Editorial
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The Association of Researchers in Construction Management (ARCOM) is 31 years old. It was founded early in 1984 by a group of researchers and academics in Edinburgh, UK. Every year since ARCOM has organized and held a conference to promote and disseminate the growing body of research in Construction Management. By 2015 this global collective of academics and occasional industrialists consider all aspects of the delivery and management of the built environment. The research field has grown in maturity and significance and continues to draw from a vast range of disciplines, methodological approaches and theoretical backgrounds.

The 30th annual ARCOM Conference in Portsmouth was a true celebration of how research in our field has grown in depth, breadth and international context: 195 delegates from 28 different countries enjoyed a busy programme of research papers, keynotes, the Langford Lecture and a debate on method. The debate, *"A method for construction management research?"* reflected a growing awareness within the research community of changes in trends and approaches to how construction research is conducted. Chan (2015) asked: Should there be a method that characterises construction management research in the same way ethnography dominates in anthropological research and experimental methods prevail in psychology? In other words, should we celebrate the breadth and diversity on display at our conferences or do we seek what we perceive to be the markers of much more mature fields and call for singularity? Professors Tim Broyd (University College London), Libby Schweber (University of Reading), Christine Räisänen (Chalmers University of Technology), Mark Addis (Birmingham City University) and Stuart Green (University of Reading) considered this and, together with very pertinent audience input, consensus was that construction management research and its community should not be defined by a single method. Calls for methodological pluralism (Dainty, 2008) and mixed-methods research (e.g. Fellows, 2010 and Zou et al, 2011) have received much support in construction management literature, and the debate panellists at the 30th annual ARCOM conference supported this view:

> *Tim Broyd took the view that the problems the construction industry faces are multi-faceted, and thus demand a variety of methodological approaches to answer different lines of inquiry. Stuart Green reiterated that construction management is a field of research that borrows and learns from pure disciplines. Therefore, methodological approaches ought to be based on whichever disciplinary position the researcher takes. It is crucial to recognise that the community is not and cannot be a single, uniform group of researchers given the complexities and peculiarities of construction.* (Chan, 2015)

It is often perceived that, traditionally, construction management research has been dominated by positivist approaches that employ analysis of quantitative data (Dainty, 2008; Fellows, 2010). 'The

other', the analysis of qualitative data or interpretivist research, has been 'the alternative' fought for initially by Seymour and Rook (1995) and Seymour et al (1997) and many others since. Recently, Fellows (2010: 11) noted a shift from largely positivistic, "hard" research into interpretivistic, "soft" research.

While 'dominance' of method is possibly subjective, a quantitative view is also possible! Analysis by Carman (2014) of all the ARCOM papers published since 1997 suggests clearly that around 2004 qualitative methods started to take over from quantitative research as the predominant single approach. Use of mixed methods shows similar, though less marked, trends, increasing from around 20% of all ARCOM papers in 1997 to over 30% by 2013. Of course, ARCOM is not the sole arbiter of construction research approaches and thus Carman undertook further analysis of papers published in Construction Management and Economics (CM&E) over the same time period. Here the picture is less clear with quantitative work being the dominant approach throughout the majority of the period 1997 to 2013 (though one year, 2009, shows slightly more qualitative papers than quantitative).

Importantly, a key facet of the argument in this editorial is questioning how well does this blunt quantitative analysis reveal the full picture. Perhaps a bigger story is the *nature* of the qualitative and interpretivist research on offer. The analysis above probably fails in exactly the way that those who promote interpretivist research suggest, by not revealing the nuances and subtleties of the methods employed. Thus, there should be an acknowledgement of an established worth of interpretivist research. Interpretivist research has become more visible, better valued and well respected way of enquiry, rich in contextual detail. It may be that this type of research is still lesser in number of studies published in journals such as the CM&E, yet the quality of interpretive research has improved as the sophistication and comprehension of research methods within the community has grown. Examples of this can be seen in this conference issue; papers on ethnography, critical discourse analysis, semiotic analysis and praxiographic study demonstrate a maturity of application of sophisticated techniques that are now much better attuned to a construction context than was perhaps the case a decade or so ago. Interpretivist research has become a stream of activity that now has significant impact within our community and industry. It is no longer 'the alternative' approach.

What seems to be emerging as 'the new alternative' is a middle ground, one that responds to the calls for methodological pluralism and mixed methods research and employs techniques such as qualitative comparative analysis (Jordan et al, 2011). Mixed methods research is presented as the "third methodological movement" with the idea that analysis of quantitative and qualitative data can be fruitfully used in conjunction with one another (Teddlie and Tashakkori, 2011). And yet, perhaps here lies a danger that we end up not realising the benefits of deep, contextual insight offered by interpretivist research nor the generalizability of large scale positivist study. It is not only time consuming and difficult to find and develop researchers with skills, experience and expertise in both research domains; it is also challenging to design mixed-methods research (see for example Creswell, 2014). At the same time, this middle ground offers an opportunity to view positivist and interpretivist research as compatible and not polar opposites on a continuum.

The 13 papers in this issue were selected from an initial list of 30, identified by the editors and reviewers of the 30th ARCOM conference held in September 2014 in Portsmouth, UK. The editors of CM&E invited the 30 authors to re-work their papers and submit for full review in CM&E. These papers were subject to the same level of peer review and editorial consideration that other CM&E papers receive. We present the final 13 that 'made the cut'.

The first paper by Höök, Stehn and Brege discuss the management and development of a portfolio of business models via a longitudinal case-study of a building material company. They employ qualitative process research methods to build the case-study. Chronological stories about what happened in the form of critical strategic incidents and the outcomes of these events are analysed as the process data. Temporal bracketing is used as a qualitative analytical tool that helps decompose the data and identify specific theoretical mechanism recurring over time. The theoretical contribution of this work is a model to facilitate an understanding about how critical strategic incidents can trigger changes in a portfolio of business models and the management of that portfolio. Empirically drawn conclusions highlight the pitfalls of overlooking the fact that a strategy can contain many and different business models, and also the gains when a strategy is deliberately managed as a portfolio of business models.

The second paper in this issue focuses on reduction of carbon emissions in buildings. Increasingly, innovative low carbon technologies are integrated within buildings - rather than being bolt on extras. Much attention has been given to the development of these technologies and their use, but relatively little research has explored issues arising from their inclusion into buildings during construction. Boyd, Larsen and Schweber use a social construction of technology (SCOT) approach to examine the different interests and issues which shape the co-development of building integrated photovoltaic technology (BIPV) and the building. The authors use SCOT as a theoretical lens to analyse the perspectives of three UK construction industry professionals and look at the problems which arise over the inclusion of BIPV, the solutions which are found and the negotiations which are at play. Of particular interest are the definitions of six relevant social groups (which are not role dependent) which help to account for the co-development of the technology and the building. The authors reflect upon the way that contractual boundaries shape the interplay of these groups and the evolution of the building and technology.

Sherratt, Crapper, Foster-Smith and Walsh explore safety within a unique segment of the construction workforce; volunteer construction workers. Unstructured interviews with volunteer workers returning from international development projects and regular volunteer construction workers who work on the UK heritage railways provided data for discourse analysis which reveals two dominant discourses: 'safety from experience' and 'safety as different'. Safety from experience emerged within interviews with both sets of respondents. Concerns about the trend to shift responsibility and subsequent exacerbation of poor practices are highlighted. Safety as different overseas also raises concerns about potential exposure of volunteer workers to health and safety risks. This is specifically pertinent within an environment that is perceived to be inevitably unsafe and one where workers feel unable to challenge and change safety.

Galea, Powell, Loosemore and Chappell explore why the construction sector remains the most male dominated sector in Australia. The lack of gender equality in the construction sector is a persistent problem recognised in Australia and elsewhere, which exacerbates skills shortages, reduces

productivity and constrains innovation. Using New Institutionalism theories the authors explore, through document analysis and interviews with senior managers, the robustness and revisability of formal policies and practices that impact on gender equality in two large Australian multinational construction firms. Applying this theoretical lens, the authors reveal that formal policies and practices are primarily focused on increasing the numbers of women in construction and lack the enforcement needed to genuinely challenge the gendered norms, practices and narratives of the sector.

Gosling, Naim, Towill, Abouarghoub and Moone investigate the impact of supplier initiatives. Data that allows for longitudinal analysis to compare the impact of various supplier development approaches against Key Performance Indicators is rare and needed if we are to understand supply chain management in the construction sector more comprehensively. Hence, an interesting and unique dataset, which records supplier performance data since 1990 for a large UK based construction and consultancy organisation, was acquired, exploited and analysed, using descriptive statistics and statistical testing. Whilst the company operates globally, the primary focus of the dataset is UK projects for iconic commercial buildings. Suppliers are categorised into different relational groups to allow analysis of different supplier development initiatives. The headline finding is that there is a significant difference in the volatility of performance associated with different relational groups: closer relationships give more consistency in Key Performance Indicators. These findings offer encouragement for other organisations engaged in supply chain development initiatives, showing that greater consistency in construction sector performance can be obtained via such initiatives.

Löwstedt explores the variations, contradictions and tensions underlying practices on a building site using self-reflexive ethnography. A short four-week ethnographic study illustrates how the subjective “I” of the ethnographer can be used as an active producer of knowledge, by reflecting on how insights from an individual’s role, both as an observer and as a worker, can account for the complex interplay between socialities and materialities on a building site. This paper presents a personal learning journey as a researcher and a reflexive discussion about the method, self-reflexive ethnography. It highlights that ‘being there’ is just as important for effective ethnography as is ‘not being there’, i.e. time spent away from the site or doing the interviews.

O'Keeffe, Thomson and Dainty use practice theory to investigate the concept of design evaluation as ‘a practice’ within a major National Health Service (NHS) hospital project . Praxiography is the specific research technique adopted. It immerses the practice theory driven researcher into the praxis of organised activity and its situated setting. This offers a unique insight from within. The research reveals both the constitutive role of practical intelligibility and the implications of external policy situations on the day-to-day co-ordination of design evaluation practices. The epistemic use of artefacts in design and the reflexive practical significance of “arresting moments” are also found to act and order the design evaluation process in ways which stand stark in contrast to the highly ordered perspective conveyed in design quality evaluation policy. These research findings can act to sensitise designers and evaluators to crucial phenomena that are not emphasised by existing NHS design quality policy regimes. They may also foster a deeper, reflexive understanding of the dynamics of design and design evaluation in ways that instruments of current NHS design policy overlook.

Seboni and Tutesigensi deploy a conceptual model as a lens to study project manager-to-project (PM2P) allocation practices of a large organisation in Botswana. A case study in the mining industry was undertaken using semi-structured interviews and enumeration to collect quantitative and qualitative data. The findings reveal both strengths and weaknesses in the application of the conceptual model. For practitioners it offers a novel way of improving the effectiveness of the PM2P processes; it is a management tool that helps managers understand what can be done to improve the PM2P practice. Academically the research contributes to the understanding of PM2P practices in the context of Botswana where no previous studies have been published.

Sherratt develops a critical discourse analysis of the UK Department of Health's Responsibility Deal Construction Pledge. She questions the exercise of paternalistic or pastoral power in light of commercial organisations' vested interest in worker output, rather than health, and the challenge to workers' personal freedoms. She argues that the Pledge portrays UK construction industry workforce as unhealthy, overweight and unable to make the 'right' decisions about their own health. Yet, the practical health of individual workers is not prioritised. Instead, workers are considered as productive units contributing to work, industry, its corporations and the wider UK economy. Questions are raised which demand research on health management within the construction industry from both practical and philosophical positions.

Shibeika and Harty draw on diffusion of innovations theory to investigate how digital innovations diffuse across complex firms. They employ a contextualist approach through an in-depth case study of a large, international engineering project-based firm. The diffusion process is traced over three phases: centralisation of technology management, standardisation of digital working practices, and globalisation of digital resources. The research reveals parallel paths of diffusion occurring across the firm, where both the innovation and the firm context were continually changing. Within the complex social system tensions arise between the local and central, the unique and routine, the ad-hoc and standard. The study is descriptive, rather than prescriptive, and thus offers an opportunity to develop the understanding of different types of innovations in construction project-based contexts.

Ulubeyli, Arslan and Kivrak examine cartoons about occupational health and safety issues in the construction workplace through the General Theory of Verbal Humour, a semiotic analysis method. Semiotic analysis involves qualitative examination of systems and implications of signs; it is an interpretive science dedicated to the study of the production of meaning in society. The purpose is to offer neutral descriptions rather than value judgements. Ulubeyli, Arslan and Kivrak use cartoons which are humorous by nature as the research materials and find that occupational incidents and occupational health and safety (OHS) related problems are similar in different countries around the world. Although national and habitual signs take place in some cartoons, construction-based OHS perceptions and reasons for occupational incidents do not change significantly. The analysis offers an opportunity to affect change in the general perceptions of society about OHS in construction and potentially also help reduce occupational accidents by way of targeted training interventions. Especially international contractors who employ migrant workers from different cultural backgrounds may benefit from the use of cartoons as lingua franca in OHS training.

Anders and Lidelöw explore industrialised house-builders' interpretations of local requirements using institutional logics. Using interview data they propose a model for categorising and understanding different types of local requirement settings. Their research findings indicate that

industrialised house-builders do not perceive intentional requirement setting as problematic, yet the house-builders struggle to cope with interpretive local requirement setting. This research contributes to the theoretical development of institutional logics by applying Thornton et al's (2012) institutional logics perspective to the context of the Swedish construction sector. Anders and Lidelöw suggest that the concept of institutional logics can be used to understand interaction between different organisations within the same organisational field as well as it can be used for understanding stability and change within a single organisation or a field which has been the predominant use of the theory. They also promote agency and the individual as important levels of analysis, which have often been neglected in construction management research.

Xiong, Skitmore and Xia explores and seeks to validate the internal dimensions of occupational stress. Psychology Perceived Stress Questionnaire (PSQ) identifies one stressor –demand– and three sub-dimensional emotional reactions –worry, tension and joy– as relevant to measuring occupational stress. This instrument is tested in a survey of young construction cost estimators in China. Principal component analysis, confirmatory factor analysis and structural equation modelling are used to test the construct validity. The research findings support the use of PSQ in the study of occupational stress in construction and in China. Also, the study demonstrates the divisibility of occupational stress and develops a new framework for assessing the relationship between stressors and stress through identified core characters and manifest variables of occupational stress in a standardized way.

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