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# Assessment of Participation of Quantity Surveyors in Oil and Gas Projects in Nigeria

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# Assessment of Participation of Quantity Surveyors in Oil and Gas Projects in Nigeria

Odesanya Busayo Kehinde<sup>α</sup> & Ebhohimen Tolulope Ehijel<sup>σ</sup>

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## I. INTRODUCTION

Out of the leading industries in Nigeria, the oil and gas over the years has proven to be the most contributing and determining factor of Nigeria's economy (Centre for Energy Economics [CEE], 2006; Odularu, 2008). Recent studies (Klynveld Peat Marwick Goerdeler [KPMG] 2014); Owusu-Manu, 2011) divides the sector into: upstream sector which is characterized

by exploration and production of crude oil and gas; downstream sector (midstream inclusive) which involves transmission and conveyance, distributing and marketing, refining, liquefied natural gas; and services sector which includes exploration support services, drilling services, downstream services, wireline services, refinery maintenance etc. Adepetun (2013), opined that the petroleum sector accounts for more than 95% of export earnings and more than 75% of Nigerian Federal Government revenue. Likewise, the Nigerian economy depends upon the Petroleum Industry, with the contribution to National Revenue exceeding 90% (Onyeador, 2011).

Studies by (Jagboro and Dada, 2012; Rabie and Riad, 2011) defined the traditionally quantity surveyor to be a professional concerned with the contracts and costs on construction projects, and that they control construction costs by accurate measurement of the work required. In their study, they also ascertained that these methods involve activities which may include value management, tendering, valuation, change control, claims management and cost estimation. Jagboro (1991) therefore asserted that the quantity surveying profession was at start known for expertise in building work however, an increasing evolution of the profession into new areas including engineering, contract management, and project management. In addition, Mohammad and Price (2014), in their study also pointed out the fact that procurement is also a major aspect of contract management which happens to be capital intensive. Mogbo (1998), further stressed that quantity surveying is said to be an applied science but which has its root in construction Economics and Management, which is applicable in Engineering: Civil, Electrical, Mechanical, Process, Petroleum etc).

Previous studies (Circa, 2012; Said, Shafiel, and Omran, 2010; Nkado, 2002) has shown that there has been a huge development in the number of services a quantity surveyor can render. Some of which are; investment appraisal, advice on cost limits and budgets, whole life costing, value management, risk analysis, insolvency services, cost engineering services, subcontract administration, technical auditing, planning and supervision, valuation for insurance purposes, project management, facilities management, administering maintenance programmes, advice on

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contractual disputes, planning supervisor, employers' agent, programme management, cost modelling, and sustainability advisor (Seleey, 1993).

Moreover, the findings by the Association for the Advancement of Cost Engineering International [AACEI] (2007) reported the relationship between the Cost Engineer and a Quantity Surveyor. While Engineers are responsible for functional and physical creation (design) in term of dimensional element of structures e.g. road and bridge. However, seeing beyond the functional and physical dimension, less tangible dimensions of money, time and other resources invested (collectively referred to as Costs), someone need to estimate the cost, determine activities time to build it, continually monitor and control, assess the progress in relation with time and money expended to ensure clients objectives. However, the engineering skills and knowledge require for cost dimension in construction are quite different. From that difference, the skills of a cost engineer is born.

Holmes and Joyce (1993) defines competency as action, behaviour or outcome which a person should be able to demonstrate, or the ability to transfer skills and knowledge to new sector. Moreover, Onyeador (2011) opined Knowledge which entails the technical, economic/financial, commercial, organizational, and political aspects of the sector to be key to effective participation of quantity surveyors in the Nigerian oil and gas projects. Opawole, Awodele, Babatunde and Awodele (2012) concluded in their study that the training of quantity surveyors will help them handle the measurement of civil engineering works. Previous researches suggested that Quantity Surveyors need to possess a full understanding of the overall life cycle of exploration and production (upstream) down to refining (downstream) to project life cycles and activities performed at each stage of the life cycle. A multi-disciplinary knowledge of other related professional disciplines is much required, since the quantity surveyor occupies a central role of interacting with other members of the design and construction/engineering team (Hassal, Dunlop and Lewis, 1996; Nkado, 2000).

Although, the Federal Government of Nigeria by the enactment of the Nigerian Content Development Act in April, 2010 has given rise to the hope of the involvement of the quantity surveying practice in the oil and gas projects, (Ojo and Eytape, 2011), it is left to the quantity surveyor has a professional to possess some pre-qualification skills. Heum, Quale, Karlsen, Kragha and Osahon, (2003) highlighted certain promising areas where opportunities exist in the industry which are to include: fabrication and construction; well construction and completion; modification, maintenance and operations; transportation; control systems and ICT; design and engineering; and consultancy.

## II. PREVIOUS STUDIES

### a) *Quantity Surveyors and the Oil and Gas Industry*

Olanrewaju, Anavhe and Abdul-Aziz (2014), noted that "Quantity Surveying is universal and is carried out under different names, such as building economist, cost consultant, management consultant, cost economist, project consultant, and commercial manager". Also, the diversification has been said to have robbed the profession of an identity (Olanrewaju and Anavhe, 2008) unlike other allied profession where an engineer remains an engineer or where an architect remains an architect.

Defining the role of a Quantity Surveyor, "the Quantity Surveyor is the expert who is concerned with financial integrity, contractual matters, procurement, and delivering value for the clients' money invested" (Olanrewaju, Anavhe and Abdul-Aziz, 2014, para. 1). The services that the Quantity Surveyors currently provide have shifted from the 'downstream' to 'upstream'. The dynamism of quantity surveying enables it to venture into other areas like facility management, value management, knowledge management, risk management, arbitration, maintenance management, centre management, system management, and project management. Moreover, Quantity Surveyors are adaptable creatures capable of reinventing themselves according to the demands of the modern progressive clients (Cartlidge, 2003). Talking about the present roles that the Quantity Surveyors perform today, they have diversified into industries including petrochemical, manufacturing, automobile, mining, telecommunication, shipping, transport, and agriculture. The major impetus for this diversification is the changing requirements of the stakeholders. In addition, The Nigerian Institute of Quantity Surveyors (NIQS), the professional body that regulates the activities of the Quantity Surveyors in Nigeria was established in 1969 by some UK trained Nigerians. Since the late 90s, the Nigerian Institute of Quantity Surveyors (NIQS) is now a member of the International Cost Engineering Council (ICEC).

### b) *Quantity Surveyors Roles as Cost Engineer in the Oil and Gas Industry*

Findings made by Jagboro (1991), reveals that the Quantity Surveying profession was only known for building work, but now it has digressed into new areas like Engineering, Contract Management, and Project Management. With this, the Researchers, Ojo and Eytape (2011) therefore took time to see the dependency of Oil and Gas Industry on the Quantity Surveying Profession as touching the cost aspect. So therefore, this review will be to see the similarities between the skill competitiveness and the practice of Cost Engineer and Quantity Surveying with a view to provoke opportunity for Nigerian Quantity Surveying particularly in the oil and gas.

The Cost Engineering skill was defined from the Advancement of Cost Engineering International [ACEI] (2007), as skills that empowers a person who estimate the cost, determine activities time to build it, continually monitor and control, assess the progress in relation with time and money to ensure client's objective. There were clients that showed the comparison of the skills of a Cost Engineer and a Quantity Surveying. It was therefore stated by the International Cost Engineering Council [ICEC] (1996, 2002), that Quantity Surveying is more related to building design and construction, while Cost Engineering relates more to Engineering projects.

The major difference is that the two bodies responds to different professional bodies and have different modes in taking professional qualification. In its publication, ACEI (2007) stated least years allowed becoming a Quantity Surveying and Cost Engineer. For a Cost Engineer to be certified, it requires at least 8 years of post-graduation of which four (4) must be a degree/HND in law, business administration, information technology, accounting etc. Also, the Quantity Surveying, just 36 months industrial experience and a degree/HND level will make a Cost Engineer.

A step to creating opportunities for Quantity Surveyors by the Government is the enactment of the Nigerian Content Development Act, April 2010. Under Clause 15, 28 and 42, NIQS has the chance to creating opportunities for its members in order to compliment the few in the industry working as Contract Engineer, Project Control Engineer, Proposal and Estimating Engineer, Planning Engineer etc

### c) *Educational Curriculum for Administration of Engineering Projects*

Quantity Surveying profession was at start known for expertise in building work. There is, however, an increasing evolution of the profession into new fields including engineering. For this evolution to be worthwhile in Nigeria, there is the need to understand the major aspects under which engineering constructions are administered, and the scope of Quantity Surveyors' education and training in Nigeria (Jagboro, 1991).

The researcher opined that Quantity Surveyors services are fully appreciated when it comes to engineering projects unlike Nigeria where their involvement is fully appreciated for building engineering constructions but at seemingly low level in engineering projects. Some previous works attributed this to professional rivalries while some are of the opinion that the present education/training of Quantity Surveyors in Nigeria has not led to adequate qualitative competence of the quantity surveyors due to the embryonic state of the discipline.

As a discipline, Quantity Surveying is said to be concerned with detailed calculation and measurement of both materials and labour required

for construction activities including building, and engineering project, reveals a multi-disciplinary nature. Jagboro emphasized the link between the Nigerian educational curriculum and the administrative aspect of the profession in handling Engineering projects. However, Seley (1993) is of the opinion that sound knowledge and expertise of project design and cost solution to physical and geological problems are the required proficiency for administering civil engineering projects. Quantity Surveyors' education as an applied science which is in effect a construction economics and management oriented that covers various areas of construction sciences (engineering: civil, electrical, product and chemical, among others), pure and applied economics, finance, accounting, politics, sociology, government administration and law; the study identified quantity surveyors' training to be interdisciplinary covering about 80% of course required providing financial administration required for all forms of constructions. (Mogbo, 1998).

Jagboro (1991) opined that the educational training of quantity surveyors in Nigeria has brought about nothing but inadequate quantitative competence of the professionals which is as a result of the embryonic state of the discipline is also seconded by Mogbo (1998) who advocated for an overhauling to the quantity surveyors syllabi in the Nigerian tertiary institutions to respond to all engineering projects. Contrary to aforementioned opinions, Ajanlekoko (2003), emphasized the recognition of the curriculum of quantity surveying programme by the international assessment that quantity surveyors in Nigeria possess requisite skills, education and training to ensure value for money in all construction works. Adebola (2002) who asserted that the present level of education and training of Quantity Surveyors in Nigeria is adequate for that required for all forms of engineering projects. However, Awodele (2003) believes that lack of adequate training is not a serious factor that influences the involvement of Quantity Surveyors in civil engineering works in Nigeria.

The research methodology of the study involved a review of the Higher Diploma and Degree syllabi of the Polytechnics and Universities of the Nigerian education system respectively. The syllabi were obtained from the polytechnic and universities in the south western Nigeria where quantity surveying are studied at both undergraduate and postgraduate levels. In a publications, Seeley (1993) argued that the skill requirements for the execution of civil engineering projects are sound knowledge and expertise of engineering construction including proficiency in proffering design solution to physical and geological problems; and proficiency in cost appraisal.

Civil engineering as defined by the Curriculum and Course Specification for Nigerian University system (2005) is the discipline involved in the

planning, design, construction and operation of physical facilities essential to modern life and community living. It also defines the discipline to be involved in financial probity in the conception, planning, and execution of development projects (all forms of engineering infrastructure); as well as a discipline that requires adequate training in feasibility studies of capital projects, cost modelling, contract documentation and procurement, contract administration and management, project management consultancy, information technology, facility management, arbitration, and fire insurance assessment.

From the discussion of findings, a sample was drawn from the curriculum specification of the Nigerian University commission and the National Board of Technical Education for degree courses in quantity surveying and civil engineering. The result reveals a greater correlation of civil engineers education and training to 'design and construction' and a greater correlation of Quantity Surveyors education and training to 'cost appraisal and management of civil and other engineering projects. These services constitute the major components of the cost appraisal and financial administration of engineering projects. The research shows a low correlation between the curriculum and course specification of quantity surveying in the Nigerian education system and 'Design and Construction' of civil engineering constructions. Quantity Surveyors are not expected to design and construct civil engineering infrastructure but 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. The results, however, agree with Seeley (1993) that while cost appraisal forms a substantial part of the education and training of Quantity Surveyors, it represents only a part of the education and training of civil engineers.

The researcher concluded that revealing that the study the 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 directly the requirement of cost appraisal and administration of the financial aspects of civil engineering and other engineering projects. It was therefore suggested that there should be a continuous overhauling of the curriculum and course content of quantity surveying in the Nigerian higher education system.

### III. RESEARCH METHODOLOGY

The study was carried out by carrying out a survey which will give an overview of the numerical level of participating Quantity Surveyors in oil and gas projects. As a result of this, this research was carried out by acquiring primary and secondary data which was used to analyze the research questions. The primary data was collected systematically with the use of questionnaire while the secondary data was gotten from journals of related literatures. The study was done through questionnaires distribution to seek the view of Quantity Surveyors which were self-administered. The research population was characterised of Nigerian Quantity Surveyors/Cost Engineers practicing in oil and gas companies and quantity surveying firms who have executed oil and gas projects. These members were chosen based on the fact that the professionals have the required knowledge (i.e. experience) for the analysis for the research questions.

Non-Probabilistic sampling technique was used, i.e. Snowball sampling technique. The reason behind the employment of this type of sampling technique is because of the peculiarity of the study i.e. it might not be easy to access the Quantity Surveyors that are involved in the execution of oil and gas projects.

Analysis of data collected is quantitative in nature. The first section which contains the Demographic Information of the Respondents was analysed using the Percentile. While the second, third and fourth sections which are to identify the roles Quantity Surveyors play in oil and gas projects; to assess the level of involvement of Quantity Surveyors in such projects; to identify the factors affecting the participation of Quantity Surveyors in oil and gas projects respectively, was analysed using the Mean Item Score (MIS). The mean item score formula is given by:

$$\frac{5N_5 + 4N_4 + 3N_3 + 2N_2 + 1N_1}{n}$$

Using 5 (five) point LIKERT SCALE which corresponds to:

"5" = very high.

"4" = high.

"3" = average.

"2" = low.

"1" = very low.

Where N = number of respondents to a particular scale

n = total number of respondents.

And

$$\frac{5 + 4 + 3 + 2 + 1}{5} = 3 \text{ (i.e. positive decision)}$$

Decision Rule

Any mean score below 3.00 is considered a negative decision, while any mean score from 3.00 and above was considered a positive decision.

#### IV. DATA PRESENTATION AND ANALYSIS

Fifty Questionnaires were administered among Quantity Surveyors who practices in upstream sector companies, downstream sector companies, oil and gas servicing firms and quantity surveying firms, of which only a total of 45 questionnaires were recovered successfully.

Table 4.1 reveals the Type of Employment of the Respondents in their respective companies and firms in Lagos State. A total of 37 Quantity Surveyors amounting to 82.2% are full time staffs, while a total of 5 Quantity Surveyors amounting to 11.1% works as Temporary staffs i.e. Ad-hoc staffs, and 3 Quantity Surveyors amounting to 6.7% are part time staffs i.e. Casual staffs.

Table 4.2 shows the Quantification of the Respondents; 22 Quantity Surveyors amounting to 48.9% are Members of NIQS; 12 Quantity Surveyors amounting to 26.7% are Probationers; while 8 Quantity Surveyors amounting to 17.8% happened to be Graduates and; 3 Quantity Surveyors amounting to 6.7% were fellows of NIQS.

Table 4.3 reveals the Type of Employing Company who are involved in Oil and Gas projects; 15 Quantity Surveyors amounting to 33.3% are staffs in Quantity Surveying Consultancy Firms; while 11 Quantity Surveyors amounting to 24.4% works in the Companies of Downstream Sector; while 11 Quantity Surveyors amounting to 24.4% are recruited to Oil Servicing Firms; and 8 Quantity Surveyors amounting to 17.8% are staffs in Companies in the Upstream Sector.

Table 4.4 shows the Years of Working Experience of the Respondents; 16 Quantity Surveyors are having a working experience between the range 6-10years; while 12 Quantity Surveyors are having a working experience between the range 11-15years; also 9 Quantity Surveyors are having a working experience between the range 1-5years; 6 Quantity Surveyors are having a working experience range of 16-20years and lastly; only 2 Quantity Surveyors are having a working experience between the range 21-25years.

Table 4.5 reveals the number of Oil and Gas projects the respondents has been involved in; 35 Quantity Surveyors have been involved in projects between the range 1-9; while 9 Quantity Surveyors have been involved in more than 9 projects. However, one of the questionnaires administered, one was left void.

*Table 1:* Type of Employment

Type of Employment	Frequency	Percent
Full time	37	82.2
Temporary(daily)	5	11.1
Part time	3	6.7
Total	45	100.0

*Table 2:* Qualification of Respondent

Qualification	Frequency	Percent
MNIQS	22	48.9
PROBATIONER	12	26.7
GRADUATE	8	17.8
FNIQS	3	6.7
Total	45	100.0

*Table 3:* Type of Employing Company

Employer	Frequency	Percent
QS		
Consulting Firm	15	33.3
Downstream	11	24.4
Oil Servicing Firm	11	24.4
Upstream	8	17.8
Total	45	100.0

*Table 4:* Years of Working Experience

Years of Working Experience	Frequency
6-10	16
11-15	12
1-5	9
16-20	6
21-25	2
Total	45

**Table 5:** Number of Oil and Gas Project Executed

Projects	Frequency
1-9	35
Above 9	9
Total	44
Void	1
Total	45

**Table 6:** Roles of Quantity Surveyors in Oil and Gas Projects

Roles of Quantity Surveyors in Oil and Gas projects	Mean	Rank
Cost Estimator	4.62	1
Cost Engineer	4.30	2
Contract Manager	4.16	3
Procurement Planning Manager	4.11	4
Cost Planning Manager	4.11	4
Total Cost Manager	4.11	4
Budgeting Manager	3.76	7
Asset and Facility Manager	3.67	8
Value Analysis and Engineering Manager	3.67	8
Planning Manager	3.64	10
Assessment Manager	3.60	11
Investment Feasibility Manager	3.53	12
Project Implementation and Performance Manager	3.49	13
Arbitrator	3.33	14
Resource Manager	3.22	15
Risk Manager	3.20	16
Technical Auditor	2.93	17
Supply and Distribution Manager	2.84	18
Health, Safety and Environment Manager	2.24	19

Table 6 shows the roles the Quantity Surveyors plays in the execution of Oil and Gas projects; The roles that were ranked high includes: Cost Estimator with a mean of 4.62; Cost Engineer has a mean score of 4.30; Contract Manager with a mean score of 4.16; while the role of Procurement Manager, Cost Planning, Total Cost Manager were ranked on the same level with their mean scores of 4.11. On the other hand, the roles that were ranked least includes: Technical Auditor with a mean score of 2.93; Supply and Distribution Manager with a mean score of 2.84; and lastly, Health, Safety and Environment Manager with a mean score of 2.24 making it the lowest ranked. Although, in this section, two

questionnaires were invalid i.e. Cost Engineer and Procurement Planning.

Quantity Surveyors' Level of Participation in Oil and Gas Projects.

**Table 7:** Level of Participation of Quantity Surveyors in Oil and Gas Projects

Level of Participation	Frequency	Percent
Average	23	51.1
Low	11	24.4
High	9	20.0
Very High	1	2.2
Very low	1	2.2
Total	45	100.0

Table 7 shows the respondents' opinion on the level of Quantity Surveyors in Oil and Gas projects; 23 Quantity Surveyors which makes up 51.1% opined that the Quantity Surveyors' level of participation in oil and gas projects is on the Average, while 11 Quantity Surveyors which makes up 24.4% were of the opinion that the Quantity surveyors' level of participation in oil and gas projects is low, also 9 Quantity Surveyors with 20.0% were of the opinion that the Quantity Surveyors' level of participation in oil and gas projects is high, just a (1) Quantity Surveyor which makes up 2.2% opined that the Quantity Surveyors' level of participation in oil and gas projects is very high and lastly, a (1) Quantity Surveyor which makes up 2.2% opined that the Quantity Surveyors' level of participation in oil and gas projects is very low.

**Table 8:** Oil and Gas Projects' Dependency on the Participation of Quantity Surveyors

Dependency of Oil and Gas Projects' delivery	Frequency	Percent
Average	19	42.2
High	14	31.1
Low	6	13.3
Very High	5	11.1
Very low	1	2.2
Total	45	100.0

Table 8 shows the respondents' opinion on the Dependency of the participation of Quantity Surveyors for Oil and Gas projects delivery: 19 Quantity Surveyors (42.2%) were of the opinion that the dependency is on an average; while, 14 Quantity Surveyors (31.1%) were

opined that the dependency is high; 6 Quantity Surveyors (13.3%) claimed that the dependency is low; while 19 Quantity Surveyors (11.1%) were of the opinion that the dependency is very high; and lastly, 1 Quantity Surveyor (2.2%) opined that the dependency is very low.

*Table 9:* Level of Participation of Quantity Surveyors

Roles of Quantity Surveyors	Mean	Rank
Cost Estimator	4.33	1
Cost Engineer	4.13	2
Total Cost Manager	3.89	3
Procurement Planning Manager	3.77	4
Contract Manager	3.67	5
Risk Manager	3.47	6
Cost Planning Manager	3.36	7
Value Analysis and Engineering Manager	3.33	8
Budgeting Manager	3.29	9
Resource Manager	3.29	9
Asset and Facility Manager	3.24	11
Project Implementation and Performance Manager	3.13	12
Planning Manager	3.13	13
Assessment Manager	3.02	14
Investment Feasibility Manager	2.98	15
Arbitrator	2.93	16
Technical Auditor	2.87	17
Supply and Distribution Manager	2.80	18
Health, Safety and Environment Manager	2.13	19

Table 9 shows the Respondent's Perception on the Level of Participation of Quantity Surveyors in the Execution of Oil and Gas Projects based on roles they perform in such projects: From the analysis, their response depicts that the level at which the Quantity Surveyors participates as Cost Engineers is the most ranked with a mean score of 4.33; while as Cost Engineers are ranked with a mean score of 4.13; while a mean score of 3.89 for Quantity Surveyors participating as Total Cost Managers; Procurement Planning Managers with a mean score of 3.77; and Contract Managers with a mean score of 3.67; Contrarily, the roles ranked lowest were: Investment Feasibility Managers with a mean score of 2.98; Arbitrators with a mean score of 2.93; Technical Auditor with a mean score of 2.87; Supply and Distribution Managers with a mean score of 2.80; and, Health, Safety and Environment Managers ranked the lowest with a mean score of 2.13.

*Factors Affecting the Participation of Quantity Surveyor in Oil and Gas Projects*

*Table 10:* Factors Affecting the Participation of Quantity Surveyors

Factors	Mean	Rank
Lack of Technical Knowledge/Skills	3.93	1
Educational Curriculum in Tertiary Institutions	3.89	2
Government Policies/Nigerian Content Development Act	3.76	3
Inter-Professional Rivalries	3.67	4
Corruption/Politics played amongst Stakeholders	2.56	5

Table 10 shows the Respondent's ranking on the Factors that could affect the Level of Participation of Quantity Surveyors in the Execution of Oil and Gas Projects; based on the analysis, Lack of Technical Knowledge/Skills was ranked the highest with a mean score of 3.93; with Educational Curriculum in Tertiary Institutions ranked second with a mean of 3.89; Government Policies/Nigerian Content Development Act with a mean score of 3.76; Inter-Professional Rivalry with a mean of 3.67; while Corruption/Politics played amongst Stakeholders was ranked lowest with a mean score 2.56.

## V. DISCUSSION OF FINDINGS

The study is characterized with respondents working in Lagos State, comprising of 37 Quantity Surveyors (82.2%) who are full time employed, 5 Quantity Surveyors (11.1%) who are Temporary staffs i.e. Adhoc workers and 3 Quantity Surveyors (6.7%) who are part time staffs i.e. Casual Workers, in their workplaces. 22 Quantity Surveyors (48.9%) are Members of NIQS, 12 Quantity Surveyors (26.7%) are Probationers, while 8 Quantity surveyors (17.8%) are Graduates and, 3 Quantity Surveyors (6.7%) are Fellows of NIQS. 15 Quantity Surveyors (33.3%) are staffs in Quantity Surveying Consultancy Firms, 11 Quantity Surveyors (24.4%) are staffs in Quantity Surveying Consultancy Firms, same as Oil Servicing Firms, and 8 Quantity Surveyors (17.8%) are staffs in Quantity Surveying Consultancy Firms. 35 Quantity Surveyors have been involved in less than 10 projects, 9 Quantity Surveyors have been involved in more than 9 projects. 16 Quantity Surveyors have spent 6-10years as working experience, 12 Quantity Surveyors have spent between 11-15years as working experience, 9 Quantity Surveyors have spent between 1-5years as working experience, 6 Quantity Surveyors have spent between 16-20years as working experience, 2 Quantity Surveyors have spent between 21-25years as working experience. The above analysis shows that a larger chunk of the respondents, Quantity Surveyors who work full time in Quantity Surveying Consultancy Firms which are members of NIQS body having spent 6-10years in experience, who have been involved in less than 10 projects.



From the analysis, it is clear that the response from the respondent pertaining roles of Quantity Surveyors in oil and gas projects are positive except three which are: Health, Safety and Environment Manager; Technical Auditor and; Supply and Distribution Manager. The analysis proves that the Quantity Surveyors' roles in projects are majorly Cost Estimator which was ranked high and, secondly; Cost Engineer.

Onyeador (2011) opined that Cost engineering which is the main function of the Quantity Surveyor that intends to participate in Oil and Gas projects is quite different from Quantity Surveying as a profession. The major difference between the two is that the Quantity Surveyor works mainly in the building Construction while the Cost Engineer tilts towards Engineering Projects. Also, Ajator (2014) submits that costing of oil and gas projects present great opportunities for the Quantity Surveying consultants as is the case in advanced countries where cost engineers perform this role.

According to Jagboro (1991), the Quantity Surveyor profession was said to be into mainly building, but as the profession increased in evolution, in new areas which include Engineering, Contract Management, Project Management etc. "Interestingly, Quantity Surveying practice is gaining more relevance in Asset Management, Project Management, Taxation, Law, Insurance, Banking and Manufacturing – especially oil and gas" (Yakub, 2005). The analysis shows that the level of participation of Quantity Surveyors in oil and gas projects is on the average. With this, it will be impossible to disprove the afore-reviewed literatures which submit that the participation of Quantity Surveyors in oil and gas projects is on the increase. Nevertheless, the analysis shows the opinion of the respondents on the level of involvement, using the roles the Quantity Surveyors have been playing in past projects. Their responses show that there has been a high involvement of Quantity Surveyors playing the roles of Cost estimators and secondly, cost engineers. Conversely, the study shows that the level of participation of Quantity Surveyors playing the roles of Investment Feasibility Manager, Arbitrator Technical Auditor and Supply and Distribution Manager is on a low scale.

The respondent also expressed their opinion on the delivery of oil and gas projects' dependency on the participation of Quantity Surveyors. The analysis shows that the dependency of oil and gas projects' delivery on the participation of Quantity Surveyors is on the average. The research identified five causative factors that could affect the participation of Quantity Surveyors in oil and gas projects, but four factors are prevalent which are: Lack of Technical Knowledge/Skills, Educational Curriculum in Tertiary Institutions, Government

Policies/Nigerian Content Development Act and, Inter-Professional Rivalries.

Results from the findings revealed that Lack of Technical Knowledge/ Skills is the most prevalent factor affecting the participation of Quantity Surveyors. This finding agrees with Onyeador (2011) which affirms that Knowledge which ranges from technical general knowledge to technical detailed knowledge is the first criteria to effective participation of Quantity Surveyors in the oil and gas project. Quantity Surveyors have to understand the overall Lifecycle of exploration and production to refining of the Oil and Gas industry.

Another factor that affects the participation of Quantity Surveyors in such projects is the Educational Curriculum in Tertiary Institutions. This is supported by Jagboro (1991) who opined that the educational training of quantity surveyors in Nigeria has brought about nothing but inadequate quantitative competence of the professionals which is as a result of the embryonic state of the discipline; and by Mogbo (1998) who advocated for an overhauling to the quantity surveyors syllabi in the Nigerian tertiary institutions to respond to all engineering projects. This disproves the assertion Ajanlekoko (2003), who emphasized the recognition of the curriculum of quantity surveying programme by the international assessment that quantity surveyors in Nigeria already possess requisite skills, education and training to ensure value for money in all construction works. Likewise, Adebola (2002) asserted that the present level of education and training of Quantity Surveyors in Nigeria is adequate for that required for all forms of engineering projects.

Government Policies/Nigerian Content Development Act has been discovered to be the next prevalent factor. The result shows that the Act could either favour or disfavour the profession's involvement in oil and gas projects. According to PIB publication, the Nigerian Local Content Development Act requires that professional services including legal, financial and insurance services be provided solely by Nigerian firms. Since Quantity surveyors provides financial services in construction and engineering projects (Mogbo, 1998), the profession is not left out.

Lastly, Inter-Professional Rivalries has been researched to be another prevalent factor affecting the participation of Quantity surveyors in oil and gas projects. Rivalries among the professionals in the construction industry refer to the degree of which professionals in the construction industry respond to competitive moves of other professionals in the industry (Olanrewaju 2011). This assertion correlates with this research, such that, has there are rivalries of Professionals in construction projects, likewise oil and gas projects.

## VI. CONCLUSION

The findings show that the level at which Quantity Surveyors participate in oil and gas projects is on an average level. It also shows that most Quantity Surveyors currently practicing in such projects are playing the roles of Cost Estimator and Cost Engineer. Conversely, the level of participation of Quantity Surveyors as Investment Feasibility Manager, Arbitrator, Technical Auditor, Supply and Distribution Manager and Health, Safety and Environment Manager is low. It was also revealed that level of dependency on the services the Quantity Surveyors render to the success of oil and gas project is on the average. The research hypothesized five factors that affect the participation of Quantity Surveyors in oil and gas projects of which four was deduced to be more prevalent. These factors are; Lack of Technical Knowledge/Skills which is the most prevalent; Educational Curriculum in Tertiary Institutions; Government Policies/Nigerian Content Development Act and Inter-Professional Rivalries.

## VII. RECOMMENDATIONS

In the light of this foregoing conclusion drawn from the findings, it is deemed fit that some strategies and realistic recommendations that if properly implemented would alleviate some of the problems facing the participation of Quantity Surveyors in oil and gas projects. These recommendations include;

1. Nigerian Content Monitoring Board which was created by the Government so as to monitor the achievement of local content in the oil and gas industry, should begin/continue to ensure that the provisions for local professional services in the Act are adhered strictly, and any defaulters are brought to book. Also, Quantity Surveyors should ensure they understand the provisions applicable to their involvement in oil and gas projects.
2. The educational curriculum at Tertiary institution should be revised as the scope of the profession increases. Measurement, estimating, procurement, management, etc. of heavy engineering projects and oil and gas components should be incorporated in the curriculum.
3. Also, Quantity Surveyors should be encouraged to be registered by International Cost Engineering Council [ICEC], and any associated professional bodies, so that the necessary skills and knowledge to participate in oil and gas projects can be acquired.
4. Regulatory bodies or enforcement agencies should be established in order to constrain every expert involved in the execution of oil and gas projects to his or her profession. Also, expository seminars, launch books, journals, and other official publication should be encouraged so as to make every

stakeholder/shareholder (including the Governments and Oil and Gas Parastatals) involved in oil and gas projects aware about the benefits of having Quantity Surveyors in such projects.

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