

TOWARDS A CO-PRODUCTION RESEARCH AGENDA FOR CONSTRUCTION COMPETITIVENESS

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We outline and discuss a new research agenda for understanding competitiveness for construction management (CM) research. We begin by arguing that a unified theory of construction competitiveness is neither plausible nor desirable, and instead advocate a more pluralistic and contextualised perspective. We then present some of our core research findings in terms of the research *process* best able to support the competitiveness of the UK construction sector in the long-term. These findings are positioned within current thinking on co-production research, i.e. research where academics and practitioners co-operate in the joint production of knowledge with a particular emphasis on the process of moving knowledge into practice. Thereafter we seek to summarise what we have learned about the way in which competitiveness is enacted by regional construction firms. Attention is also given to the unbounded contexts within which innovations must be implemented. We further argue that the shaping effects of the past are too often ignored by policy makers and researchers. Finally, attention is given to substantive topics for further research.

Keywords: competitiveness, construction sector, knowledge, research, embeddedness

INTRODUCTION

‘Sustained Competitiveness in the UK Construction Sector: A Fresh Perspective’, or the *Big Ideas* for short, is a collaborative research project across Reading, Loughborough and Salford universities which began in April 2005. One of the commitments that we made at the outset of the *Big Ideas* project was to develop a ten-year research agenda addressing the theme of construction competitiveness. We also made a commitment to offer a ‘fresh perspective’; of particular importance was to avoid replicating the tired research agendas of the past and to attempt to offer something a little more radical and even, dare we say it, a little more theoretically informed. The purpose of this paper is to outline the scope and content that such a research agenda might entail. It must also be recognised that the research agenda needs to address the requirements of different constituents, namely (i) the research community, (ii) industry practitioners and (iii) policy makers. Different versions of the research agenda may need to be articulated to cater for the needs of these different audiences. However, the temptation to go too far down this road at the outset has been avoided. Indeed, the continuous tendency to dichotomise ‘knowledge-producers’ from ‘knowledge-users’ we find to be outdated and unhelpful. Notwithstanding this comment, there are clearly issues about the appropriateness of different forms of language for different audiences. But in the first

instance it is important to formulate an overall message which is coherent, theoretically informed and yet also grounded in the empirical research that we have done over the last three years.

The paper is structured as follows. Firstly, we address the extent to which the *Big Ideas* project has contributed to a unified theory of construction competitiveness; but more importantly we rehearse the main arguments in support of our view that this is neither achievable nor desirable. We then present some of our core findings in terms of the research *process* best able to support the competitiveness of the UK construction sector in the long-term. These findings are positioned within current thinking on co-production research, i.e. research where academics and practitioners co-operate in the joint production of knowledge with a particular emphasis on the process of moving knowledge into practice. Thereafter we seek to summarise what we have learned about the way in which competitiveness is enacted by regional construction firms. Attention is also given to the unbounded contexts within which innovations are invariably implemented. We further argue that the shaping effects of the past are too often ignored by policy makers and researchers. Finally, attention is given to substantive topics for further research.

CAN WE DEVELOP A UNIFIED THEORY OF CONSTRUCTION COMPETITIVENESS?

Construction management research is frequently challenged in terms of its theoretical underpinnings and criticised for its lack of any underlying ‘unified theory’. The various literature reviews which underpinned the empirical work conducted on the *Big Ideas* project have demonstrated beyond any shadow of doubt that there is no unified theory of competitiveness *per se*, and neither is there any single theory which can be adopted to guide future work. Indeed, the empirical work has reinforced the contention that any quest for a unified theory would be misdirected. Proposals to develop unified theories invariably build on the ‘standard model’ of theorizing informed by the popularisation of Popper's (1963) philosophy of science. From this perspective, theory is seen to play a crucial role in scientific development and is crucially judged in terms of the extent to which it aids explanation and prediction. Such a world view rests on an idealized model of physics from the 1950s and 60s in which a coherent community of scientists, guided by an internally generated agenda, worked to develop a unified theory. However, it is erroneous to suggest that this model prevails across the natural sciences *per se*. Kuhn (1962) was especially influential in arguing that it is the dominant paradigm which shapes scientific production rather than any unified theory.

Within the domain of the built environment, a further problem is caused by the fact that the world does not stand still while ‘scientists’ seek to converge upon an accepted theory. Even if there were a coherent community of built environment researchers striving in this direction, their efforts would be continuously disrupted by the need to take on board externally generated ideas and policy initiatives. Examples include the continuous development of the sustainability debate and the progressive evolution of PFP/PPP and other procurement approaches. Raberneck (2008) argues that the construction sector is perennially characterised by uncertainties about product (what to build?) and process (how to build?). Such uncertainties are seen to arise from conflicts between two conceptual frameworks that are inseparable from the construction context. This first relates to the institutionalised recipes that are inherited from the past; these govern how the process of building is organised. The

second relates to the constantly evolving framework of thought that shapes what we think about buildings and the objectives that we set for the building process. This idea of conflicts arising from these two alternative conceptual frameworks coincides with the challenge throughout the *Big Ideas* project of co-ordinating between Work Package 1 (exploring the future) and Work Package 2 (how the present is shaped by the past). Significant progress has been made in populating these two frameworks with empirical data; although in both cases coverage has been incomplete and partial. Hence there is considerable further scope for populating an ongoing research agenda with the endless conflicts that arise from these two frameworks.

The rejection of any possibility of a unified theory of construction competitiveness has significant implications for the adopted research approach. From the outset, the *Big Ideas* project sought to explore the complementary use of different research approaches. At times this has been extremely challenging leading to exchanges which can best be characterised as the 'dialogue of the deaf'. Such 'paradigm wars' have of course occurred previously within the discipline of construction management (CM) (Seymour *et al* 1997; Runeson, 1997) along similar lines to those which have characterised other disciplines (cf. Rosenhead and Mingers, 2002). There is no need here to re-visit these previous debates, other than to note an emerging consensus in favour of multi-paradigmatic pluralism. Cairns (2008) summarises current thinking by advocating an 'ambivalent' approach to theorising; ambivalence in this context is not meant to imply apathy, but rather to emphasise the coexistence of seemingly incompatible states. Such ideas are increasingly recognised and debated within CM. Certainly the emphasis on multi-paradigmatic pluralism, embracing a broad variety of ontological and epistemological stances, is much more appealing than trying to adhere to any goal of 'unified theory'. What is clear is that researchers working on the *Big Ideas* project have gained valuable experience of multi-paradigmatic research, while at the same time striving to provide meaningful outputs to industry. To a certain extent, the lessons of this experience are still being absorbed, but there is little doubt that the research team is uniquely placed to comment on how methodological pluralism should be enacted within the context of the construction sector. Cairns' (2008) theoretical exposition is useful in providing a framework against which we can position our accumulated experience. Here at last is a commentary that promotes a meaningful alternative to the instrumental rationality of the Egan (1998) agenda and its subsequent imposition by powerful clients. Indeed, there is much comfort here for those of us who have long since expressed discomfort at the instrumental rationality which consistently underpins industry improvement recipes such as lean thinking (cf. Green and May, 2003). The proposed alternative is based on Flyvbjerg's (2001) notion of 'value-rationality' which seeks to question the purpose and motivations of decision-makers, ascertain the desirability of projected outcomes to different stakeholder groups and, where appropriate, to future generations of affected stakeholders. As summarised by Cairns (2008), the emphasis lies on 'interrogating the ethics of different stakeholders and making often difficult choices between competing rationalities'. This alternative position is particularly appropriate for construction because it resonates with the heterogeneity of the sector. We learned very quickly (if we did not already know) that there is no such thing as the 'construction sector'. Any responsible research agenda must clearly seek to reflect the heterogeneity of the sector and to understand the different perspectives of the multiplicity of stakeholders of which the industry comprises.

CO-PRODUCTION RESEARCH

None of the above distracts from the necessity for research which is useful to industry. The issue of industry impact has always been high on the agenda of construction academics and the *Big Ideas* project is no exception. However, in recent years the linear model of research-innovation-impact has become discredited in favour of other models which emphasise the non-linear, iterative and multi-agent character of the innovative process (Perkman and Walsh, 2007). In consequence, attention has increasingly focused on ‘co-production’ research whereby practitioners and academics cooperate to develop new knowledge and technologies together. More specifically, the term is used to signify the dynamic interaction between researchers and practitioners which unfolds over time. The emphasis lies on the industrial benefits derived through participating in the research *process*. It is therefore suggested that a research agenda for the future needs to be explicitly structured around the co-production of knowledge which serves the needs of two audiences: researchers and practitioners. Both must receive equal recognition.

The idea of co-production research builds on the ‘Mode 2’ theory of knowledge production, (or rather its ‘co-production’) put forth by Gibbons et al (1994). In essence, Gibbons *et al* argue that a new form of knowledge production started to emerge in the mid 20th century which they characterised as context-driven, problem-focused and interdisciplinary. Mode 2 is seen to involve multidisciplinary teams being brought together for short periods of time to work on specific problems in the real world. This is distinguished from traditional research, which Gibbons *et al* labelled ‘mode 1’, which they saw as academic, investigator-initiated and discipline-based knowledge production. The notion of Mode 2 research was subsequently adopted by the Royal Academy of Engineering (2000), who emphasised the need for the development of new quality assessment mechanisms to take into account the ‘efficiency or usefulness’ of the research as judged by a community of practitioners. They further emphasised that the results of engineering research are often heavily contextualised:

“...successful engineering research will produce outputs and processes that are relatively difficult to separate from the context of application in industry, government or any other section of society”.

The point of interest here is that the CM research community, especially within the leading research centres, is increasingly cited as being an exemplar of co-production research. There are now embedded learned behaviours relating to co-production research and its enactment. Certainly, on the *Big Ideas* project we have enjoyed extensive interaction with industry and have every justification in aligning ourselves with the idea of ‘context-driven’ research. Traditionalists of course frequently dismiss co-production research as ‘mere consultancy’. But we are not at all embarrassed if industry partners were able to derive short-term benefit from our research. Indeed, we would see this as a positive benefit. Overall, we would emphasise the importance of acknowledging the need to deliver to two audiences from the outset. Furthermore, we would concur with Maclean and Macintosh’s (2002) observation that such projects are likely to be more rewarding than those which only cater for the needs of one audience.

Of particular importance to co-production research is an ongoing commitment to the feedback of emerging insights to industry partners on a variety of levels. Each request for an interview, or access to data, should be combined with a commitment to feedback the resultant findings and interpretations. The empirical research on the *Big Ideas* has been strongly

characterised by this commitment, with feedback events ranging from open half-day seminars to personalised briefing for CEOs. In our experience, social-scientists and colleagues from within business schools are frequently amazed by the depth and longevity of our links with industry. A useful metaphor to describe the more established *modus operandi* within these other research communities is that of ‘smash-and grab’ research. Once they have the data, industry partners never hear from the researchers again as they concentrate all their energies on the production of the journal publications upon which their careers depend. Such an approach is the antithesis of co-production research.

LOCALISED LEARNING AND EMBEDDEDNESS

Empirical work on the *Big Ideas* project into the way in which regional contractors continuously respond to dynamic environments has moved forward the research agenda in this area. Existing popular theories relating to competitive advantage (Porter, 1980), the resource-based view (RBV) of competitiveness (Barney, 1991) and dynamic capabilities (Teece *et al.*, 1997) have been found to be of limited use in making sense of enacted processes (Green *et al.* 2008). In contrast, our case studies of regional contractors have revealed the complexities and emergent nature of how firms enact strategy in practice. This is highly dependent on the ways these firms operate within specific and local contexts, whether these are grounded in geographical regions, or particular market niches. For these firms, strategy is performed through the ways that they embed themselves within these various domains, and how this enables them to leverage specific opportunities. We believe this reaffirms the need to rethink competitiveness and competitiveness research, in terms of engagement with localised contexts, beyond generic solutions, instrumentalism and goal-orientation.

Our argument resonates strongly with the concept of *embeddedness* as articulated in the discipline of economic geography. This is derived from empirical observations that entrepreneurial and economic activity tends to be concentrated within certain locations, leading to particular configurations both regionally and by specialisation or market. The concept stresses the importance of local contexts and the social networks which constitute them. Activities such as developing the ability to recognise and act upon opportunities specific to these localised contexts (Jack and Anderson, 2002) together with gaining reputation and credibility within these contexts are central to being competitive. As Maskell *et al.* (1998) contend, competitiveness is rooted in a firm’s ability to mobilise capabilities within specific domains, ‘which are difficult to imitate for outsiders, and which are partly based on intense interaction between a limited number of actors within a regional or national industrial system’. This is significant for how ‘unique capabilities’ are developed; they are not bounded within a specific firm, but are constituted across networks. This extends firm-centric accounts of competitiveness in emphasising the ways that tacit skills, resources and capabilities are developed across organisations and, more importantly, across local and social networks.

This process of developing capabilities is one of *localised learning*; it is through on-going processes of localised learning that becoming and remaining embedded depend. It represents interactive engagement between organisations and other local stakeholders, rooted in specific contexts, which give rise to unique capabilities and opportunities. But this approach is not, intended to be presented as a panacea. There are potential problems of becoming over-embedded, which can result in over-reliance on a limited number of relational ties and key individuals and risks strategic visions becoming too entrenched and resistant to change. However, positioned as a process, rather than outcome, embeddedness and the localised

learning processes which constitute it offers a new and important perspective on how competitiveness in construction is enacted.

RELATIVE BOUNDEDNESS AND CONSTRUCTION CONTEXTS

An important aspect of the notion of embeddedness is that it is not firm-centred; becoming embedded requires engagement across local contexts, and the development of relations and networks between firms. A firm cannot become embedded in isolation from wider contexts. This is a key insight developed from our studies of regional contractors within the *Big Ideas* project, and has particular resonance more generally within construction contexts, where project-based work is carried out by temporary constellations of inter-organisation actors. But this characteristic also brings challenges, especially when attempting to shift or shape current practices.

Many approaches to enacting change place a strong coordinating ‘champion’ at the centre of the process. Where such a systems integrator is present, centralised mediation can effectively steer and manage change processes. Such efforts can be seen as relatively bounded; there is a coherent centre which aligns the various parties and entities involved. But what happens if the innovation’s effects or repercussions extend beyond the control or sphere of influence of the implementer? In other words, what happens if the innovation is relatively unbounded? There is at present little research which charts how the implementation of change plays out in such circumstances. The significance of this for future research is a shift in focus from the unit of the firm to the wider networks in which particular actors and organisations are situated. Research would need to be directed at exploring the ways that relations are developed across these inter-organisational networks, and examining the interactions and negotiations mobilised over time. Such a research agenda would involve ascertaining who, or what, is being drawn into the negotiations that take place around such change processes, and who and what is being excluded.

The notion of relative boundedness accounts for the contexts in which change is enacted. This means that implementation of the same processes or techniques may be more or less bounded in one location rather than in another and hence generates different challenges and different outcomes. Considering relative boundedness avoids common assumptions that change is uncontested, always taking place within coherent and unilateral landscapes. It also brings more clearly into focus the range of context-specific pre-existing conditions and practices at which change is directed.

Within construction, the appreciation of boundedness is highly significant in terms of attempts to reconfigure sequences and practices of inter-organisational project work. Construction work shows seemingly indelible and intractable patterns such as the partial exchange of information leading to reworking, recourse to litigation, and inflexible sequences in which different actors are mobilised on a project. In such contexts the effects of implementation cannot always be tightly controlled and constrained, and extend beyond the influence of a single organisation or individual. In order to successfully innovate in such a relatively unbounded context, the cooperation or alignment of multiple actors and spheres of influence from across different organisations would be required. Considering the relative boundedness of attempts at transformation and change recognises this, and can contribute to bridging the gaps between calls for reconfiguring construction work and detailed exploration of how change plays out in specific contexts.

CONTEXTUALIST RESEARCH

A further important touchstone for a future research agenda is provided by the tradition of 'contextualist research', which emphasises the importance of studying 'reality in flight' and of locating present behaviour in the context of its historical antecedents (Pettigrew, 2003). Few current CM researchers give significant attention to time, with the result that much of their work is an 'exercise in comparative statics'. In contrast, our research agenda would recommend that researchers follow the approach of historians to 'reconstruct past contexts, processes, and decisions' in order to discover patterns, find underlying mechanisms and triggers, and combine inductive search with deductive reason (after Pettigrew, 2003).

Such an approach has already produced alternative accounts of competitiveness as part of the *Big Ideas* project. Rather than view competitiveness as if it were a tangible, acontextual and generic entity that can be measured, benchmarked, transported and improved, it is better positioned as an emerging and evolving set of discourses and material manifestations, situated within specific contexts and historical trajectories. These temporalities are both contingent and complex. The circulation and development of policy initiatives, the legitimization and popularization of generic improvement recipes are directly implicated in shaping over time the contexts, both broad and local, within which competitiveness is constituted and performed.

The re-conceptualisation of competitiveness as an emerging discourse rather than an intrinsic characteristic of organisations has significant implications for research. It certainly questions the relevance of narrowly-construed positivist research methodologies and points towards the need to understand the unfolding complex processes through which competitiveness is enacted and legitimised. The important point for future research is that the context within which strategic decisions are made must be conceptualised as an active part of any analysis. But context is not only *shaping*, it is also *shaped* by action (Pettigrew, 1997). Issues of consideration include unpacking how contexts have been shaped over time, the relationship between language and action and the way that human agency relates to structural aspects of society. Such a research agenda would require a significant shift in theoretical orientation, together with a multitude of research skills beyond those normally mobilised in the cause of construction competitiveness. Of key importance would be the need to shift from a 'being ontology' towards a 'becoming ontology' (cf. Chia, 1995). Such a shift equates directly with a conceptualisation of competitiveness as subject to continuous processes of flux and transformation, rather than an objective characteristic that can be possessed and measured.

POPULATING THE AGENDA WITH SUBSTANTIVE RESEARCH TOPICS

Consistent with the stated commitment to co-production research is the principle of engaging industry in the setting of the research agenda. Furthermore, this is seen to be an ongoing and contextualised process, rather than something which is done at a distance. Nevertheless, on the basis of extensive engagement with a broad cross-section of industry practitioners, colleagues at Loughborough have identified a range of substantive areas which are currently of central importance to industry concerns. These include skills and skill shortages, both in terms of trades and management, issues of recruiting and retaining staff, the need for better collaborating across supply chains, and engaging clients. Similarly, specific markets have been consistently identified as important, such as homes and social housing and hospitals.

In themselves, the above topics do not especially constitute anything which is new or innovative. Furthermore, the current economic downturn is likely to have already changed industry priorities in terms of what they consider to be important. Nevertheless, it is contended that fresh insights could be developed in all these areas by the unfolding application of the research approach advocated above. Staff training becomes an issue of ensuring that individuals have the necessary capabilities to develop and sustain inter-firm social networks. Retention becomes central in keeping those social networks in place. Similarly, leveraging opportunities in specific markets such as hospitals, schools or affordable housing can be positioned as underpinned by becoming embedded into specific local networks and framework arrangements.

The *Big Ideas* project has succeeded in developing exemplar system dynamics models and exploring how they might be used to better inform decision making. There still remains significant scope for interaction with industry in terms of identifying meaningful applications. Nevertheless, several such potential applications have from emerged from the workshops done to date with industry. From the outset, the use of system dynamics – and the modelling process especially – was primarily seen as a vehicle for the development of learning and social coordination (de Geus, 1994; Vennix, 1996). As such, the enactment of system dynamics modelling is entirely consistent with the principles of co-production research. However, the communication of the core ideas of system dynamics to construction sector audiences has consistently presented a challenge, and the degree of engagement originally envisaged between modellers and construction practitioners has been difficult to achieve. But the introduction of new ideas, and new ways of thinking is never easy and the models developed to date by colleagues at Salford University have undoubtedly established proof of concept. Future research opportunities lie in the development of models to allow a comparative process analysis between different procurement approaches. Related to this is the exploration of the dynamic effects of the way in which clients decide to package their projects. Further opportunities are provided in terms of better informing contractors' project selection strategies. For example, what are the consequences of targeting a larger number of smaller projects rather than targeting a smaller number of large projects? Such decisions are of central importance to contracting firms, and yet decision support algorithms are few and far between.

The final potential topic for the proposed research agenda relates to the nature and benefits of co-production research itself. Current thinking within policy domains tends to focus on *links* between universities and industry, but the concepts of open, networked and interactive innovation suggests that *relationships* play a more important role (Perkman and Walsh, 2007). In the context of construction-related research, little is known about the nature of such relationships, how they arise, how they are maintained over time and the effects they have on the innovation process. This in itself would constitute a significant research agenda for several years to come.

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