

COMPETENCIES REQUIRED BY QUANTITY SURVEYORS IN SOUTH AFRICA

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The ability of the quantity surveying profession to meet changing client needs and to grow the market for quantity surveying services depends on the knowledge base of the profession. A competency-based assessment of the quantity surveying profession is therefore relevant in the changing built environment. The relative importance of current and future competencies required by quantity surveyors, and the gaps between important competencies and current proficiency levels are reported. A questionnaire developed from the literature and depth interviews of selected practitioners was completed by 150 practitioners from a proportional stratified random sample of professional quantity surveyors in South Africa. The results reveal that technically orientated competencies are rated highest in current importance. Future important competencies, however, are more management orientated. Low proficiency levels suggest strategic focus on imparting project management, marketing and advanced financial management competencies. Factor analysis indicates four underlying groupings of surveyed competencies which are represented in a model. These categories are presented as an alternative perspective on the competencies of quantity surveyors. The categorisation is helpful in the assessment of course content for the education and training of quantity surveyors.

Keywords: competency, quantity surveyor, ranking, South Africa

INTRODUCTION

Quantity surveying as a professional service originated in the UK in 1785 (Seeley, 1979) but quantity surveying services in construction date back much earlier to the time of the Egyptian pyramids (Thompson, 1968). Professional quantity surveyors have emerged as respected financial specialists and advisers in the construction industry of those countries where their expertise is recognised. However, as both the nature of construction and the needs of clients have evolved over time, so the roles and responsibilities of the quantity surveyor have increasingly come under the spotlight.

A justification for a study of the competencies required by quantity surveyors is that the ability of the quantity surveying profession to meet changing client needs and to grow the market for quantity surveying services depends on the knowledge base of the profession. Prokesch (1997) advocates that building and leveraging knowledge is the key to success in this age of globalisation, while Male (1990) opines that knowledge is an important power base for professions generally. Competencies are the manifestation of knowledge acquired through education, training and self-learning. Wisner (1994) insists that competencies provide a common cultural thread, a language

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for success, a framework for thinking about excellence and a way of communicating the future.

Competent quantity surveyors must have a range of skills, knowledge and understanding which 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. These issues can be addressed by a competency-based review of the profession (Mole *et al.*, 1993). This paper aims to assess the relative importance of competencies that are essential for excellence in current as well as future quantity surveying services, and to evaluate the gaps between the important competencies and their current level of use by professional quantity surveyors.

COMPETENCY PERSPECTIVE

Competency is something which a person who works in a given occupational area should be able to do (Stewart and Hamlin, 1992a). It is a description of 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 (Holmes and Joyce, 1993). It is the demonstration of an integration of knowledge, skill, personal attributes and value orientation (Meyer and Semark, 1996). The focus of this paper is on individual competencies within the organisational or work-related context.

The competence philosophy has gained research attention in a number of professions (Stewart and Hamlin, 1992b). Competency-based studies aimed at enhancing the quality of professional services through "self-reflection" by each professional grouping have been conducted on the clergy (Barker, 1992), attorneys (Cresswell, 1995), internal auditors (Hassal *et al.*, 1996) and project managers (Fry, 1997; Birkhead, 2000). A helpful framework proposed by Meyer and Semark (1996) for the identification and assessment of competencies suggests four consecutive levels of competencies: national, organisational, occupational and generic meta-competencies. Meyer and Semark (1996) opine that each competency level is supported by those below it, which suggests that an improvement at the level of occupational competencies for the profession of quantity surveying will ultimately and positively impact on the national competencies of South Africa.

QUANTITY SURVEYING COMPETENCIES

The Royal Institution of Chartered Surveyors (RICS) (1971) and Male (1990) emphasise that the distinctive competencies or skills of the quantity surveyor are associated with measurement and valuation which provide the basis for the proper cost management of the construction project in the context of forecasting, analysing, planning, controlling and accounting. Leveson (1996) indicates that quantity surveying competencies lie in the financial and contractual control of the building project but advises quantity surveyors to pay attention to developing skills in human relations. According to Hassal *et al.* (1996), the process of professionalisation 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. Willis *et al.*, (1994) have described that body of knowledge of the quantity surveyor as incorporating 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.

The RICS (1998) sets out the requirements and competencies for the assessment of professional competence by listing the competencies required of quantity surveyors in three categories: basic competencies, core competencies and optional competencies, as shown in Table 1. The basic competencies are common to all construction professions under the RICS structure (land surveying, building surveying, *etc.*); the core competencies are uniquely required of quantity surveyors while the optional competencies reflect areas of specialisation or future career diversification.

Table 1: Headings of competencies required by quantity surveyors for APC

Basic competencies	Core competencies	Optional competencies
Personal and Interpersonal skills	Construction Contract Practice	Arbitration and Other Dispute Resolution Procedures
Business skills	Construction Technology and 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 and Techniques
		Taxation Allowances and Grants
		Valuation

Source: The Royal Institution of Chartered Surveyors (1998)

The taxonomy in Table 1 is readily recognised by quantity surveyors, as confirmed in the qualitative survey. However, no previous local or international study has examined the current and future importance ratings of competencies required by quantity surveyors in comparison with the current proficiency levels of those competencies in practice. This study attempts to fill this gap by highlighting those competencies which practitioners consider of critical current and future importance but perceive as having low levels of evidence in practice.

METHODOLOGY

The descriptive survey method (Leedy, 1997) was adopted for the study. A preliminary research approach comprising a qualitative method of data production was used to confirm some competency themes identified in the literature and to generate new themes from the target population. This approach comprised the use of non-standardised scheduled preliminary interviews of a convenience sample (Zikmund, 1997) of practising quantity surveyors in the Gauteng province of South Africa. The quantitative method of data production comprised the design, pre-testing and administration of a structured questionnaire nationally among members of the target population selected on the basis of a proportional stratified random sampling. The sampling approach is fully described in Nkado (1999).

The target population was registered quantity surveyors and quantity surveyors-in-training members of the Association of South African Quantity Surveyors (ASAQS).

The mailing list of 2,450 registered quantity surveyors and quantity surveyors-in-training of the ASAQS was obtained and used as the target sampling frame. A representative sample size of 613 was obtained, after allowing for the principle of

appropriate sample sizes (Krejcie and Morgan, 1970), stratified random sampling and the problem of non-response (Zikmund, 1997).

QUESTIONNAIRE DESIGN

The research questionnaire was designed to include only those competencies that were mentioned by three or more interviewees, as deduced from a content analysis of the preliminary interviews. The validity of this questionnaire design was tested in a pilot survey. The questionnaire covered the demographic background of the respondents, specifically those aspects that were likely to influence their ratings of the competencies, and contained 23 competency headings with an addendum enumerating the range of outcomes covered by each heading. The competency headings were listed in alphabetical order for ease of cross-referencing to the addendum. Respondents were requested to rate three aspects of these competencies on a Likert Scale 1 to 5, namely:

- A: the level of importance of each competency for a career as a quantity surveyor at present, from “Not Important” (rated 1) to “Very Important” (rated 5);
- B: the level of evidence of each competency in the quantity surveying profession in South Africa, from “Poor” (rated 1) to “Excellent” (rated 5); and
- C: the level of importance of that competency for a career as a quantity surveyor in the future, say by year 2010, from “Not Important” (rated 1) to “Very Important” (rated 5).

RESULTS AND DISCUSSION

Response

Table 2 presents the response rate achieved after nine weeks of initial and follow-up mailing. The 25% response rate is relatively low and enhances the potential for bias in the interpretation of results. It, however, falls within the response range of similar postal surveys of professional quantity surveyors (Atkin *et al.*, 1993; Procter, 1997).

No major bias in the respondent sample was detected by an inspection and chi-square analysis of the respondents' demographic characteristics and career intentions. Since the nation-wide survey was based on a probability sample and the respondents' characteristics fall within all the classes of the listed demographic variables, the sample was assumed to be representative of the target population.

Re-scaling of ordinal data

A common error in the analysis of Likert scale responses is to treat the ordinal ratings as interval data (Bendixen and Sandler, 1995). However, correspondence analysis can be used to re-scale the Likert scale responses from ordinal to interval data. This is achieved by calculating the Euclidean distance between scale points on the first two axes and apportioning these distances to recalculate the numerical values of the scale points between 1 and 5. Bendixen and Sandler (1995) have clearly documented this procedure which is essential for parametric manipulation and interpretation of the raw data.

The conversion of the Likert scale was performed separately for each of the three sets of ratings of important competencies, evidence of the competencies and future importance of the competencies. Table 3 illustrates only the conversion for ratings of important competencies based on a correspondence analysis of the ratings received for

the 23 competencies. The re-scaling shows that any assumption that the original ratings were interval in nature would be questionable.

Table 2: Analysis of respondent sample

		Membership of the ASAQS				
		Registered member	QS in-training	Total	% of Total	Response rate (%)
Target Sample	Male	388	176	564	92	
	Female	30	19	49	8	
	Total	418	195	613	100	
	% of Total	68	32	100		
Respondent Sample	Male	105	31	136	91	22.2
	Female	9	5	14	9	2.3
	Total	114	36	150	100	24.5
	% of Total	76	24	100		

Table 3: Re-scaling of 5-point Likert scales for rating of important competencies

			Eigen Value	Cum. Percent retained	
		Axis 1	0.172616	77	
		Axis 2	0.031923	91	
Likert scale for Importance		Axis 1 co-ordinate	Axis 2 Co-ordinate	Euclidean distance	Adjusted 5-point scale
	1	Not Important	0.968	-0.496	
2		0.803	-0.257	1.39537	1.806
3	Important	0.265	0.186	2.79721	3.421
4		-0.178	0.097	1.17688	4.101
5	Very Important	-0.441	-0.157	1.55618	5

RELATIVE IMPORTANCE OF COMPETENCIES

The importance of competencies for current and future career success, and proficiency levels were ranked by computing the means of the re-scaled respondents' ratings and converting these to percentages on the basis of the maximum rating of 5. A high degree of consistency was observed in the ranking of the current importance of the 23 competencies, as the ranking was not influenced by any of the demographic variables in the respondent sample. This ranking can be said to be generic to the quantity surveying profession in South Africa. These 23 competencies therefore define the body of established knowledge and techniques which the quantity surveyor can apply to practical problems, as argued by Willis *et al.* (1994) and Hassal *et al.* (1996).

Table 4 presents the aggregate ranking of the competencies under the various headings. This result shows that quantity surveyors have below average proficiency levels in about 60% of competencies considered important for present and future business success, although the demographic background of respondents significantly influenced the proficiency ratings for 65% of the competencies. There is thus ample room for improvement of proficiency levels, *e.g.* through Continuing Professional Development (CPD).

Further analysis of Table 4 reveals that, due to their high importance and low evidence ratings, inculcating marketing and advanced financial management competencies requires immediate attention by academic institutions, quantity surveying firms and CPD training providers to improve the levels of proficiency among practitioners.

Table 4: Aggregate ranking of competencies from highest (Rank 1) to lowest (Rank 23)

Rank	Current Importance	Future Importance	Evidence/Proficiency Levels
1	Computer literacy and information technology	Computer literacy and information technology	Measurement
2	Procurement and financial management	Procurement and financial management	Procurement and financial management
3	Economics of construction	Economics of construction	Professional practice
4	Construction contract practice	Project management	Construction contract practice
5	Measurement	Marketing	Economics of construction
6	Professional practice	Personal and interpersonal skills	Computer literacy and information technology
7	Marketing	Advanced financial management	Mapping
8	Personal and interpersonal skills	Property investment funding	Personal and interpersonal skills
9	Development appraisal	Construction contract practice	Development appraisal
10	Advanced financial management	Development appraisal	Construction technology and environmental services
11	Leadership and general management skills	Professional practice	Leadership and general management skills
12	Project management	Skills in managing a business unit	Skills in managing a business unit
13	Skills to work with emerging contractors	Leadership and general management skills	Marketing
14	Skills in managing a business unit	Skills to work with emerging contractors	Project management
15	Construction technology and environmental services	Measurement	Law
16	Arbitration and other dispute resolution procedures	Law	Management of joint quantity surveying appointment
17	Law	Arbitration and other dispute resolution procedures	Arbitration and other dispute resolution procedures
18	Property investment funding	Construction technology and environmental services	Property investment funding
19	Management of joint quantity surveying appointment	Macro-economic perspectives	Skills to work with emerging contractors
20	Mapping	Facilities management	Advanced financial management
21	Macro-economic perspectives	Management of joint quantity surveying appointment	Macro-economic perspectives
22	Facilities management	Mapping	Facilities management
23	Research methodologies and techniques	Research methodologies and techniques	Research methodologies and techniques

Also, project management and marketing require strategic emphasis in the education and training of quantity surveyors for future business and career success, due to the high future importance and low proficiency ratings of these competencies.

MODELLING

A model of competencies required by quantity surveyors (Figure 2) was derived from a factor analysis of the highly consistent current importance ratings of the 23 competencies. An emphasis in factor analysis is parsimony, *i.e.* the fewest meaningful number of factors. Too many factors will lead to difficulty in the interpretation of results and too few factors may result in important factors being missed. The key criteria of eigenvalues greater than one, scrutinising the knee of the scree plot (see Figure 1) and minimum percentage retention (generally above 35%) were applied to the choice of a four-factor solution, which explained 56% of the inertia. After varimax rotation to simplify the interpretation of the factors, the competencies associated with the various factors as well as the relative importance of these factors were then derived, as fully described in Nkado (1999). Table 5 indicates the derived relative importance rating of the four factors.

The resulting model in Figure 2 suggests that *Competencies for the delivery of corporate built environment asset and financial objectives* are the “core” competencies of quantity surveyors. This category of competencies is firstly supported

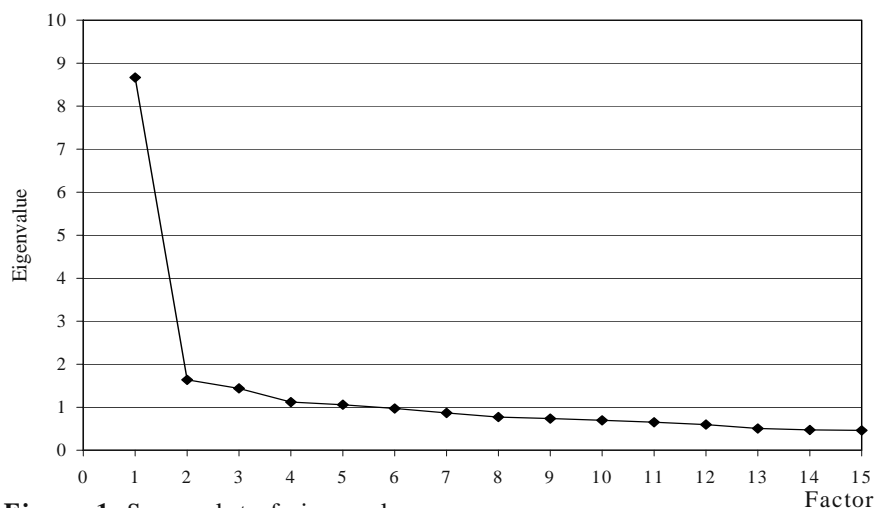


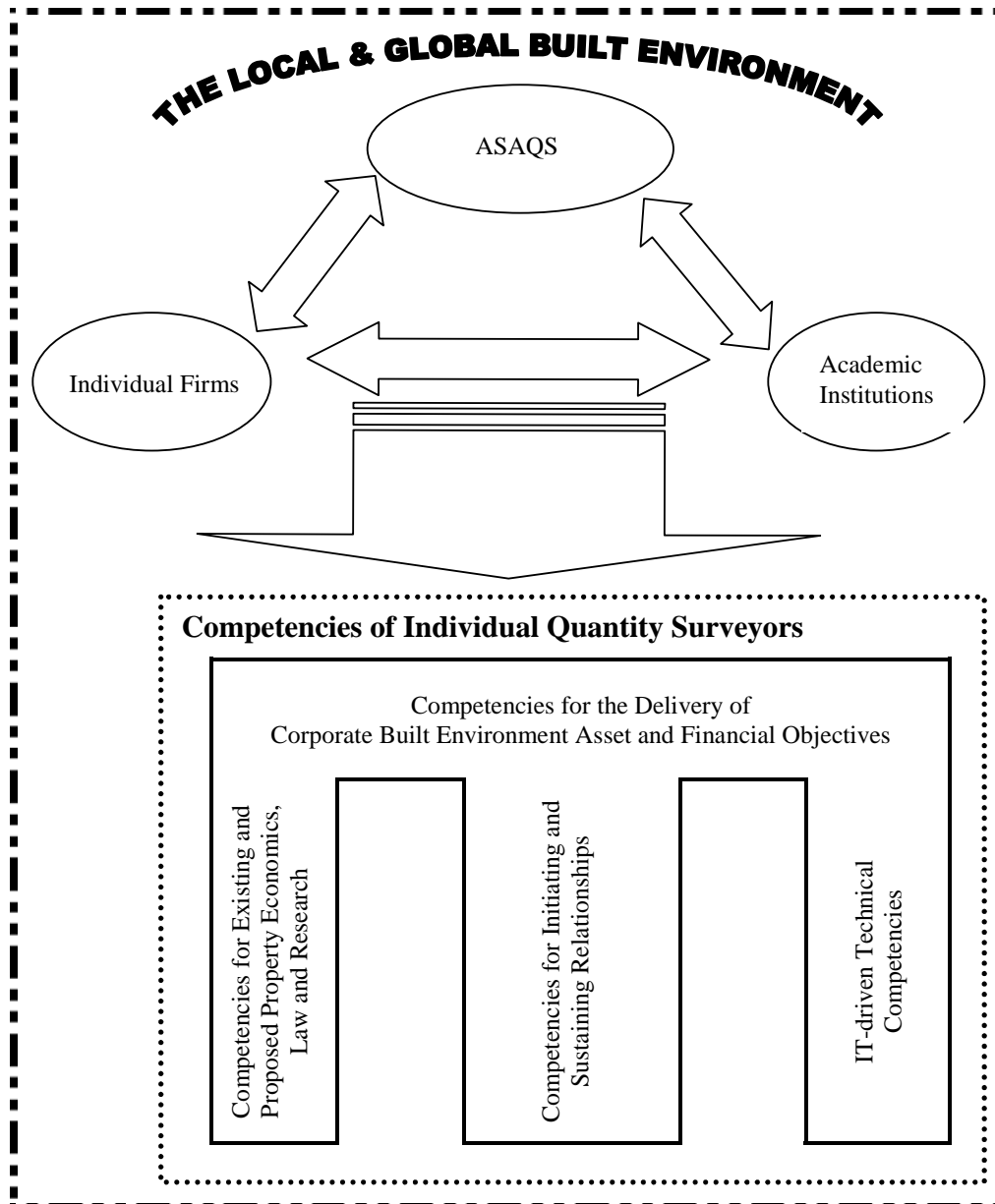
Figure 1: Scree plot of eigenvalues

by the category of *Competencies for initiating and sustaining relationships*, subsequently by *IT-driven technical competencies* and *Competencies for existing and proposed property economics, law and research*.

Table 5: Importance ranking of the four factors

Competence category	Aggregate of average current and future importance rankings	Relative importance
Initiating and sustaining relationships	8.3	Most important
Asset and financial objectives	9.3	
IT-driven technical competencies	10.7	
Property economics, law and research	16.1	Least important

Figure 2 (Figure 2: Competency model for quantity surveyors in South Africa) shows that acquiring, developing and deploying these competencies by individual quantity surveyors will be greatly influenced by synergistic interactions between and input



from the ASAQS, individual firms and accredited academic institutions. The second category of management orientated competencies were shown, on aggregate, to be the most important of the four categories for the future business success of quantity surveyors. Notably, routine technical competencies are shown to likely decline in future importance, presumably due to the computerisation of these functions.

CONCLUSION

Quantity surveyors in South Africa recognise the need to improve their proficiency levels in the competencies recognised as vital for the present and future business success of the profession. Practitioners identified six competencies as important, though these were not recognised in the literature as such. These are, in order of importance: marketing, advanced financial management, leadership and general management, effective working relationships with emerging (small, local) contractors, macro-economic perspectives, and managing joint quantity surveying appointments. Marketing is rated among the first five future important competencies and advanced

financial management among the first ten future competencies required of quantity surveyors. Since management orientated competencies will become more important for the future business success of quantity surveyors, project management, marketing, and personal and interpersonal skills should be included in the academic and training curricula of quantity surveyors. The views of clients and other end users on the subject of this paper are being researched in a complementary study.

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