Ethnographic research in the construction industry: a critical review

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Abstract

A decade ago, there were multiple calls for more ethnographic research in the construction industry in order to provide deeper insights into industry practice. Since those calls, methods under the umbrella of ethnographic methods have been more regularly applied, with various data collection techniques being adopted, often as part of multi-faceted research designs. It is argued that it is now an appropriate time to critically review ethnographic research studies over the past ten years, in order to establish the kinds of knowledge they generate and the intervention that they may inform. In doing so, this also begins to identify contributions and areas that deserve more attention. We reviewed 57 relevant studies that adopted approaches such as auto-ethnography, quasi-ethnography, ethnographic-action research, retrospective ethnography and ethnographic interviewing, used both to explore problems and confirm results. Interesting intense forms of ethnography dominated, with alternative and shorter-term ethnographic work (as opposed to 'classic' long-term approaches) forming the basis of the majority of the studies reviewed. The methods explicated within these papers suggested they were rooted within different ontological positions, with there being little consistency in terms of how the rigour of the approaches used was evaluated. There was also a distinct lack of researcher reflexivity on their emotions. This means that many researchers fail to reflect on their role within the social worlds that they study; which, in a Western construction context can be a macho, masculine, and potentially dangerous (physically and mentally) environment. Greater levels of appreciation and consistency in judging ethnographic research, and greater reflexivity on the influence of the researcher's position and influence on the practices studied, are pre-requisites for robust ethnographic practice.

Keywords: ethnography, participant observation, reflexivity, methodology

36 Introduction

37 There has been a growing interest in ethnographic practice in the construction industry over the last
38 decade. This interest could have arisen from the potential of ethnography to yield detailed and
39 comprehensive accounts of different social phenomenon (Reeves, 2008). It is an approach that can
40 illuminate complexities of the social world (Draper, 2015), which may otherwise remain hidden,
41 under-theorised and poorly understood. Ethnography provides a so-called 'cultural lens' for
42 researchers that seek to understand the culture of a group and how they behave within it (Bryman,
43 2016). Accordingly, an ethnographic approach can be particularly useful for revealing insights into
44 the different construction stakeholder groups that are under-theorised. For example, prior work has
45 explored a group protesting against a controversial construction project (see Teo & Loosemore,
46 2014); as well as social negotiations between different groups, such as the interactions between a
47 principal contractor group and subcontractor groups (see Lingard & Oswald, 2020). Hence, the
48 growing interest in ethnographic work could have developed from researchers seeking to
49 complement traditional research methods, with those that can provide deeper insights into under-
50 theorised, dynamic and complex construction problems and topics.

51 It is also important to note that there has been an adoption of innovative ethnographic approaches
52 (that are less time-consuming than long-term 'classic' work). This has offered flexibility to
53 researchers to undertake approaches more suited to the transient and dynamic construction
54 environment, as well as an opportunity towards shaping interventions to practice (see Pink et al.,
55 2010). This is an important shift, and one which suggests that ethnographic practice can have
56 practical as well as theoretical benefits; through offering fresh perspectives for practical
57 improvement (see Pink et al., 2010). The recent increase in innovative techniques, such as
58 ethnographic-action research (e.g Scholtenhuis et al., 2016), focus on practical implementation and
59 improvement, and suggest this is another reason for the recent uptake in various ethnographic
60 techniques.

Ethnographic research occurs in the natural social setting, not a contrived and controlled experimental setting (Pole & Morrison, 2003). This means there are both opportunities to design the research to account for the specific context where ethnographic research takes place, but also challenges in that it can be unexpected and difficult to manage (see, for example, Borys, 2012; Hamid & Tutt, 2019, Parry, 2014).

In recent years a diverse range of research approaches under the umbrella of ethnographic methods have emerged, which provide insights that could not have been captured through more traditional and less immersive research approaches. This is not to say that construction ethnographies are a recent phenomenon as there have been several classic studies which have revealed deep, and in some cases, seminal insights into site cultures and practices (e.g. Sykes 1969; Applebaum 1982). However, as well as such in-depth long-term ethnographies, there has been a rise in the range of innovative ethnographic practices, from short-term targeted methods to those using visual and digital approaches (e.g. Pink et al., 2016; Pink et al., 2017). Hence, ethnographic research is now being undertaken in various forms, away from classic long-term observational studies that could involve years of fieldwork. To help present and discuss results, this review has categorised ethnographic work into three classifications. 'Long-term', which involves an observational data collection period of over six months. 'Short-term', which involves an observational data collection period of six months or less. Finally, 'alternate', which is where researchers have described their approach as a type of ethnographic research, such as ethnographic-action research, retrospective ethnography or ethnographic interviewing.

Regardless of the method adopted, however, ethnographies inevitably bring the researcher 'closer to the action' in terms of their involvement with practice. Recent construction ethnographies have resulted in researchers being involved in everything from protests (see Teo & Loosemore, 2014) to drinking in bars with workers (see, Thiel, 2012) as part of their research approach. Researchers have been exposed to unexpected findings, such as multinational workforces 'creating their own

language' to communicate (see Tutt et al., 2013a); and the development of informal reward systems (known as 'Vegas Time'), where workers could covertly do as they pleased, after finishing production-pressured tasks (see Oswald et al., 2019). They have also encountered disturbing situations, such as woman being at risk of sexual exploitation by managers (see Parry, 2014) and a fatal traffic accident involving a Tamil migrant construction worker, which grew into a 'riot', shortly after fieldwork in a Tamil community had begun (see Hamid & Tutt, 2019). Regardless of the type of research practice, ethnographic researchers risk having to cope with difficult situations that could also risk the researchers' safety within research settings (see Morgan & Pink, 2018).

Ethnographic researchers within the construction management field have used a variety of approaches to provide further understanding of, for example: revealing insights into the implementation and development of information systems (Hartman et al., 2009); providing explanations into the manifestation of the industry's claim culture (Rooke et al., 2004); revealing differing career prospects by gender (Dainty et al., 2000); finding challenges associated with construction partnering (Shields & West, 2003); and providing understanding into sources of rule violations (Iszatt-White, 2007). Such insight and knowledge would be more challenging to capture through positivist approaches that dominate the field of construction management. Following such studies, there were many calls for more ethnographic research to be conducted within the field of construction management. In the *Journal of Construction, Engineering and Management*, Phelps and Horman (2010) stated there was a critical need for theory-building methodologies, specifically ethnography. In *Construction Management & Economics*, Bresnen (2009) argued there was value in adopting ethnographic methods to tap into areas of construction management research that were not suited to the traditional research approaches. In *Building, Research & Information*, Pink et al. (2010) also made a similar call, as ethnographic research holds considerable promise for addressing practical, problem-based research on construction sites and for informing interventions aimed at improving outcomes for workers.

A decade on from these calls (see Bresnen, 2009; Phelps & Horman 2010; Pink et al., 2010), it can be observed that there has been a proliferation of ethnographic research in construction (see, for example, Laryea, 2011; Pink et al., 2013; Mäki & Kerosuo., 2015; Oswald et al., 2018a; Hamid & Tutt., 2019). Such ethnographic studies are very useful for complementing traditional methods and providing an alternate route to finding knowledge that otherwise could not be captured. However, there has been little critical reflection on the use of such methods, or the insights that they generate. This is surprising as where similar trends have been noted in related fields, such as management studies, this has led to considerable debate and reflection on their use and how their effectiveness should be evaluated. For instance, Jarzabkowski et al., (2014) discussed appropriate and effective ways to present ethnographic work; Gherardi (2018) advocated a style of ethnographic research practice; and Vesa & Vaara (2014) recommended four ethnographic methods to advance contemporary research in strategy processes and practices. Hence, as other fields debate and reflect, there is also a need to critically review ethnographic work within the field of construction management. More specifically, this review aims to critically examine the different research approaches undertaken within the umbrella of ethnographic methods, to explore how ethnographic research is being judged in the construction management research field and to consider potential future directions for ethnographic research practice in the field.

Ethnographic methods as a route to understanding practice

‘What is ethnographic research?’

Ethnography is ‘the study of social interactions, behaviours, and perceptions that occur within groups, teams, organisations, and communities’ (Reeves et al., 2008:337). While it does typically require a significant time commitment, it also allows the researcher close access to data, that would be hard to obtain otherwise (Murchison, 2010). Or as Watson (2011:204) put it: *“we cannot really learn a lot about what ‘actually happens’ or about ‘how things work’ in organizations without doing*

135 *the intensive type of close-observational or participative research that is central to ethnographic*
136 *endeavour.”*

137 Participant observation is the primary method of the ethnographer, though this can be used in
138 combination with many other approaches, such as the use of documentary data (Laryea, 2013),
139 interviewing (Van Marrewijk & Smit, 2016), focus groups (Oswald & Lingard, 2019) or even visual
140 and digital media (Pink 2006: 106) . Indeed, qualitative methods of data collection, including
141 interviewing, focus groups, observation, and document analysis, have been included under the
142 umbrella term of ‘ethnographic methods’ in recent years (see Kawulich, 2005). As well as different
143 types of data collection, there are various ways of undertaking them. For example, observation can
144 range from non-participation to complete participation (see Spradley, 1980); or peripheral
145 membership to full membership (see Adler & Adler, 1987). Spradley’s full range of participation is:

- 146 • non-participation (observing from outside the research setting)
- 147 • passive participation (observing in the setting without participation in activities)
- 148 • moderate participation (observing in the setting with almost complete participation in
- 149 activities)
- 150 • complete participation (observing in the setting with complete participation in the culture).

151 In addition to different types of participation, there are also varying lengths of time that
152 ethnographic researchers can spend within the setting. ‘Classic’ ethnography is associated with
153 lengthy periods of time, such as a year or two, with the people being studied (see, for example,
154 Moore, 2013). Yet this is now seen as one approach to ethnographic research, with other forms of
155 applied ethnographies being implemented (see Pink 2005). These applied forms are not only shorter
156 in nature, but also adopt different methodological, practical and analytical entry points (Pink &
157 Morgan, 2013). For instance, short-term ethnographers often intervene in peoples’ lives in intense
158 and potentially intrusive ways which are typically not sustainable in longer ethnographic work (ibid).
159 However, critics have described short-term ethnography as a ‘quick and dirty’ where there is an

impossibility that complete and detailed understanding of the setting can be gathered (see Hughes et al., 1995). This has been contended by others, who argue that the intensity of data collected can compensate for the short-time periods (see Knoblauch, 2005). Complexities within this debate can arise considering applied ethnographic studies can come in many forms, such as an ethnographic-action research approach, or using short-term observations in conjunction with ethnographic interviewing. Regardless of the form, to remain truly ethnographic, it can be argued that the researcher should in a position where it is possible to provide thick description (see Gertz, 1973). The practice of thick description is a way of providing rich context and the meaning that people place on their actions, words and other things. This enables those from outside the context to understand the meaning of the behaviours occurring within the research setting.

Challenges to ethnographic work in construction

The construction industry has traditionally been researched using quantitative methods, associated with positivism and the natural sciences. Yet, the field of construction management research is not well defined (Dainty, 2008), and is placed at the intersection between natural and social sciences (Love et al., 2002). Concerns over the apparent dominance of positivism in the mid-1990s led to a philosophical debate initiated by two papers in particular which questioned the dominance of positivism and the nature of the insights that it produces (see Seymour & Rooke, 1995; and Seymour, Crook, & Rooke, 1997). In a recent analysis of construction safety research methods, Zou et al. (2014) argued that it is prudent that more researchers adopt a more constructivist ontological and interpretivist philosophical standpoint; suggesting that there may be a gap between the direction taken by researchers and the practical needs of the construction industry with relation to safety. Ethnographic research that is evaluated against a positivist frame of rigour and robustness, can be challenged in terms of reliability, validity and generalisability. Some ethnographers argue that their studies are unique (Schensul & LeCompte, 2012) and that it is important to recognise how, if at

all, generalizable the findings are. Indeed, it could be perceived as a strength that the researcher is able to identify generalizability as a limitation; rather than claiming broad (rather than specific) conclusions, which the research has not set out to achieve. Pink et al. (2010: 657) explained that ethnographic studies tend to focus on the particular, rather than the general, by summarising the application of ethnographic findings to practice:

‘The situated nature of ethnography need not preclude the generation of recommendations for informing practice, so long as they can be appropriated in ways that reflect the nuances of the contexts in which they are subsequently applied. As such, care was taken to avoid the imposition of prescriptive or normative advice, but to highlight pertinent insights or areas of promising practice’.

As a research setting the construction industry may expose researchers to tough, macho and masculine environments (see Lacuone, 2005). For example, Baarts (2009) reflected on being a female ethnographic researcher in the construction industry, where she would ‘play up’ to tales of heavy drinking to fit in. However, she also explained that she would tell her workmates to “shove it up their asses,” when they made her feel uncomfortable. Hence, the researcher’s identity, as well as the setting, can increase risks of emotional distress that should be carefully considered. Ultimately, as an ethnographic researcher, one is different to others within the research setting, which can mean that the researcher is a target for many jokes. Sage (2013), Shipton (2013) and Oswald (2016) all noted that their researcher or student status brought many presumptions among research participants. The moderate participant observation approach (observing without complete participation in activities) undertaken by Oswald (2016) lent itself to light-hearted comments about being a ‘part-timer’ and a lazy student. Shipton (2013) found it ‘a bit annoying’ after a while, but ‘played along with the lazy student jokes to keep things light-hearted’. She also got the ‘impression that people were not even listening when I talked about my studies’, perhaps suggesting that they weren’t very interested or didn’t understand.

The challenges associated with both academic judgement and practical undertaking of ethnographic research in the construction industry deserve attention. As aligning with an appropriate theoretical frame of robustness and rigour, and negotiating the research setting, are essential in order to perform a successful ethnographic research project in the construction industry. This review will focus on both how ethnographic work has been undertaken in the construction setting, as well as how it is being arbitrated within the academic community.

Ethnographic research methods in construction: critical review

The review of ethnographic studies within the construction industry comprised of studies since 2011, in high quality journals, and those that were captured from a keyword search. To investigate the studies since the calls made (see Bresnen, 2009; Phelps and Horman, 2010; Pink et al., 2010) only studies published from 2011 were included. The search for relevant published work occurred in June 2019; hence, there may be other appropriate work that has been published since then that is not included in this review.

The selection criteria also involved screening for journal quality, based on rankings and reputation. The construction journals that were selected based on reputation, adopting a similar categorisation to Xue et al.'s (2012:2) review: 'the journal has important impact and unanimous recognition in the research community of construction engineering and management.' Based on this categorisation, the following six journals were selected:

- Construction Management and Economics (CM&E)
- Journal of Construction Management in Engineering (JCEM)
- Engineering, Construction and Architectural Management (ECAM)
- Management in Engineering (MiE)
- Automation in Construction (AiC) and;
- Building, Research and Information (BRI)

Construction journal quality was also based on rankings by the Scimago Institution. This ranking is based on the number of journal citations, as well as the prestige of the journals where citations emerge. Reputable construction journals were checked to confirm they were within the top quartile (Q1) or second quartile (Q2) criteria; and were then deemed appropriate quality for this review. Within these construction journals, the keywords 'ethnography' and 'ethnographic' were searched to find relevant studies since 2011.

However, acknowledging that many relevant construction studies could have been published in multi-disciplinary journals, the Elsevier database was also searched following recommendation from an experienced librarian. Two searches were conducted within the Elsevier database, and the first 500 results were checked for each search. The two keyword searches were: 'construction ethnographic' 'construction ethnography'. The studies in multi-disciplinary journals were checked for relation to the construction industry. Following the keyword search in the Elsevier database, other relevant studies were found to being published in the following (Q1) journals: English for Specific Purposes (ESP); Safety Science (SS); Gender, Work & Organisation (GWO); Ethnography (E); Energy Policy (EP); International Journal of Project Management (IJPM); Habitat International (HI); Progress in Planning (PiP); and Journal of Transport Geography (JTG).

[insert Table 1]

Incorporating studies published within Elsevier meant that a range of relevant research published in multi-disciplinary journals was captured. Hence, the construction studies that were deemed relevant for this review were those: published within the above outlined construction and multidisciplinary journals, that were published between 2011 and June 2019, and those where the authors had described their research approach as ethnographic or an ethnography. As a limitation, it is also acknowledged that relevant construction studies published multi-disciplinary journals (outside of Elsevier) may not have been captured by this approach. For example, Pink et al.'s (2016, 2017) work

published in journals *Video journal of education and pedagogy* and *New technology, work and employment*.

There was a total of 57 relevant studies found for this critical review (see table 1). The proliferation of ethnographic studies is particularly noticeable, with over one third (21) of all the studies since 2011 coming in 2018 and 2019. This is despite the review search occurring in mid-2019, hence not capturing papers in late 2019.

Results

The results revealed that ethnographic research contributed to a variety of areas within the field of construction management. Ethnographic work provided insights on complex social phenomenon such as protests (Teo & Loosemore, 2014) and compensation cultures (Oswald et al., 2019a); into the complexities associated with the implementation of new technology (Scholtenhuis et al., 2016); as well as insights into social classes (e.g. Thiel, 2012) and practices (Mäki & Kerosuo, 2015). The ethnographic approaches in the 57 studies are discussed below having been split into three categories: 'longer-term', 'shorter-term' and 'alternate' ethnographic approaches. While both shorter-term and alternate approaches can be classified as applied ethnographic research, they have been separated to more clearly present the results. Studies that undertook observations over a six-month ethnographic data collection period were considered 'longer-term', and six-months or less, 'shorter-term'. 'Alternate' ethnographic approaches were considered to be less common forms, such as ethnographic-action research, autoethnography and retrospective ethnography.

Longer-term ethnographic work

[insert Table 2]

In some cases, longer-term ethnographic work closely aligned with 'classic' forms of ethnographic research. For example, in a study for almost a year Thiel (2012:3) embedded deeply into the culture, adopting a number of different roles while undertaking his participant observation. He even spent time outside of normal work-hours 'getting drunk with them [participants] in the evenings and weekends'. Other roles during business hours included working as a labourer, observing the site office, and working with painters helped provide different insights on working class culture. In other cases, while the data collection period was gathered over a long-time, actual ethnographic observations were sporadic, and combined with other methods. For example, Van Marrewijk et al.'s (2014) study was over a six-year period, but observations were not constantly captured (such as in classic forms of ethnography). Instead different forms of observational approaches included: researchers participating in (five) different seminars, and doctoral researchers observing (four) different groups. Hence, arguably this work could be viewed as multiple applied ethnographic approaches, but over a long data collection period. Other studies had long data collection periods where observations were on a monthly or biweekly basis, rather than constant embedded ethnographic observations associated with classical ethnographic research. For instance, Abirad & Dossik (2019) observed the construction stage for 15 months through attending recurring project meetings, and analysis of relevant project artefacts. Similarly, Mehrbod et al. (2019) observed 44 design coordination meetings. 'Classic' ethnographic research from anthropological roots are typically characterised by full immersion in an unknown setting, where the researcher enters with broad and undefined purpose for a long period of time. While these construction ethnographic studies occurred over lengthy periods, the other aspects of the approach do not fully align with a 'classic' ethnography, with many researchers entering the research setting on a sporadic basis (e.g. monthly). Hence, this suggests that we should not always associate 'longer-term' ethnographic studies with 'classic' or traditional ethnographies within the construction industry.

As well as the rate of observations varying widely, the number of research setting locations also fluctuated. For instance, Koch & Schultz's (2018) study into construction defects involved over 100

days at one site across a 15-month period. Fonseca et al. (2014) used two different construction sites to investigate accident prevention; and highlighted 25 cases from their systematic observations which occurred for three times per week, eight hours per day. Others used several locations, Baborska-Narožny et al. (2017) exploring overheating risks in multiple UK apartments. They undertook observations of fabric and system settings, walk-through visits and informal discussions with inhabitants, and recorded detailed notes and photographic/thermographic surveys. Wade et al. (2017) shadowed a range of installers approximately 30 times for a total of 400 hours, conducted 20 semi-structured interviews. While the multi-setting approach may not align with 'classic' ethnographic studies (which were typically undertaken in a single setting over a long period), the extensive fieldnotes Wade et al. (2017) undertook (ranging from four thousand to ten thousand words) is more of a typical feature of classical approaches.

Further, the type of observations (e.g. participatory or non-participatory) and supporting research methods ranged widely. An example of this can be viewed through the work of Zapata-Lancaster & Tweed (2014), who adopted a non-participatory approach. This involved observation of design and delivery team meetings, and visits to construction sites. In Oswald et al.'s (2018a,b,c) work, over 1500 hours was spent on one construction project as a participant observer in the health and safety department. Hence, the researcher participated on site safety walks, had informal discussions with employees, and attended meetings and training sessions. Documentary data, such as meeting minutes, and safety observation reports, were used to support the observations. However, no formal interviews were used, which was uncommon when compared other construction ethnographic studies. For instance, Wu et al. (2015) investigated owners' leadership on high-speed rail projects in an eleven-month study that used ethnographic interviewing and workshops involving 237 managers in key positions. Others combined observations with interviews and documentary data, such as Teo & Loosemore (2014), who undertook 24 semi-structured interviews, as well as ethnographic observations of protest activities and documentary analysis of published sources about the protest. They demonstrated how use of a long-term ethnographic approach can help identify

333 how sustained protests can occur over a period of time, as well as providing insights on informal or
334 formal protest group structures, network layers and participation.

335 Longer-term studies appeared to provide more of an opportunity to investigate cultural aspects. For
336 example, Toivonen & Toivonen (2014) and Van Marrewijk et al. (2014) both undertook longitudinal
337 studies on interventions with top management and culture change respectfully. Van Marrewijk &
338 Smit (2016) explored cultural practices by observing daily work routines, workshops, informal
339 gatherings, celebrations, and meetings across a consortium. They also undertook 66 interviews of
340 workers, engineers, supervisors, administrative staff, and senior management across the
341 consortium. The rationale for more longer-term studies that are culturally focused, could be because
342 culture changes tend to take time, and hence, they are more suited to research that is conducted
343 over a lengthier period. Longer-term approaches could also offer an opportunity to explore other
344 complexities such as ambiguity (see Majoor, 2018), social power (Sage et al., 2012), strategic
345 intermediaries (De Wilde & Spaargaren, 2019) and change management (see Shipton et al., 2014).

346 There was also an opportunity for longitudinal case studies (in longer-term ethnographic work), such
347 as Löwstedt et al. (2018), who undertook a five-year study on a large multinational company. They
348 gathered data from: open-ended interviews of 27 practitioners, field observations in a series of
349 strategy workshops, and a four-week ethnography with the first author working as a 'dog's body'.

350 The construction industry is very transient, dynamic and fragmented leading to various social
351 complexities that have been researched above. Insights revealed from these studies can provide
352 guidance and perspectives on the management of construction projects. For example, Löwstedt et
353 al. (2018) made a theoretical contribution, by investigating strategy from a practice perspective,
354 which they note is neglected in the project literature. Shipton et al. (2014) explained that theoretical
355 accounts of making changes are rare, and from observed changes in their study, they provided
356 practical insights to inform policy guidance and contract drafting. Hence, ethnographic approaches

can be used for theoretical and practical purposes in the construction industry, on complex but important topics, that are often left untouched.

Shorter-term applied ethnographic approaches

[insert Table 3]

Shorter-term ethnographic work could be as little as a couple of days for each ethnographic case. For instance, Jia et al.'s (2017) study comprised of two full working days on two construction sites, meeting workers for a pre-work session (where health measurements, such as, blood pressure were captured) and an after-work session (measurements captured again). The workers wore health monitors during the day, while the researcher(s) observed activities on site during the day and interviewed managers. Mäki & Kerosuo (2015) used an applied ethnographic approach for three days, capturing 30 hours of recorded data on site manager practices. Handford & Matous (2011) shadowed two Japanese engineers for a week on an international joint venture project. They attempted to record all their spoken communication, as well as conducting seven ethnographic interviews, to illuminate findings on communication skills and relationship building for young engineers. Koch's (2013) data collection was over a ten-day period, where a group of carpenters were shadowed, and then interviews were undertaken with quantity surveyors, foremen and other central roles. This ethnographic work investigated local safety culture, and then used five other ethnographic studies to explore grander cultures. Within the short-term studies it can be observed that not all studies complied with Pink & Morgan's (2013) expectations of an ongoing and sharply focused ethnographic-analytical-theoretical dialog, suggesting that short-term construction ethnographic research was being viewed and critiqued in different ways.

Other short-term studies (six month or less data collection period) still had very time-consuming observational work. For example, Laryea (2011) undertook a study on the UK tender process through

552.5 hours of direct observation during business hours. The researcher used questions to confirm understanding, assisted the bid teams in their daily work for routine tasks, and provided a feedback report in return for access to the case studies. Similarly, Ramalingam & Mahalingam's (2018) six-month study involved 800 hours of participant observation that entailed capturing the daily project routines, processes and interactions of multinational engineering firms. They also used interviews, that were ethnographic in nature to start, and then more semi-structured, based on their observations. Ikioda (2016) also spent six-months studying the effect of a new road on the everyday practices of street traders in Nigeria.

The shorter nature of this ethnographic approach did not reduce the possibilities of adopting different roles or investigating multiple research settings. For instance, Löwstedt (2015) adopted two roles (a worker and observer) and used a self-reflexive lens in a four-week study to provide insights on building site practices. Tutt et al.'s (2013a) multi-sited study across 10 UK construction sites involved 'shadowing' of workers; participant observation in key areas; formal interviews with health and safety professionals and site managers; informal interviews with migrant workers; and the collection of documentation, such as hazard report cards, site safety books, and photographs. Oswald & Lingard (2019) undertook a multi-sited participant observation approach, participating in formal and informal safety walks for over 100 hours across six months. Hampton et al. (2019) explored stress in construction through multi-site observations for two to four hours per day, between one and three times a week, for six months.

Another use of ethnographic practice was to inform further study of a quantitative nature. For example, Cao et al. (2015) used a three-month ethnographic approach as an exploratory study to help develop a questionnaire on Building Information Modelling. Arana & Wittek (2016) also undertook a three-month study partaking in meetings, lunch and engaged in long and informal conversations with low-income housing communities in Mexico. Similar to Cao et al. (2015) this was then supplemented with 28 questionnaires; as well as 17 semi-structured interviews, and video data

to investigate community resilience. Studies that used ethnographic methods to explore how to conduct a more quantitative research design would typically focus on presenting the quantitative results, and avoid ethnographic presentations associated with thick description (see Geertz, 1973).

The results from this review of short-term approaches demonstrate a wide range of methods. Such mixed method approaches can push the boundaries of what is expected in terms of the presentation ethnographic work, and they should be careful not to fall into the ‘quick and dirty’ critiques that have previously been made about short-term ethnographic approaches. Within the field of construction management research, this could be of particular importance given it can be observed that the construction journals are dominated by shorter versions of participant observation, and other alternate forms, such as ethnographic-action research. This could be due to the nature of the industry, which is transient and dynamic, as opposed to stable settings that are more likely to accommodate classic approaches.

Alternate applied forms of ethnographic research

[insert Table 4]

The preceding section highlights how ethnographic research in construction has extended from classic longer-term approaches into shorter forms, which have become more popular in the field of construction management. There has also been an emergence of different types of ethnographic research including: auto-ethnographic, quasi-ethnographic, ethnographic-action, retrospective ethnography and ethnographic interviewing.

Firstly, there has been use of ‘auto’ forms of ethnography, with Grosse (2019) discussing three forms of reflexivity in his autoethnography; and Kanjanabootra & Corbitt’s (2016) study used a researcher auto-ethnography, which was interpreted with ethnographies of 18 other construction practitioners. Hamid & Tutt (2019) captured 108 photos in a worker photo diary, known as auto-photography;

while Van der Hoorn & Whitty (2017) used a quasi-ethnographic approach, where research participants took photographs of their day-to-day experiences. This was so the researchers could interview them about the participants' practice experience, without physically being present in the participant's workplace.

Ethnographic-action research has been a popular choice for investigating technology on construction projects. Scholtenhuis et al. (2016) implemented 4D models on three case projects, before qualitatively assessing them in an ethnographic-action research approach. Project meetings were tape recorded and notes were taken about how the 4D-models influenced mindful behaviour. Mahalingam et al. (2015) visited sites several times a week in an ethnographic-action research methodology to investigate the enablement of BIM adoption; and Zanen et al. (2013) tested a 4D CAD model with a tender team, to prepare a bid for the expansion of a Dutch highway. Ma et al. (2018) used informal interviews, project meetings, document analyses, and reflections in their six-month ethnographic-action research on BIM integration.

Other ethnographic work has used previous ethnographic studies to compare cases, or write discussion papers. Judson & Maller (2014) drew upon ethnographic case studies to explore to what extent low energy and other environmental concerns come into play in renovations. They undertook walk-through house tours, collected photographs and interviewed home-owners. Wade et al. (2018) drew upon two studies: one as described in Wade et al. (2017) on heating installers, and the other, investigating architects, as another key influence on energy demand in buildings. This involved: observation of a meeting between architect and homeowner on four architects' projects, inspection of e-mail streams of four different architects, and semi-structured interviews with eight architects. Dossik et al. (2019) discussed their ethnographic work on architecture, engineering and construction teams, and triangulated this with interviews of industry experts.

In other approaches, Ness (2012) undertook a retrospective ethnography by drawing upon her experiences as a bricklayer, to explore the gender imbalance in construction. Grau et al. (2017)

456 adopted ethnographic methods to capture the responses of subject matters experts to statistical
457 research findings. Spence et al. (2018) used ethnographic pilot studies to observe the launch of a
458 new tool; and Dossik et al. (2015) undertook observation of virtual meetings to explore 'messy talk'
459 and working in virtual teams. Hacker et al. (2019) undertook 10 semi-structured ethnographic
460 interviews, and Berteaux & Javernick-Will (2015) using ethnographic interviewing to explain
461 quantitative data. In another case, interviewing was used prominently, as the planned non-
462 participant observation did not materialise (see Borys, 2012).

463 The results suggest that these alternate forms of ethnographic work are far from the characteristics
464 associated with classic forms of ethnography, where researchers spent many years observing in one
465 setting. For instance, it was observed that there was a lack of self-reflexivity within some alternate
466 forms of ethnographic research, including ethnographic-action research. Within action research, the
467 research teams are typically influencing and controlling by taking action; and hence have more
468 potential for impact on the natural setting. As researchers adopt roles that involve more than
469 observation, self-reflexivity arguably becomes even more important, as researchers have more
470 potential to influence the natural setting. The contemporary shifts away from traditional forms of
471 ethnographic work, raise questions on the boundaries of ethnography, as well as the judgement and
472 presentation of ethnographic work, which is discussed in more detail below.

473

Discussion

The boundaries and contribution of ethnography

This review has identified a wide and varied range of approaches to undertaking ethnographic research within the construction industry, which have moved far from the traditional classic ethnographic studies from the field of anthropology. These diverse approaches have offered contributions to knowledge, theoretical challenges, and practical purposes within the construction sector. For instance, Wade et al. (2017) explained that prior literature had been unable to capture when, how and why new heating controls are installed. They contributed to knowledge through investigated how installers selected and explained central heating controls. Through traditional positivist construction management research approaches, 'how' and 'why' practices occur can be challenging to richly detail. Ethnographic work is able to help fill this void, which can be left untouched by the traditional orthodoxies that are commonly relied upon. It can also challenge current research themes, debates and trajectories. For example, Oswald & Lingard (2019) explained that previous research into health and safety (H&S) leadership had almost solely focused on the supervisor-to-worker interaction, typically through quantitative methods. Yet they challenged this dominant perspective, explaining that H&S leadership was also created through the social interaction of other stakeholders beyond this single-level perspective. Their ethnographic work raised other connections required for positive H&S leadership amongst multiple stakeholders including: the site managers, the principal contractor foremen, the subcontractor supervisors, and the H&S advisor. As well as this theoretical challenge, ethnographic work can provide practical understanding through the application of ethnographic-action research studies. These can be utilised when implementing new technologies into the workplace (see, for example, Scholtenhuis et al. 2016), which can help understand the 'why' and 'how' performance has been affected, and to make practical changes based on these findings. Hence, ethnographic work can hold considerable

promise for understanding construction practice and offers a route to understanding that creates a valid basis for proposing interventions (see Pink et al., 2010).

Within the review, observations (including participant or non-participant observation) were involved in almost all studies. Except for unusual research designs, such as Van der Hoorn & Whitty's (2017) quasi-ethnographic approach; and those that solely relied on the ethnographic interview (e.g. Hacker et al., 2019). Interviews were extremely common but were used within different forms. For example, Zapata-Lancaster & Tweed (2014) used semi-structured interviews to explore and gain initial understanding of the case studies for further investigation; while Fonsenca et al. (2014) used interviews to help capture data on events of interest, that were missed in observations, due to the impossibility of being able to observe all activities. Hence, there is no single or right way to do ethnographic research (Pink et al., 2013), and this is clearly reflected in the variety of approaches undertaken within the construction industry. However, it is worth noting that to remain an ethnographic approach, studies that use (more formal) interviews should also: adopt open questions to encourage longer accounts from participants; demonstrate that some form of observations in the natural setting were also undertaken (Allen, 2017); and, present the work with thick descriptions to allow for deep understanding into the context (Geertz, 1973).

The flexibility of the ethnographic research approach can be fundamental to its success, as even planned research designs have to be changed around the time of fieldwork. For example, Wade et al. (2018:45) explained that: 'The initial intention in the study design was to observe meetings between architect and client on eight different projects. However, a number of architects conducted much of their client interaction via e-mail.' Borys' (2012) plan of non-participant observations did not manifest, as the organisation elected did not grant approval for this data collection method. Issues with access is a problem that actually 'looms large in ethnography' (Hammersley & Atkinson, 2007:41), and it can be a rude surprise (Feldman et al., 2003) to researchers that had not anticipated the challenges involved in being granted access. Hence, flexibility may be necessary in some cases.

For example, Jia et al. (2017:343) adopted two different approaches for each of their case studies as 'Chongqing study was slightly different [to the other case], where the informal site management structure and culture made it easier for researchers to build trust with the participants'. While there is clear variation in ethnographic approaches, most studies were conducted as applied, rather than longer-term 'classical' ethnographies. Longer-term ethnographies are characterised by a lot of 'hanging around' waiting for action to occur; whereas in applied approaches, the ethnographer places themselves in the centre of the action from the beginning and engages participants into the project (Pink & Morgan, 2013). The rise of shorter-term applied ethnographies could be explained by many reasons, such as the lesser time demands and their focused nature, where research questions are more firmly responded to (Pink & Morgan, 2013). This is likely to be more desirable for both the researcher(s) designing the project, and the participants when supporting the research through their involvement.

Judging and presenting ethnographic work

The ethnographic studies in the review also varied in terms of ontological positioning. For example, Handford & Matous (2011) determined if language items and features were of interest through frequency or statistical significance. The reduction of the complexities of language in order to quantify through frequencies or statistical significance, ontologically more aligns with a positivist framework. Whereas other studies, such as Judson & Maller (2014) aimed to capture such complexities and used theories of social practice to illuminate insights on case studies. It is through this critical review that we encourage debate by arguing that while there may be no 'right' or 'single' way to do ethnographic research, there is still 'good' and 'bad' ways to perform it. This essentially refers to how ethnographic research should be judged. Within a field dominated by traditional positivist approaches there could be a tendency to judge ethnographic work within this framework. For example, Ilozor & Kelly (2012:24) stated: *'The generalizability, reliability, and validity of these*

548 *findings are somewhat suspect due to the inherent limitations of ethnography in relation to sample*
549 *size.'*

550 This example is not an uncommon criticism of qualitative work (see Zou et al., 2014) and this can
551 shape the way ethnographic research is viewed, judged and presented in academic journals within
552 the field. Yet, Amis & Silk (2008) in wider organisational studies contended that this judgement,
553 founded on a positivistic perspective of the social world, is inherently unsuited. Pole & Morrison
554 (2003) offered the counter-argument, that non-ethnographic methods: are over precise; do not
555 account for uncertainty of social life; lack detail and depth of social action; and fail to acknowledge
556 the researcher-researched interaction in the production of social knowledge. This does not mean
557 that one approach is 'right' and another is 'wrong', but that different types of research should
558 arguably be assessed on the frameworks in which they were designed. As Pole & Morrison (2003:15)
559 state: *'...we do not see the need to counter them by arguing that the findings from ethnographic*
560 *research are precise or objective or generalizable. To do so would be to fall into a technical trap of*
561 *judging ethnography by characteristics to which it does not aspire. Ethnography does not set out to*
562 *do or be any of these things and in its more general defence we would argue that as long as*
563 *ethnographers do not claim that their research can meet what are essentially positivistic*
564 *characteristics, then such challenges are largely irrelevant.'*

565 Ethnographic studies within this review attempted to discuss and demonstrate methodological
566 rigour in varied ways. For example, Handford & Matous (2011:90) made 'no strong claims about the
567 generalizability of the findings' suggesting an alignment with Pink et al.'s (2010) recommendation to
568 focus on the particular, rather than the general. However, Merbod et al. (2019:199) adopted an
569 opposing perspective and attempted to generalise their findings, stating: *'In order to validate our*
570 *findings from prior steps, a variable-centered approach was employed to generalize the findings of*
571 *this research based on other domains and technologies (specifically human computer interaction).'*
572 While the range of variants within ethnographic approaches are arguably welcomed to complement

573 each other, the way ethnographic methodological rigour is judged within the construction
574 management community should arguably remain constant.

575 It can be contended that as ethnographic research generates different forms of knowledge to
576 positivist work, it should also be evaluated differently to the positivist criteria of reliability, validity
577 and generalizability (see Finlay, 2006). There are other ways to assess ethnographic work with, for
578 example, Richardson (2000) suggesting the criteria: substantive contribution, aesthetic merit,
579 reflexivity, impact, and expression of a reality. Jarzabkowski et al. (2014) explained that credible and
580 authentic storytelling is at the heart of ethnography, with the evidence lying in the construction of
581 convincing text. Hammersley suggests as validity is essentially about truth, it must be plausible and
582 credible (Hammersley, 1991), and the amount of evidence, and kind of evidence, should be
583 considered depending on the types of claims made (Hammersley, 1992). Hence, the assessment of
584 validity should be based on identifying the main claims, and comparing the evidence provided with
585 what is judged to be necessary, given the claim's credibility and plausibility (Hammersley, 1992).
586 However, this review suggests that these frameworks are not always applied when assessing
587 ethnographic work within the construction industry.

588 In the reviewed papers, the varied range of descriptions within the methodological sections is
589 perhaps inherent, due to the flexible nature of ethnography as a research approach. However, this
590 could also suggest that when challenged by reviewers during the peer-reviewed process, there are
591 fundamentally different ways of judging ethnographic research that are rooted in almost opposing
592 ontological positions. This has resulted in the depth of the theoretic-empirical dialogue, which is a
593 hallmark of ethnographic approaches, varying in depth across the ethnographic studies in the
594 construction industry. Considering the proliferation of short-term ethnographies in this review, it is
595 worth noting that within this approach, there is an expectation of an ongoing and sharply focused
596 ethnographic-analytical-theoretical dialog (see Pink & Morgan, 2013). The ethnographic studies
597 were also presented in very dissimilar ways, with the use of figures and tables (see Zanen et al.,

2013; Scholtenhuis et al., 2016), figures and quotes (see Ramalingam & Mahalingam, 2018), vignettes (see Shipton et al., 2014) and prologues (see Tutt et al., 2013b; Oswald et al., 2018a). While different ethnographic approaches may lend themselves to certain ways of presenting, the issue of presentation is one that should be discussed within the field of construction management, considering it has begun to receive attention in wider organisational studies (see, for example, Jarzabkowski et al., 2014; Gherardi, 2018).

Researcher self-reflection

The increase in ethnographic studies suggests that there has been a gradual turn away from disconnected methods, towards those that rely on the situated lived experiences of the researcher. Within ethnographic approaches there is an acknowledgement that there is an interdependence between the researcher and those being researched. Hence, in ethnographic work, it can be argued that this interaction should be acknowledged and discussed to help demonstrate methodological robustness. For instance, Laryea (2011:277) reflected on the influence he had on social reactivity concluding that ‘tendering is a commercially expensive exercise where procedures are not likely to be influenced by the presence of a researcher’. To improve research success, studies explained how they attempted to improve the researcher-researched relationships, in order to reduce the threats of social reactivity and enhance the chances of gather quality data. For example, in the study by Borys (2012), the researcher spent six months ‘getting to know’ the organisation, as the study was on the sensitive topic of safety procedures. Also, Teo & Loosemore (2014) explained that their research involved participating in protest activities to build trust within the protest community. However, some studies had very little or no researcher self-reflection, which appeared to misalign with the recognition that ethnographic researchers are part of the social world being investigated. For instance, Wu et al.’s long term ethnographic study, they (2015:1668) stated: ‘Data collection

lasted for as long as 11 months. During this period, the research team spends most time in the investigation field to make interviews, observations and workshops.' Yet, the discussion of any self-reflexivity of the research team was unclear. Other examples lacking self-reflexivity included ethnographic-action research studies (e.g. Mahalingam et al., 2015), ethnographic interviews (e.g. Hacker et al. 2019), and short-term ethnographic work (e.g. Cao et al, 2015). In particular, ethnographic-action research studies avoided self-reflexivity of the researcher that was involved in the observations and action-research process. Reflectivity involves self-awareness (Lambert et al., 2010), and a continuous process of reflection that builds understanding into how the researcher's "social background, location and assumptions affect their research practice" (Hesse-Biber, 2007, p.17). Within some papers reviewed, there was an absence of such personal disclosure, and seemingly a lack of self-recognition of the relationship between the researcher and those being researched. It is perhaps because the authors thought it would be inconsistent with editorial demands or did not align with traditional positivist thinking within the field. However, self-reflexivity is central to the undertaking of ethnographic research, even within all its various forms.

Finally, it is also worth considering the researcher's own health and safety, as ethnographic work continues to grow in an industry that can pose threats to the researchers involved. For example, Teo & Loosemore (2014:44) acknowledged their research was 'a tricky, unpredictable and emotional experience', where they encountered participants who were mostly warming, but some sceptic, and in one extreme case, outright hostile. Also, in earlier work Papp (2006:196) reflected that 'sexual harassment posed a significant methodological and perceptual challenge'. In an industry that is global, there can be research settings that are dangerous and problematic. For instance, Arana & Wittek (2016) explained that the low-income housing communities in Mexico City, where they gathered data, were both dangerous and suspicious of outsiders. Therefore, the communities chosen were negotiated based on the first author's existing personal contacts to reduce personal risk to the researcher gathering data. There is little acknowledgement of researcher emotions in qualitative texts (Briggs, 2013), and perhaps this should get more attention within academic text for

the protection of researchers, through learning from others that have experienced similar challenges.

Conclusion

There were calls for more ethnographic work in leading construction journals in 2010, and we have seen a proliferation of ethnographic work within the last decade. Understanding what really happens in organisations, in research terms, is crucial within the field of construction management. Proponents of ethnographic research would argue that to fully unpack this, one would have to ‘be there’ to conduct intensive observations or participate. The contributions of ethnographic research to the field of construction management have been wide and varied, from: helping to understand how technology can be successfully implemented in the industry, to providing insights on complex social phenomenon, to revealing the challenges of working across multinational language contexts. These studies have been characterised by a diversity of approach, albeit leaning towards short-term intense ethnographic encounters (see Pink and Morgan 2013). The wide variety of long, short and alternate ethnographic studies complement, rather than replace, other research rooted in positivist ontologies.

The shorter-term approaches, and alternate methods, such as ethnographic-action research, have been dominant over classic ethnographic work, particularly within construction journals. This shift highlights that there is a move towards the ethnographic researcher undertaking a more central and intense role; as opposed to the researcher ‘hanging around’, awaiting what emerges and describing the culture of the group. The central role of the researcher allows for focus on specific problems and challenges that are targeted (such as the implementation of a new technology), allowing for fresh perspectives and practical-based solutions to be recommended. This shift is important as it

represents a move towards ethnographic research approaches that offer practical, as well as theoretical, benefits.

Clearly, judging ethnographic work through a positivist lens would be inappropriate. It is also incumbent on the ethnographic researcher to subject their work to the same reflexive rigour as those in the fields from where the methods were derived. Key here is reflexivity, but while almost all studies described the type of observations undertaken, fewer reflected on the interaction and challenges the researcher had with participants within the setting, to gain acceptance, or the perspective that they brought to the research setting. Depending on how one judges ethnographic work, will ultimately decide the weight placed on self-reflexivity. Greater self-reflexivity should be encouraged, both as it is a central plank of ethnographic practice, but also because of the inherent risks facing the researcher working within such a hazardous environment as a construction site.

Data Availability Statement

All data, models, and code generated or used during the study appear in the submitted article

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Data Availability Statement

All data, models, and code generated or used during the study appear in the submitted article.

Tables

Table 1: Number of ethnographic studies per year

Year	No. of studies found
2011	2
2012	4
2013	5
2014	7
2015	7
2016	5
2017	6
2018	10
2019	11

946 Table 2: Longer-term ethnographic research approaches (23)

Author(s)	Journal	Data gathering period	Longer-term ethnographic approach
Sage et al. (2012)	BRI	1 year	Observations, documents and semi-structured interviews
Thiel (2012)	E	51 weeks	51 weeks as a participant observer at three interlinked building projects, and 32 interviews
Fonseca et al. (2014)	SS	2 and a half years across two sites	Participant observation of two sites, and interviews
Teo & Loosemore (2014)	HI	Interrupted over a two-year period	Observations, semi-structured interviews, and document analysis
Van Marrewijk et al. (2014)	BRI	Six years	Irregular participant observations, and interviews
Shipton et al. (2014)	CM&E	Eight months	Over 200 hours of observations, 17 interviews and a document study
Toivonen & Toivonen (2014)	IJPM	Over three years	Meeting observations, informal discussions, two structured interviews and documentation
Zapata-Lancaster & Tweed (2014)	EP	Between 12 to 21 months per case	Non-participatory observations, interviews and document analysis
Wu et al. (2015)	IJPM	11 months	Ethnographic interviews, observations and workshops
Van Marrewijk & Smit (2016)	IJPM	One year	Participant observation and interviews in a multinational consortium
Baborska-Narożny et al. (2017)	BRI	Visits every seven weeks for about a year	Informal discussions, observations, Facebook group content, photographic/thermographic surveys, and semi-structured interview
Teo & Loosemore (2017)	IJPM	Over a year	Observations, semi-structured interviews, and document analysis
Wade et al. (2017)	BRI	400 hours	Shadowing, observing, taking photos, and interviewing heating installers
Koch & Schultz (2018)	CM&E	15 months	Observations, formal and informal interviews, and collection of written background materials
Löwstedt et al. (2018)	IJPM	Five years	Open-ended interviews, observations, and ethnography
Oswald et al. (2018a,b)	SS	Three years	Participant observation and documentary data
Oswald et al., (2018c)	CM&E	Three years	Participant observation and documentary data
Abdirad & Dossik (2019)	ECAM	15 months	Ethnographic observations, interviews and artefact analysis
De Wilde & Spaargaren (2019)	BRI	16 months	Observations, interviews, documents, communication material, meetings, and inspections
Mehrbod et al. (2019)	AiC	Two years	Observation of design coordination meetings
Oswald et al. (2019a)	ECAM	Three years	Participant observation and documentary data
Oswald et al. (2019b)	JCEM	Three years	Participant observation and documentary data

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950 Table 3: Shorter-term applied ethnographic research approaches (16)

Author(s)	Journal	Data gathering period	Shorter-term ethnographic approach
Handford & Matous (2011)	ESP	1 week	Researchers spent one week gathering ethnographic data from interviews, recordings, insights and observations
Cao et al. (2015)	AiC	3 months of observations	Interview, observations and document analysis as initial exploratory study
Koch (2013)	CM&E	10 days	Observation, interviews and cross-case analysis
Laryea (2011)	CM&E	65 days	552.5 hours direct observation, interview and documentary analysis of tender process
Laryea (2013)	JCEM	13 weeks	Direct observation, interview and documentary analysis of relevant tender documents
Tutt et al. (2013a,b)	CM&E	Short-term visits across 10 sites	Participant observation, shadowing, documents, and formal and informal interviews
Löwstedt (2015)	CM&E	4 weeks	Adopted two roles (observer and worker) in a 4-week study
Mäki & Kerosuo (2015)	CM&E	Three-day periods	Shadowing site managers work, writing fieldnotes, recorded audio, videos and photographs
Arana & Wittek (2016)	BRI	Over three months	Irregular participant observations in social activities, interviews, video and survey data
Ikioda (2016)	JTG	Six months	Non-participant observation, informal interviews and photographs
Jia et al. (2017)	CM&E	Two days per case	Health measurements (e.g. height, weight), observations of daily activities, and interviews
Majoor (2018)	PIP	Six months	Informal conversation, attending meetings, lunch walks and interviews
Ramalingam & Mahalingam (2018)	CM&E	Six months	800 hours participant observations, interviews, project documents, email logs
Hampton et al. (2019)	ECAM	Six months	Interviews, and observations on 10 sites that involved activities by 5 to 20 people.
Oswald & Lingard (2019)	SS	Six months	Participant observation across four construction projects, and focus groups

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Author(s)	Journal	Ethnographic approach used
Borys (2012)	SS	'Getting to know' period, semi-structured interviews, a review of safe work method statements and a site walk
Ness (2012)	GWO	A retrospective ethnography of 30 years experience, in conjunction with analysis of reports and interviews
Judson & Maller (2014)	BRI	49 home tours, with supplementary photographs and interviews
Zanen et al. (2013)	AiC	Ethnographic-action approach where the participatory researcher spent six months at a tender team's office
Berteaux & Javernick-Will (2015)	MiE	Ethnographic interviewing (in conjunction with questionnaires)
Dossick et al. (2015)	MiE	Online ethnographic data, observing virtual meetings
Mahalingam et al. (2015)	JCEM	Ethnographic-action research observing and helping with implementation of BIM
Kanjanabootra & Corbitt (2016)	CM&E	An auto-ethnography, and analysis of ethnographies of other construction professionals
Scholtenhuis et al. (2016)	JCEM	Ethnographic-action research of 4D models on three case projects
Grau et al. (2017)	JCEM	Ethnographic data used to help and explain statistical findings
Van der Hoorn & Whitty (2017)	IJPM	A quasi-ethnographic approach supported with semi-structured interviews
Ma et al. (2018)	MiE	Ethnographic-action research to develop a BIM roadmap
Spence et al. (2018)	BRI	Ethnographic approach used as a pilot study
Wade et al. (2018)	BRI	Combined two observational studies
Dossik et al. (2019)	ECAM	Used ethnographic work to produce a discussion paper
Grosse (2019)	CM&E	An autoethnography as a construction business owner in Berlin
Hacker et al. (2019)	JCEM	Semi-structured ethnographic interviews
Hamid & Tutt (2019)	CM&E	In-depth interviews and auto-photography, and complimentary periods of participant observation