

A REVIEW OF MASLOW, HERZBERG AND VROOM IN THE CONSTRUCTION INDUSTRY OVER THE LAST 25 YEARS

Elena Navarro¹

School of Construction Management and Engineering (ETSGE), Universidad Politécnica de Valencia, Camino de Vera s/n, 46022 Valencia, Spain

Motivation has been one of the most widely discussed concepts in general management. Although researchers in construction management have not been as enthusiastic about the subject, considerable efforts have been made to apply the concept both to construction operatives and professionals. This literature review aims to establish the relevance of motivation theories to the construction industry, and to research attempts to apply these theories both to blue and white collar construction workers. The paper details various past trends, predicts some future trends, and suggests certain areas in which future research on motivation in the construction industry should focus. Regarding the findings, coding has been done according to publication outlet, authors, nature of study, country of publication, target population, methodology and nature of study. Studies focused on the operative are more numerous, start earlier in time and cover more countries than the ones centred on the construction professional. Maslow (1943), Herzberg *et al.* (1959) and Vroom's (1964) motivation theories have been mostly used and are still in use, while positivism and quantitative techniques have predominated over qualitative approaches.

Keywords: job satisfaction, motivation, operative, professional

INTRODUCTION

The topic of work motivation plays an important role in the management field and, indeed, has received much attention over the past several decades in both research journals and management periodicals (Steers *et al.* 2004). As it happens with other human resource issues, motivation is seriously under-researched by the construction research community and there is little evidence of cross-disciplinary learning from other relevant fields such as Human Resource Management (HRM), Industrial and Organisational (I/O) Psychology and Organisational Behaviour (OB).

Researchers in construction management have not been very enthusiastic about work motivation, but some efforts have been made to apply the concept both to construction operatives and professionals. In order to increase our knowledge and further deepen into the subject, it seems relevant to review the work that has been done and consider the state-of-the art in this area. Therefore, the research presented in this paper will address the following objectives: to review the empirical work published on work motivation in the construction industry and to highlight a number of issues that may deserve more attention in future research.

¹ enavarro@omp.upv.es

The term motivation is not always used clearly. For example, in the literature of OB, I/O psychology and even that of construction management it may refer to either job satisfaction or to the motivation to perform. Both concepts are clearly linked and interchangeably used in practice, although there is a subtle difference between them (Bowen *et al.* 2008, Locke and Latham 2004).

Etymologically, the term motivation comes from the Latin word "motivus", "motive" in English. Vroom (1964: 6) suggests that it is "a process governing choice made by persons... among alternative forms of voluntary activity", while Pinder (1998) defines motivation as a set of energetic forces that originate both within as well as beyond an individual's being, to initiate work-related behaviour and to determine its form, direction, intensity, and duration. Most definitions are mainly concerned with factors or events that energise, channel, and sustain human behaviour over time. Secondly, job satisfaction describes or measures the extent of a person's contentment in his/her job (Bowen *et al.* 2008). It measures "what is" - the degree of job satisfaction, while motivation measures "why" - the explanation for the degree of job satisfaction. It is clear then that satisfaction versus choice, effort and persistence, do not necessarily have the same causes or effects, and may not affect one another.

The importance of motivation in the workplace is captured in the equation: Job performance = ability x motivation. This equation succinctly explains why the subject of motivation is a cornerstone in the fields of HRM, (I/O) Psychology and (OB).

Theories for predicting, explaining, and influencing a person's job motivation are numerous and they have been classified in different ways. The most common classification differentiates between content and process theories. Content theories aim to identify factors associated with motivation in a relatively static environment and focus on "what" motivates the individual, whereas process theories view job motivation from a dynamic perspective and look for causal relationships focusing on "how" motivation occurs (Ruthankoon and Ogunlana, 2003).

A comprehensive review of motivation theories is beyond the scope of this paper and is available elsewhere (Latham 2007). However, due to the impact and influence they have had in construction management research, Maslow's needs theory (1943), Herzberg's two-factor theory (Herzberg *et al.* 1959) and Vroom's (1964) expectancy theory should be highlighted. Maslow suggested that, as individuals develop, they work their way up a hierarchy based on the fulfilment of a series of prioritised needs, including physiological, safety and security needs, belongingness, esteem and self-actualisation. He argued that the first three needs on the list represent deficiency needs that people must master before they can develop a healthy personality, while the last two represent growth needs that relate to individual achievement and to the development of human potential (Steers *et al.* 2004). Maslow's as well as Herzberg's are clear examples of content theories.

Herzberg *et al.* (1959) concluded that while one cannot motivate others per se, it is possible to enrich a work environment so that it allows self-motivation. As Latham (2007) pointed out, his most controversial conclusion was that job satisfaction and job dissatisfaction, are two continua rather than being a continuum. That is, the opposite of job satisfaction is not job dissatisfaction but no job satisfaction. Herzberg argued that to enrich a job attention should be given to job content, recognition, responsibility, achievement, and opportunities for advancement. Contextual or hygienic factors such as working conditions, company policy, supervision, and salaries should only be considered as ways of minimising job dissatisfaction.

Vroom (1964) developed a cognitive theory based on personal expectancies, valences, choices and instrumentalities, and presented the first systematic formulation of expectancy theory as it related to the workplace. His theory is an example of process theory. He argued that employees tend to rationally evaluate various on-the-job work behaviours, choosing those they believe will lead to their most valued work-related rewards and outcomes. Thus, the attractiveness of a particular task and the energy invested in it will mainly depend on whether the employee believes his/her accomplishments will lead to valued outcomes (Steers *et al.* 2004, Latham 2007).

METHOD

To review empirical studies on motivation in the construction literature, a search was carried out in various online databases (Science Citation Index, Social Science Citation Index, Scopus) and in various international journal catalogues in the fields of construction, engineering and project management. Combinations of several keywords were tried to search for publications on motivation in the construction industry such as: work motivation, job attitudes, construction workers, construction professionals, construction industry, job satisfaction. Databases were also searched with the names of authors who have carried out extensive work in this area, i.e., Maloney and McFillen. This search resulted in a broad selection of a large number of works that included empirical, theoretical and conceptual papers, unpublished dissertations, books, book reviews and magazine articles.

In order to separate empirical studies from the larger pool the following selection criteria was established: the research paper is written in English language, the study is empirical in nature, it principally focuses on the subject of work motivation or job satisfaction and it employs Vroom's, Maslow's or Herzberg's motivation theories as the framework for research. Finally, the study covers papers published over the past 25 years, that is from 1984 until now. It was also decided to select refereed articles from journals and conferences, as these articles have gone through the peer review process and therefore achieved an acceptable quality. Two unpublished dissertations have also been selected. This method of selecting articles has also been employed by authors who have presented literature reviews (Dabke *et al.* 2008, Toor and Ofori 2008) and meta-analysis in management research.

A total of 34 works were found addressing the subject and fulfilling the required criteria. Among these, there were 25 journal articles, 1 unpublished PhD dissertation, 1 unpublished master thesis and 7 conference papers. Table 1 presents a summary of these empirical studies.

MAIN FINDINGS

It was found that empirical testing in work motivation in the construction industry dates back to the 70s, although the current decade has witnessed an increase in focus on job satisfaction. Whereas the focus in the 1970s and 1980 was on the motivation of operatives and construction workers, research in the 1990s and in the present decade has also explored the motivation of construction managers and white collar professionals.

From Table 1 we can also conclude that most empirical studies have been published in the Journal of Construction Engineering and Management followed by Construction Management and Economics. Other journals such as Building and Environment, Building Technology and Management and Engineering, Construction and Architectural Management, together with the ARCOM and CIB conferences

proceedings have also played an important role. Most studies have been carried out in the USA and UK, followed by Thailand, Australia, South Africa, Nigeria, Canada and Iran.

It was also found that almost all of the studies are quantitative in nature, and use survey questionnaires to collect information. It is also evident that the studies included in this review are cross-sectional in nature, leading to a bias in static analysis.

As regards the frameworks which researchers have employed, almost half of them have chosen Vroom's (1964) expectancy theory, which was used first by Maloney and McFillen in the mid-1980s, when trying to discover ways to improve performance and productivity. The rest of the studies have chosen either Maslow's, Herzberg's or both theories at the same time. Their aim has been to identify motivating and demotivating factors and to establish their ranking in order to make international comparisons (Ogunlana and Chang 1998, Kaming *et al.* 1998, Olomolaiye and Ogunlana 1988, Olomolaiye and Price 1988, Asad and Dainty, 2005). Others have tried to test the original theory (Ruthankoon 2005, Ruthankoon and Ogunlana 2003, Chan 1993) while some have tried to discover the influence of certain variables such as age (Chileshe and Haupt 2007, Chan 1993, Torrance and Cathcart 1986), gender (Bowen *et al.* 2008, Gilbert and Walker 2001) or education (Torrance and Cathcart 1986).

Table 1 also shows that studies included in this review consider a wide range of workers: white collar workers such as site managers, project managers, site engineers, quantity surveyors, service and line managers, and blue collar workers. In the latter, the most thoroughly researched, we can include bricklayers, carpenters, steel fixers, millwrights, roofers, apprentices, etc. One study was also conducted on women in construction trades (Dabke *et al.* 2008).

Table 1: Studies on motivation and job satisfaction based on Maslow, Herzberg and Vroom.

Author/s and year of publication	Country of study	Nature of study	Framework	Respondents	Research methods	Publication outlet
Bowen <i>et al.</i> 2008	South Africa	Satisfaction levels and factors, influence of race and gender	Maslow	146 registered quantity surveyors	Quantitative: web-based online questionnaire survey	Constr Manag and Econ
Dabke <i>et al.</i> 2008	USA	Job satisfaction of women	Vroom	38 women in construction trades	Quantitative: postal questionnaire	J Constr Eng M
Aiyetan and Olotuah 2006	Nigeria	Motivation and performance relationship	Maslow, Herzberg, McGregor	74 management staff and operatives	Quantitative: questionnaire	Proceed. of ARCOM
Uwakweh 2006	USA	Motivation, satisfaction and performance	Vroom	201 construction apprentices	Quantitative: postal questionnaire	J Constr Eng M

Asad & Dainty 2005	UK	Comparison of motives for 3 occupational groups	Maslow	87 employees from 32 companies	Quantitative: structured questionnaire	Journal of Constr Research
Uwakweh 2005	USA	Influence of foremen on apprentices' motivation, performance and satisfac.	Vroom	201 construction apprentices	Quantitative: postal questionnaire	J Constr Eng M
Hewage & Ruwanpura 2005	Canada	Motivational factors for workers	Vroom	More than 50 workers from 2 companies	Quantitative: observation, interviews and questionnaire	Proceed. of CSCE
Ruthankoon 2005	Thailand	Testing of Herzberg's Theory	Herzberg	344 professionals from 42 sites	Quantitative	PhD Dissertation
Zhou 2004	Canada	Motivat. and performance relationship job satisfac./ outcomes relationship	Vroom	57 construction management professionals from 2 companies	Sequential triangulation: industrial survey, in-depth interview	Master thesis
Ruthankoon and Ogunlana 2003	Thailand	Testing of Herzberg's Theory	Herzberg	64 engineers and 61 foremen from 29 sites	Quantitative and qualitative: critical incident	Eng, Constr and Archit Manag
Uwakweh 2003	Syria	Motivational score of craft workers	Vroom	73 workers from one firm	Quantitative: questionnaire survey	Proceed. of CIB
Gilbert and Walker 2001	Australia	Relationship between motivation and gender	Vroom	58 white collar professionals	Quantitative: postal questionnaire	Eng, Constr and Archit Manag
Smithers and Walker 2000	Australia	Influence of workplace environment on motivat.	Vroom	58 white collar professionals	Quantitative: postal questionnaire	Constr Manag and Econ
Yisa <i>et al.</i> 2000	Iran	Motivating and demotivating factors	Maslow, Herzberg	57 site managers	Quantitative: postal questionnaire	Proceed. of ARCOM
Shoura and Singh 1999	USA	Needs' fulfilment and motivational levels	Maslow	39 construction engineers of 1 company	Quantitative: postal questionnaire and qualitative field surveys	Journal of Manag in Engineer.
Kaming <i>et al.</i> 1998	Indonesia	Motivating and demotivating	Maslow, Herzberg, Vroom	243 operatives on 27 high-	Quantitative: structured questionnaire	Building Environ

		factors		rise projects	interviews	
Ogunlana and Chang 1998	Thailand	Needs, motivators and demotivators	Maslow, Herzberg	61 construction workers from 7 sites	Quantitative: questionnaire survey	Eng, Constr and Archit Manag
Zakeri <i>et al.</i> 1997	Iran	Motivators	Maslow, Herzberg	335 operatives from 31 sites	Quantitative: structured questionnaire	Building Environ
Chan 1993	Australia	Influence of age, experience, project size, and salary Testing of theories.	Maslow, Herzberg, McClelland	23 project managers	Quantitative: postal questionnaire	Proceed. of CIB
Barrett 1993	UK	Wants, gets and needs	Maslow	683 professionals	Quantitative: postal questionnaire	Proceed. of CIB
Young 1991	UK	Drives for changing jobs	Maslow, Herzberg	73 managers from 3 contractors	Quantitative: interviews and questionnaires	Leadership and Org Devel Jour
Olomolaiye 1990	UK	Motiv. and productivity relationship	Vroom	157 bricklayers from 12 sites	Quantitative: act. sampling observations, survey	Constr Manag and Econ
Olomolaiye and Price 1989	UK	Motivators and demotivators	Maslow, Herzberg	97 operatives from 12 sites	Quantitative: questionnaire survey	Building Research and Practice
McFillen & Maloney 1988	USA	Motivational climate	Vroom	703 unionised workers	Quantitative: questionnaire survey	Constr Manag and Econ
Olomolaiye & Ogunlana 1988	Nigeria	Needs, motivators, demotivators	Maslow, Herzberg	83 operatives from 7 sites	Quantitative: questionnaire survey	Building Environ
Olomolaiye and Price 1988	UK	Satisfiers and dissatisfiers	Herzberg	97 operatives from 12 sites	Qualitative: survey	Building Technology and Manag
Nicholls & Langford 1987	UK	Testing of Herzberg's theory	Herzberg	32 site engineers	Quantitative: survey	Chartered Institute of Building
Maloney & McFillen 1987	USA	Influence of foremen on performance	Vroom	703 unionised workers	Quantitative: questionnaire survey	J Constr Eng M
Torrance & Cathcart 1986	UK	Ranking of motivating factors, influence of age and education	Maslow	40 service managers and 23 line managers employed by a contractor	Quantitative: questionnaire survey	Building Technology and Manag
Maloney & McFillen	USA	Valence, satisfaction,	Vroom	703 unionised	Quantitative: postal	J Constr Eng M

1986a, 1986b, 1985		motivational climate, motivating potential		workers	questionnaire	
Mackenzie and Harris 1984	UK	Incentive expectations	Maslow, Herzberg	Managers from 30 firms	Quantitative: structured interviews	Building Technology and Manag

FUTURE TRENDS

Although predicting future trends or suggesting areas on which research should focus is not an easy task, some insights and ideas can be taken from looking elsewhere, that is, to the wider context of HRM, OB and I/O psychology research. Our literature review has shown that works on motivation in the construction industry have used very few constructs from a wide range of possibilities. For example, no empirical studies have been carried out on goal-setting, social cognitive or organisational justice theories, although they had ground-breaking impact when initially promulgated. According to Latham and Pinder (2005) these last three theories now dominate the motivation literature and have overwhelmed behaviourism and expectancy theory. Future research could be carried out following these frameworks which seem to be common in other fields. Construction management researchers should also move from an overemphasis on employee cognition and behaviour to emotions. In fact, research on affect is blossoming and disciplines of HRM, OB and I/O psychology are currently undergoing an "affective revolution"(Latham 2007, Latham and Pinder 2005). According to this trend, the effects of mood and emotion on a person's performance and behaviour could also be explored in the field of construction.

A further related line of enquiry is to undertake studies focusing on a different level of analysis. Most of the studies reviewed in this paper have focused on motivation of individuals. However, during the last decades there has been a shift in organisations toward more group-based work. This change has been reflected in work motivation research by an increased attention in group settings (Ambrose and Kulik 1999). This tendency should also appear in the construction industry, where diverse groups of employees operate as an itinerant labour force working in teams in order to reach short-term project objectives in various settings. There are processes affecting teams, such as the specific ways in which members motivate and demotivate one another, that do not emerge when focusing on the individual motivation. Hence, Latham (2007:256) and Locke and Latham (2004:392) recommend the study of motivation on team effectiveness.

Considering the fact that by 2010 nearly half the workforce of most developed countries might be aged 45 or over, Kanfer and Ackerman (2004) have remarked the need of understanding the effects of aging and adult development on work motivation. The scarce research in this area represents a gap which could also be explored by the construction management research community.

Regarding the methodology used, we have seen that positivism and quantitative techniques have predominated over qualitative approaches and that survey questionnaires have been used the most to collect information. In this respect, the use of introspection as a method for studying and understanding motivation is recommended. Locke and Latham (2004:398) even suggest that "developing structured interviews might yield more accurate data than using questionnaires" because the researcher could check with the participants how they interpret the

questions and help them to introspect and, therefore, increase the answer's accuracy. It is also evident that the studies included are cross-sectional in nature without reference to time. Time-related referents have been rarely used in research published in OB literature (Latham 2007) despite the fact that almost everything managers and workers do is framed in terms of time: going to workplace, meeting deadlines, developing stress, etc. One suggestion to solve this problem is the use of "unobtrusive methods for collecting time-series data (e.g. use of diaries, videos, internet surveys)" (Latham 2007:254). On the other hand, motivation, being temporal in nature, could be examined through longitudinal studies. Further research could explore how the economic recession that most developed countries are undergoing nowadays affects motivation in the construction industry.

CONCLUSIONS

A motivated workforce is frequently pointed out as a sign of competitive advantage. Its importance in construction projects is undoubtedly relevant since, despite recent advances in technology and production management techniques, the construction industry remains one of the most people-reliant industrial sectors.

A review of motivation research in social sciences, management studies and construction management reveals a number of issues that need to be addressed in the construction industry. There is scope for the development and adoption of different research frameworks, new approaches and methods for understanding work motivation in construction. In this regard, research can benefit from the advances that have been made in HRM, OB and I/O psychology such as considering teams, time, life-span research and emotions.

The review presented in this paper only takes into account empirical research conducted on motivation and job satisfaction according to a restricted theoretical framework and time period. Although there exist some important and influential works in the area, which are descriptive in nature, employ different frameworks or were written before 1984, this review does not consider them due to the limited scope of this paper. But a similar review might be used for a comprehensive literature analysis, which would help to mark what has been done and what needs to be done in the future.

REFERENCES

- Aiyetan, AO and Olotuah, AO (2006) Impact of motivation on workers' productivity in the Nigerian construction Industry. In: Boyd, D. (Ed) *22nd Annual ARCOM Conference*, 4-6 September 2006, Birmingham. ARCOM, 239-48.
- Ambrose, ML and Kulik CT (1999) Old friends, new faces: motivation research in the 1990s. *Journal of Management*, **25**(3) 231-92.
- Asad, S and Dainty, A R J (2005) Job Motivational Factors for disparate occupational groups within the UK Construction Sector: a comparative analysis. *Journal of Construction Research*, **6**(2) 223-36.
- Barrett, P (1993) Motivational profiles for construction professionals. In: *CIB W65, Symposium 93*, 15- 22 September 1993, University of West Indies. Vol. 2, 641-49.
- Bowen, P, Cattell, K, Distiller, G and Edwards, P (2008) Job satisfaction of South African quantity surveyors: an empirical study. *Construction Management and Economics*, **26**(7) 765-80.

- Chan, APC (1993) Motivation of the project manager. In: *CIB W65, Symposium 93*, 15- 22 September 1993, University of West Indies. Vol. 2, 931-42.
- Chileshe, N and Haupt, TC (2007) Age influences on the job satisfaction of construction workers: evidence from South Africa. In: Boyd, D. (Ed) *23rd Annual ARCOM Conference*, 3-5 September 2007, Belfast, UK, ARCOM, 389-90.
- Dabke, S, Salem, O, Genaidy, A and Daraiseh, N (2008) Job satisfaction of women in construction trades. *Journal of Construction Engineering and Management*, **134**(3) 205-16.
- Gilbert, GL and Walker, DHT (2001) Motivation of Australian white-collar construction employees: a gender issue? *Engineering, Construction and Architectural Management*, **8**(1) 59-66.
- Herzberg, F, Mausner, B and Snyderman, B (1959) *The motivation to work*. John Wiley.
- Hewage, KN and Ruwanpura, JY (2005) Most important worker motivational factors that impact the productivity of Alberta Construction Projects. In: *CSCCE 6th Construction Specialty Conference*, Toronto, June 2005.
- Kaming, P, Olomolaiye, P, Holt, G and Harris, F (1998) What Motivates Construction Craftsmen in Developing Countries? A Case Study of Indonesia, *Building and Environment*, **33**(2-3) 131-41.
- Kanfer, R and Ackerman, PL (2004) Aging, adult development and work motivation, *Academy of Management Review*, **20**(3) 440-58.
- Latham, GP (2007) *Work Motivation: History, Theory, Research, and Practice*. Thousand Oaks, California, Sage Publications.
- Latham, GP and Pinder CC (2005) Work motivation theory and research at the dawn of the twenty-first century, *Annual Review of Psychology*, **56**, 485-516.
- Locke, EA and Latham, GP (2004) What should we do about motivation theory? Six recommendations for the 21st century. *Academy of Management Review*, **29**(3) 388-403.
- Loosemore, M, Dainty, A R J and Lingard, H (2003) *Human Resource Management in Construction Projects*. London: Spon Press.
- Mackenzie, KI and Harris, FC (1984) Money the only motivator? *Building Technology and Management*, **22**, 25-9.
- Nicholls, CJ and Langford, DA (1987) Motivation of site engineers. The Chartered Institute of Building, Technical Information Service, **78**, 1-7.
- Maloney, W and McFillen, J (1985) Valence of and Satisfaction with Job Outcomes. *Journal of Construction Engineering and Management*, **111**(1) 53-73.
- Maloney, W and McFillen, J (1986a) Motivation in Unionised Construction. *Journal of Construction Engineering and Management*, **112**(1) 122-37.
- Maloney, W and McFillen, J (1986b) Motivational implications of construction work. *Journal of Construction Engineering and Management*, **112**(1) 137-51.
- Maloney, W and McFillen, J (1987) Influence of Foremen on Performance. *Journal of Construction Engineering and Management*, **113**(3) 399-415.
- Maslow, AH (1943) A theory of human motivation. *Psychological Review*, **50**, 370-96.
- McFillen, J and Maloney, W (1988) New answers and new questions in construction worker motivation. *Construction Management and Economics*, **6**(1) 35-48.

- Ogunlana, SO and Chang, WP (1998) Worker motivation on selected construction sites in Bangkok, Thailand. *Engineering Construction and Architectural Management*, **5**(1) 68-81.
- Olomolaiye, PO (1990) An evaluation of the relationships between bricklayers' motivation and productivity. *Construction Management and Economics*, **8**, 301-13.
- Olomolaiye, PO and Ogunlana, SO (1988) *A Survey of Construction Operative Motivation on Selected Sites in Nigeria*. Building and Environment, **23**(3) 179-85.
- Olomolaiye, PO and Price, ADF (1989) Construction operatives motivation and productivity. An evaluation of motivation variables in construction operatives in the UK. *Building Research and Practice*. The Journal of CIB, **2**, 114-20.
- Olomolaiye, PO and Price, ADF (1988) Work more important than money for bricklayers. *Building Technology and Management*, **26**(5) 17-9.
- Pinder CC (1998) *Work motivation in organisational behaviour*. Upper Saddle River, NJ: Prentice Hall.
- Ruthankoon, R and Ogunlana, S O (2003) Testing Herzberg's two-factor theory in the Thai construction industry. *Engineering, Construction and Architectural Management*, **10**(5) 333-41.
- Ruthankoon, R (2005) *Testing of Herzberg's motivation theory in the construction industry*, Unpublished PhD thesis, Asian Institute of Technology, School of Civil Engineering, Thailand.
- Shoura, MM and Singh, A (1999) Motivation Parameters for Engineering Managers Using Maslow's Theory. *Journal of Management in Engineering*, **15**(5) 44-55.
- Smithers, GL and Walker, DHT (2000) The effect of the workplace on motivation and demotivation of construction professionals. *Construction Management and Economics*, **18**(7) 833-41.
- Steers, RM, Mowday, RT and Shapiro, DL (2004) The future of work motivation theory. *Academy of Management Review*, **29**(3) 379-87.
- Toor, A and Ofori, G (2008) Taking leadership research into future: a review of empirical studies and new directions for research. *Engineering, Construction and Architectural Management*, **15**(4) 352-71.
- Torrance, VB and Cathcart, JP (1986) Motivation of construction managers. *Building Technology and Management*, Dec-January, 38-41.
- Uwakweh, BO (2003) Motivating craft workers: a case study with Syrian workers. In: *Joint International Symposium of CIB Working Commissions*, Singapore, 22-24 October 2003.
- Uwakweh, BO (2005) Effect of Foremen on Construction Apprentice. *Journal of Construction Engineering and Management*, **13**(12) 1320-27.
- Uwakweh, BO (2006) Motivational climate of construction apprentice. *Journal of Construction Engineering and Management*, **132**(5) 525-32.
- Vroom, V H (1964) *Work and Motivation*. New York: John Wiley.
- Yisa, SB, Holt, GD and Zakeri, M (2000) Factors affecting management motivation in the Iranian construction industry: a survey of site managers. In: *16th Annual ARCOM Conference*. Glasgow Caledonian University, Scotland, Vol. 2. 465-72.
- Young, B (1991) Reasons for changing jobs within a career structure. *Leadership and Organisation Development Journal*, **12**(1) 12-16.

- Zakeri, M Olomolaiye, PO Holt, GD and Harris, FC (1997) Factors affecting the motivation of Iranian construction operatives. *Building and Environment*, **32**(2) 161-66.
- Zhou, Y (2004) *Motivation, performance and job satisfaction of construction management professionals*, Unpublished Master Thesis, Department of Civil Engineering, University of Calgary, Australia.