossible to fully block out personal predispositions and no researcher is neutral. Yet, I was able to acknowledge and query my biases, and those of other people involved in the project, and the meanings constructed around making changes.

Not everyone involved in the project thought that changes were ‘bad’ and had to be minimised. Indeed, it depended entirely on the nature of the change and why it was being instigated. Some changes were essential for the functionality of an area; others would enhance the infrastructure and ultimately the service provision of the hospital. The end-users, who were typically instigated changes, clearly felt that their changes were essential for the functioning of the building and I could empathise with their understandable ambitions to want the best-possible facility. Often these individuals, who typically possessed highly technical building, clinical or health service knowledge, would use their knowledge and position to emphasise certain changes as being essential for the functioning of the building. This highlights the need to have some control over end-user groups and their “shopping list” of requirements in order to prioritise how the contingency budget will be spent on changes. This was a difficult task for the Client Representative and his approach was ad hoc, just addressing requests for changes as they surfaced from end-users. The notion of end-user sign-off was seen as very important on the project, but was deeply flawed. During the construction phase of the project, everything that had been incorporated into the contract had, technically, been signed-off. Yet, individuals in the project team were still focused on getting uncertain aspects of the design, including changes, signed off

by the relevance end-users. Sign-off was seen to represent a state after which no further changes could be made, or it would be more difficult for the end-users to justify changes, and so it was seen as a way to minimise potential changes. Of course, achieving sign-off of an area did not prevent changes from happening. In fact, some areas had been changed multiple times and end-users were making further changes to their own changes. This was a frequent topic of conversation whereby many of the people in the project team would complain to one another, and me, about the end-users and how the Client Representative was dealing with their requests for changes. Undoubtedly, these multiple changes shaped attitudes towards change and towards end-users instigating them biases about the need to minimise and control change.

Structuration: reproducing and challenging change management practices

As an organisation, the project consists of patterns of recurring practices called social systems. Social systems have structural properties, “especially institutionalized features, stretching across time and space” (Giddens 1984: 377) that are produced through, and influence, action by knowledgeable agents. In this paper, discussions will focus on what Giddens terms ‘structures of legitimation’ which are reproduced through norms of interaction that “always centre upon relations between the rights and obligations ‘expected’ of those participating in a range of interaction contexts” (Giddens 1984: 30). Norms are backed up by sanctions, which reinforce ‘legitimate’ conduct. Humans, as knowledgeable agents, reproduce legitimate actions due to embedded norms which they have learnt and reproduced in past interactions. Therefore, “norms articulate and sustain established structures of legitimation. They reinforce the normative order through tradition, rituals, and practices of socialization” (Orlikowski and Robey 1991:149). Actors can choose not to follow norms and break away from conventions and existing structures of legitimation. The challenge for ethnographic research is to understand people’s lived experiences, how meanings are constructed around practices and notions of ‘legitimate’ and ‘illegitimate’ conduct.

Concerns to minimise and tightly control changes were evident in practices around the use of the contract and attitudes towards sign-off of designs. Contract conventions set out the ‘expected’ way of managing changes under that contract type. This establishes sanctions by the incorrect use of the contract being potentially regarded as poor PM practice which can have reputational and commercial consequences. Moreover, there are specific contractual sanctions for not following contract procedures; particularly in relation to the time periods for reply (the parties can become ‘time-barred’). Contract practices establish norms of conduct of making changes that are informed by the traditions and conventions of the project organisation and the construction industry, which constitute structures of legitimation. The dominant industry discourse, which advocates that changes should be minimised and, if unavoidable, tightly controlled, shape these norms and subsequent interactions on the project. By people in the project team closely following contract procedures and pursuing sign-off in order to minimise and control changes, their behaviour reaffirmed this dominant industry discourse, and thereby reproduced these structures of legitimation. Expectations of actors’ conduct were reinforced by the presence of the framework organisation, which monitored practices in the project and posed a threat of sanctions for non-compliance. Contract procedures were also used due to concerns for demonstrating accountability. This reinforces the dominant discourse within the public sector with regards to the need to demonstrate transparent control of public spending. This structure of legitimation influenced approaches to making changes on the project and was reaffirmed through

certain individuals' concerns for following processes, which sometimes detracted from considerations about the need for the change in terms of building functionality.

There were also opposing practices which challenged structures of legitimation. This was apparent in practices where, rather than minimising changes, end-users were actively pursuing changes that they regarded as important for the functionality of the building. This highlights the alternative view of changes as opportunities to improve the end product so that end-users have a building that suits their needs rather than adhering to an out-of-date design specification. Yet it also emphasises the need to have some form of control over end-users' requests for changes as it would not be economically viable to agree to all requests. This reinforces the need for change control measures which are in place under the contract, but it also highlights the need for a more proactive way of dealing with these constant requests, rather than the ad hoc 'fire-fighting' practices that were observed. Practices which challenged structures of legitimation were also evident in informal practices with regards to information processing and individuals not adhering to contract procedures and communication protocols. These practices challenge the assumption that strict contract change control is the best way to manage changes. However, these practices were not considered favourably by individuals in the project team who were 'kept out of the loop' and it often created more work for them trying to find out what proposals and decisions had been exchanged between end-users and other people involved in making changes. As a result, they had little impact in modifying the dominant shared conventions about best-practice change control. Instead the unfavourable views of some individuals with regards to these informal practices reinforced the perceived importance of contract practices. However, contract procedures were insufficient as they did not account for the complex process to determine the requirements of a change. This altered existing structures of legitimation as alternative practices were adopted to cope with changes.

CONCLUSIONS

The aim was to explore how changes are made in a construction project. This aim was founded on a call for more research into project practices in order to provide practical and theoretical understandings of the lived experiences of individuals in local settings. There was a need to better understand practices rather than following unchallenged discourses that changes should be minimised and strictly controlled. Using an ethnographic approach, the making of changes in a hospital project is explored and presented in the form of thematic findings which have been interpreted from descriptive narratives that are the focus of ongoing doctoral research. The findings highlight the importance of contract procedures for individuals involved in making changes in order to control and minimise changes and demonstrate accountability. Existing structures of legitimation both influenced practices and were reaffirmed by them. At times the dominant discourse overshadowed actors' considerations about the content of the change and whether or not it was required. There were also challenges to structures of legitimation, evident in informal practices of change control and the active pursuit of changes by end-users. This highlights the practical implications of the study, whereby contract drafting could be informed by these insights into how contract procedures are used in practice and their shortcomings. Moreover, it provides insights for policy guidance. Following the norms of PM and public sector best-practice, demonstrating accountability was often put first by certain individuals in the project team, with considerations about the change being secondary. This highlights how these concerns can be detrimental to a project by shifting the focus from the actual change to the process of making the change. There is a theoretical contribution

by drawing upon concepts from structuration theory to further our understandings of structures and interactions involved in making changes in a project.

REFERENCES

- Atkinson, P, Coffey, A, Delamont, S, Lofland, J and Lofland, L (2001) Editorial introduction. In: P. Atkinson, A. Coffey, S. Delamont, J. Lofland and L. Lofland, (eds.) "Handbook of ethnography". London: SAGE Publications.
- Baert, P (1998) "Social theory in the twentieth century". Oxford: Polity Press.
- Chan, P W and Räisänen, C (2009) Editorial: informality and emergence in construction. "Construction Management and Economics", 27(10), 907-912.
- Cicmil, S, Williams, T, Thomas, J and Hodgson, D (2006) Rethinking project management: researching the actuality of projects. "International Journal of Project Management", 24(8), 675-686.
- Clifford, J (1986) Introduction: partial truths. In: J. Clifford and G.E. Marcus, (eds.) "Writing culture: the poetics and politics of ethnography". London: University of California Press.
- Cox, I D, Morris, J P, Rogerson, J H and Jared, G E (1999) A quantitative study of post contract award design changes in construction. "Construction Management and Economics", 17(4), 427-439.
- Fetterman, D M (1998) "Ethnography: step-by-step". 2ed. London: SAGE Publications.
- Fletcher, D and Watson, T (2007) Voice, silence and the business of construction: loud and quiet voices in the construction of personal, organizational and social realities. "Organization", 14(2), 155-174.
- Giddens, A (1984) "The constitution of society". Oxford: Polity Press.
- Love, P E D (2002) Influence of project type and procurement method on rework costs in building construction projects. "Journal of Construction Engineering and Management", 128(1), 18-29.
- Orlikowski, W J and Robey, D (1991) Information technology and the structuring of organizations. "Information Systems Research", 2(2), 143-169.
- Pink, S, Tutt, D, Dainty, A and Gibb, A (2010) Ethnographic methodologies for construction research: knowing, practice and interventions. "Building Research & Information", 38(6), 647-659.
- Pink, S, Tutt, D and Dainty, A (2013) Introducing ethnographic research in the construction industry. In: S. Pink, D. Tutt and A. Dainty, (eds.) "Ethnographic research in the construction industry". Abingdon: Routledge.
- Sage, D J and Dainty, A (2012) Understanding power within project work: the neglected role of material and embodied registers. "Engineering Project Organization Journal", (iFirst), 1-14.
- Schatzki, T R (2001) Introduction: practice theory. In: T.R. Schatzki, K. Knorr Cetina and E. Savigny, (eds.) "The practice turn in contemporary theory. London: Routledge.
- Silverman, D (2006) "Interpreting qualitative data: methods for analysing talk, text and interaction". 3ed. London: SAGE Publications.
- Stocks, S N and Singh, A (1999) Studies on the impact of functional analysis concept design on reduction in change orders. "Construction Management and Economics", 17(3), 251-267.

- Sun, M and Meng, X (2009) Taxonomy for change causes and effects in construction projects. "International Journal of Project Management", 27(6), 560-572.
- Van Maanen, J (1988) "Tales of the field: on writing ethnography". London: The University of Chicago Press.

