Routledge
Taylor & Francis Group

Construction Management and Economics

ISSN: 0144-6193 (Print) 1466-433X (Online) Journal homepage: https://www.tandfonline.com/loi/rcme20

Resolving the UK construction skills crisis: a critical perspective on the research and policy agenda

Paul W. Chan & Andrew R. J. Dainty

To cite this article: Paul W. Chan & Andrew R. J. Dainty (2007) Resolving the UK construction skills crisis: a critical perspective on the research and policy agenda, Construction Management and Economics, 25:4, 375-386, DOI: 10.1080/01446190600863152

To link to this article: https://doi.org/10.1080/01446190600863152

Construction Management and Economics (April 2007) **25**, 375–386

Resolving the UK construction skills crisis: a critical perspective on the research and policy agenda

PAUL W. CHAN[1]* and ANDREW R. J. DAINTY[2]

[1]*School of the Built Environment, Northumbria University, Ellison Building, Ellison Place, Newcastle upon Tyne NE1 8ST, UK*
[2]*Department of Civil and Building Engineering, Loughborough University, Ashby Road, Loughborough LE11 3TU, UK*

Received 12 January 2006; accepted 31 May 2006

The ongoing skills crisis in the UK construction industry has constrained the productive capacity of the industry. Past research and skills policies have largely failed to develop an understanding of the realities of the skills crisis at the grassroots level. Solutions offered by researchers and policy makers have previously had little demonstrable impact in addressing skills concerns. Much of these policies seems disconnected from the realities experienced by employers and by those working in the industry. A critical perspective on resolving the skills crisis is offered. A set of mutually reinforcing research and policy initiatives are proposed, including the need for researchers and policy makers to move away from the conventionally national approach in addressing the skills problem and to engage in genuine, joined-up thinking that meets the needs of local regions. Furthermore, employers and employees are called to be reflective practitioners in their participation of the skills development agenda. Adopting these recommendations could overcome many shortcomings in research and policy that have hitherto done little to combat the construction skills crisis.

Keywords: Skills shortages, critical perspective, bottom-up approach, labour market, research

Introduction

The skills agenda has grown in prominence within the UK in recent years, mainly in recognition of the low-skills equilibrium from which the country suffers (Keep and Mayhew, 1998), and the productivity gap between the UK and the US/mainland Europe (Bloom *et al.*, 2004). Given the shift towards the knowledge economy (see Drucker, 1998), and the realization of the importance of lifelong learning to continuous improvement, solving the UK skills gap has become a pressing priority (see Commission of the European Communities (CEC), 2000; also known as the Lisbon Strategy). For the construction industry, efforts are also being made to mitigate an acute skills crisis where shortages of both craft and professional workers threaten the productive capacity of the sector. Construction remains one of the few sectors to have a dedicated training board (Druker and White, 1996).

*Author for correspondence. E-mail: paul.chan@unn.ac.uk

Despite skills concerns within the sector, there is some evidence of discord between the policy decisions made in relation to improving the construction skills base and the practicable impact that this is having on skills provision within the sector. For example, Dainty *et al.* (2005a) reported that according to the small firms who make up the vast majority of employers within the sector, normative labour market and taxation policies and quasi-regulatory attempts to control the industry's employment and training practices have seemingly done little to safeguard the long-term sustainability of skills provision. Given these divergent realities, the disconnection between skills research and policies and the skills needs in practice is subjected to critical appraisal. It is contended that skills research and policies have failed to address skills concerns on the ground, and that genuine skills improvement will require a sustained effort to understand the practical realities of skills provision at a project level. Initially, a review of the salient points of skills research is presented, which acts as a backdrop for a critical appraisal of the current labour market situation. The

Construction Management and Economics
ISSN 0144-6193 print/ISSN 1466-433X online © 2007 Taylor & Francis
http://www.tandf.co.uk/journals
DOI: 10.1080/01446190600863152

ensuing discourse explores the need for a more coordinated research effort to appreciate the intricacies of skills development within the sector more holistically.

Review of skills research

The growing interest in skills in UK construction, particularly since the 1990s, is attributable to a number of factors. First, as Clarke (1992) observed, there was increasing evidence of a skills crisis within UK construction, apparent either 'in terms of skilled labour shortages or a decline in the quality of construction work' (p. 1). Attention to the acute situation of the skills crisis was brought to the fore by the recession of the early 1990s (Churchill, 1997). For example, the Latham (1994) report led to a series of strategic skills and training reviews (e.g. Construction Industry Board, 1998). These reports have viewed the skills crisis from an industry-wide perspective, acknowledging the disincentive for employers to invest in training due to the growing trend of self-employment (Winch, 1998; Harvey, 2001) and the unattractive image of the industry that pushes the much needed skilled labour away to other sectors (Dainty *et al.*, 2000). At the same time, changes in technology such as the growth of offsite manufacturing (Agapiou *et al.*, 1995; Gann and Senker, 1998) have begun to engender a rethink of traditional trade boundaries (Clarke and Wall, 1998) with some writers promoting the development of multiskilling (Scott and Cockrill, 1997; Burleson *et al.*, 1998; Haas *et al.*, 2001). Dainty *et al.* (2004) also argue that the deep entrenchment of traditionally fragmented skills structure has inevitably narrowed the industry's skills base and has delimited its innovative capacity.

Given the labour-intensive nature of construction activity and the size of the sector in terms of the number of people it employs, there is a wealth of skills-related research undertaken within the construction management discipline. A synthesis of this literature suggests that skills research could be broadly categorized into two main streams: the first dealing with more quantitative nature of *skills shortages*, and a second which has been more concerned with the qualitative nature of *skills gaps*. It is important to review both if a thorough understanding of the labour market is to be developed.

Skills shortages

Skills shortages have been a recurrent problem within construction over the past 30 years (DfEE, 2000) and there remain widespread concerns that the industry will not have the labour capacity to cater for the projected growth in the medium term (see Delargy, 2001; Crates, 2001; Allen, 2004). Skills shortage studies have tended to reinforce the view that the construction industry faces a skills crisis and desperately needs to invest in training its workforce. These range from the regular skills foresight reports (e.g. CITB, 2003) that predict industrial growth and resourcing levels using an econometric or similar forecasting model, to other qualitative and quantitative studies that consistently illustrate an industry encountering recruitment problems of both blue-collar operatives (e.g. Agapiou, 2002) and white-collar professionals (e.g. Dainty and Edwards, 2003).

Of course, studies have also been undertaken to formulate strategies to cope with the issue of skills shortages. For instance, there has been a push towards encouraging non-traditional recruitment in the UK industry over the past decade (Dainty and Bagilhole, 2005). Attempts to tap into women and ethnic minorities, as well as the option of adult (re)training, have been explored, with some degree of success in plugging the skills shortages in both craft and professional employment (Clarke and Wall, 1998; Ellison, 2003; deGraft-Johnson *et al.*, 2003; Commission for Architecture and the Built Environment, 2005). It has also been suggested that EU expansion could provide short-term solutions to the problem of skills shortages (Royal Institution of Chartered Surveyors, 2005), although this is unclear given contrasting statistical evidence from recent Danish research (Clarke, 2005).

Employers' responses to tackling the skills shortage problem have also been examined. For example, a survey conducted by Mackenzie *et al.* (2000) revealed that employers considered the Construction Skills Certification Scheme (CSCS), stability of the industry and shift towards direct employment as preferred ways for mitigating the skills shortage problem. Indeed, it is encouraging to observe that since Mackenzie *et al.*'s (2000) call for government backing to support or even legislate the CSCS scheme, the Office of Government Commerce (OGC) has recently agreed that Whitehall should use only those contractors who hire CSCS-registered labour (Barrick, 2003). This policy was partially driven by the need to combat the rise in illegal workers following EU expansion (Broughton, 2004). Interestingly, the Pearce report (2003) commented on the fairly *strong* skills profile of the UK construction industry and observed a decline in the proportion of self-employed labour when compared to the early 1990s. Thus it would appear that such initiatives, together with taxation legislation which has been developed to regulate the labour market more

effectively (see Briscoe *et al.*, 2000) may be taking effect within the sector.

Despite improvements in the vocational skills situation, severe problems remain, particularly in relation to the framework of National Vocational Qualifications (NVQs) which underpins the industry's craft skills framework. A number of writers (e.g. Callender, 1997; Grugulis, 2003) have criticized the inadequacy of the NVQ framework for its lack of academic rigour and dilution of technical content. Clarke and Winch (2004) argued that vocational practice should have a firm theoretical base and maintained that the Modern Apprenticeship system diminishes the role of theoretical knowledge since the system is highly dependent on the goodwill of employers. Furthermore, Callender (1997) bemoaned that 'inadequate skill levels are set out as standards to be aimed at, and are perpetuated rather than improved by NVQs' (p. 50). The Construction Industry Board (1998) echoed this sentiment by claiming 'many NVQs accredit candidates mainly for what they can do already, rather than encouraging or requiring them to improve' (p. 62). Arguably, the recognition of a skilled tradesman through the CSCS scheme, advocating the attainment of NVQ level 2 (CSCS, 1999) is insufficient when compared to other countries like Denmark and Germany (CITB, 2003) or even Scotland (Clarke and Wall, 1998) where there are registration mechanisms that recognize skills at the base qualification of level 3. Thus, it would seem that NVQs in Britain have contributed to the failure of the sector to raise skill levels within the sector (Grugulis, 2003; Dainty *et al.*, 2005b).

It would appear, therefore, that the current qualification structure is out of step with industry needs and is in need of reform. Clarke and Winch (2004) suggested a need for greater integration between the regulators of training, training providers, trainees and employers as they recommended a three-tier system of block release, simulation and work experience in the pursuit of qualifications. Qualifications should, in principle, result from a training course; however, NVQs are not necessarily linked to any course structure, nor are training providers required to follow a particular training course syllabus (Callender, 1997). As such, heeding Clarke's and Winch's (2004) recommendation of strengthening the theoretical base could be a starting point for reformation of the NVQ system.

Skills gaps

Resolving skills shortages only represents one aspect of dealing with the skills challenge. Skills gaps are the 'skills deficiencies of employees' (Bloom *et al.*, 2004, p. 3). Thus, while research into skills shortages regarded shortfalls from a more quantitative perspective, research into skills gaps was concerned with the descriptive content of those skills deficiencies.

Within construction, much research into plugging the skills gaps revolves around criticisms of industrial fragmentation in terms of technical and professional boundaries. Clarke and Wall (1996), for instance, found that Britain depended largely on simple construction processes where the blue-collar sector remained cocooned within traditional trade boundaries and suggested a need to move away from the narrow definition of skill derived from a task-based approach. Crossing traditional boundaries was also recommended by the Construction Industry Training Board (CITB) (CITB, 2000) and the more recent Office of the Deputy Prime Minister (ODPM) skills review for sustainable communities (ODPM, 2004). This report reiterated the industry's weakness in such skills as managing working relationships and the workforce ability to see the wider picture with regard to the way the different specialists work together to produce the built environment. Reilly (2001) also emphasized the importance of inter/intra-team trust, interorganizational teamwork and cooperative working. In terms of the implications of EU expansion, Dench *et al.* (2006) highlighted the need to enhance the language skills of migrant labour and to promote greater integration between the migrant and local workforce.

It would appear that much research into skills gaps has concentrated on generic skills. The Royal Institution of Chartered Surveyors (RICS) offered an explanation (Royal Institute of Chartered Surveyors, 2003) for the prominence placed on generic skills in citing El-Sabaa's (2001) study, which revealed that of the three groups of skills—human, organizational and technical—human and organizational skills were consistently rated more highly in the agriculture, electricity and IT industries. Bloom *et al.* (2004) further argued that post-Fordist production has led to greater complexity and thus, a greater emphasis on generic skills throughout organizations. In a similar vein to research into skills shortages, researchers have also critiqued strategies for tackling skills gaps. For example, Boyd and Wild (1993) argued that the education and training system is inadequate for such a vocational occupation as construction, because the system tends to be reductionist in its approach. Pitt (1995) also questioned the relevance of academic institutions in meeting the skills gaps where generic skills are concerned. He established that while academia develops an individual's broad technical expertise, intellect, effort, analytical and problem solving capabilities, the industry values more specialized technical

abilities and more importantly, interpersonal and communication skills, personal qualities, judgement and vocational experience.

Increasingly, there is greater awareness that skills development stems from a combination of theoretical education and work-based experience (Ford, 1992; Bloom *et al.*, 2004; Paulsson and Sundin, 2004). However, such development has to be supported by employers' goodwill, which is known to be flawed in terms of skills development (see Beckingsdale and Dulaimi, 1997). For example, Clarke and Wall (1998) criticized the employer-led CITB for serving the short-term needs of influential players with little regard for SMEs. As Grugulis (2003) states, 'employers generally respond only to short-term skills needs, usually in an ad hoc way; few, if any, plan skill formation and development over more than two years' (p. 470). Mechanisms such as Investors in People, which set out to ground the practice of developing employees within organizations have also been labelled as a badge collecting exercise (Bell *et al.*, 2002).

Mitigating the industry's skills challenge: priority issues

The extant body of literature reviewed here paints a grim picture of the current construction skills situation, in terms of both skills shortages and the quality of skills within the sector. Similar issues have been debated in other countries including the USA (Construction Users Roundtable, 2004) and Australia (Building and Construction Industry Working Group, 2001). The review raises questions as to whether the current emphasis in research and policy making is aligned with the sector's skills needs. Fundamentally, three aspects of the current situation appear to underpin the apparent inability of the sector to provide a high quality and sustainable skills base to safeguard its future growth and development. First, there is some ambiguity in terms of what the skills issues are that currently face the industry; it is unclear as to whether the present situation is rooted in a quantitative shortage or a lack of high quality skills within the labour market, or even both. Second, there appears to be unwillingness on the part of employers to take individual responsibility for addressing the skills problem, with a culture of abdicating such activity to the industry training board to which many firms pay a training levy. A third problem concerns the role of individuals working within the sector and their willingness to engage in the upgrading of skills and lifelong learning that itself would help to overcome skills concerns. These issues are discussed in more depth below.

Ambiguity of the concept of skills

Until recently, qualifications have provided a convenient and readily understood proxy for skills. Grugulis (2003) maintained that qualifications '[…] can help employers identify suitable employees, provide individuals with portable credentials, and give occupational groups bargaining power; but each of these advantages stems from the skills that qualifications are assumed to certify, not from the simple fact that qualifications exist' (p. 458). Again, it is clear that recent trends in UK construction, especially with the Construction Skills Certification Scheme (CSCS) and other schemes to accredit existing skills with recognized qualifications, seem to promote the latter by advocating mass certification as opposed to rethinking the skills base in order to upgrade the skills of the working population.

Technological solutions to skills shortages such as offsite manufacturing have raised concerns as to whether they might deskill the industry in the future. The assumption that offsite manufacture should result in deskilling (Braverman, 1974) is debatable, for Clarke (1992) reminded us of empirical evidence that suggests increased use of technology could bring about skills upgrading in terms of learning new skills. Gann and Senker (1998) further warned that 'increasing technical sophistication of both construction products and processes means that the need for technical, knowledge-based skills is growing; introducing new technologies creates problems at interfaces between new and existing systems; this occurs when people lack the skills to work alongside those using new technologies' (p. 574). This warning did not escape, for example, the recent Barker (2004) report into increasing the housebuilding stock. According to Barker (2004, p. 113), new production methods (such as offsite manufacturing) require housebuilders, their subcontractors and employees to develop new skills and competencies. The report falls short of explicating what these new skills and competencies might be, or how the interface between the new and traditional skills should be managed, although ongoing work in this area will hopefully result in greater clarity (see Ball, 2005; Home Builders Federation, 2006).

Incidentally, the interface between new and traditional skills is extremely crucial in refurbishment and repair work. Given that around half the industry's output is in refurbishment and repair work, for which offsite fabrication is less relevant, the need to identify skills needed for refurbishment and repair becomes more pertinent. Yet, few studies focus on refurbishment and repair skills. Egbu (1999), through interviewing 32 refurbishment organizations and analysing 142 surveys, developed a menu of refurbishment skills for consideration. Interestingly, he found that workers

and managers in refurbishment works tended to have closer involvement with site-based activities, and that greater credence was attached to the ability to plan and manage risks related to the uncertainty of refurbishment works. The findings imply that refurbishment and repair works demand skills levels beyond the introduction of new production methods.

Suggestions for 'innovating away' the skills shortage have formed popular discussion topics for many industry commentators and policy bodies in recent years. It would seem that the post-Egan performance agenda of the industry has led to a plethora of initiatives being advocated that seek to promote economic performance potentially at the expense of skills development. Indeed, skills development is often replaced with concepts such as 'dynamic capabilities' (Teece *et al.*, 1997), 'core competencies' (Prahalad and Hamel, 1990) and 'organizational learning' (Chan *et al.*, 2005) as routes to enhance the productive capacity of organizations. Yet, while these initiatives aim to espouse a firm's flexibility and continuous improvement, there is a lack of a proven relationship with business performance (Scarbrough, 1998). Much of the connection emanates from anecdotal evidence and 'apparent consensus that increasing skill levels benefit individuals, organizations and the economy as a whole' (Grugulis, 2003: 457). It is contended, therefore, that the obsession with business performance has led to the dominance of economic approach towards defining skills. Such narrow and atomistic perspective of skills concerns only attributes 'that [are] amenable to quantitative measurement and [have] objective [characteristics] independent of the observer' (Stasz, 2001, p. 387).

Stasz (2001) suggests that the assessment of skills (linked to qualifications and wage labour) has been addressed from this more quantitative perspective, drawing parallels with Dainty *et al.*'s (2004) observation of the dominance of econometric models. Stasz (2001) calls for greater emphasis on the socio-cultural understanding of the labour market, which takes into account how workers utilize skills within their occupational roles. Stasz (2001) cited, for instance, a study of hairdressers (Harris, 1991), which found that while hairdressers denied the understanding of ratio and proportion when asked about mathematical skills needed for their jobs, the same individuals were proficient in mixing the correct proportions of dye, thus illustrating a discrepancy between employees' reports of academic skills and actual skills used in practice. The socialization aspect of skills is equally important to the understanding of skills through the proxy of qualifications. It is here that Clarke (1992) was perhaps one of the first in construction to point out the need for a more extensive and more social definition, although such a definition is arguably yet to emerge. Clarke and Wall (1996) also called for a shift towards industry-wide systems of training and a skills definition that considers the entirety of the building process, as opposed to perpetuating the narrow, atomistic view of skills. Yet, a more sophisticated socio-cultural understanding of skills is unlikely to emerge given the dominant focus on business performance, which has set the concentration on a purely economic model of skills.

Responsibility for addressing skills concerns

Current understanding of the construction labour market context is largely grounded in the outputs of top-down models of skills assessment. Dainty *et al.* (2004) observed the tendency to use highly quantitative econometric models to forecast skills needs for the industry, and questioned its appropriateness in dealing with the problem given the constraints presented by the widespread use of self-employed, transient labour (see Winch, 1998) and the shift in public policy in favour of devolution of responsibility to the regions (DTI, 2003). Further, such top-down approach is less appropriate considering the project-based nature of the industry, which could create immense challenges in implementing a pan-industry, national skills policy. As a result, the current industrial skills policy can be seen to be disconnected from the regional, local and firm-specific needs of the industry, which is problematic given that the industry tends to operate on this 'localised' basis (Huemer and Östergren, 2000). A tacit acknowledgement of this is the recent move by the Sector Skills Council to set up regional observatories for examining skills needs at a local level (see ConstructionSkills, 2004).

Another issue is that the seriousness of the skills problem, while undoubtedly encountered by firms, is seen as being largely the responsibility of those charged with the governance of the sector. The corollary of this is the emergence of 'latent' skills shortages, defined by Mayhew (2003) as those gaps that go unrecognized by organizations simply because they have managed to cope operationally (but not necessarily effectively) without the requisite skills (Bloom *et al.*, 2004). Latent skills shortages become particularly problematic within project-based construction (see Groák, 1994), as projects tend to be won at short notice, requiring the rapid mobilization of teams to distant locations, which in turn leads to individual employee (training) needs being excluded from the resourcing decision-making process (Langford *et al.*, 1995; Loosemore *et al.*, 2003).

Given the complexities of interorganizational interaction on construction projects, it is perhaps useful to consider if skills needs to meet operational

requirements effectively are actually taken into account in the first place, especially where human resource allocation at the project level is concerned. However, if latent skills shortages have yet to be recognized by firms, then the identification of such shortages might prove to be less than straightforward. Bloom *et al.* (2004), drawing on studies by Finegold and Soskice (1988) and Hogarth and Wilson (2002), propounded the adoption of technology as a possible manifestation of latent skills shortages, where employers implemented technological solutions, e.g. IT to counteract the lack of skills. Yet, the issue of latent skills shortages specific to the UK construction industry would be inadequately explained merely through the implementation of technological solutions since the construction industry does not rely upon a high degree of technological sophistication (see Clarke and Wall, 1996). A good example is provided by the example of offsite production discussed earlier. The quantity of existing building stock and the ingrained nature of (time-honoured) processes render technological change problematic for an industry such as construction.

The preceding discourse suggests a need for more work to be done in establishing what skills shortages, particularly latent skills shortages, really mean for firms running projects as their core business. Recent work has already begun to explore the impacts of latent skills shortages at the project level. For example, Chan and Cooper (2006), in a case study of a public–private partnership found that construction practitioners often do not know what skills they have (or have not). Consequently, practitioners do not know what skills they need, at times to the detriment of the project outcomes. From interviewing project participants, Chan and Cooper (*ibid.*) enabled the various project participants to collectively identify the necessary skills by addressing recruitment, deployment and development practices throughout the design and construction process. This example recognizes Clarke and Wall's (1996) assertion of the need to consider skills requirements throughout a building project, although such efforts are not reflected in industry labour market statistics. Thus, there is a clear research need to link up industrial policy with the manifestation of skills shortages at regional, firm and potentially project levels.

Of course, such joined-up thinking of policy can only be effectively implemented if employers fully uphold the responsibility of training. According to Dainty *et al.* (2005a), employers tend to abdicate from such responsibility through the payment of a training levy to the CITB, which Clarke and Wall (1998) argue is low in comparison to other European countries anyway. Forde and MacKenzie (2004) believe that the reliance of subcontracting and agency workers compels employers to 'front-load' skills training and accept that training is someone else's responsibility (usually through apprenticeship). Forde and MacKenzie (*ibid.*), however, made fascinating findings from their analysis of 188 questionnaire responses. Their findings suggest that employers increasingly display a willingness to engage in the training of what they term as 'contingent' workers (i.e. subcontractors and agency workers), especially in mandatory areas of health and safety. Since the industry is dominated by subcontractors, made up largely of SMEs, this has implications on the role of SMEs in training participation. Again, initiatives and grants like the Independent Training Group Grant for SMEs (IGTA, see www.citb-constructionskills.co.uk) by the CITB are likely to encourage this phenomenon. However, access to such support must be made less cumbersome (Clarke and Wall, 1998).

Role of individual employees

From Stasz's (2001) argument discussed above, it is clear that individual employees are a crucial element in the effective deployment of skills. However, the culture of industry and employer-led skills development and training has meant that employees often do not have discretion nor exercise autonomy over their personal development. This is unsurprising since modern management is seen to be neglecting the accrual of benefits to individual employees when it comes to driving improvement initiatives. Indeed, such initiatives can be described as neo-Taylorist in their approach (perhaps disguised in the form of 'lean production' or 'flexible working') (see Nyhan *et al.*, 2004, p. 69). The problem is compounded by the decline in trade unionism, especially since trade unions are increasingly under-represented IN skills policy making and implementation in the CITB (Clarke and Wall, 1998).

There is extensive recognition of the lack of employee autonomy in making work design decisions (see Cully *et al.*, 1999 for a diagnosis of the 1998 Workplace Employee Relations Survey). Moreover, there is growing evidence that the lack of employee autonomy could lead to detrimental outcomes where skills are concerned. For instance, Thursfield (2001) argued that a Taylorist form of work organization, where workers are viewed as machines and therefore seen as merely a factor of production, is still prevalent and this could promote deskilling (Braverman, 1974). Thursfield (2001) maintained that 'some jobs remain doggedly Taylorist and […] that Braverman's deskilling thesis remains highly relevant to an understanding of […] employees' perceptions of skills' (p. 517). In a similar vein, Grugulis and Bevitt (2002) investigated the impact of Investors in People on a hospital trust, and suggested that short-term performance targets and business needs might contravene employees' training

requirements and thereby lead to erosion of skills (see also Pfeffer, 2001; Grugulis *et al.*, 2003).

In advocating a socio-cultural perspective in the definition of skills detailed above, and 'crossing the levels' to link up the firm, project and individual levels with industrial policy, the role of the individual employee needs to be revisited. In so doing, one should go beyond the current employer-led structure, with its emphasis on business objectives from a unitarist position, to involve employees for the mutual benefit of organizations, employees and the industry as a whole. Therefore, this 'softer' approach could present a plausible start in unravelling the expectations of both the employers and employees in terms of what requisite skills are necessary in practice and how to develop them.

A way forward: recommendations for industry and research

The skills crisis in the UK construction industry is a deeply entrenched problem that has been well researched and legislated for over the past decade. Of course, more research into understanding the dynamic nature of the skills problem needs to be continued. Work done on encouraging non-traditional entrants into the industry also needs to be advanced to consider practical ways in which the industry can benefit from the high levels of ability that women and ethnic minority professionals can potentially offer. Similarly, further debates on the use and implications of migrant labour are essential. Concomitantly, it is important that research is undertaken to reflect the needs of the workforce. In particular, it is vital to examine the individual worker's propensity to engage in the (vocational) skills development agenda, especially where adult trainees are concerned.

Nonetheless, the persistence of the skills problem suggests inadequacy of research and more importantly, skills policy hitherto. The critical discussion presented here highlights immense opportunities for improving the situation. The preceding section outlined three priority areas—rethinking the definition of skills, engaging the employers' responsibility and involving individual employees in the skills development agenda—that should be embraced by academics, industrialists and policy makers to curtail the problem. This section will put forward a number of practical recommendations that can be adopted by industry and academia to tackle these suggested priority areas.

First, current research efforts must move away from the dominant industry-level approach to understanding the skills crisis. It is evident that the wealth of industry-level statistics on skills shortages and the tendency for some academics to generalize their research findings on the skills gaps have failed to avert the current skills crisis. Instead, researchers and policy makers must now recognize the intricacies involved at the regional, local and firm-specific levels, as well as the idiosyncrasies of particular sub-sectors (e.g. housebuilding). Research findings should therefore not be masked to represent the industry, but rather, researchers should openly develop an appreciation of the precise level of analysis involved in their discussion of skills. In order to engender change, policy makers, in particular, should steer away from centrally planned systems and move closer to the grassroots level by endorsing more qualitative research into the skills challenge.

Second, the definition of skills, as was alluded to earlier, is not uncontested. As such, the continuous expansion of the definition of skills (e.g. capabilities, competencies, etc.) could be seen as less helpful since this adds to confusion and lack of clarity. It could be argued that such confusion creates difficulties for policy makers and companies to genuinely tackle the problem; what we do not understand, we cannot address! In order to address this therefore, there should be more concerted efforts in debating the skills crisis with a view to gaining consensus on skills definition.

Such consensus must be derived by engaging with the multitude of stakeholders including employers, employee representation, training and education providers and the state. Given the decline in trade unionism, the term 'employee representation' is used not to further marginalize the relevance of trade unions, but to involve other means of representation that could include human resource managers, employment agencies and operations managers (i.e. those who work closest to construction operations such as site managers, project managers). In terms of training and education providers, deeper partnerships between employers and further and higher education institutions can strengthen the relevance of courses and achieve greater alignment between demand and supply requirements (Royal Town Planning Institute, 2003; Chartered Institute of Building, 2004). The state, particularly through government departments responsible for employment issues (e.g. Department for Work and Pensions, the Home Office and HM Revenue and Customs) should also be more involved with the sector to ensure that policies such as those pertaining to immigration and taxation contribute to sustaining and improving the skills base.

Indeed, ensuring effective stakeholder involvement can be challenging at the national level, and therefore needs to be devolved to the regional and local levels. Nonetheless, research efforts, policy making and implementation should be more coordinated in understanding the nature of the skills problem. This could be encouraged through

the creation of a skills network (or forum) of academics, policy makers and industrialists. The Sector Skills Council (ConstructionSkills) is addressing this through its development of an industry research observatory (ConstructionSkills, 2004) which offers the potential to provide such a forum for the sector. However, since the observatory is a fairly new initiative, it waits to be seen as to whether the conduct of the observatories can genuinely bring about the much-needed change. Research needs to be undertaken to examine the effectiveness of observatories to bring about real change. Alongside this, the implications of labour mobility across the regions need to be explored (see Beaney, 2006).

Third, and following on from the preceding point, academics, policy makers and industrialists must move away from the conventionally national approach in tackling the skills crisis. In line with the point on emphasizing the analysis at the regional and sectoral levels, all employers must actively engage in constant dialogue with policy makers and academics to address their skills needs. Similarly, policy makers and academics should seek to foster a genuine partnership in tackling the skills crisis. One plausible route would be to tap into the resources of regional bodies such as the regional development agencies and best practice clubs (e.g. Constructing Excellence). Indeed, embedding the creation of a skills network or forum (see above) within the regional bodies could serve to strengthen the active participation of employers in developing solutions that could mitigate the skills crisis. A cautionary note, however, is that relying on those involved in such initiatives runs the risk of 'preaching to the engaged' rather than firms who have hitherto been reluctant to work proactively to begin to address skills concerns.

Fourth, employers and employees must conduct themselves as reflective practitioners if they want to solve the skills crisis and participate in the lifelong learning agenda. Employers must actively determine what their latent skills shortages are and where they are manifested, i.e. at company or project levels. The case study example highlighted in Chan and Cooper (2006) could be a way forward. Employees should also regularly track their skills levels beyond the mere recognition of the current qualifications framework and actively seek out development opportunities through further training and learning opportunities. Moreover, employers must facilitate this bottom-up approach and involve employees through mechanisms such as job analyses, appraisals and collective agreements (for which an existing infrastructure exists). Where craft workers are concerned, partnerships in dialogue could also be forged with trade unions and trade associations to determine the skills needs of both employers and employees at the project level. This is not dissimilar to the tripartite arrangement between employers, employees and the state during the original formation of the CITB in 1964. Such partnerships must move beyond rhetorical statements of intent to provide a forum for an active dialogue between employers and employees within the sector.

Finally, academics have a crucial role in enabling employers and employees to become reflective practitioners. For example, more research should be undertaken using the less prominent 'socio-cultural lens' in defining and understanding skills. By focusing on the terms used by individuals in the construction of the skills base, the role of academia could be instrumental in challenging the current qualifications framework and instilling relevance of the skills crisis to individual employees. This could act as a catalyst for a positive cycle that would encourage employees to put more efforts into personal development and improvement. Clearly, this is a dynamic process and therefore, it is essential that research should be fed back to policy makers and educational institutions so that training courses and qualifications become more appropriate in providing for the necessary skills. Arguably, networks and collaboration with regional bodies suggested above would provide a fertile ground for such dissemination.

In effect, the five action points established in this section are practical steps that could be taken to challenge the current state of thinking in terms of solving the skills crisis. It is maintained that for far too long, disconnected agendas between the key social partners (employers, employees and policy makers) exist, which prevent the improvement of the skills situation. Moreover, there is a discord between theory and reality of the skills crisis that can be explained by the dominance of a top-down, economic approach that fails to distinguish between various levels of analysis (regional and sectoral) that would be more appropriate for the construction industry. Thus a paradigm shift in dealing with the skills crisis is advocated which is illustrated in Table 1.

Conclusions

Current skills research and policy agenda in the UK have been critiqued; arguably, these remain inadequate in addressing the skills problem that affects the UK construction industry. This is because of the dominance of the economic approach in defining skills that is detached from the realities of regional and sectoral differences that might exist. In particular, three pressing areas of priority should be addressed: the ambiguity of the concept of skills; the abdication of the responsibility for skills development by employers; and the lack of involvement of individual employees

Table 1 A critical perspective on resolving the skills crisis

Level	Current state	New paradigm
Industry level	Policies are dominated by top-down approach, immersed with industry-level statistics and research.	There is a need for the bottom-up approach where employees are given more voice in determining skills base and needs.
	Labour market regulation and governance through qualifications framework and quasi-regulatory initiatives (e.g. Investors in People) are detached from the upskilling and lifelong learning agenda.	There needs to be a rethink on current qualifications framework to address the upskilling and lifelong learning agenda. The bottom-up approach should present a possible avenue for this to take place.
	Analysis of the labour market is managed centrally by the Construction Industry Training Board (CITB).	Research should place more emphasis on regional and sectoral variations and move away from industry-level statistics.
Firm level	Employers appear to abdicate responsibility in solving the skills crisis, preferring to transfer responsibility financially through e.g. the CITB training levy, thus allowing top-down policies to perpetuate.	Employers should become reflective practitioners and engage with employees, policy makers and academics in the quest to identify their skills needs at firm and project levels. Mechanisms such as job analyses and appraisals should be adopted.
	There is little research in establishing latent skills shortages at the firm and project levels.	Academic research could be instrumental in facilitating the employers' pursuit in plugging latent skills shortages.
Individual level	Individuals are rarely involved in solving the skills crisis. Where craft skills are concerned, there is no equitable representation of employees in the policy defining process.	Individuals should become reflective practitioners by engaging with researchers to provide a socio-cultural perspective on the labour market.
	There is ambiguity with the definition of skills which are often assessed using the economic approach based on existing qualifications framework.	Research efforts should be more coordinated, possibly through networks that engage with employers, employees and policy makers.

in solving the skills crisis. To eradicate the current disconnection between skills research and policy and skills needs in practice, there needs to be a fundamental shift in research and policy to move away from the dominant, conventionally national approach to examining the skills crisis. There must be genuine, joined-up thinking that addresses the skills problem at the local regions by engaging with relevant stakeholders including employers, employees, training and education providers and the state. The paradigm shift should also consider the needs of those working in the sector. Employees and their employers must conduct themselves as reflective practitioners in the skills development agenda, potentially facilitated by academic researchers and policy makers. Taken together, these recommendations could provide a point of departure for mitigating the skills crisis in the future.

References

Agapiou, A. (1998) A review of recent developments in construction operative training in the UK. *Construction Management and Economics*, **16**, 511–20.

Agapiou, A. (2002) Perceptions of gender roles and attitudes toward work among male and female operatives in the Scottish construction industry. *Construction Management and Economics*, **20**, 697–705.

Agapiou, A., Price, A.D.F. and McCaffer, R. (1995) Planning future construction skills requirements: understanding labour resource issues. *Construction Management and Economics*, **13**(2), 149–61.

Allen, K. (2004) Round and round and round we go. *Building*, 19 March, 54–57.

Ball, M. (2005) *The Labour Needs of Extra Housing Output: Can the Housebuilding Industry Cope?*, UPE Consultancy, London.

Barker, K. (2004) *Delivering Stability: Securing our Future Housing Needs*, HM Treasury, London.

Barrick, A. (2003) Back from the dead. *Building*, 12 December, available at http://www.building.co.uk (accessed 19 February 2006).

Beaney, W.D. (2006) An exploration of sectoral mobility in the UK labour force: a principal components analysis. Unpublished MSc thesis, Newcastle Business School, Northumbria University, UK.

Beckingsdale, T. and Dulaimi, M.F. (1997) The Investors in People standard in UK construction organisations. *CIOB Construction Papers*, 9–13.

Bell, E., Taylor, S. and Thorpe, R. (2002) A step in the right direction? Investors in People and the learning organisation. *British Journal of Management*, **13**, 161–71.

Bloom, N., Conway, N., Mole, K., Möslein, K., Neely, A. and Frost, C. (2004) *Solving the Skills Gap: Summary Report*

from a CIHE/AIM Management Research Forum, Advanced Institute of Management Research (AIM), London.

Boyd, D. and Wild, A. (1993) Educating and training for quality, in Boyd, D. (ed.) *Proceedings of Conference 'What is the Future of Construction?'*, University of Central England, Birmingham, UK.

Braverman, H. (1974) *Labour and Monopoly Capitalism: The Degredation of Work in the Twentieth Century*, Monthly Review Press (MRP), New York.

Briscoe, G., Dainty, A.R.J. and Millett, S.J. (2000) The impact of the tax system on self-employment in the British construction industry. *International Journal of Manpower*, **21**(8), 596–613.

Broughton, T. (2004) The bigger picture: how Eastern European workers will change British construction. *Building*, 11 June, pp. 24–6.

Building and Construction Industry Working Group (2001) *Building Brighter Futures: Present and Future Skill Needs in the Building and Construction Industry*, Department of Education, Training and Youth Affaird (DETYA), Canberra, Australia.

Burleson, R., Haas, C., Tucker, R. and Stanley, R. (1998) Multiskilled labour utilisation strategies. *ASCE Journal of Construction Engineering and Management*, **124**(6), 480–9.

Callender, C. (1997) Will NVQs work? Evidence from the construction industry. Report by the Institute of Manpower Studies (IMS) for the Employment Department Group.

Chan, P. and Cooper, R. (2006) Talent management in construction project organisations: do you know where your experts are? *Construction Information Quarterly*, **8**(1), 12–18.

Chan, P., Cooper, R. and Tzortzopoulos, P. (2005) Organisational learning: conceptual challenges from a project perspective. *Construction Management and Economics*, **23**, 747–56.

Chartered Institute of Building (2004) *Presidential Commission on Construction Education*, Interim report, January, CIOB, Englemere.

Churchill, S. (1997) Modern Apprenticeships: a regional overview. *Education and Training*, **39**(6), 230–6.

CITB (2000) *Managing Profitable Construction: The Skills Profile*, CITB, Bircham Newton.

CITB (2003) *Construction Skills Foresight Report*, CITB, Bircham Newton.

Clarke, L. (1992) The building labour process: problems of skills, training and employment in the British construction industry in the 1980s. Occasional Paper No. 50, CIOB, Englemere.

Clarke, L. (2005) CLR Denmark conference: one year since EU enlargement. *European Institute for Construction Labour Research (CLR) News*, **2**, 53–5.

Clarke, L. and Wall, C. (1996) *Skills and the Construction Process: A Comparative Study of Vocational Training and Quality in Social Housebuilding*, The Policy Press, Bristol.

Clarke, L. and Wall, C. (1998) *A Blueprint for Change: Construction Skills Training in Britain*, The Policy Press, Bristol.

Clarke, L. and Winch, C. (2004) Apprenticeship and applied theoretical knowledge. *Educational Philosophy and Theory*, **36**(5), 509–21.

Commission for Architecture and the Built Environment (2005) *Black and Minority Ethnic Representation in the Built Environment Professions*, CABE/Royal Holloway University of London, London.

Commission of the European Communities (2000) *Commission Staff Working Paper: A Memorandum on Lifelong Learning*, European Commission, Brussels.

Construction Industry Board (1998) *Strategic Review of Construction Skills Training*, Thomas Telford, London.

ConstructionSkills (2004) The more we know, the better we can work. *Building* supplement on *A Constructor's Manual: Best Practice in Construction*, 19 November, p. 26.

Construction Users Roundtable (2004) Confronting the skilled construction workforce shortage. WP-401, CURT White Paper series, CURT, Cincinnati.

Crates, E. (2001) Breaking down the barriers. *Construction News*, No. 6738, 18 October, pp. 26–7.

Construction Skills Certificate Scheme (CSCS) (1999) *Construction Skills Certification Scheme: Scheme Booklet*, 10th Revision, November, CITB, Kings Lynn.

Cully, M., Woodland, S., O'Reilly, A. and Dix, G. (1999) *Britain at Work: As Depicted by the 1998 Workplace Employee Relations Survey*, Routledge, London.

Dainty, A.R.J. and Bagilhole, B.M. (2005) Equality and diversity in construction: guest editorial. *Construction Management and Economics*, **23**, 995–1000.

Dainty, A.R.J. and Edwards, D.J. (2003) The UK building education recruitment crisis: a call for action. *Construction Management and Economics*, **21**, 767–75.

Dainty, A.R.J., Bagilhole, B.M. and Neale, R.H. (2000) A grounded theory of women's career under-achievement in large UK construction companies. *Construction Management and Economics*, **18**, 239–50.

Dainty, A.R.J., Ison, S.G. and Root, D.S. (2004) Bridging the skills gap: a regionally driven strategy for resolving the construction labour market crisis. *Engineering, Construction and Architectural Management*, **11**(4), 275–83.

Dainty, A.R.J., Ison, S.G. and Briscoe, G.H. (2005a) The construction labour market skills crisis: the perspective of small-medium sized firms. *Construction Management and Economics*, **23**, 387–98.

Dainty, A.R.J., Ison, S.G. and Root, D.S. (2005b) Averting the construction skills crisis: a regional approach. *Local Economy*, **20**(1), 79–89.

deGraft-Johnson, A., Manley, S. and Greed, C. (2003) *Why Do Women Leave Architecture?*, RIBA/University of West of England, London/Bristol.

Delargy, M. (2001) At boiling point. *Building*, 26 January, pp. 24–7.

Dench, S., Hurstfield, J., Hill, D. and Akroyd, K. (2006) *Employers' Use of Migrant Labour: Summary Report*, Report undertaken for the Home Office by the Institute of Employment Studies, HMSO, London.

DfEE (Department for Education and Employment) (2000) *An Assessment of Skill Needs in Construction and Related Industries*, Skill Dialogues: Listening to Employers

Research Papers, DfEE and Business Strategies Ltd, London.

Drucker, P.F. (1998) *Peter Drucker: On the Profession of Management*, Stone, N. (ed.), Harvard Business School Press, Boston.

Druker, J. and White, G. (1996) *Managing People in Construction*, Institute of Personnel and Development, London.

DTI (Department of Trade and Industry) (2003) *UK Competitiveness: Moving to the Next Stage*, DTI, London.

Egbu, C.O. (1999) Skills, knowledge and competencies for managing construction refurbishment works. *Construction Management and Economics*, **17**, 29–43.

Ellison, L. (2003) *Raising the Ratio: The Surveying Profession as a Career: A Report for the RICS Raising the Ratio Committee*, RICS, London.

El-Sabaa, S. (2001) The skills and career path of an effective project manager. *International Journal of Project Management*, **19**, 1–7.

Finegold, D. and Soskice, D. (1988) The failure of training in Britain: analysis and prescription. *Oxford Review of Economic Policy*, **4**(3), 21–53.

Ford, G.W. (1992) Integrating technology work organisation and skill formation, in Costa, M. and Easson, M. (eds) *Australian Industry: What Policy?*, Pluto Press Sydney.

Forde, C. and MacKenzie, R. (2004) Cementing skills: training and labour use in UK construction. *Human Resource Management Journal*, **14**(3), 74–88.

Gann, D. and Senker, P. (1998) Construction skills training for the next millennium. *Construction Management and Economics*, **16**, 569–80.

Groák, S. (1994) Is construction an industry? Notes towards a greater analytic emphasis on external linkages. *Construction Management and Economics*, **12**, 287–93.

Grugulis, I. (2003) The contribution of National Vocational Qualifications to the growth of skills in the UK. *British Journal of Industrial Relations*, **41**(3), 457–75.

Grugulis, I. and Bevitt, S. (2002) The impact of Investors in People: a case study of a hospital trust. *Human Resource Management Journal*, **12**(3), 44–60.

Grugulis, I., Vincent, S. and Hebson, G. (2003) The rise of the 'network organisation' and the decline of discretion. *Human Resource Management Journal*, **13**(2), 45–59.

Haas, C.T., Rodriguez, A.M., Glover, R. and Goodrum, P.M. (2001) Implementing a multiskilled workforce. *Construction Management and Economics*, **19**, 633–41.

Harris, M. (1991) Looking for the maths in work, in Harris, M. (ed.) *Schools, Mathematics, and Work*, The Falmer Press, London, pp. 132–44.

Harvey, M. (2001) *Undermining Construction: The Corrosive Effects of False Self-employment*, The Institute of Employment Rights, London.

Hogarth, T. and Wilson, R. (2002) *Skills Matter: A Synthesis of Research on the Extent, Causes and Implications of Skill Deficiencies*, Department for Education and Skills (DfES), Sheffield.

Home Builders Federation (2006) *Modern Methods of Construction (MMC) for the Provision of Housing: Technical Report Covering the Barriers to the Greater Use of MMC and the Mechanisms to Overcome Them*, Barker 33 review recommendations, HBF, London.

Huemer, K. and Östergren, K. (2000) Strategic change and organisational learning in two 'Swedish' construction firms. *Construction Management and Economics*, **18**, 635–42.

Keep, E. and Mayhew, K. (1998) Was Ratner right? Product market and competitive strategies and their links with skills and knowledge. *Employment Policy Institute Economic Report*, **12**(3), 1–14.

Langford, D., Hancock, M.R., Fellows, R. and Gale, A.W. (1995) *Human Resources Management in Construction*, Addison-Wesley, Harlow.

Latham, M. (1994) *Constructing the Team*, HMSO, London.

Loosemore, M., Dainty, A. and Lingard, H. (2003) *Human Resource Management in Construction Projects: Strategic and Operational Approaches*, Spon Press, London.

Mackenzie, S., Kilpatrick, A.R. and Akintoye, A. (2000) UK construction skills shortage response strategies and an analysis of industry perceptions. *Construction Management and Economics*, **18**, 853–62.

Mayhew, K. (2003) The UK skills and productivity gap. Presentation given at the AIM/CIHE Management Research Forum: solving the skills gap, BT Tower, London, 30 October.

Nyhan, B., Cressey, P., Tomassini, M., Kelleher, M. and Poell, R. (2004) European perspectives on the learning organisation. *Journal of European Industrial Training*, **28**(1), 67–92.

ODPM (Office of the Deputy Prime Minister) (2004) *The Egan Review: Skills for Sustainable Communities*, ODPM, London.

Paulsson, K. and Sundin, L. (2000) Learning at work: a combination of experience-based learning and theoretical education. *Behaviour and Information Technology*, **19**(3), 181–8.

Pearce, D. (2003) *The Social and Economic Value of Construction: The Construction Industry's Contribution to Sustainable Development*, nCRISP, London.

Pfeffer, J. (2001) Fighting the war for talent is hazardous to your organisation's health. *Organisational Dynamics*, **29**(4), 248–59.

Pitt, J. (1995) Integration of academic and vocational education, in Chang, W. P. and Tenah, K. A. (eds) *Proceedings of CIB W89 Construction and Building Education and Research Beyond 2000*, University of Florida, USA, 5–7 April.

Prahalad, C.K. and Hamel, G. (1990) The core competence of the corporation. *Harvard Business Review*, May–June, 79–91.

Reilly, M. (2001) *Changing Skills Needs in the Construction Industry*, CRISP, London.

Royal Institute of Chartered Surveyors (2003) *Learning from Other Industries*, RICS, London.

Royal Institute of Chartered Surveyors (2005) *RICS Construction Market Survey: United Kingdom, Second quarter (July)*, RICS, London.

Royal Town Planning Institute (2003) *Royal Town Planning Institute Education Commission*, final report, January, available at www.rtpi.org.uk/resources/publications/education-commission/report (accessed 19 February 2006).

Scarbrough, H. (1998) Path(ological) dependency? Core competencies from an organisational perspective. *British Journal of Management*, **9**, 219–32.

Scott, P. and Cockrill, A. (1997) Multiskilling in small and medium sized engineering firms: evidence from Wales and Germany. *International Journal of Human Resource Management*, **8**(6), 807–24.

Stasz, C. (2001) Assessing skills for work: two perspectives. *Oxford Economic Papers*, **3**, 385–405.

Teece, D., Pisano, G. and Shuen, A. (1997) Dynamic capabilities and strategic management. *Strategic Management Journal*, **18**(7), 509–33.

Thursfield, D. (2001) Employees' perceptions of skill and some implications for training in three UK manufacturing firms. *Human Resource Development International*, **4**(4), 503–19.

Winch, G. (1998) The growth of self-employment in British construction. *Construction Management and Economics*, **16**(5), 531–42.