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Factors Affecting the Competence of Quantity Surveying Professionals in Zimbabwe

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Abstract: The increased complexity of construction projects necessitates the need for quantity surveying professionals to achieve and maintain the highest levels of competency. However, various factors have inhibited their expected professional practice aptitude. Hence, this study reported on the factors affecting the competency of surveying professionals. A questionnaire-based descriptive survey strategy was undertaken to collect quantitative data from both consultant quantity surveyors and contractor quantity surveyors on the factors that influence their competence. The factor analysis revealed four significant components, including inadequate project and professional practice, inadequate academic and technological advances, inadequate organisational structure and teamwork and unclear individual career development goals. In addition, an assessment of the statistically significant differences based on the ranking by consultant and contractor quantity surveyors was undertaken. Contractor quantity surveyors consider inadequate polytechnic education and training, inconsistent project implementation strategies and unclear organisation development goals as impacting most negatively on the competence of quantity surveying professionals. This finding reveals a need to establish collaboration between higher education institutions and professional bodies for the development and implementation of relevant strategic plans to resolve these inadequacies. Also, organisational development goals and project implementation strategies are relevant and important for contractors as opposed to firm consultants. The withdrawal of primary data from quantity surveying professionals was the only limitation; however, the factors primarily affecting quantity surveyors and their insights are vital.

Keywords: Competence of quantity surveyors, Construction projects, Consultant quantity surveyors, Contractor quantity surveyors, Developing countries

INTRODUCTION

Construction projects are becoming increasingly more sophisticated as clients expect value for their money (Yap et al., 2021). One of the professions critical to a successful construction project delivery is quantity surveying (Adesi, De-Graft and Murphy, 2018). However, a significant case has been made for inadequate competence of quantity surveying professionals in the construction industry (Dada, 2017; Adesi, De-Graft and Murphy, 2018; Shayan et al., 2019; Chamikira et al., 2020; Moyo et al., 2023). Further, numerous studies have acknowledged that the roles of quantity surveyors have evolved and continue to evolve (Crafford and Smallwood,

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2007; Dada and Jagboro, 2012; Dada, 2017; Akinola, 2019; Shayan et al., 2019). Despite competence being one of the most significant factors ensuring the success of a construction project, insufficient emphasis has been placed on it (Yong and Mustaffa, 2012). In addition, the lack of practice-informed research for construction professionals, including quantity surveyors, exacerbates the determination of context-specific resolutions. The lack of empirically revealed strategies for improving the competence of quantity surveying professionals compounds the challenge. In Zimbabwe, continuous professional development programmes, curriculum redesigns and designation-specific interventions have been recommended to address the inculcation of expected competencies (Moyo et al., 2023). However, these measures can only be effective if the factors that affect the competence of quantity surveying professionals are identified (Dada and Musa, 2016).

Therefore, this study aims to determine the factors that affect the competence of quantity surveying professionals in Zimbabwe. De Silva (2014), Perera et al. (2017) and Yogeshwaran, Perera and Ariyachandra (2018) reveal a mismatch between the competencies of quantity surveying graduates and the expectations of the construction industry. Even though previous scholars have advocated for greater collaboration between higher education institutions and the construction industry in developing and delivering programmes, a more integrated approach to deriving resolutions is pertinent. Therefore, determining the factors that affect the competence of quantity surveying professionals would go a long way in revealing remedies, besides an assessment of statistically significant differences between the insights of contractor quantity surveyors and consultant quantity surveyors.

In studies by Dada and Jagboro (2018) and Yap et al. (2021), only the views of quantity surveyors (working for contractors, consultants and client organisations, amongst others) were solicited as they were believed to be the best positioned to reveal the factors affecting their competence within their profession. Further, Moyo et al. (2023) revealed statistically significant differences in expected competencies due to designations between contractor quantity surveyors and consultant quantity surveyors and Bowen et al. (2008) only considered salaried and employed registered quantity surveyors to report on significant differences in job satisfaction aspects. Therefore, a potential variance in the insights between the two designations is expected.

The next section of the current article presents the factors affecting the competence of quantity surveyors. After that, the method utilised to resolve the research questions is elucidated, the findings are delineated and the implications are stated. Lastly, the conclusions, recommendations from the study and limitations of the study are presented.

Factors Affecting the Competence of Quantity Surveyors

Adesi, De-Graft and Murphy (2018) define competence as a human characteristic that includes knowledge, skills and special attributes to succeed in a particular profession. Competence-based measures are pertinent to the validation of performance (Dada and Jagboro, 2018). The factors affecting competence among quantity surveying professionals are aspects within the training of quantity surveying professionals that considerably affect how they express themselves in terms of knowledge, skills and attributes. Since quantity surveying professionals are important for the financial and contractual management of construction projects (Shayan et al., 2019), an interrogation of factors affecting their competence

is pertinent to addressing shortcomings in the delivery of construction projects. While some factors emanate from empirical studies, others have been inferred from recommendations from studies on the expected competencies of quantity surveyors. Table 1 shows factors affecting competence among quantity surveying professionals gathered from previous studies.

Table 1. Factors affecting the competence of quantity surveyors from previous studies

Code	Factors	Sources
FC1	Lack of adequate experience	De Silva (2014), Dada and Musa (2016) and Wanda, Tramontin and Haupt (2016)
FC2	Lack of relevant continuous professional development programmes	Crafford and Smallwood (2007), Dada and Musa (2016); Wanda, Tramontin and Haupt (2016), Dada and Jagboro (2018), Shayan et al. (2019), Moyo et al. (2023) and Yap et al. (2021)
FC3	Limited exposure	Shafie, Khuzzan and Mohyin (2014), Dada and Musa (2016) and Wanda, Tramontin and Haupt (2016)
FC4	Inadequate university undergraduate education and training	Crafford and Smallwood (2007), Hassan et al. (2011), Shafie, Khuzzan and Mohyin (2014), Olanrewaju and Anahve (2015), Dada and Musa (2016), Wanda, Tramontin and Haupt (2016), Dada (2017), Perera et al. (2017), Dada and Jagboro (2018), Yogeshwaran, Perera and Ariyachandra (2018), Moyo et al. (2023) and Yap et al. (2021)
FC5	Lack of apprenticeships on-the-job training (acquisition of specific skills)	De Silva (2014), Olanrewaju and Anahve (2015), Dada and Musa (2016), Dada and Jagboro (2018) and Yap et al. (2021)
FC6	Inadequately prepared for advances in information and communication technology	Hassan et al. (2011), Shafie, Khuzzan and Mohyin (2014), Dada and Musa (2016) and Yap et al. (2021)
FC7	Unclear individual career development goals	Bowen et al. (2008), Dada and Musa (2016) and Shayan et al. (2019)
FC8	Inadequate polytechnic education and training	Crafford and Smallwood (2007), Hassan et al. (2011), Shafie, Khuzzan and Mohyin (2014), Olanrewaju and Anahve (2015), Dada and Musa (2016), Wanda, Tramontin and Haupt (2016), Dada (2017), Perera et al. (2017), Dada and Jagboro (2018), Yogeshwaran, Perera and Ariyachandra (2018), Moyo et al. (2023) and Yap et al. (2021)
FC9	Lack of adequate research and development	Chynoweth (2013), Dada and Musa (2016), Wanda, Tramontin and Haupt (2016) and Moyo et al. (2023)
FC10	Lack of teamwork and development	Bowen et al. (2008), Yong and Mustaffa (2012), Dada and Musa (2016) and Dada (2017)

(*Continued on next page*)

Table 1. *Continued*

Code	Factors	Sources
FC11	Inadequate organisation set-up/structure	Bowen et al. (2008), Dada and Musa (2016) and Shayan et al. (2019)
FC12	Variable project implementation strategies	Dada and Jagboro (2018) and Shayan et al. (2019)
FC13	Unclear organisational development goals	Bowen et al. (2008) and Shayan et al. (2019)

Moreover, the greater empowerment of employees is identified as being essential. Crafford and Smallwood (2007) recommend interventions in curricula design, assessment of professional competency and continuous professional development to resolve the issue of competence deficiencies within the South African construction industry. Bowen et al. (2008) believe that organisational and team development structures can contribute to the competence of quantity surveyors by considering the nexus between competence, motivation and job satisfaction between salaried and employed quantity surveyors. On the other hand, Hassan et al. (2011) are in favour of incorporating advanced information technology in the training of quantity surveyors to enable them to respond to the developments in the construction industry.

Yong and Mustaffa (2012) mention team development through close relationships between professional project participants as being paramount to achieving construction project success in Malaysia. De Silva (2014) suggests the adoption of experiential learning as the remedy to reduce the gap between academic and practical training. This means exposing chartered surveyors more to on-the-job training and various experiential requirements as the fundamental part of their training. According to Shafie, Khuzzan and Mohyin (2014), employers suggest higher educational institutions and quantity surveying professionals to collaborate to improve quantity surveyors' soft skills by enhancing their exposure through increasing presentations in communication and information technology. Despite this, little has been achieved. Olanrewaju and Anahve (2015) suggest that quantity surveyors acquire and enhance their procurement of building services engineering skills, not only through higher and tertiary education but also through on-the-job training for the provision of a holistic service. The aspects of exposure and on-the-job training seem pertinent to the development of the quantity surveying professional. However, the nature of the construction industry, in which this can achieve positive results, should also be under consideration. With developing countries lagging behind in terms of technological advances, a number of aspects require deeper interrogation.

Dada and Musa (2016) investigate several factors that affect the competence of quantity surveying professionals. The factors were derived from a pilot study. Despite the few number of factors under study, factor analysis generated three components, namely organisation structure and team development, industrial exposure and the route of educational training. However, statistically significant differences due to insights of the various respondent groups were not assessed. Further, the inclusion of respondents such as medical doctors and lawyers likely lessens the validity of the results as they are less knowledgeable concerning the

competence requirements of quantity surveyors. Wanda, Tramontin and Haupt (2016) allude to the need to develop essential interventions through higher education and professional skills training while Perera et al. (2017) recommend curricula realignment as a way of dealing with the competence tensions between academia and the construction industry. Such realignment should consider contextual industry expectations through greater intensities of cooperation between the two sectors.

Dada (2017) identifies the need for higher-educational institutions and professional bodies to work together to enhance the competence of quantity surveying professionals through curricula redesign and continuing professional development programmes. Further, enhancing teamwork and development through improving communication skills is considered paramount. Related to this, Yogeshwaran, Perera and Ariyachandra (2018) reported on the need to design tertiary programmes that are acceptable to the construction industry in terms of addressing the expected competencies of quantity surveying graduates in developing countries. Shayan et al. (2019) contend that there is a need for individual quantity surveyors and quantity surveying companies to adjust for the incorporation of future competencies in line with global trends. Yap et al. (2021) consider internships, curricula design and continuing professional development as strategies to bridge the gap between the current and expected competencies of quantity surveyors.

All the highlighted factors in the previous studies are pertinent towards the development of competent quantity surveying professionals. Factor analysis seemingly reduces the number of factors and enables the determination of effective and coordinated strategies to resolve the challenges. Further, the generation of significant differences from various respondents enables the determination of targeted interventions. The next section explains the approach for this study.

RESEARCH METHOD

This study is part of broader research on the challenges faced by quantity surveyors, hence the methodology is similar to the one published in other journals. A questionnaire-based descriptive survey strategy was undertaken to collect quantitative data from both contractors and consultant quantity surveyors on the factors affecting their competence. The need to exercise objectivity and collect information from a large population (Leedy and Ormrod, 2016) supports this approach. Also, as supported by Dada and Jagboro (2018) and Yap et al. (2021), this positivist philosophy entails the use of numbers through scientific methods to contribute to acceptable knowledge (Saunders, Lewis and Thornhill, 2016).

Sampling

All 83 construction companies residing in Harare and Bulawayo and listed in the list of companies of the Construction Industry Federation of Zimbabwe (CIFOZ) were included in the contractor quantity surveyor selection. According to the CIFOZ list, more than 90% of the construction companies in Zimbabwe were found in the selected geographical areas. All eight CIFOZ categories (A–H) were approached for participation in the study where category A companies were the most organisationally and technically competent and financially stable. The survey

managed to collate data from all eight contractor categories represented in the study area with 48.6% of the contractors being in Category A. This was the highest category and as such, a high representation confirms the validity of the study. Consultant quantity surveyors in all 22 quantity surveying firms in Zimbabwe were also selected for participation in the current study.

Instrument Design

An online questionnaire that comprised two sections was utilised. Demographic information on the age, gender, designation, educational level and experience of the respondents constituted the first section. The second section required the respondents to rate the importance of the factors affecting the competence of quantity surveying professionals where 1 = "Not important", 2 = "Little importance", 3 = "Somewhat important", 4 = "Important" and 5 = "Very important".

DATA ANALYSIS

The collected quantitative data were processed and analysed using the Statistical Package for Social Science (SPSS) version 24, with 95% confidence in the results (Field, 2014). The questionnaire's reliability in providing stable and consistent results (Taherdoost, 2016) was confirmed by a Cronbach alpha reliability test. The questionnaire showed a very good reliability of 0.844. Factor analysis is a multivariate analysis technique that reduces the number of variables into interrelated factors or components (Yong and Pearce, 2013). This was used to reveal significant challenges faced by quantity surveying professions in Zimbabwe. The Kaiser-Meyer-Olkin (KMO) test, with a measure of 0.700, was also utilised to measure the sampling adequacy for conducting factor analysis with a validity of > 0.5 being acceptable (Ather and Balasundaram, 2009). Also, Bartlett's test for sphericity, which measures the multivariate normality of the set of distributions, with a value of 0.000 being < 0.05, indicates appropriately multivariate normal and acceptable data for factor analysis (Benson and Nasser, 1998). Significant components, with eigenvalues ≥ 1, were extracted using the principal component analysis with varimax rotation (Kaiser, 1958). Eigenvalues measure the variance in all variables attributable to that component or factor (Ather and Balasundaram, 2009). Varimax rotation maximises variance for each factor by enhancing the high loadings and reducing the low loadings (Benson and Nasser, 1998). Acceptable loadings ≥ 0.4 are considered stable for utilisation (Guadagnoli and Velicer, 1988). The descriptive categories of components' titles were derived from the constituents' variables (Asiedu and Ameyaw, 2021; Yap et al., 2021), as opposed to the utilisation of the variable with the highest factor model (Ather and Balasundaram, 2009).

The relative importance index (RII) assesses importance with "Not important" < 0.2; 0.2 <, "Of little importance" ≤ 0.4; 0.4 <, "Somewhat important" ≤ 0.6; 0.6 <, "Important" ≤ 0.8; 0.8 < and "Very important" ≤ 1 (Famiyeh et al., 2017). From this evaluation scale, importance was regarded from RII > 0.6. The Shapiro-Wilk test (sig. value of 0.000 which is less than 0.05) for normality for samples of more than 50 indicated that the data were not normally distributed (Ghasemi and Zahediasl, 2012). Thus, non-parametric tests for testing significant differences in demographic variables were utilised. Specifically, the Mann-Whitney U test, which compares the

central tendency of two independent samples for the demographic designation variable was employed (Blumberg, Cooper and Schindler, 2008). The statistical significance level for all tests is based on a standard value of $p < 0.05$.

RESULTS AND DISCUSSION

This section reports the profile of respondents as well as the results of the importance of the expected competencies and factor analysis.

Profile of Respondents

The response rate was a collective 48.6%, represented by 51 respondents (14 out of 22 consultant quantity surveyors and 37 out of 83 contractor quantity surveyors) from a population size of 105. This was satisfactory as it complies with Baruch's (1999) study, suggesting the response rate of 60% with a standard deviation of 20% as a standard norm for populations of professionals. The profile of the respondents, as shown in Table 2, shows a male-dominated construction industry, as indicated by Magwaro-Ndiweni (2016). As a representative of the population sizes, contractor quantity surveyors (72%) were the most represented designation, while consultant quantity surveyors had a lower percentage (28%). All the educational levels were proportionally represented, thereby adding to the validity of the study. Generally, all work experience categories were sufficiently defined and relevant to ascertaining the inclusivity of this study. In addition, all the demographic variables under consideration were well-constituted and this supported competent statistical analysis.

Table 2. Demographics of respondents

Description	Total	%
Gender		
Male	44	86
Female	7	14
Designation		
Contractor quantity surveyor	37	72
Consultant quantity surveyor	14	28
Educational Level		
Diploma	17	33
Degree	19	37
Master of Science	15	30
Experience		
Less than five years	19	37
6 years to 10 years	15	30
11 years to 15 years	9	18
More than 15 years	8	15

Factors Affecting the Competence of Quantity Surveying Professionals

From the factor analysis, four components were revealed with an eigenvalue of ≥ 1, which explained 68.994% of the total variance with factor loadings ranging from 0.892 to 0.532. The constituent factors, as shown in Table 3, of each component contributed to the title of the group of competencies (Ather and Balasundaram, 2009). Each group of competencies is discussed in Table 3.

Table 3. Factor analysis results

Factors	Component			
	1	2	3	4
Inadequate organisation, project and professional practice aspects				
FC13 Unclear organisational development goals	0.814			
FC1 Lack of adequate experience	0.794			
FC8 Inadequate polytechnic education and training	0.691			
FC12 Inconsistent project implementation strategies	0.670			
FC3 Limited exposure	0.560			
FC5 Lack of on-the-job training structures (acquisition of specific skills)	0.558			
FC2 Lack of relevant continuous professional development programmes	0.532			
Inadequate academic and technological advances				
FC4 Inadequate university undergraduate education and training		0.798		
FC6 Inadequately prepared for advances in information and communication technology		0.721		
FC9 Lack of adequate research and development		0.634		
Inadequate organisational structure and teamwork				
FC11 Inadequate organisation set-up/structure			0.892	
FC10 Lack of teamwork and development			0.844	
Unclear individual career development goals				
FC7 Unclear individual career development goals				0.794
Eigenvalue	4.793	1.792	1.244	1.140
The proportion of variance (%)	36.871	13.783	9.569	8.770
Cumulative variance (%)	36.871	50.655	60.224	68.994

Note: Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalisation.
a. Rotation converged in eight iterations.

Component 1: Inadequate organisation, project and professional practice aspects

The first component is named "Inadequate organisation, project and professional practice aspects" and accounted for 4.793 eigenvalues with a variance of 36.871%. The factors included in this component were "Unclear organisational development goals" (sig. = 0.814), "Lack of adequate experience" (sig. = 0.794), "Inadequate polytechnic education and training" (sig. = 0.691), "Inconsistent project implementation strategies" (sig. = 0.670), "Limited exposure" (sig. = 0.560), "Lack of on-the-job training structures (acquisition of specific skill)" (sig. = 0.558) and "Lack of relevant continuous professional development programmes" (sig. = 0.532). The factors in this component consisted of issues related to the organisation, projects and professional practice.

Both consultant and contractor firms need to have clear developmental goals as this helps significantly in mapping professional needs (Shayan et al., 2019). Changing developmental goals due to prevailing economic conditions has a detrimental effect on the training of quantity surveying professionals. Further, the organisation's strategy should be long-term and allow for the nurturing and longevity of employment contracts. This means the provision of favourable employment conditions is paramount. Failure to achieve this leads to a high turnover of professionals, inevitably affecting their competence and the overall performance of the organisation. Related to this, professionals have the opportunity to be exposed to high levels of proficiency of senior and experienced professionals regarding what is expected of them (Dada and Musa, 2016). This translates to relevant on-the-job training for quantity surveying professionals and potentially responds to the shortcomings in polytechnic education and training in the study area. Therefore, there is a need to align polytechnic education and training to the current needs of the construction industry in Zimbabwe. Standardisation of polytechnic training in accordance with regional and international quantity surveying organisations is important if competency objectives are to be met.

In terms of project-related aspects, the project implementation strategies (Dada and Jagboro, 2018) need to be consistent for the different types of projects undertaken by the consultant and contractor firms. This ensures the development of adequate competencies among quantity surveying professionals that are associated with specific types of projects. As a result, they can work independently and affect their relevant improvement strategies. The lack of types of projects within the Zimbabwean construction industry is a limitation. However, intensive implementations of project-related aspects are achievable. The resolution of relevant continuous professional development programmes is important as it deals with professionals aligning to the changing needs of clients as and when such changes are required. The collaboration with educational institutions culminates in the development and implementation of relevant continuous professional development programmes and is the prerogative of the professional body. There is a need for the existent professional body in Zimbabwe to be more visible and effective in delivering its mandate. Furthermore, where experts cannot be found in the construction industry, collaboration with other external bodies is pertinent.

Component 2: Inadequate academic and technological advances

The second component is named "Inadequate academic and technological advances" and accounted for 1.792 eigenvalues with a variance of 13.783%. The

factors included in this component were "Inadequate university undergraduate education and training" (sig. = 0.798), "Inadequately prepared for advances in information and communication technology" (sig. = 0.721) and "Lack of adequate research and development" (sig. = 0.634). This component consisted of factors that dealt with academic and technological advances.

Improvements in university undergraduate education and training are one of the most common recommendations (Crafford and Smallwood, 2007; Hassan et al., 2011; Shafie, Khuzzan and Mohyin, 2014; Olanrewaju and Anahve, 2015; Dada and Musa, 2016; Wanda, Tramontin and Haupt, 2016; Dada, 2017; Perera et al., 2017; Dada and Jagboro, 2018; Yogeshwaran, Perera and Ariyachandra, 2018). Having course or module instructors from the construction industry would go a long way in bridging the competency gap. However, the curriculum redesigning should suit the needs of the specific study areas since the construction industry consists of varying levels of development. A nexus between the construction industry and academia needs to be established in Zimbabwe. There is also a great need for continuous collaboration and forecasting future needs within the industry as well as planning for this. This can be achieved by the promulgation of a robust research and development unit (Moyo et al., 2023), either as a separate entity that drives the construction industry or within universities. In addition, such an initiative must be supported by the intended beneficiaries (built environment organisations, clients and other relevant stakeholders) and be constituted by competent researchers.

Moreover, advances in information and communication technology (Yap et al., 2021) cannot be ignored. The complexity of projects and the sophisticated needs of clients require quantity surveying professionals to be abreast of such advances. The current traditional approaches in the Zimbabwean construction industry regarding measurement, estimation and communication are time-consuming, laborious and costly. Therefore, dealing with this aspect at the construction industry policy level may have the most impact. Also, professional bodies can implement requirements that enable professionals to acquire relevant information and communication technology skills. Interventions such as partnerships with international firms and incentives for incorporating such advances may also be implemented.

Component 3: Inadequate organisational structure and teamwork

The third component is named "Inadequate organisational structure and teamwork" and accounted for 1.244 eigenvalues with a variance of 9.569%. The factors included in this component were "Inadequate organisation set-up/ structure" (sig. = 0.892) and "Lack of teamwork and development" (sig. = 0.844). This component consisted of organisational structure and teamwork factors.

The importance of adequate organisational structures (Bowen et al., 2008) cannot be overemphasised as it allows professionals to work and plan within the mission, vision and core values of the firms. The scarcity of construction projects in the study area had possibly contributed to the lack of adequate organisational structure. This is due to the short lives of the organisations as they diversify or exit and re-enter the industry at various economic intervals.

Also, the managerial or leadership competencies of the quantity surveying professionals in Zimbabwe need to be further developed to improve the organisational set-up of quantity surveying firms. Inevitably, once this has been aligned, professionals can exert themselves competently and in a unified direction. Such structures also aid the gradual and effective progression of quantity surveying professionals. Teamwork and development are beneficial (Bowen et al., 2008; Yong and Mustaffa, 2012) within the organisation or with other construction professionals in the execution of construction projects. While teamwork may exist across the different construction professionals, quantity surveying firms rarely enter into partnerships or joint ventures in the Zimbabwean construction industry. This is owing to the highly competitive environment that exists and possible trust issues. However, teamwork and development enhance confidence and motivate quantity surveyors to grow in their profession. Hence, these two factors create a conducive environment for quantity surveying professionals to develop and advance professionally.

Component 4: Unclear individual career development goals

The fourth component is named "Unclear individual career development goals" and accounted for 1.140 eigenvalues with a variance of 8.770%. The factor included in this component was "Unclear individual career development goals" (sig. = 0.794). The issue of having clear individual career development goals is important (Dada and Musa, 2016) as it enhances the competency of quantity surveying professionals. Quantity surveying graduates can select various career development goals after graduation. This can affect quantity surveying professionals at different levels of their career development and even encourage career path deviations because the slumps in the construction industry encourage the movement of quantity surveying professionals across different roles as they endeavour to survive in the industry. This is exacerbated by a lack of career development advisory roles from within the professional body in Zimbabwe. Such a scenario makes it difficult for quantity surveyors to progress and develop in specific roles, thereby affecting their competence. Although the factors against individual career development are numerous, relevant stakeholders should fulfil their role in reducing their effects. The professional body should also play its part in its career advisory capacity and allow for registration under various designations (Moyo et al., 2023). In short, innovation and clear organisational structures are essential if consultant and contractor firms are to support their professionals' individual career development goals.

Significant Differences Due to Designation

Respondents contributed their insights on the factors affecting the competence of quantity surveying professionals, as shown in Table 4.

Table 4. Ranking of factors affecting the competence of quantity surveying professionals

Factors	Overall		Consultant Quantity Surveyor		Contractor Quantity Surveyor		Mann Whitney Results
	RII	Rank	RII	Rank	RII	Rank	Sig.
FC3 Limited exposure	0.843	1	0.854	1	0.814	5	0.501
FC5 Lack of on-the-job training structures (acquisition of specific skills)	0.816	2	0.805	2	0.843	4	0.683
FC6 Inadequately prepared for advances in information and communication technology	0.788	3	0.762	5	0.857	2	0.082
FC9 Lack of adequate research and development	0.788	3	0.789	3	0.786	7	0.537
FC1 Lack of adequate experience	0.784	5	0.778	4	0.800	6	0.677
FC2 Lack of relevant continuous professional development programmes	0.745	6	0.741	9	0.757	8	0.809
FC10 Lack of teamwork and development	0.745	6	0.757	7	0.714	11	0.629
FC11 Inadequate organisation set-up/ structure	0.745	6	0.746	8	0.743	9	1.000
FC7 Unclear individual career development goals	0.737	9	0.762	5	0.671	13	0.339
FC13 Unclear organisational development goals	0.737	9	0.686	10	0.871	1	0.003*
FC12 Inconsistent project implementation strategies	0.729	11	0.681	11	0.857	2	0.002*
FC4 Inadequate university undergraduate education and training	0.647	12	0.616	12	0.729	10	0.064
FC8 Inadequate polytechnic education and training	0.612	13	0.573	13	0.714	11	0.028*

According to the RII evaluation scale, under the overall ranking and that of contractor quantity surveyors, all 13 factors were considered important with RII > 0.6 (Perera et al., 2007). However, consultant quantity surveyors considered "Inadequate polytechnic education and training" as not important with RII ≤ 0.6. This is contrary to the studies undertaken by Crafford and Smallwood (2007) in South Africa and Dada and Musa (2016) in Nigeria, in which the factor is considered important. This is potentially due to differences in the curricula of polytechnic education in developing countries. The notion is that polytechnic education and training are adequate for the needs of consultant quantity surveyors in the study area.

The top three factors affecting the competence of quantity surveying professionals included "Limited exposure" (RII = 0.843), "Lack of on-the-job training structures (acquisition of specific skill)" (RII = 0.816), "Inadequately prepared for advances in information and communication technology" (RII = 0.788) and "Lack of adequate research and development" (RII = 0.788). The issues of exposure and lack of on-the-job training structures (acquisition of specific skills) are very important (RII ≥ 0.8). According to Shafie, Khuzzan and Mohyin (2014), Wanda, Tramontin and Haupt (2016) and Dada and Musa (2016), skills are transferred when professionals are exposed to different types of projects and different professional teams. However, owing to the potential scarcity of construction projects in Zimbabwe, the necessary exposure required by quantity surveyors is either limited or inadequate.

In addition, the complexity of projects (Yap et al., 2021) exacerbates the demise of quantity surveying professionals. The factors of "Inadequately prepared for advances in information and communication technology" and "Lack of adequate research and development" were considered very important, thereby supporting the findings of Hassan et al. (2011), Shafie, Khuzzan and Mohyin (2014), Chynoweth (2013) and Moyo et al. (2023). The advent of building information modelling as a foundation of digital transformation cannot be ignored, and its lack of adoption is detrimental to the needs of construction stakeholders, as alluded to by Yap et al. (2021). Shafie, Khuzzan and Mohyin (2014) also support adequate preparation for advances in information and communication technology to enable quantity surveying professionals to remain relevant and offer value for money to construction clients. The two factors indicate a general lack of research and development within the higher-educational institutions and professional bodies to enable the enhancement of quantity surveying professional competencies. As opined by Moyo et al. (2023), research and development are essential to improving the profession.

The Mann-Whitney U test confirmed that there was no significant difference between the collective insights of consultant quantity surveyors and contractor quantity surveyors on these factors; therefore, these are considered the most important factors from both designations. However, the results of the Mann-Whitney U tests showed that there was no statistically significant difference in 10 of the 13 factors affecting the competence of quantity surveying professionals concerning designation since their *p*-value > 0.05. Moyo et al. (2023) determine that the two designations have statistically significant differences in terms of the expected competencies of quantity surveying professionals, but they generally agree on their insights concerning the factors that affect their competence. The individual factors, which were analysed, had statistically significant differences, as shown in Table 5.

Table 5. Summary of Mann-Whitney U test results on designations

Factors	Sig.	Designation Mean Ranks	
		Consultant Quantity Surveyor	Contractor Quantity Surveyor
FC8 Inadequate polytechnic education and training	0.028	23.30	33.14
FC12 Inconsistent project implementation strategies	0.002	22.30	35.79
FC13 Unclear organisational development goals	0.003	22.34	35.68

Among the factors, contractor quantity surveyors had higher mean ranks as compared to those of consultant quantity surveyors, as shown in Table 5. This indicates that contractor quantity surveyors generally consider inadequate polytechnic education and training, inconsistent project implementation strategies and unclear organisational development goals as negatively impacting the competence of quantity surveying professionals. This is most likely due to the aspects of organisational development goals and project implementation strategies being more relevant and important for contractors as opposed to consultants. Importantly, contractor quantity surveyors are expected to function better when the company has clear and adequately stipulated organisational development goals and project implementation strategies. Also, the expected competencies for contractor quantity surveyors allocate more importance to adequate polytechnic education and training as generally supported by Dada and Musa (2016), Perera et al. (2017), Dada and Jagboro (2018), Yogeshwaran, Perera and Ariyachandra (2018) and Yap et al. (2021). Again, this supports the findings that the two designations have varying expectations (Moyo et al., 2023).

CONCLUSIONS

The increased complexity of construction projects necessitates the need to ensure that built environment professionals achieve and maintain the highest levels of competency. However, this is seldom accomplished as various factors negatively affect the competency of these professionals. One of the critical professionals is a quantity surveyor, whose responsibilities include the effective cost and contractual management of construction projects. Hence, this research aimed to determine the factors that affect their competence in the Zimbabwean construction industry through factor analysis.

Significant factors include inadequate project and professional practice, inadequate academic and technological advances, inadequate organisational structure and teamwork and unclear individual career development goals. These findings are consistent with issues that affect developing countries and reveal a need to establish collaboration between higher-educational institution and professional bodies for the development and implementation of relevant strategic plans for resolving these inadequacies. Therefore, construction organisations need to adjust their organisational structures and development goals to align with accepted global best practices. Also, quantity surveying graduates and professionals need

adequate career advice and mentorship to enable them to optimise their skills within the profession. Effective research and development can timeously drive the resolution of the challenges affecting quantity surveying professionals and even proffer contextual innovations.

Furthermore, the research also assessed statistically significant differences due to the designations of consultant and contractor quantity surveyors. Many factors have no significant differences due to these designations, except inadequate polytechnic education and training, inconsistent project implementation strategies and unclear organisation development goals, which have significant variances. Contractor quantity surveyors consider these to be more important compared to consultant quantity surveyors owing to these factors being more relevant and required in construction companies. This is due to the competitive nature and economic challenges of the construction industry, which require construction companies to be resourced with adequately trained quantity surveying technicians and for those organisations to be well organised and structured.

The withdrawal of primary data from quantity surveying professionals was the only limitation. However, the factors primarily affecting quantity surveyors and their insights were discussed. Further research can consider the factors affecting the competence of the other key built environment professionals to establish a holistic intervention strategy.

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