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Assessment of the involvement of quantity surveyors in civil engineering construction project in Kano State, Nigeria

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Abstract
Past studies have revealed the lack of involvement of Quantity Surveyors (QS) in Civil Engineering project (CEP) in Nigeria which leads to the false notion of competence of QS in CEP and QS lack of awareness on job opportunity to explore in CEP. In view of this, the study assessed the involvement of QS in Civil Engineering construction project in Kano state with a view of improving the participation of QS in Civil Engineering projects to improve effective cost estimation in the Civil Engineering projects. The use of quantitative research approach was employed using questionnaire survey. For this purpose, 94 copies of questionnaire were administered to registered construction professionals in Kano with a response rate of 77.66%. The use of descriptive and inferential statistical methods was adopted for this research; Mean Item Score (MIS) and Spearman Rank correlation, Analysis of Variance (ANOVA) and Post Hoc test were employed for data analyses with the aid of IBM SPSS 27. Findings from the study revealed that: competence of QS to value element of CE works, the most agreed upon are building material technology (MIS = 4.03) and construction technology (MIS = 3.96); It was concluded that the involvement of QS in CEP in kano is on an average and that QS are competent to value for most element of Civil Engineering. however, some gaps were identified for improvement. gaps identified includes area of transport engineering, geotechnical engineering, water resources & irrigation engineering and hydraulics. It was therefore recommended that QS fill the gap and acquire basic skills for the element as you can't measure what you don't know and to fully participate in CEP and for QS to end the conservative era and diversify as their involvement equals effective estimation of CEP.
Keywords: Civil Engineering, Competence, Effective cost estimation, Elements, Kano State.

Introduction

The construction industry plays a very important role in the development of any country either developed, developing, or underdeveloped because of its direct contribution to the economy, the industry micro economic contribution to the gross domestic product (GDP), gross national product and gross fixed capital formation cannot be overlooked (Olanrewajua and Anahve, 2015). Between 2010 and 2012, the sector experienced average growth of 18.08%. In 2014, the construction industry contributed 2.568.464.75 to the GDP. In the first quarter of 2015, it contributed 697,366.62 million (4.34%) to the entire real GDP, in 2022 construction sector contributes 12.9 trillion to Nigeria GDP in the first three quarters (National bureau of statistics (NBS), 2022). With this much effect on the economy QS should be brought in to moderate the cost aspect of both building and civil engineering works considering the large share of the total budgeting allocation of capital projects (Oke et al, 2010).

The dynamism of the construction industry calls for the need of stringent cost control and effective cost management that provide the client with value for his money (Oke et al, 2010).they also call for the skill of professional QS to carry out these roles this is also agreed by Oladimeji and Adebiyi (2017) that QS are the professionals that are responsible for ensuring financial probity and achieving value for money in the execution of building, civil engineering and heavy engineering in Nigeria. however, the involvement of QS in carrying out construction project particularly civil engineering project is very low this is also supported by Owojori (2010) that affirms that level of involvement of QS is low and their roles are being carried out by builders and civil engineers but however, in cases where QS services are provided by QS the cost of the project are reduced substantially. The parameters of time, cost, and quality are used to gauge a project's success. However, it is generally known in Nigeria that civil and heavy construction projects haven't done well on any of the metrics (Osurbor, 2017). Also, there is a widespread belief in Nigeria that engineers can manage civil and heavy engineering contracts through design, costing, and management utilising a bill of engineering measures and evaluation (BEME). Yet over time, there have been no records of any successful civil and heavy engineering projects, necessitating a change in approach and method of operation (Osurbor, 2017). QS must be involved in civil engineering projects for the industry to leverage on the dynamism of the QS profession this study aims at improving the involvement of QS in carrying out civil engineering works by assessing the competence of QS to value elements of civil engineering works to promote effective estimation of civil engineering works.

Literature review

Quantity Surveying is a science that focuses on the precise computation and measurement of the labour and materials needed for construction operations, including building and engineering projects (Opawole et al., 2012). These services are carried out by Quantity surveyors (QS). Quantity surveyors are experts who are concerned with the financial integrity in the conceptualization, planning, and implementation of both new development projects and renovation activities (Jagboro, 2016), while Civil Engineering is a field engaged in the planning, design, building, and operation of physical infrastructure necessary for contemporary life and communal living Opawole et al. (2012). The role of QS in civil engineering works consist of two stages at the precontract and post contract stage. At the Pre-Contract Stages of any Project, quantity surveyor performs the following roles: Project development advice, Estimating and cost advice, advice on tendering procedure and contractual arrangements, Cost planning, Preparation of bills of quantities, Insurance of Civil Engineering projects. At Post Contract Stages of Civil Engineering and building projects, quantity surveyor performs the following roles: Interim valuation/final valuation, Arbitrator/expert witness, Measurement of variation and agreeing claims, preparing, and setting

final account with contractors, construction cost and Contract audit. (Pacific association of Quantity Surveyors (PAQS), 1999).

Quantity surveyors are employed by every branch of the global construction industry, including Civil Engineering and are competent to value for all aspect of civil engineering (royal institute of chartered surveyors (RICS), 2018). According to Olanrewaju and Anahve (2015), the responsibilities of QS have expanded across a variety of industries, including petrochemical, manufacturing, agriculture, automotive, mining, telecommunication, shipping, and transportation. Nonetheless, most QS still view engineering services as outside limits (Ashworth, 2010; Marsh, 2013). which is why in Nigeria, QS involvement is fully appreciated for building engineering construction but minimal in engineering project. where as in Great Britain, where Nigeria's Quantity Surveying education derived its source and model from, QS are adequately engaged in engineering projects (Olanrewaju, and Anahve, 2015). The QS has made significant impact on construction cost administration and have contributed positively to the growth of the Nigerian building industry in several areas that include financial accountability, management of inflation, risk management and ensuring clients in the construction industry value for money Owojori (2010). Similar studies by Oke, et al, (2010) also emphasizes on the beneficial impact of QS which includes, reduction in the cost of construction, project delivery to time, faster and more effective project management, and reduction in disputes. However, QS involvement is still considered low by several of similar studies making one to mistake their lack of involvement for incompetence because most QS in Nigeria view this as a no-go area, while outside of Nigeria, the diversification of the QS serves as a reminder that we are still developing slowly in Nigeria. Thus, steps should be taken to boost the QS's engagement in CE projects since CEP offers more job prospects and would lead to more successful execution of civil engineering project.

Quantity Surveyor Competence to Value for Civil Engineering Works

A competent quantity surveyor, according to Babalola (2009), is required to have a variety of skills, knowledge, and understanding as well as the ability to use those skills and knowledge in a variety of contexts and organisations. Personal and social skills, business skills, information technology, professional practice, legislation, measurement, and mapping are among the fundamental capabilities of QS (RICS, 1998). Construction contract practice, construction technology, environmental services, construction economics, procurement, and financial management are among QS's key capabilities (RICS, 1998). Arbitration and other dispute resolution processes, facilities management, insolvency, insurance, project management, finance for real estate investments, research methodologies and techniques, taxes allowances and grants, valuation are among the optional skills of QS (RICS, 1998). Under the RICS system, all construction professionals must possess the same fundamental abilities, but only quantity surveyors must possess the core competences, which are areas of specialty or potential future career diversification (Nkado and Meyer, 2001). Quantity Surveyors are not expected to design and construct Civil Engineering infrastructure but rather to show adequate understanding of the design and construction with the aim of being able to communicate and interpret for the purpose of the cost management services. They also supported this competency required of Quantity Surveyors in managing Civil Engineering works. Nigerian quantity surveyors have developed significant competencies in cost planning and control, estimation, the construction procurement system, contract documentation, contract administration, project management, feasibility/viability studies, valuation, financial management, development economics, risk management, life cycle costing, facility management, arbitration, and dispute resolution, according to a study conducted by Dada and Jagboro (2012). Additionally, it was noted by Dada and Jagboro (2012) that a significant portion (75%) of Nigerian quantity surveyors' competencies fall under the core competencies band of the Royal Institute of Chartered Surveyor's competency scheme; this demonstrates how positively and dynamically the country's practice of Quantity Surveying is responding to the needs of the built environment, including accurate assessment and evaluation of Civil Engineering works (Olawumi and Ayegun, 2016).

The curriculum used by different tertiary institutions that provide degrees in Quantity Surveying is suitably prepared with the necessary topic areas for the efficient training of aspiring QSs. This is supported by Adeyelu (2015), who claimed that undergraduate-level programmes in Quantity Surveying provide an appropriate foundation that gives graduates of the profession the skills necessary to assure financial probity during the project's conception, planning, and execution phases. This is supported by Ajanlekoko (2003), who argued that the curriculum used in Quantity Surveying programmes needs to be evaluated internationally for QSs in Nigeria to have the necessary education, training, and skills to guarantee that value for money is realised in all construction projects. This is consistent with NIQS (2018), which asserted that training QSs gives them the knowledge and abilities necessary for managing the financial and contractual aspects of a project from inception to conclusion. Olanrewaju and Anahwe (2015) claimed jointly that it would be inappropriate to assert that all quantity surveyors have the necessary training and expertise to offer expert guidance on engineering services in the same way that they do for other construction-related procedures.

According to a few researchers (Ashworth, 2010; Ashworth, Hogg, and Higgs, 2013; Marsh, 2003), some quantity surveyors have specialised their work to the point where they prefer to be referred to as "M and E Quantity Surveyors," ostensibly to denote those who are "qualified" to provide guidance on building and Civil Engineering services. Applied sciences such as civil, electrical, product, and chemical engineering, as well as pure and applied economics, finance, accounting, politics, sociology, government administration, and law are all included in the curriculum of quantity surveyors, according to Mogbo (1998). However, Mogbo (1998), who argued for an overhaul of the quantity surveyor's syllabi in the Nigerian tertiary institutions to address all engineering projects, supports Jagboro's (1991) claim that the training of quantity surveyors in Nigeria has not resulted in adequate quantitative competence of the professionals. It is reasonable to conclude from these points of view that many quantity surveyors have distinguished themselves and possess the necessary knowledge and skills to successfully acquire and manage Civil Engineering projects. This submission is supported by Opawole et al. (2012) who reported that in a recent survey that "education and training of Quantity Surveyors in Nigeria provides adequate skill

requirement for providing services requiring measurement of Civil Engineering works as well as services requiring evaluation of Civil Engineering works and financial management with about 51.2% and 52.2% of the curriculum and course content of University and Polytechnic respectively satisfying. Meanwhile, they recommended that the Quantity Surveying curriculum and course material be continually revised in Nigeria's higher education system in order to bring the discipline up to the constantly evolving worldwide standards demanded by the expanding problems of engineering projects.

Element of Civil Engineering

Protection of the welfare and safety of the people" is the slogan of the Civil Engineering discipline. In fact, the term "civil" in "Civil Engineering" refers to the field's involvement in projects that benefit the public, such as government structures, military installations, mass transit systems (such as roads, trains, airports, and waterways), water treatment facilities, waste management systems, irrigation systems, etc. (Prakash, 2015). Civil Engineering has a very broad range of applications, and it encompasses a wide range of subjects that are diverse and contribute to the overall advancement of any civilization. Prakash (2015) lists and explains the several divisions that fall under the Civil Engineering field.

- Building Materials Technology
- Geotechnical Engineering
- Structural Engineering
- Construction Technology
- Hydraulics
- Water Resources and Irrigation Engineering
- Transportation Engineering
- Environmental Engineering

Research methodology

A quantitative research approach was employed for the study. The use of well-structured questionnaire was adopted for data collection. Descriptive and inferential statistical tool such as mean item score MIS and percentages, analysis of variance (ANOVA) was used to analyse the data collected. ANOVA test carried out at the 95% confidence interval to identify the difference in the response of professionals following the ANOVA, post hoc test for multiple comparison was carried out to identify which group differ from the others.

The questionnaire was administered to the relevant professionals involved in Civil Engineering construction works such as: Architects, Quantity Surveyors, Engineers and Builders. Research population involves a large collection of individuals or object that is the focus of a scientific query. It refers to the total number of the considerable population for the research (Morenikeji, 2006). The targeted population for this research is made up of selected professionals that are involved in the execution of civil engineering construction project. professionals include (Architects, Quantity Surveyors, Builders and Engineers) working in kano state registered under their professional bodies.

The list containing information about professionals registered in Kano state from which data were collected constitutes the study's sampling frame. Architect NIA (224), QS NIQS (55), Engineers COREN (1100), Builders CORBON (50)

The sample size for this research consists of the selected registered professionals of total population 1429. The sample size was calculated using the Yemane (1967) formula:

Where n = sample size; N = total population, e = level of precision as 0.1.

Using the above formula sample size is calculated to be 94. Therefore, sample size adopted for this research is 94.

The data for this study was retrieved with the aid of questionnaire. The questionnaire was used to collect data based on the research objective based on a five-point Likert's Scale format.

Discussion of result

Presentation of Respondents' Profile

Response rate; the total number of distributed questionnaires was 94 and 73 questionnaires were retrieved; the 73 questionnaires retrieved were deemed useful for this research. showing an effective response rate of 77.66% which is considered adequate for this analysis, in carrying out a statistical analysis in a survey in which the response rate is above or equal 30 is acceptable (banty, 2008).

Table 1: Respondents' profile

Profile	Statistic	percentile
Designation	**Frequency**	**Percentage (%)**
Safety officer	1	1.4
Site engineer	27	37
Construction manager	9	12.3
Project manager	26	35.6
Others	10	13.7
Total	**73**	**100**
Profession	**Frequency**	**Percentage (%)**
Architect	3	4.1
Builders	9	12.3
Engineer	27	37
Quantity Surveyors	32	43.8
Others	2	2.7
Total	**73**	**100**
Educational Qualification	**Frequency**	**Percentage (%)**
HND	18	24.7
BTech/BSc	35	47.9
MSc/MTech	17	23.3
PhD	1	1.4
Others	2	2.7
Total	**73**	**100**
Professional Qualification	**Frequency**	**Percentage (%)**
NIA	3	4.1
CORBON	9	12.3
COREN	13	17.8
NIQS	32	43.8
Others	16	21.9
Total	**73**	**100**
Years of Working experience	**Frequency**	**Percentage (%)**
-Jan	21	28.8
10-May	26	35.6
15 Oct	15	20.5
15 20	8	11
Above 20	3	4.1
Total	**73**	**100**
Sector of organisation	**Frequency**	**Percentage (%)**
Public	24	32.9
Private	49	67.1
Total	**73**	**100**
Years of operation of the respondents' organisation	**Frequency**	**Percentage (%)**
10-15	37	50.7
15 20	11	15.1
20-25	6	8.2
25-30	4	5.5
above 30years	15	20.5
Total	**73**	**100**
Organisation Activity	**Frequency**	**Percentage (%)**
Civil Engineering	1	1.4
building and Civil Engineering	59	80.8
Civil Engineering and others	13	17.8
Total	**73**	**100**

Most of the respondents are site engineers with 37.0% and the next majority are the project manager with 35.6% next is 13.7% of the respondents are designated other roles on construction site, 12.3% are construction managers, while the lowest 1.4% of the respondent are site managers. This shows that the mix of majority of the respondents contains professionals who perform various roles in Civil Engineering construction project. Therefore, information retrieved from them could be relied upon for this research. The profile of respondents' profession indicates that majority 43.8% of the respondents are Quantity Surveyors. This is followed by Engineers who are 37.0% of the respondents. Builders are next in population with a total of 12.3% respondents. 4.1% of the respondents are Architects, while 2.7% of the respondents are from other construction related professions. These professionals are therefore capable of given reliable information required for the study.

It is shown that majority of the respondents are holders of Bachelor's Degree (B. Tech/BSc) with a percentage of 47.9%; 24.7% are holders of Higher National Diploma (HND); and 23.3% of the respondents are holders of Master's Degree (M. Tech/MSc) while 2.7% are holders of PhD. This implies that the respondents are educated enough to read and understand the information in the questionnaire with only minimal or no guidance required. They are therefore able to give reliable response to the questionnaire.

43.8% of the respondents are professional members of the Nigerian Institute of Quantity Surveyors (NIQS); 21.9% of the respondent are professional members of other bodies of the built environment professions, 17.8% of the respondents are registered members of the Council for the Registration of Engineers in Nigeria (COREN); 12.3% of the respondents are professional members of the Council of Registered Builders of Nigeria (CORBON); 4.1% of the respondents are registered members of the Nigerian Institute of Architects (NIA). This indicates that the respondents are certified experts of their various professional bodies. They are therefore certified to give reliable information that is needed for this study.

It was shown that majority (35.6%) of the respondents have between 5 and 10 years of experience; 28.8% of the respondents' have between 1 and 5 years of experience; 20.5% of the respondents have between 10 and 15 years of experience; and 11.0% of the respondents have 15-20 years of experience and 4.1% have above 20 years of experience.

This shows that there is a balance of experience within the years of experience of the respondents and changes overtime can be balanced based on the response given by the years of experience of each respondent, as well as majority of the respondents have between 5 and 10 years of experience which is sufficient for this study. Majority of the respondents work in the private sector of the industry with 67.1% while, 32.9% of respondent work in the public sector.

Years of operation of the respondent's organisation. 50.7% of the respondent's organisation have 10-15 years of operation; 20.5% of respondent's organisation have above 30 years of operation; 15.1% of respondent's organisation have 15-20 years of operation; 8.2% of respondent's organisation have 20-25 years of operation and 5.5% of respondent's organisation have 25-30 years of operation.

From the analysis it shows that 80.8% of the respondent organisation carryout both building and Civil Engineering; 17.8% carryout Civil Engineering and other works; 1.4% carryout only Civil Engineering works. Therefore, information provided can be relied upon for this study as all respondents are involved in civil engineering works.

Table 2 shows ranking of different Element of Civil Engineering works base on the respondents' perspectives, analysis was carried out to assess the competence level of QS to value for each element. Element presented where ranked according to competence level of QS to measure for them using MIS, the ranking implies the QS level of competency to value for a particular element which also implies that their ability to measure for each element could vary or be alike. analysis shows the MIS score for each element, the results of the analysis show that the competence level of QS to value for building technology work is the highest with M1S 4.03; construction technology comes 2nd with MIS 3.96; surveying 3rd MIS 3.80; structural engineering 4th MIS 3.59; environmental engineering 5th MIS 3.58; transport engineering 6th MIS 3.43; geotechnical engineering 7th MIS 3.25; water resource and irrigation engineering 8th MIS 3.22; hydraulics 9th with MIS 3.06. Based on the analysis and their group mean 3.55 most respondent agree that QS are competent to value for all the element of Civil Engineering works on an average level but are neutral in some element .base on this analysis decision on some element remains neutral this implies that the QS competence to value for them is average which indicate lacking in that particular area this is also identified by Olawumi and Ayegun,(2016) that the QS need to include important skills and competencies concerning civil engineering which may be lacking in the current program

Table 2: Competence of QS to Value for the Different Element of Civil Engi neering

S/NO	Element of Civil Engineering	Mean	Rank	Decision
1	Building materials technology	4.03	1st	Agree
2	Construction technology	3.96	2nd	Agree
3	Surveying	3.80	3rd	Agree
4	Structural engineering	3.59	4th	Agree
5	Environmental engineering	3.58	5th	Agree
6	Transport engineering	3.43	6	Neutral
7	Geotechnical engineering	3.25	7th	Neutral
8	Water resources and irrigation engineering	3.22	8th	Neutral
9	Hydraulics	3.06	9th	Neutral
	Group mean	***3.55***		***Agree***

Table 3 shows the significant difference between the responses of the different group of professionals on the competence level of QS to value for the different element of civil engineering.

Table 3: Variation in Respondents' Opinion Based on Their Profession and Descriptive Statistics.

	Variables	Sum of Squares	df	Mean Square	F	Sig.
1	Surveying	5.486	4	1.372	1.16	0.336
		80.432	68	1.183		
		85.918	72			
2	Building materials technology	14.097	4	3.524	4	0.006
		59.848	68	0.88		
		73.945	72			
3	Geotechnical engineering	8.38	4	2.095	2.26	0.072
		63.182	68	0.929		
		71.562	72			
4	Construction technology	17.028	4	4.257	3.92	0.006
		73.848	68	1.086		
		90.877	72			
5	Structural engineering	10.119	4	2.53	1.69	0.162
		101.55	68	1.493		
		111.67	72			
6	Hydraulics	3.923	4	0.981	0.84	0.508
		79.858	68	1.174		
		83.781	72			
7	Water resources & irrigation engineering	2.636	4	0.659	0.51	0.729
		87.858	68	1.292		
		90.493	72			
8	Transport engineering	2.682	4	0.67	0.66	0.622
		69.154	68	1.017		
		71.836	72			
9	Environmental engineering	7.539	4	1.885	1.33	0.267
		96.296	68	1.416		
		103.84	72			

Table 3 shows the significant level of difference between and within the group of each profession base on the P-value (0.05) from the one way ANOVA test carried out .one way ANOVA test is used in comparing three or more sets of scores gotten from different groups(Kruskal and wallis,1952).if the f value is greater than the critical F-value of 2.866 it means there is a significant difference in the response of each group of professional while if the f value is lower it means there exist a significant relationship between the groups of professional response on the level of QS competence to value that particular element. From the table 3 we can conclude that there is no significant difference between the responses of each group as the f value for these elements(surveying, geotechnical engineering, structural engineering, hydraulics, water resources & irrigation engineering, transport engineering, environmental engineering) are less than our critical F-value of 2.866, that is to say each group of professionals have similar responses to the elements mentioned except for building material technology and construction technology where the f value are greater than the critical F-value of 2.866 implying that there is a significant difference of opinion of each group on the QS competence to measure for them.

Table 4 shows a multiple comparative test to understand which group differ from the another. The comparative test is carried out on two element of civil engineering which are building material technology and construction technology base on the identified significant difference in the respondent view of QS competent to value for them.

Table 4: Post Hoc Test (Tukey HSD) on Identified Element with Difference of Opinion

S/N	Dependent Variable	(I) profession	(J) profession	Mean Difference (I-J)	Std. Error	Sig.
1	Building materials technology	architect	builder	1.222	0.625	0.299
			engineer	0.519	0.571	0.893
			quantity surveyor	-0.073	0.566	1.000
			others	-0.167	0.856	1.000
		builder	architect	-1.222	0.625	0.299
			engineer	0.704	0.361	0.302
			quantity surveyor	-1.295	0.354	0.004
			others	-1.389	0.733	0.331
		engineer	architect	-0.519	0.571	0.893
			builder	0.704	0.361	0.302
			quantity surveyor	-0.591	0.245	0.124
			others	-0.685	0.688	0.856
		quantity surveyor	architect	0.073	0.566	1.000
			builder	1.295	0.354	0.004
			engineer	-0.094	0.684	1.000
			others	0.167	0.856	1.000
		others	architect	1.389	0.733	0.331
			builder	0.685	0.688	0.856
			engineer	0.094	0.684	1.000
			quantity surveyor	1.000	0.695	0.605
2	Construction technology	architect	builder	0.406	0.629	0.967
			engineer	-0.500	0.951	0.984
			quantity surveyor	-1.000	0.695	0.605
			others	0.704	0.401	0.408
		builder	architect	-1.406	0.393	0.006
			engineer	-1.500	0.815	0.359
			quantity surveyor	-0.296	0.634	0.990
			others	0.704	0.401	0.408

		quantity surveyor	-0.703	0.272	0.086
		others	0.796	0.764	0.835
	quantity surveyor	architect	0.406	0.629	0.967
		builder	1.406	0.393	0.006
		engineer	0.703	0.272	0.086
		others	-0.094	0.760	1.000
	others	architect	0.500	0.951	0.984
		builder	1.500	0.815	0.359
		engineer	0.796	0.764	0.835
		quantity surveyor	0.094	0.760	1.000

Table 4 shows that the responses of each group of professional on the competence level of QS to value for each element are significantly different and further details the difference of response for each professional for building materials and technology and construction technology the table shows the largest difference is between the builders and the other professionals the data also show a lower rating of QS competence to value building material technology and construction technology from the builders, while other professionals show significant differences in their response but fall within the same ranking as they unanimously agree that QS are competent to value building material technology and construction technology

Summary of Findings

The study shows the ability of QS to value elements of civil engineering works base on their level of skills. The study ranks their skills to measure the elements of civil engineering works, with building material technology and construction technology ranking the highest in terms of QS competence to value for them. This is also consistent with previous study that QS participate and have shown competence in the aspect of building engineering (Opawole et al, 2012). It is also consistent with that of Oladimeji and Adebiyi (2017) that QS that involve them self in civil engineering construction technology have shown high level of competence such that the cost of project are substantially reduced.

Base on this study it is agreed upon that QS are competent to value for all the element of civil engineering project but are neutral when it comes to the aspect of transport engineering, geotechnical engineering, water resources & irrigation engineering and hydraulics. For element that they remain neutral as regard competence to value for them the responses are not significantly different as all the group of professionals hold the same Opinion. This further shows that the QS do not either participate in these areas or don't have the required skills to value such project work so they don't get involved. this is consistent with similar study that while QS are involved in some aspect of engineering and have shown competence in those areas it is still very low in some aspect of civil engineering Olawumi & Ayegun, similar gaps are also identified by Opawole et al, (2012); Oladimeji and Adebiyi (2017) that QS need to fill the gaps in the aspect of civil engineering as compared to other kinds of project.

For elements identified with lower rating for QS competence to value for them we cannot ignore the influence of the QS respondents as majority of the QSs are neutral in those aspect as well. So, we can conclude that majority of QSs respondents don't have the required skill to value for them and see it as a no go

Conclusion and recommendation

This study addressed the involvement of QS in Civil Engineering projects to promote effective cost estimation in Civil Engineering construction project. based on findings of this study the following conclusions were arrived at. that QS are competent to value for all element of Civil Engineering but average level in terms of some element. the study shows that most respondent agree that QS can value or measure for the following elements of civil engineering: building material technology, construction technology surveying, structural and environmental engineering while they have low ranking for the following elements transport engineering, geotechnical engineering, water resources & irrigation engineering and hydraulics. the implication of this results shows the lacking of QS in some areas of civil engineering and calls for improvement advocating for QS to fill the gap in civil engineering as involvement of QS in CEP enrich QS to meet current need of the industry.

This result shows that the lack of involvement of QS in the different aspect of civil engineering construction project has not allowed the services and skills of QS to be fully utilised and recognised. The conservation of QS does not give room for diversification of QS in Nigeria as the case is different from other countries where for example QS in Malaysia are completely involved in ship building construction, aerodrome etc. It is also found out that the ratio of registered QS in Kano to that of Engineers is 0.8:10 hence the issue of conservation as the larger the number the greater the chances of diversification as there are more job opportunities to explore. This study shows their competence in some element of Civil Engineering project but their lack of involvement in carrying out Civil Engineering project in Kano state.

This study recommends that more QS should be involved in Civil Engineering construction project which in turn leads to effective estimation of Civil Engineering works. To improve their involvement more focus should be placed by QS on the major factors affecting Civil Engineering project cost in order to reduce the cost of construction, enhance performance and generate confidence within the industry to further diversify into other aspect of Civil Engineering that QS records average competency level base on this research to eliminate the false notion. Organise series of seminars and training sessions for QS who intend to diversify into different aspect of Civil Engineering and propagate policies set by the NIQS that allows the QS to be involved in Civil Engineering construction contract. Encourage QS through programmes and scholarships to study the different aspect of engineering in a more diverse way to develop more standards and rules to other aspect of engineering such as ship building construction, aerodrome construction etc. to close the gap of the said QS conservation. Furthermore, to encourage QS to acquire basic knowledge on the different element as you cannot measure what you do not know.

Furthermore, the limitation and implication of this research lies majorly in the fact that it was carried out in kano state, Nigeria. Among the professionals involved in carrying out civil engineering project as a result cannot be reliable in terms of Nigeria as a whole or other state. Further study could be conducted in other state to gain a wider view of the situation. further research could also be done on the works classified under each element of civil engineering.

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