

MULTISKILLING: A UK CONSTRUCTION AND BUILDING SERVICES PERSPECTIVE

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The overall significance of the construction and building services sector internationally cannot be overemphasized. In the UK, the industry currently accounts for 10% Gross Domestic Product (GDP) and employs 2 million people, which is more than 1 in 14 of the total workforce. However, regardless of its peculiarity there has been a steady decline in the number of trade entrants into the construction and building services sector. Consequently, available 'pool of labour' is inadequately resourced; productivity is low; existing labour force is over stressed; there is an increase in site deaths and long-term labour shortage is envisaged. Today, 'Multiskilling' has been suggested as a strategy for addressing these issues - effectively utilizing existing 'pools of labour'. This paper is aimed at reviewing the concept of Multiskilling as applied in both construction and non-construction sectors as a backdrop for evaluating Multiskilling in the UK construction sector. Inference is drawn from a quantitative survey of Black Country constructors and the forecast implications of Black Country skills crisis are confirmed. A framework for sustaining a generic Multiskilling barrier - inadequate training provision - is conceptualized.

Key words: conceptual framework, construction, building services, multiskilling, skills shortage.

INTRODUCTION

The sustainability of any construction and building services sector is pivotal to the 'wealth and stability' of any nation - be it developed or developing. In the UK, the significance of the construction and building services sector cannot be overemphasized; wherein the sector currently accounts for 10% Gross Domestic Products and employs approximately 2 million people which is more than 1 in 14 of the total workforce (Ejohwomu *et al.*, 2005a; Anumba *et al.*, 2004; CITB, 2003). Since the early (nineties) UK recession - acclaimed cause of a significant loss in construction manpower (Hillibrandt 1995; Harvey and Ashworth, 1993; Morton, 2002), there has been disequilibrium in the supply of, and demand for construction and building services skills. A situation which is currently being exacerbated by evidence of outstanding economic recovery, growth and stability amidst decline in the number of entrant trainees and a record low retention rate (2005; Ejohwomu *et al.*, 2006; Construction News, 2006); the implication of which encompasses: threat to global competitiveness, persistent skills crisis, unemployment and a stressed workforce (Ejohwomu *et al.*, 2006). Although, there is evidence of inconsistencies on some of the forecast implications (Ejohwomu *et al.* 2005b); empirical studies by Dainty *et al.* (2005) and overall perceptions amongst stakeholders and employees are somewhat

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divergent *only* on the severity and *not* the reality of UK's skills crisis. Consequently, this paper is aiming to review the concept of Multiskilling as applied in both construction and non-construction sectors as a backdrop for evaluating Multiskilling in the UK construction sector.

MODELLING REGIONAL CONSTRUCTION AND BUILDING SERVICES PERCULIARITIES

There are some obvious characteristics of the construction and building services sector, which have become synonymous with the sector globally (Morton 2002: 13-14). The employment of craftsmen in the sector is characterized by instability, finite durations of employment services, pool of labour, highly fragmented in nature (Uwakweh and Maloney 1991; Rainbird 1991; Ejohwomu *et al.* 2005). Dainty *et al.* (2004) argued that over the past 20 years attempts to understand the severity of construction skills shortages have tended to rely on information generated by econometric models. Although, the reliability and usability of econometric models have been questioned in relation to the reality of extrapolated data, which is a resultant effect of the evolution of econometric models with time i.e. there is correlation between changes made to an existing model and the set required (Heijke 1994). However, within the UK, the CITB employment model, which is the most widely cited (Dainty *et al.* 2004) might need to rely on a sufficiently holistic employment model if it must accommodate the dynamism of current and future forecasts.

MULTISKILLING: A NEW DEFINITION

It is because existing definition(s) of the word, Multiskilling, completely extends the construction and building services sector; a 'new' and 'universal' definition has been derived using the framework outlined in table 1. Thus, Multiskilling can be defined simply as a labour utilization strategy that is 'motive driven', factor influenced – regardless of any impeding limitations and 'benefit' inclined. By standardizing the definition of Multiskilling this report hopes to sufficiently operationalize the instruments of survey and in part address the limitations of globalization, especially its potential for construction industries in developing countries through technology transfer and international comparisons of construction activities level in different countries (Ofori, 1994; Ruddock, 2002).

Table 1: Conceptual framework for deriving a new definition

Industry	Country	Motivation	Definition	Dominant Factor(s)	Benefits	Limitation
Construction	United States	<ul style="list-style-type: none"> steady demand for improved productivity and the shortage of skilled craft workers. declining number of craft entrants (Burleson <i>et al.</i>, 1998). multiple tiers of field supervision that reduces crew efficiency (Cass, 1992). worker idle time from 20 – 45% (Thomas, 1991). construction delays and remark (Halpin, 1992). delays/managerial costs associated with jurisdictional dispute (Clough and Sears, 1994). Single skill being a restrictive factor in the implementation of new technology (Livesay, 1996). 	It's a labour utilization strategy where workers possess a range of skills appropriate for more than one work process and are used flexibly on a project or within an organisation; a multi-skilled construction trade worker is an individual who possesses or acquires a range of skills and knowledge and applies them to work tasks that may fall outside the traditional boundaries of his or her original trade.	Culture and characteristics of the sector.	5-10% labour cost saving; a 35% reduction in required forces; a 47% increase in average employment duration; increased earnings potential for multiskilled labourer (Burleson, 1998).	Paradigm shift required all through the industry; Ability to standardize and sustain training provision.
Japanese firms	Japan	<ul style="list-style-type: none"> Technical change: a major component of patient focused care Provides clients less fragmented and more efficient services and minimizes the impact of the unavailability of professionals (Lathrop, 1991). 	A singly skilled worker – Multiskilling is achieved and maintained by explicit partners of job rotation with a work group on the shop floor (Carmichael and Macleod, 1993).	Culture and technological innovation (Carmichael and Macleod, 1993 1993).	Solves the inactive problem and induces workers support labour-saving technical progress (Carmichael, and Macleod, 1993).	Multiskilling is not the whole storey.
Health care	Canada	<ul style="list-style-type: none"> Potential to impact positively on the quality of service received by clients 	An approach to care / a concept in which staff are crossed trained but not professionally abducted into two or more tasks associated with at least two disciplines – this can be intra or interdisciplinary multiskilled (Makeley, 1998).	<ul style="list-style-type: none"> - role of the specialist and generalist - range of service providers that are needed to meet client needs - quality of service; competence in theoretical knowledge as well as task performance - impact of interactions on client satisfaction (CASW, 1998) 	Cost effective, partial solution to recruitment problems; Supports flexible use of staff to increase job satisfaction and job security (CASW, 1998)	May compromise the complexity of the people and environments in which they function and does not preserve and foster the unique contribution of all professions (CASW, 1998)

MULTISKILLING: LITERATURE REVIEW

Drawing on the ‘new’ definition, for the term Multiskilling, this report believes the concept of Multiskilling, as enshrined in the construction and building services paradigm, can be traced to the design and development of the World’s early mega-structures - the Egyptian Pyramids and Great Walls of China. But because most of the workings of these era (18th and 19th centuries) were less systematic, there are little or no evidences to empirically or otherwise substantiate this reports’ confidence that the concept of Multiskilling was conceived during ancient or early construction and building service activities. However in the US construction sector, where it is widely recognised that labour productivity, craft skill acquisition and the declining number of craft entrant have become critical, the Multiskilling concept and strategy is being recommended for its benefits – yielding a 5-20% labour cost savings, a 35% reduction in required workforce, a 47% increase in average employment duration, and an increase in earning potential for the multiskilled construction worker (Burlison *et al.*, 1998). Although the findings of Burlison *et al.* (1998) which is the only known study to have evaluated the potential project impact of Multiskilling in construction in USA - a developed country. Haas *et al.* (1999) synthesized and formalized the methods that successful construction companies currently apply in implementing a multiskilled workforce. Dada and Ekpe (2006) in an empirical study of the place of Multiskilling in the Nigerian construction sector – a developing country indicated amongst others that while Multiskilling reduces workers’ idle time and enhances employability of workers, it discourages specialisation – a claim which Carmichael and Macleod (1993) refute. Today, the barrier to Multiskilling includes lack of training, meeting license requirements and resistance to change (Dada and Ekpe, 2006); though Carmichael and Macleod (1993) have argued that Multiskilling is a key strategy for fostering change in Japanese firms. Overall, the merits of the concepts of Multiskilling is believed to be ‘multidimensional’; and, a redress for the demerits of implementing change, skills shortage, declining productivity, and un-employment stability (Burlison *et al.*, 1998; Cass, 1992; Thomas, 1991; Halpin, 1992; Carmichael and Macleod, 1993; Clough and Sears, 1994; Lathrop, 1991 and Livesay, 1996).

METHODOLOGY

The research aim necessitated surveying the views of a representative sample of agencies and companies selected from the construction and building services sector. This sample was drawn initially by a specially convened Project Steering Group, encompassing representatives from a wide range of agencies and companies across the sector, with additions being made on an iterative basis as opportunities and new contacts arose. The Survey Tool was piloted via face-to-face interviews to ensure better understanding and full detailed responses. Though not representative of all construction related agencies / companies in the Black Country, the focused nature of those interviewed – as well as the manner in which this was done – ensures that the findings reported here provide an in-depth and highly indicative picture of the views held across the Black Country. In particular, respondents were encouraged to elaborate upon their responses whenever possible, this being reflected in a number of direct quotations.

The piloting of the survey tool in this way also provided the basis for ensuring its veracity and robustness in relation to future iterations, which adopt a larger-scale postal/telephone approach (more appropriate for the more structured element of the

survey). The questions encompassed the range of issues pertinent to the research, incorporating a number of specific sections relating to the conduct of training needs assessment and resources spent on training and development; ease / difficulty of recruiting multiskilled workers; relevance of multiskill to future trades, level of qualification required and how important it would be to provide additional training provision for both new and traditional trades. The questionnaire adopted a semi-structured approach, incorporating traditional ‘tick box’ questions with those which allowed more open and in-depth responses. In the case of the structured questions, in a number of cases a Likert system of grading responses was used (i.e., ‘this is a good thing’ to ‘this is a bad thing’) in order to provide greater depth to the subsequent interpretation. All interviews were conducted face-to-face with an average duration of approximately 40 minutes. The completed questionnaires were coded and analysed using the Statistical Package for the Social Sciences (SPSS). Narrative based responses were incorporated into a separate word document for the purpose of analysis.

SUMMARY OF RESEARCH FINDING AND DISCUSSION

Using the methods identified above the representatives of a total of 43 companies were interviewed, these being selected upon their ability to provide the required level of detail in respect to the questions asked (most commonly they were the individuals who were charged with dealing with personnel issues within their company). The 43 respondents represented a broad spread of businesses across the four boroughs in terms of both size and activities. Figure 1 detail’s the structural variability and similarity of national, regional and sub regional - Black Country¹. - businesses structures by size.

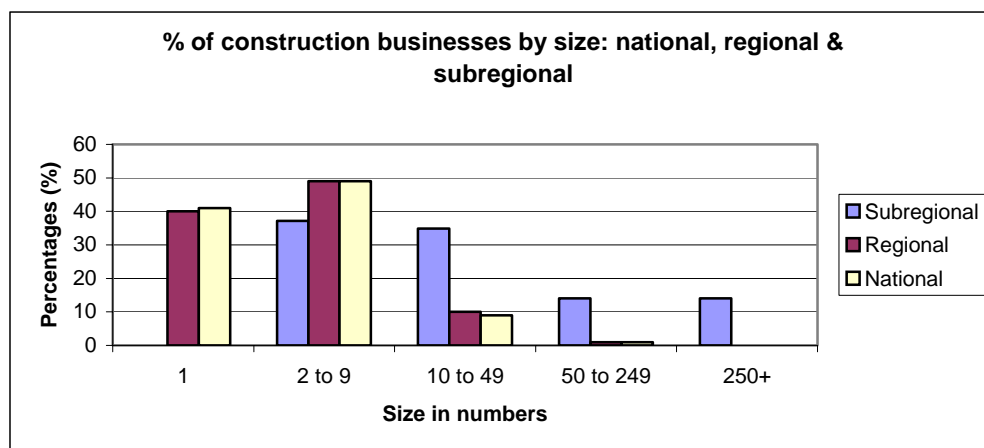


Figure 1: Compares national, regional and sub regional structure of construction businesses by size

Although, some of the variability evident in figure 1 can be attributed to the different sources, methods and information gathering framework used; this report believes most of the data variability are as a result of the peculiarities of the Black Country sub region. However, by accepting the realities and forecast implications of the

¹ A sub region in the Victorian era which played host to over 20,000 companies and because of the smoke that used to bellow from these manufacturing factories it was termed the Black Country.

phenomenon of UK's skill crisis this report tries to evaluate the 'status' of the barrier – lack of training – and the sustainability of Multiskilling as a likely redress for unemployment, low productivity and disequilibrium in the supply and demand for construction and building services skills in the Black Country sub region. The instruments of survey along side variable identification and overall construct validity encompassed the challenges affecting Black Country businesses, characteristics of its' workforce, training and recruitment, and future considerations.

Majority of the skilled workforce in the Black Country are aged over 50 years. 77% are skilled while only 11% of those aged between 26 – 35 years are skilled. Inferring that the Black Country construction sector might need to rely on either or both, the concept of Multiskilling or 'informal' labour market, if the sub region is to satisfy current and future demands. On the issue of meeting future business challenges, respondents have ranked the following in descending order to be what they thought was needed in order to meet future business challenges:

- all types construction skills (multi-skilling);
- contract management;
- craft skills – need for more training – support for industry as a whole;
- electrical skills; building construction;
- every sort of tradesman, electricians, bricklayers and plasterers in particular;
- identifying where staffing can be resourced from;
- management courses.

The perception of importance of training in the Black Country construction and building services trades suggests that different skill sets require different training period. Also, this may be dependent on the level of skill possessed by the trainee. A perception of importance of training in construction and building services trades will likely influence the quality and quantity of Black Country training provision. Table 2 below is an aggregate representation – mean ranking – of survey responses across all businesses. Overall, respondents have indicated that it is important to provide additional training for most of the trades listed in table 2. However, it is more important to provide training for:

- carpet, floor and tile finishes
- cladding system works
- prefabrication and building components

A logical explanation for the absence of Multiskilling from the list of trades requiring more training could be that, because Black Country business are yet to fully adopt the concept of Multiskilling they are unable to sufficiently equate its' benefits to importance of providing additional training.

Table 2: Future consideration – importance of providing additional training output from a Friedman Test. On a likert scale 1 = very little importance while 5 = extremely important.

How important is this trade(s) to provide additional training?	Mean Rank
1) multi-skilling	8.67
2) brickmason, blockmason, and stonemason	10.17
3) brickmasons, concrete finishers, segmental pavers, & terrazzo skilled wks	8.50
4) ground engineering works	7.28
5) Carpet, floor, & tile finishes	6.39
6) construction and equipment operators	7.28
7) wood works, joinery, & carpentry	10.17
8) painting and decorating	7.72
9) structural and reinforcing iron metal	7.72
10) curtain walling	7.72
11) modular building works	7.72
12) cladding system works	6.89
13) prefabrication of building components	6.89
14) heating and ventilation	8.44
15) mechanical services and plumbing	8.44

In relation to the difficulty and ease of acquiring specific skills for the purpose of developing their businesses. The overall perception of respondents was that it was generally ‘okay’ for them to acquire skills for the purpose of developing their businesses over the course of the next five years. Although, the overall consensus of respondents in table 3 was that Multiskilling is second in the mean ranking of the most difficult skill to acquire. Refer to table 3 for details of mean ranking on how easy it is to recruit sufficiently skilled workers.

Table 3: Trade recruitment ease output from a Friedman Test. On a likert scale 1 = very difficult while 5 = extremely easy

Please indicate how easy it is to recruit sufficiently skilled workers in the following trades.	Mean Rank
1) Ease of recruiting sufficiently skilled worker in multiskilling	4.50
2) ease of recruiting sufficiently skilled worker in brick, block and stone masons	4.33
3) Ease of recruiting sufficiently skilled worker in cement masons, concrete finishes etc	4.83
4) Ease of recruiting sufficiently skilled worker in ground engineering works	7.17
5) Ease of recruiting sufficiently skilled worker in carpet, floor, & tile installers and finishers	11.17
6) Ease of recruiting sufficiently skilled worker in construction & equip. operator	9.50
7) Ease of recruiting sufficiently skilled worker in wood works, joinery & carpentry	8.83
8) Ease of recruiting sufficiently skilled worker in painting & decorating	11.17
9) Ease of recruiting sufficiently skilled worker in structural & reinforcing iron metal	9.50
10) Ease of recruiting sufficiently skilled worker in curtain walling	7.50
11) Ease of recruiting sufficiently skilled worker in modular building works	7.50
12) Ease of recruiting sufficiently skilled worker in cladding system works	7.50
13) Ease of recruiting sufficiently skilled worker in prefab. & building component wks	7.50
14) Ease of recruiting sufficiently skilled worker in heating & ventilation	9.50
15) Ease of recruiting sufficiently skilled worker in mechanical services & plumbing	9.50

MULTISKILLING: A NEW FRAME WORK

The model presented in figure 2 is a new Partnership in Training (PT) Framework, which has been conceived in line with the newly derived definition on the concept of Multiskilling. The model is offering a 2-year qualification in Multiskilling along side a 3-tier specialization route that in Work Based Learning. The model is also creating a platform which will bridge existing divide between the supply and demand sides of the Black Country sector. Overall, this PT model should be received as a skills

acquisition strategy developed towards sustainability of a multiskilled workforce which is in turn a potential redress for skills crisis.

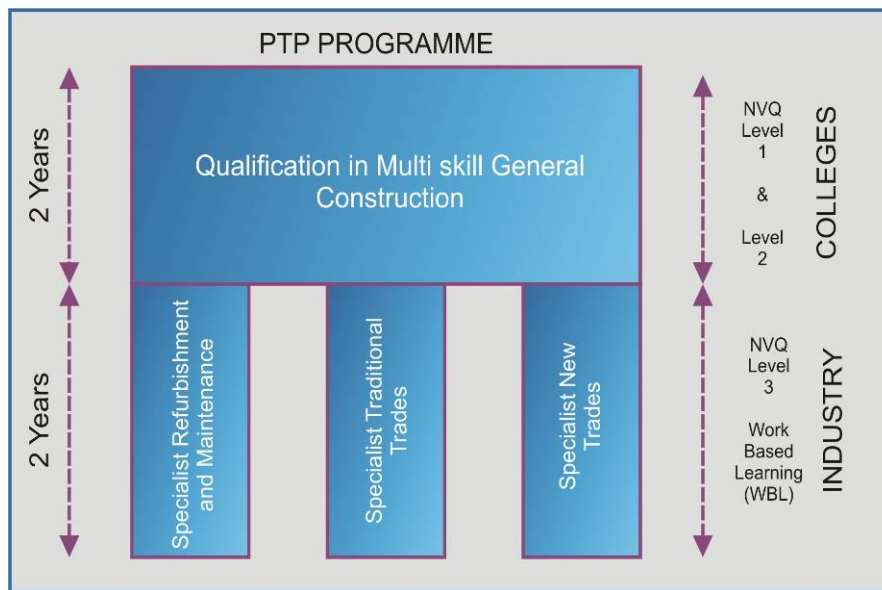


Figure 2: A PT Model

CONCLUSION

Drawing from a broader application of the concept of Multiskilling; a new definition is derived - a labour utilization strategy that is 'motive driven', factor influenced and 'benefit' inclined. This 'new' definition was a backdrop for identifying and operationalizing the laboratory's (Black Country) instruments of survey. Consequently, some of the forecast implications of UK's skills crisis were empirically confirmed and Multiskilling is being prescribed as a partial redress along side a conceptual model - Partnership in Training (PT), which tends to bridge existing divide between the supply and demand sides of construction and building services sector. Overall, this report is accepting Multiskilling as a realistic redress for skills shortage, the implication of which is a paradigm shift in the underlining structure of the construction sector. Although, some of the emerging benefits of a multiskilled workforce includes: 5-20% labour cost savings, a 35% reduction in required workforce, a 47% increase in average employment duration, and an increase in earning potential for the multiskilled construction worker; drawing on the method proposed by Haas *et al.* (1999) for the successful implementing of a multiskilled workforce. It would be impractical to fully adopt Multiskilling in the UK's construction sector given its' present structure which is micro-enterprise dominant – 93.58% of UK's construction enterprises are micro (NSO, 2005; Thomas and Sommerville, 2005). Although, additional research is warranted in this area, it is pertinent to note that because the concept of Multiskilling is still 'emerging' in relation to the composition of UK's construction sector. The realization of a realistic 'lead time' for the developed PT model – 2 years qualification in Multiskill general construction and 2 years specialist training – was largely dependent on empirical evidences gathered on UK's existing skills and training framework.

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