

The Need for Professionalism and Competencies in the Construction Industry

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Abstract

The quantity surveyors, in the present day construction industry, through his skills and ability analyze cost components of a construction project in a scientific way and apply the results of his analysis to a variety of financial and economic problems confronting the developer and the designer. The wide array of quantity surveyors' responsibilities means that they have to be educated, trained, and highly skilled in diverse subjects. However, competence, in any sphere of work, can be a difficult concept to pin down especially when it relates to professional occupations where such roles can be complex, and the knowledge and skills involved many and varied professionals. This paper aims to investigate the competencies of quantity surveyors in the process of discharging its professional duties by evaluating the effects of professional competency on quantity surveying practices in Nigeria. The study population comprised the quantity surveyors who are professionals in the private organization in the Nigerian construction industry. Data were obtained to assess the professional views on the profession, examine the roles of quantity surveyors in the construction industry and assess the need for professionalism and competencies in the industry. Questionnaires were administered to the randomly selected 200 practicing quantity surveyors in Lagos state. Findings revealed that the major role of quantity surveyors in the construction industry is the preparation of the bill of quantity as it ranked 1st with RII value of 1.00; it was also discovered that the quantity surveyors were in agreement to client service delivery as the first ethical standard that construction professionals should consider when performing their professional obligations in order to avoid project failure and over-cost. It is therefore recommended that the professional bodies and the academia should organize proper and adequate service training, workshop and seminars which will enhance the possibility of acquiring more skills and experience so as to improve competence in the discharge of quantity surveyors professional duties.

Keywords: Professionalism, competency, ethical standard, industry

1.0 Introduction

Quantity surveyors as a key professional in the construction industry can be involved in cost planning, cost management, project procurement, contract administration, feasibility studies and asset financial management. Hence, their clients include developers, government bodies and agencies, building proprietors, architects and contractors. The quantity surveyors, in the present day construction industry, through his skills and ability analyze cost components of a construction project in a scientific way and apply the results of his analysis to a variety of financial and economic problems confronting the developer and the designer (Ilias, Mohd & Abdelnaser, 2010).

Badu and Amoah (2004) held that these changing roles had been redefined by the educational system received by the quantity surveyors. The wide array of quantity surveyors' responsibilities means that they have to be educated, trained, and highly skilled in diverse subjects. Lenard (2000) also argued that the changing nature of the construction and development industry such as the adoption of innovative technological processes and development, the emergence of highly focused professionals and the full range of advanced technologies necessitate a much stronger emphasis on job competencies than ever before. However, competence, in any sphere of work, can be a difficult concept to pin down especially when it relates to professional occupations where such roles can be complex, and the knowledge and skills involved many and varied professionals (Cheetham & Chivers, 1996).

According to Ilias et al (2010) quantity surveyors are construction economists who fulfilled varied and comprehensive duties to support cost-effective construction and property development projects. The core competencies of quantity surveyors include determining project budgets, measuring project quantities, preparing contract documentation such as bills of quantities and cost control documents, administering contracts, and preparing final accounts. Despite being recognized as a professional discipline distinct from architecture and civil engineering since 1836, quantity surveyors are not immune to the threats and changes in their operating environment. Some parties in the construction industry have been critical about the quality of works and services provided by quantity surveyors. Some even question the importance of appointing quantity surveyors as project consultants. Nonetheless, Nkado (1999) gives an over view of the ubiquitous need of certain professional skills in quantity surveying that are pertinent to meeting clients' demands.

Poon (2004) noted that some quantity surveying firms don't seem to understand how to handle clients' money and are culpable of certain actions that could be severely damaging to clients' interests which in turn affect the integrity and competencies of quantity surveyors. Pearl (2005) attribute this ugly phenomenon that has robbed quantity surveying profession, the much expected pride of place among professionalism in the industry to the

conflict of views of the various cadres of practicing quantity surveyors as regards certain ethical principles and the systemic complexities that make it difficult to justify certain culpable conceptions and practices.

Therefore, this paper aims to investigate the competencies of quantity surveyors in the process of discharging its professional duties by evaluating the effects of professional competency on quantity surveying practices in Nigeria. In the bid to achieve this, the following questions arise:

- i. What are the roles and functions of quantity surveyor in Nigeria?
- ii. What are the areas of competences required of a quantity surveyor in the construction industry?
- iii. What are the effects of quantity surveyor's competence on the performance of quantity surveying firms?

2.0 Literature Review

2.0.1 Concept of professional competency

Stewart and Hamlin (1992) defined competency as something which a person who works in a given occupational area should be able to do. Holmes and Joyce (1993) also view competency as an action, behaviour or outcome which a person should be able to demonstrate, or the ability to transfer skills and knowledge to new situations within the occupational area. Meyer and Semark (1996) described competence as the demonstration of an integration of knowledge, skill, personal attributes and value orientation. Wisner (1994) insists that competencies provide a common cultural thread, a language for success, a framework for thinking about excellence and a way of communicating the future. Baker et al., (1997) observed that companies were starting to look into workers' competencies when they realised that providing a framework which brings greater clarity to the idea of competence in business in general, and operations and technology management in particular, would bring competitive advantage to their organizations.

Rankin (2000) reported that a significant number of companies in the UK are using competencies to improve individual and corporate performance. Roggema-van Heusden (2004) attempted to define competence from professional personnel point of view. They held that, competence is the ability to perform well in a professional situation that involves the accomplishment of a certain task or the dealing with a problem, in a manner that can be observed and be judged by others. That is to say: a competent professional is capable of applying the necessary expertise in confluence with effective behaviour. Competent quantity surveyors must have a range of skills, knowledge and understanding that can be applied in a range of contexts and organisations (Hassall *et al.*, 1996). Yet pressing issues which confront the quantity surveying profession today include increasing the relevance and level of awareness of the profession's services in the built environment and increasing the range of business opportunities for continued growth.

2.0.2 The roles of quantity surveyors

A qualified quantity surveyor can gain employment in quantity surveying firms, construction companies, or property developers. Large organisations (public or private) that deals with a significant amount of building or construction procurement as part of their activities normally employ quantity surveyors among other construction professionals to become their project managers. Most quantity surveyors who work in consultant firms are retained by the construction clients to ensure that what is eventually built is what the clients want or could afford (National Commercial Services UK, 2004). The responsibilities of the client's quantity surveyor include the preparation of Bills of Quantities and the giving of advice on what a project would cost. He also does cost planning during the design stage of a project, examine tenders, price quantities and report his findings. He also negotiates rates with contractors on negotiated contracts, valuing work in.

Badu and Amoah (2004) noted that the distinctive skill of a quantity surveyor lies in his ability to analyse a project applying his skills and knowledge to the competence areas like progress payment and making recommendations as to payments to be made to the contractor including advising on the financial aspects of variations. The contractor's quantity surveyor on the other hand engages himself in matters relating to costs and estimates from the perspective of 'entrepreneurial' contractor, and agrees on measurements with the client's contractor for any specific project. The principle role of the quantity surveyor here is to look after the financial interests of the contractor. He will calculate and record the financial value of the work carried out and ensures that the contractor is paid properly and on time.

During the currency of the contract, he will be involved in measurements on site and from drawings in order to establish the true value of work done in the interim period (National Commercial Services UK 2004). He also collects information about cost of various operations or method of construction from which the contractor can prepare future estimates. He might also be tasked to prepare the project report and assists the contractor in his management scheduling plans (Badu and Amoah, 2004).

In general, according to John Austen Associates (2004) the principal services that could be offered by any quantity surveying firm are:

- i. Preliminary cost advice and feasibility estimates.
- ii. Cost planning.
- iii. Advising on contractual methods.

- iv. Advising on selection of other consultants.
- v. Advising on contractor selection.
- vi. Preparing tender documents.
- vii. Obtaining or negotiating tenders.
- viii. Reporting on tenders received or package deal/design and build offers.
- ix. Evaluating construction work.
- x. Preparing and agreeing accounts for/with contractors.
- xi. Preparing expenditure statements for tax accounting purposes.
- xii. Periodic financial reporting
- xiii. Technical auditing.
- xiv. Assessing replacement value for insurance.
- xv. Project management related services.
- xvi. Giving expert evidence in arbitrations, adjudications and legal disputes. and
- xvii. Preparing/defending against construction contract claims.

2.0.3 Assessment of quantity surveying professional competencies

According to Royal Institution of Chartered Surveyors (1971) and Male (1990) opined that the competencies of the quantity surveyor are usually associated with the measurement and valuation that provides the basis for the proper cost management of the construction project in the context of forecasting, analyzing, planning, controlling and accounting. Hassal *et al.* (1996) noted that the process of professionalization demands that a profession should take responsibility for a prescribed body of knowledge by first defining the substantive field of knowledge that the professional should command and secondly the process of applying that knowledge. Thus, Leveson (1996) concluded that the area of quantity surveying competencies lies in the financial and contractual control of the building project and therefore the need for quantity surveyors to pay attention to developing soft skills.

Willis *et al.* (1994) described that body of knowledge of the quantity surveyor as one which incorporate the services of: preliminary cost advice; cost planning including investment appraisal, life-cycle costing and value analysis; procurement and tendering procedures; contract documentation; evaluation of tenders; cash-flow forecasting, financial reporting and interim payments; final accounting and the settlement of contractual disputes; cost advice during use by the client; project management; and specialist services. RICS (1998) therefore sets out the requirements and competencies for the assessment of professional competence by listing the competencies required of quantity surveyors in three categories which are: the basic competencies, the core competencies and the optional competencies. The basic competencies under the RICS structure are common to all construction professions such as land surveying, building surveying, *etc*; the core competencies are those uniquely required of quantity surveyors while the optional competencies reflect areas of specialization or future career diversification.

2.0.4 Competency required of quantity surveyor

Akosile, Ogunsemi and Owoeye (2007) identified and classified areas of competencies required of quantity surveyors into three categories viz basic, core and optional. In 1998, The Royal Institution for Chartered Surveyors (RICS) put forward a model of competencies for quantity surveyors. The model was presented in three categories of mandatory/ basic, core and optional competencies.

A. Mandatory Competencies

The basic competencies are widespread to all construction profession under the RICS structure and they are the personal and interpersonal skills, professional practice and business competencies common to all pathways and compulsory for all candidates. There are basic competencies required for all positions. A basic competency is defined as a knowledge, skill, or behavior essential for one to function as an effective member of the University of Michigan. The list of basic competencies include:

- i. **Ethics and Integrity:** Consistently demonstrates the organizations values through behaviours;
- ii. **Customer Service:** Consistently meets the organization's expectations for customer service, striving constantly to achieve them;
- iii. **Communication:** Effectively communicates verbally and in writing;
- iv. **Problem Solving:** Develops effective approaches, addresses needs, and solves problems;
- v. **Flexibility:** Demonstrates flexibility in one's job roles, and manages change in ways that result in productive performance;
- vi. **Technology:** Uses available equipment and technology safely, efficiently and effectively;
- vii. **Safety:** Complies with safety instructions, observes safe work practices, and provides input on safety issues;
- viii. **Self-Management:** Maximizes own time and talents to achieve organizational goals;
- ix. **Seizes Opportunities:** seeks opportunities to innovate and continually improve;
- x. **Change Resilience:** develops effective approaches for managing self through organizational change;
- xi. **Teamwork:** Works effectively with team/work group or those outside the formal line of authority to accomplish organizational goals;

xii. **Cost effectiveness:** Prudently uses resources based on organizational priorities.

B. Core Competencies

The core competencies are exclusively vital to the profession of quantity surveying and it entails construction contract practice, construction technology and environmental services, economics of construction and procurement and financial management. In other words, core competencies are those capabilities that are critical to a business achieving competitive advantage. The starting point for analysing core competencies is recognising that competition between businesses is as much a race for competence mastery as it is for market position and market power. Senior management cannot focus on all activities of a business and the competencies required to undertake them. So the goal is for management to focus attention on competencies that really affect competitive advantage.

The main ideas about Core Competencies were developed by C K Prahalad and G Hamel through a series of articles in the Harvard Business Review followed by a best-selling book – “Competing for the Future”. The central idea was that over time companies may develop key areas of expertise which are distinctive to that company and critical to the company's long term growth.

“In the 1990s managers will be judged on their ability to identify, cultivate, and exploit the core competencies that make growth possible - indeed, they'll have to rethink the concept of the corporation itself”. C.K Prahalad and G Hamel (1990)

These areas of expertise may be in any area but are most likely to develop in the critical, central areas of the company where the most value is added to its products. For example, for a manufacturer of electronic equipment, key areas of expertise could be in the design of the electronic components and circuits. For a ceramics manufacturer, they could be the routines and processes at the heart of the production process. For a software company the key skills may be in the overall simplicity and utility of the program for users or alternatively in the high quality of software code writing they have achieved. Core Competencies are not seen as being fixed. Core Competencies should change in response to changes in the company's environment. They are flexible and evolve over time. As a business evolves and adapts to new circumstances and opportunities, so its Core Competencies will have to adapt and change.

C. Optional Competencies

A set of competencies selected by the candidate from a list defined for the particular pathway. In most cases there is an element of choice. These are mostly technical competencies, but certain mandatory competencies also appear on the optional competency list and candidates are permitted to select one of these at a higher level. The optional competencies reveal areas of specialty or future career diversification and these include arbitration and other dispute resolution procedures, development appraisal, facilities management, insolvency, insurance, project management, property investment funding, research methodology and techniques, taxation allowance and grants and valuation.

Table 1 showed the diagrammatic presentation of the three categories of competencies required of quantity surveyors as proposed by RICS (1998)

Table 1: Categories of Competencies of Quantity Surveyors

Categories of Professional Competencies		
Basic	Core	Optional
Personal & Interpersonal skills	Construction Contract Practice	Arbitration & Other Dispute Resolution Procedures
Business skills	Construction Technology & Environmental Services	Development Appraisal
Data, Information and Information Technology	Economics of Construction	Facilities Management
Professional Practice	Procurement and Financial Management	Insolvency
Law		Insurance
Measurement		Project Management
Mapping		Property Investment Funding
		Research Methodologies & Techniques
		Taxation Allowances & Grants
		Valuation

Source: RICS, 1998

The Australian Institute of Quantity Surveyors (AIQS) also attempted to define and develop a model of competencies for the quantity surveyors (AIQS, 1998). They proposed 31 competency standards that need to be adhered to by the professional body in producing competent quantity surveyors. Apart from the competency standards, the Australian Institute of Quantity Surveyors also recommended 13 basic characteristics of abilities that lead to a competent quantity surveyor. These basic abilities in turn, form the platform from which a competent quantity surveyor can develop and are an integral part of the 31 units of competency standards. The basic abilities

are:

- a. Quantification/measurement – the ability to quantify and enumerate.
- b. Analysis – the ability to observe, assess, identify problems and find innovative solutions.
- c. Appraisal/evaluation – the ability to assess value.
- d. Communication – the ability to impart knowledge, ideas and concepts through oral, written and visual means.
- e. Interpersonal skills – the ability to effectively work with others and to be part of a team.
- f. Leadership – the ability to lead and motivate.
- g. Self-development – the ability to set goals, display enthusiasm, self-motivate and undertake research.
- h. Management – the ability to organize, monitor, control and plan the effective use of resources.
- i. Documentation – the ability to prepare written information in a format which clearly conveys meaning.
- j. Synthesis – the ability to combine fact or ideas into a complex whole.
- k. Computer literacy – the ability to understand and apply basic computer skills.
- l. Construction technology – the ability to understand basic construction technology.
- m. Construction law and regulation – the basic knowledge of national laws and regulations related to construction.

In 1999, The Pacific Association of Quantity Surveyors (PAQS) analyzed a full range of competencies required by a modern quantity surveyor. In principle they agreed to accept 10 competency standards for the quantity surveyors. Those are: strategic planning, budgetary process, cost estimating, cost planning, procurement advice, documentation, tendering process, construction account management, construction change management, feasibility studies.

3.0 Methodology

The study population comprised the quantity surveyors who are professionals in the private organization in the Nigerian construction industry. Data obtained involved assessing professional views on the profession, examining the roles of quantity surveyors in the construction industry and assessing the need for professionalism and competencies in the industry. Questionnaires were administered to the practicing quantity surveyors in Lagos state. The respondents were randomly selected among the various firms in Lagos state. Two hundred (200) questionnaires were distributed with the aim of eliciting response from the private organizations toward determining the need for professionalism in carrying out construction project.

4.0 Results and Discussion

Table 2: Assessment of the roles of Quantity Surveyors in the construction industry

Roles	S.A	A	U	D	S.D	RII	Rank
preparing bill of quantity	195	0	0	5	0	1.00	1
materials schedule for building project	5	30	15	75	75	0.79	4
cost estimation relating to construction materials, time and labour and cost	0	5	0	45	150	0.94	2
work in progress variation and materials on site for interim payment	0	5	30	60	105	0.87	3
cash flow payment	15	45	20	50	70	0.76	5

Source: Field Survey, 2014

* S.A = Strongly Agreed; A = Agreed; U = Undecided; D= Disagree; S.D = Strongly Disagree; RII = Relative Importance Index

The various roles of quantity surveyors in the construction industry were identified in Table 2 and ranked using its Relative Importance Index (RII). The roles of quantity surveyors in the construction industry revealed that preparation of the bill of quantity ranked 1st with RII value of 1.00; cost estimation relating to construction materials, time and labour and cost advise ranked 2nd with RII value of 0.94; work in progress variation and materials on site for interim payment ranked 3rd with RII value of 0.87; materials schedule for building project ranked 4th with RII value of 0.79, while cash flow payment ranked 5th with RII value of 0.76. The findings from the table revealed that all the roles are significant with the least role having 76 (0.76) percent significance.

Table 3: Ethical standard and competence requirements of a quantity surveyor

Ethical Standard and Competence	Mean Value	Rank
Standards of practice	3.17	3
Education & professional qualification	3.24	2
Fair competition	3.10	8
Confidentiality	3.14	6
Integrity	3.15	4
Public welfare	2.98	14
Conflict of interest	3.01	11
Safety	3.04	9
Environmental friendliness	3.02	10
Maintenance culture	3.01	11
Client's service delivery	3.29	1
Cost effectiveness	3.12	7
Fair compensation	2.96	15
Professional development	3.15	4
Sustainability	3.00	13

Source: Field Survey, 2014

Table 3 shows the mean item score (MIS) for the level of compliance of ethical practices as perceived and ranked by the quantity surveyors. From the result of the analysis, generally all the fifteen (15) ethical practices identified by the study were highly ranked with MIS ranged $3.29 \leq 2.96$ which showed ranking above average. Three ethical standards which are client's service delivery, educational training and professional qualification and standards of practice respectively indicating client service delivery as the most significant ethical standard were ranked 1st, 2nd, & 3rd by the quantity surveyors.

The quantity surveyors were in agreement to client service delivery as the first ethical standard that construction professionals should consider when performing their professional obligations. Quantity surveyors in some cases can also be contractors or consultant quantity surveyor, either working for an organization or for the contractor as they are saddled with the responsibilities of preparing the cost estimate of any proposed project, preparation of interim valuation and physical measurement of works among others to enable payment to the contractor among others. They are also to monitor the clients' resources to ensure services are delivered with the best standards and at minimum cost which is the major service delivered by quantity surveyors.

Educational training and professional qualification is also of great importance, because this is where professionals gain academic training, technical competence and skills about a particular profession. It is therefore important for professionals to have sound educational background to be able to cope with the projects challenges. This finding conforms to Chan and Chan (2002) that; professionals need to be placed in appropriate educational framework to ensure their continuous relevance. Quantity surveyors should only accept to offer services for which they are qualified by education, training and professional experience.

Quantity surveyors deals basically with financial management of the contracts and this is the area where the integrity of most professionals are put into the mud especially if there is a conflict between personal and professional values. The moral standing and upbringing of each individual professional appears on how they protect their own integrity in dealing with clients rather than being mindful of their personal gain. The findings corroborated Cardammone (2011) that established that professionals are linked with notion of services they provide, hence the need to focus more on personal professional development so as to provide services that are of high quality for all that needed their services.

Table 4: Characteristics/Knowledge/Abilities required of a competent quantity surveyor

Characteristics	Mean Value	Ranking
Computer and Information Technology Literacy	4.38	6
Leadership	3.87	11
Construction Law and Regulation	4.36	7
Self-development	4.03	10
Appraisal/Evaluation	4.34	8
Management	4.26	9
Synthesis	3.74	12
Documentation	4.56	2
Communication	4.53	3
Construction Technology	4.49	4
Interpersonal Skills	4.41	5
Quantification/Measurement Analysis	4.66	1

Source: Field Survey, 2014

The characteristics/knowledge and abilities required of a competent quantity surveyor are ranked in Table 4 according to its significant to quantity surveying profession. The table clearly indicated the areas of competence characteristics that are significant to the performance of quantity surveying firms in Nigeria. The area of quantification and measurement is been selected as the most important/significant competence required in the performance quantity surveying firms in Nigeria, with a mean score of 4.66, while synthesis is considered less important to the performance of quantity surveying firms in Nigeria, with a mean score of 3.47.

This indicated that the most important characteristics, abilities and knowledge for quantity surveyors to possess are quantification/measurement analysis, documentation, communication, construction technology and interpersonal skills which are also regarded as highly important for quantity surveyors to achieve an accepted level of competency. Other less important characteristics, abilities and knowledge to acquire are management, appraisal/evaluation, construction law and regulation, self-development, leadership, synthesis, and computer and information technology literacy.

5.0 Conclusion

Quantity Surveying is one of the professions that has attracted unprecedented ubiquitous demand in the construction industry in the recent past with increasing opportunity for service diversification and adaptive applicability. Client's satisfaction is also a function of professional ethics in relation to respecting public interest with respect to the willingness to serve the public, good sense of responsibility and practice technical competencies. Therefore, as challenges and ubiquitous demands expand with new entrants of quantity surveying practice professing with different goals, it may be difficult to hold them under serious legal obligation to uphold ethical practices. This is because they may not be recognized as members of professional bodies until they are duly examined and registered, which may not be a mandatory requisition to operate within their delimited scope. Also, except in exceptional cases, academic establishments are not so keen in monitoring the ethical conducts of their products out of school. Thus the need to reposition the profession and ensure strict monitoring to ensure that quacks and non-professionals do not bastardize the profession especially in the face of the growing economy.

6.0 Recommendation

Professionalism and competency is the bedrock and soul of the success in handling construction works. Thus, in achieving the need for professional competence in the industry, the following are hereby recommended:

- a. Organizing proper and adequate service training, workshop and seminars by the professional bodies and the academia which will enhance the possibility of acquiring more skills and experience so as to improve competence in the discharge of duties. Frequent training and retraining is inevitable to season members of the profession with current trends in ethical development and uncertainties, not only to equip members' competencies but to give the much needed rebirth to nurture and protect the goal of the professionals serving the public interest to exist.
- b. Quantity surveyor should not settle down with just the roles and function of the profession but should also acquaint themselves with the roles and function of other professionals in the field which can also be referred to as self-development to improve on their competence.
- c. Quantity Surveyors, should ensure that they possess skills that are inclusive of personal qualities, core skills and process skills. The personal qualities should include independence, adaptability, initiative taking, willingness to learn and ability to reflect on what has and what has not been achieved. The core skills of a quantity Surveyor should include the ability to present clear information within a group, self-management, critical analysis and the ability to listen to others while computer literacy, commercial awareness, prioritizing, negotiating, acting morally and ethically, coping with ambiguity and complexity are the process skills required of a quantity Surveyor.

References

- Badu, E. and Amoah, P. (2004) Quantity Surveying Education in Ghana. *The Ghana Engineer*.
- Baker, J.C., Mapes, J., New, C.C. and Szejczewski, M. (1997). *A Hierarchical Model of Business Competence*. Integrated Manufacturing Systems, Bradford,.
- Cardamone (2010). *Cardamone Construction Management Association of America* www.cmaanet.or/files/shared/sop.sampelpdf. Accessed on 20/4/2014.
- Chan, E.H.H., and Chan A.T.S., (2002). Developing of Professional System in the Construction Industry in China. *Journal of construction Research*, 3(21) 271-284.
- Cheetham, G. and Chivers, G. (1996). Towards a Holistic Model of Professional Competence. *Journal of European Industrial Training*.
- Holmes, L. and Joyce, P. (1993). Rescuing the Useful Concept of Managerial Competence: From Outcomes Back to Process. *Personnel Review*, Vol. 22 No. 6(37-52).
- Hassal, T, Dunlop, A & Lewis, S (1996) Internal Audit Education: Exploring Professional Competence.

- Managerial Auditing Journal*, 11/5, p.28-36
- Ilias, S. & Mohd, .W. (2010). *The Competency Required for Quantity Surveyors: Enhancing Continuous Professional Development*. John Austen Associates. <http://www.john-austen.co.uk>, (2004) [Accessed on the 3rd of February, 2006]
- Lenard, D. (2000). *Future Challenges in Cost Engineering: Creating Cultural Change through the Development of Core Competencies*. AACE International Transactions.
- Male S. P., and Mitrovic D., (2005). The Project Value Chain: Models for Procuring Supply Chains in Construction Proceedings, *Royal institution of Chartered Surveyors (RICS)*. Conference July 4-8 Queensland University of Technology Australian.
- Male, S (1990) Professional Authority, Power and Emerging Forms of 'Profession' in Quantity Surveying. *Construction Management and Economics*, 8(191-204).
- Meyer, T. and Semark, P. A (1996). Framework for the Use of Competencies for Achieving Competitive Advantage. *South African Journal of Business Management*, 27(4).
- National Commercial Services UK. <http://www.ncsuk.com>, (2004)
- Nkado, R.W and Kotze, M (2000) Competency-Based Assessment of Professional Quantity Surveying, a South African Perspective. *Proceedings of COBRA. University of Greenwich, UK*, 281 – 296.
- Nkado, R N (1999) *Competencies Required of Quantity Surveyors*, Unpublished MBA Research Report, Johannesburg: University of the Witwatersrand.
- Pearl, R, Bowen, P, Makanjee, N, Akintoye A and Evans K (2005) Professional ethics in the South African Construction Industry – a Pilot Study. *Proceedings of Royal Institution of Chartered Surveyors (RICS) Conference*. July 4 – 8, Queensland University of Technology, Brisbane, Australia.
- Poon J., (2003). Professional Ethics for Surveyors and Construction Project Performance' What We Need to Know. Proceedings, RICS
- Poon, J (2004). Factors influencing ethical decision making for surveyors. *Proceedings of Construction and Building Research (COBRA) Conference*, Leeds, Leeds Metropolitan University, UK.
- Rankin, N. (2000). Annual Survey of Competency Frameworks, Competency and Emotional Intelligence, IRS.
- Roggema-van Heusden, M (2004). The Challenge of Developing a Competence-Oriented Curriculum: An Integrative Framework, *Library Review*, 53(2).
- Royal Institution of Chartered Surveyors (1998). *The APC Requirements & Competencies*, London: Royal Institution of Chartered Surveyors.
- Royal Institution of Chartered Surveyors (1971). *The Future Role of the Quantity Surveyor*, London: Royal Institution of Chartered Surveyors.
- Stewart, J & Hamlin, B (1992) Competency-based Qualifications: The Case for Established Methodologies. *Journal of European Industrial Training*, 16(10)9-16.
- The Australian Institute of Quantity Surveyors (1998). National Competency Standards for Quantity Surveyors, AIQS, Australia.
- Willis, C J, Ashworth, A & Willis, J A (1994) *Practice and Procedure for the Quantity Surveyor*, 10th Ed., Oxford: Blackwell Science.
- Wisher, V (1994) Competencies: The Precious Seeds of Growth. *Personnel Management*, July.