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Determination of Objectives and Content of Quality Management Skills for theBuilding Technology Curriculum of Colleges of Education (Technical) in Nigeria: A Case of Abia State College of Education (Tech), Arochukwu

Bldr. Dr. Kingsley O. Igboko
School of Technical Education,
Abia State College of Education (Tech),
Arochukwu, Abia State.

Abstract

The purpose of the study was to determine the quality management skills for inclusion in the building technology curriculum of Colleges of Education (Tech), in Nigeria. Specifically, it sought to determine the specific objectives and content of quality management skills appropriate for inclusion in the building technology curriculum. Tworesearch questions and two null hypotheses tested at .05 level of significance guided the study. A descriptive survey research design was adopted for the study. The population forthe study was 170 respondents (80 professional builders, 45 basic technology teachers, 21 building technology graduates, and 24 industrial technical education lecturers). There was no sampling as the population was manageable. A structured questionnaire developed by Igboko (2016) was adopted for data collection. The research questions wereanalyzed using frequencies, mean and standard deviation while the hypotheses were analyzed using ANOVA. The findings include: 21 specific objectives and 65 content areas. Based on the findings, it was recommended that the National Commission for Colleges of Education (NCCE), while reviewing the building technology curriculum of colleges of education (Tech.) in Nigeria, should integrate the determined quality management skills into it. It was also recommended that further research should be conducted for the determination of other curriculum elements such as instructional activities and resources as well as evaluation techniques, for integration into the quality management componentof the curriculum.

Introduction

Building serves many useful purposes for the people. It provides shelter in the areas of factories, residences, classrooms, hostels, laboratories, libraries, conference halls, offices, conveniences and lots more. No aspect of life in any society can go without need for one form of building or the other; hence building is considered one of the basic necessities of life as it is very indispensable in the overall wellbeing of man.

However, buildings do not just spring up, they are achieved through a defined process, and this process involves the mechanics of building production. Therefore, the mechanics of building production is known as building Technology. When the mechanics are right, quality buildings will result; but when the production process is faulty, it will definitely lead to the production of buildings that cannot guarantee the safety, health and welfare of users of such buildings. This is according to the Federal Republic of Nigeria (FRN, 2006). Hence, Atkinson (1995) opined that quality should be given first place in the building production process. According to the author, it is better, cheaper and safer to get it right at first attempt than to put it right later. Obiegbu (2008) also adds that quality buildings ensure smooth running of businesses and reduction in disaster aids. Therefore, quality is very essential in the building production process.

The quality of a product has been variously discussed. According to the Nigerian Institute of Building (NIOB, 2013), the quality of a product is its conformity with existing standards or specifications, i.e. fit for the purpose as required by the client. Again, Bamisile (2004) defines quality as the totality of features and characteristics of a product or service that bear on its ability to satisfy stated needs. However, quality does not come about on its own. It is achieved through a process called

quality management. According to Nwachukwu (2009), management is the co-ordination of all the resources of an organization through the processes of planning, organizing, directing and controlling, in order to attain organizational objectives. Further, Alugbuo (2000) and Weihrich and Koohtz (2006) identify coordinating, motivating and communication as the other elements of management. Therefore, Ezeji and Onoh (2008) define management in building construction as the application of knowledge and skills in the successful quality control and execution of building construction actvities. According to chase (1998), Torbica and Stroh (1999), Liu (2003) and Bamisile (2004), customer satisfaction, reduced rework, job satisfaction and prevention of time and cost overrun are some of the many benefits of implementing quality management in the building production process.

Given the many benefits of quality management in the building industry, the practice looks very appropriate in the Nigerian situation as the industry in the country is widely plagued with serious challenges. These challenges include: building collapse (Onuoha & Olunkwa, 2013 and Uzor, 2014), defective structures (Bamisile, 2004), use of quacks and untested materials/products (FRN, 2006), project failure or abandonment (Jimoh, 2012), public apathy to the building industry (Jambol, 2012) and time/cost overrun (Bamisile, 2004). These challenges cannot be ignored if Nigerians are to derive maximum benefit from the industry.

Perhaps, one way of addressing these challenges might be to infuse quality management skills into the curriculum of institutions charged with the responsibility of training building technology teachers such as Colleges of Education (Tech). These institutions use the National Commission for Colleges of Education (NCCE) minimum standards as its curriculum. From the content of NCCE (2012), it is implied that the Building Technology Programme is meant to produce, among others, building technology teachers and practitioners capable of teaching the subject in Junior Secondary schools; building technology teachers who will be able to inculcate building scientific and technological attitude and values into the society and; building technology teachers who are motivated to start the so much desired revolution of technological development right from the Nigerian schools. Therefore, the curriculum is designed to produce teachers with the intellectual and Professional background adequate for teaching future or budding building construction workers. Unfortunately, a deeper look at the curriculum shows clear absence of quality management skills. However, Nwachukwu (2001) opines that the curriculum of technical and vocational education, of which building technology is a part, must speak of today, of real-life problems facing the environment and life in all its aspects and ramifications. According to the author, the curriculum must be responsive to present life situations, and its content should derive from the needs of the immediate community. On this score therefore, the building technology curriculum of Colleges of Education (Tech) must be made to address the current challenges facing the building industry, the situation of which is impacting negatively on the well-being of the society. If this is not done the curriculum will continue to produce graduates who lack the quality management consciousness required to train younger and future building industry operatives who are poised to contribute meaningfully towards sanitizing the building industry. Such graduates will therefore be uncompetitive in the industry. Therefore, any future attempt at reviewing the curriculum of colleges of education (Tech) in Nigeria should involve the inclusion of the quality management skills being espoused in this work.

Every skill training is normally organized in a curriculum. According to Anwuka (2000), Curriculum is defined as a planned and organized set of formal education or training intended towards the acquisition of defined or specified competences. Wheeler (1978) identified five curriculum elements to include: objectives, learning experience, content, organization and integration of content and learning experience, and evaluation. However, the present study will be limited to the specific

objectives and content of quality management skills for the Building Technology programme of Colleges of Education (Tech) in Nigeria.

The first task in any educational programme is the selection of instructional objectives. Onyemerekeya (2004) sees instructional objectives as statements of quantifiable operational nature indicating actions from which mastery of desired activities can be correctly inferred. According to Okorafor (2009), the achievement of instructional objectives is expected to bring about solution to some indentified societal problems. Onyemerekeya (2004) and Okorafor (2004) maintain that one key factor that determines instructional objectives is the contemporary society or the culture. That is, instructional objectives should be formulated to address current societal challenges. On this score therefore, quality management action statements should be infused into the specific objectives of building technology curriculum of Colleges of Education (Tech), in Nigeria. This will ensure the raising of quality management- conscious building technology teachers who will in turn infest their students and future building construction workers with the same consciousness. But content is needed to in order to realize the stated objectives.

So, objectives cannot be achieved without a content. According to Onwuka (1996) and Okorafor (2009), content includes all the knowledge, skills, concepts, principles, attitudes and values to be emphasized during the teaching and learning process. Okorafor (2004) had earlier observed that content include those things that are systematically and logically arranged to enable individuals acquire the knowledge that will enable them develop themselves and the society. Nwachukwu (2001) opines that curriculum content must address real-life situations if they are to be valid. Therefore, quality management skills are needed in the content of the building technology curriculum of Colleges of Education (Tech) in Nigeria. Such elements are essential as they will predispose the graduates to quality management consciousness and practices. This will ultimately lead to the production of better building construction operatives for the society.

Several studies have been conducted in the areas of integration of elements into a curriculum and quality management in construction. Lemchi (2005), conducted a study on integrating entrepreneurship education into the NCE Home Economics Programme. The study identified the objectives, learning experiences, instructional methods and evaluation techniques suitable for inclusion in the NCE Home Economics Curriculum. The researcher recommended that curriculum planners should utilize the objectives, learning experiences, instructional methods, evaluation technique and guidelines identified in the study for reviewing and re-planning the entrepreneurship education for Home Economics Education. Lemchi's work is related to the present one in that they are both addressing the integration of ideas into the curriculum. However, while Lemchi's work focused on the integration of specific objectives, content/learning experiences, instructional methods and evaluation techniques of entrepreneurship education into the NCE Home Economics Curriculum, the present work is on the integration of specific objectives and content of quality management skills into the Building Technology curriculum of Colleges of Education (Tech) in Nigeria. Lombard (2006) conducted a study on managing the quality of engineering on large construction projects in the South African context. The study came up with a number of findings and recommendation which include that: internationally accepted quality systems, processes, procedures and practices are also appropriate and applicable to South Africa; engineering designs should conform to owner's requirements, and to codes and standards, while at the same time making efforts to determine the reasonableness of clients' requirements through the processes of focusing, revealing and calibrating; teamwork is a factor that impacts engineering quality and should therefore be promoted; continuous improvement should be promoted; there should be explicit allocation of responsibilities. Lombard's work is related to the present one in that both of them are addressing the elements of quality management in construction.

However, while Lombard's work focused on the management of the quality of engineering on large construction projects in South Africa, the present work is on the integration of specific objectives and content of quality management skills into the building technology curriculum of Colleges of Education (Tech) in Nigeria. Hoonakker, Carayon and Loushine (2010) also conducted a study to determine the barriers and benefits of quality management in the construction industry. The results of the interviews showed that: quality is most often measured through customer satisfaction; the best way to improve quality is through education and training; and the biggest barrier to quality is personnel, among others. Hoonnakka's, Carayon's and Loushine's work is related to the present work in that they are both addressing quality issues in construction. However, while their own work was on the determination of the barriers and benefits of quality management in construction, the present work is on the integration of quality management skills into the building technology curriculum of Colleges of Education (Tech)in Nigeria with special emphasis on the specific objectives and content. Still on quality, Atkinson (1995) identifies the following as very essential: a workforce with sound skills, materials of specified quality, satisfaction of designers' intentions and expectations, recording of changes in design, application of quality standards, and improved information flow. Again, Moore (nd) identifies the logical sequence of quality management elements to include: quality plan, quality requirements, applying quality methods, phase quality review, project quality review and quality audit. Based on the foregoing, this work is underpinned by the Total Quality Management Theory. The theory of Total Quality Management (TQM) was propounded by Edward Deming, an American engineer, in 1986. The theory emphasizes the use of teams that include employees who deal directly with customers to achieve continuous quality improvements. It is based on close attention to details, self-monitoring by workers at each step and a passionate commitment to quality as part of an organization's identity, and which is internalized by everyone in the organization. The theory of TQM suggests that customer focus and customer satisfaction should be a company's primary goals. TQM believes that the quest for quality is a never-ending process in which people are continuously working to improve the service. Continuous improvement means that small but incremental improvements that occur on a regular basis will eventually add up to vast improvements in quality. When TQM is implemented effectively, the following results, according to Weihrich and Koontz (2006), will be achieved: greater customer satisfaction, fewer defects and less waste, increased total productivity, reduced costs and improved profitability, and an environment in which quality has high priority. The theory of Total Quality Management is relevant to the present study as it will guide the crafting of suitable quality management skills to be integrated into the building technology curriculum of Colleges of Education (Tech) in Nigeria. This will position the graduates well to train competent future building production workers.

Several related studies have been reviewed for this work. However, none of these studies addressed the issue of integrating quality management skills into the specific objectives and content of the building technology curriculum of Colleges of Education (Tech) in Nigeria. This is the gap that this study seeks to fill considering that the college of Education (Tech) is the institution where teachers that train young and future building construction operatives are trained. The infusion of quality management skills into their curriculum will enable them come out as quality-conscious professionals who are capable of imparting the same consciousness into their students for the overall good of the society.

Purpose of the study:

The purpose of the present study was to integrate quality management skills into the building technology curriculum of Colleges of Education (Tech) in Nigeria. Specifically, the study was to

determine:

1. The specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) in Nigeria.
2. The content necessary for achieving the specific objectives of quality management skills in the building technology programme.

Research questions

The following research questions guided the study:

1. what should be the specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) in Nigeria?
2. what should constitute the content necessary for achieving the specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) inNigeria?

Hypotheses

The following hypotheses were tested at.05 level of significance:
H0$_1$: There is no significant difference in the mean responses of professional builders, that is, CORBON-registered builders; building technology teachers in junior secondary schools; building technology graduates of Colleges of Education (Technical); and building technology lecturers of industrial technical education background on what should constitute specific objectives of quality management skills for the building technology curriculum of Colleges of Education (Tech) in Nigeria.

H0$_2$: There is no significant difference in the mean responses of professional builders, building technology teachers in junior secondary schools, building technology graduates of Colleges of Education (Technical), and building technology lecturers of industrial technical education background on what should constitute the content of quality management skills for the building technology curriculum of Colleges of Education (Tech) in Nigeria.

Method

The study adopted descriptive survey research design. This design was considered appropriate as the study sought to sample the opinion of experts on the suitable quality management skills to be included in the building Technology curriculum of Colleges of Education (Tech), in Nigeria. The study was conducted in Abia State College of Education (Tech), Arochukwu situated in the South East geo-political zone of Nigeria. The College has a well-equipped building technology department with highly qualified and dedicated lecturers and support staff. Further, the host community, Arochukwu, has a good number of registered builders, qualified basic education building technology teachers as well as graduates of building technology from colleges of Education (Tech).
The population for the study was 170, comprising 80 Registered builders, 45 basic technology teachers (building technology option), 21 building technology graduates of colleges of Education (Tech), and 24 building technology lectures in colleges of Education (Tech). There was no sampling as the population of 170 was manageable enough. This agrees with Uzuagulu (2011) who opines that studying the entire population is usually better for a study as it eliminates sampling error.

The study adopted the Technical College Building Construction Quality Management Skills Questionnaire (TCBCQMSQ) developed by Igboko (2016) as the instrument for data collection. The

Questionnaire is divided into three (3) sections. Section A sought information on the personal data of the respondents while section B was further divided into two clusters (A & B). Cluster A was about the specific objectives of quality management skills suitable for inclusion in the curriculum while cluster B sought information on the content of quality management skills necessary for achieving the stated specific objectives. The instrument was based on the real limit of numbers, that is, scores ranging from 0.5 to 1.49 were considered not appropriate; those from 1.50 to 2.49, moderately appropriate; those from 2.50 to 3.49, appropriate; and those from 3.50 to 4.00, very appropriate. Cluster A of the instrument has 21 items while cluster B has 65 items. With the help of four research assistants, the questionnaires were distributed through personal contact. This enabled the researcher and his assistants to clarify issues with the respondents. The questionnaires were retrieved from the respondents after two weeks. The number of questionnaires that were correctly filled and returned was 161. This showed a return rate of 94.71%.

The research questions were analyzed using frequencies, mean and standard deviation. And with the aid of the Statistical Package for Social Science (SPSS) Version 10.0, the two null hypotheses were analyzed using ANOVA at .05 level of significant.

Research Question 1

What are the specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) in Nigeria?

Data for this research question are analyzed and presented in Table 1

Table 1

Mean Responses of the Respondents on the specific Objectives of Quality Management skills for the Building Technology Curriculum. **Cluster Mean = 3.44**

S/N	The specific objectives of quality Management in Building Construction should include ability to:	N1= 75 X_1	N2= 43 X_2	N3 = 20 X_3	N4= 23 X_4	XG	SD	RMK
1.	Assess the workmanship skills of site workers before the commencement of any job	3.72	3.58	3.91	3.75	3.71	0.55	VA
2.	Analyze building drawings before the commencement of setting out operations.	3.71	3.77	3.74	3.75	3.73	0.52	VA
3.	Inspect setting out operations to assure conformance to design.	3.76	3.72	3.78	3.55	3.73	0.72	VA
4.	Ensure that acceptable standards of workmanship are applied in the construction of foundations and floors.	3.57	3.58	3.65	3.55	3.58	0.61	VA
5.	Obtain materials from reputable sources	3.22	3.43	3.43	3.20	3.31	0.75	A
6.	Adhere strictly to manufacturers' recommendations on the use of different materials.	3.23	3.44	3.51	3.25	3.33	0.82	A
7.	Test materials e.g. blocks, water and fine/coarse aggregates for crushing strength, injurious matters, and mud/silt respectively before use.	3.55	3.53	3.26	3.30	3.47	0.73	A
8.	Ensure that materials that do not meet specified quality standards are removed from site to avoid contaminating the good ones.	3.47	3.37	3.39	3.50	3.43	0.69	A
9.	Ensure that concrete aggregates are properly graded.	3.52	3.47	3.52	3.40	3.49	0.62	A
10	Ensure that concrete aggregates are batched according to specifications.	3.42	3.65	3.74	3.45	3.53	0.61	VA

11.	Obtain concrete that meets specified quality standards	3.72	3.47	3.59	3.25	3.57	0.65	VA
12.	Obtain blocks that meet specified quality standards.	3.51	3.63	3.65	3.55	3.57	0.64	VA
13	Inspect to assure that blocks are laid in accordance with design and specifications.	3.52	3.58	3.70	3.65	3.58	0.56	VA
14.	Ensure that site operations are executed within specified time and budget.	3.15	3.24	3.30	3.05	3.18	0.79	A
15.	Instill quality culture into every participant.	3.03	3.10	3.35	3.10	3.10	0.84	A
16.	Review every completed stage of work to assure adherence to designs and specifications.	3.33	3.63	3.74	3.30	3.47	0.73	A
17.	Insist on correcting every sub-standard work in each stage before proceeding to the next stage.	3.62	3.80	3.52	3.40	3.62	0.63	VA
18.	Ensure that solutions to problems are collectively articulated.	3.72	3.37	3.30	3.50	3.33	0.73	A
19.	Document every corrective action using technical information.	3.11	3.33	3.30	3.20	3.21	0.78	A
20.	Document changes in design as construction proceeds	3.14	3.19	3.00	3.25	3.15	0.97	A
21.	Motivate every participant adequately.	3.23	3.26	3.17	3.15	3.22	0.85	A

Key: N_1 CORBON – Registered Builders, N_2 = Building Technology Teachers, N_3 = Building technology graduates, and N_4 = IndustrialTechnical Education lecturers. VA= Very Appropriate, A = Appropriate, MA = Moderately Appropriate and NA = Not Appropriate. X_1 = Mean Response of CORBON – Registered Builders, X_2 = Mean response of Building Technology Teachers, X_3 = Mean Response of Building Construction graduates, and X_4 = Mean Response of Industrial Technical Education lecturers. Total Respondents = 161, Grand Mean = XG and SD = Standard Deviation

In Table 1, the mean responses of the respondents on the specific objectives of quality management skills for the building technology curriculum of colleges of education (technical) are presented. The data revealed that items 1, 2, 3, 4, 10. 11. 12, 13 and 17 were very appropriate while the rest of the items were appropriate. Further, a cluster mean of 3.44 was obtained for research question 1, showing that all the items were rated as being appropriate specific objectives of quality management in building technology.

Again, the standard deviation of each possible specific objective was found to be less than 1.00. This shows that the responses of individual respondents were clustered around the mean, giving the mean values added validity.

Hypothesis 1 ($H0_1$)

There is no significant difference in the mean responses of professional builders, building technology teachers in junior secondary schools, building technology graduates of colleges of education (Technical), and building technology lecturers on the specific objectives of quality management skills for the building technology curriculum of Colleges of Education (Tech) in Nigeria.

Analysis of variance (ANOVA) result for hypothesis 1 is presented in Table 2.

Table 2

Analysis of Variance of the Responses of the Respondents on the Specific Objectives of Quality Management in Building technology

S/N	The Objectives of quality Management in Building Construction	N1= 75	N2 = 43	N3 = 20	N4 = 23	X G	SD	F-	Sig. of F	RMK
1.	Assess the workmanship skills of site workers before the commencement of any job	3.72	3.58	3.91	3.75	3.71	0.55	1.87	0.14	NS
2.	Analyze building drawings before the commencement of setting out operations.	3.71	3.77	3.74	3.75	7.73	0.52	0.13	0.94	NS
3.	Inspect setting out operations to assure conformance to design	3.76	3.72	3.78	3.55	3.73	0.54	0.90	0.44	NS
4.	Ensure that acceptable standards of workmanship are applied in the construction of foundations and floors.	3.57	3.58	3.65	3.55	3.58	0.61	0.13	0.94	NS
5.	Obtain materials from reputable sources.	3.22	3.43	3.43	3.20	3.31	0.75	1.02	0.39	NS
6.	Adhere strictly to manufacturers' recommendations on the use of different materials.	3.23	3.44	3.52	3.25	3.33	0.82	1.02	0.35	NS
7.	Test materials e.g. blocks, water and fine/coarse aggregates for crushing strength, injurious matters, and mud/silt respectively before use	3.55	3.53	3.26	3.30	3.47	0.73	1.41	0.24	NS
8.	Ensure that materials that do not meet specified quality standards are removed from site to avoid contaminating the goods ones	3.47	3.37	3.39	3.50	3.43	0.69	0.26	0.85	NS
9.	Ensure that concrete aggregates are properly graded.	3.52	3.47	3.52	3.40	3.49	0.62	0.24	0.87	NS
10.	Ensure that concrete aggregates are batched according to Specifications	3.42	3.65	3.74	3.45	3.53	0.61	2.33	0.08	NS
11.	Obtain concrete that meets specified quality standards	3.72	3.47	3.59	3.25	3.57	0.65	3.38	0.09	NS
12.	Obtain blocks that meet specified quality standards	3.51	3.63	3.65	3.55	3.57	0.64	0.44	0.93	NS
13.	Inspect to assure that blocks are laid in accordance with design and specifications.	3.52	3.58	3.70	3.65	3.58	0.56	0.71	0.55	NS
14.	Ensure that site operations are executed within specified time and budget.	3.15	3.24	3.30	3.05	3.18	0.79	0.48	0.69	NS
15.	Instill quality culture into every participant	3.03	3.10	3.35	3.10	3.10	0.84	0.84	0.47	NS
16	Review every completed stage of work to assure adherence to designs and specifications	3.33	3.63	3.74	3.30	3.47	0.73	3.13	0.08	NS
17.	Insist on correcting every sub-standard work in each stage before proceeding to the next stage.	3.62	3.79	3.52	3.40	3.62	0.63	2.07	0.11	NS
18.	Ensure that solutions to problems are collectively articulated	3.27	3.37	3.30	3.50	3.33	0.73	0.57	0.63	NS
19.	Document every corrective action using technical information	3.11	3.33	3.30	3.20	3.21	0.78	0.85	0.47	NS
20	Document changes in design as construction proceeds.	3.14	3.19	3.00	3.25	3.15	0.97	0.27	0.84	NS

21	Motivate every participant adequately.	3.23	3.26	3.17	3.15	3.22	0.85	0.09	0.97	NS

Key: N_1 = CORBON – registered builders, N_2 = Building technology teachers, N_3 = Graduate of building technology N_4 = Industrial technical education lecturers. $\overline{X}_1$ = Mean response of CORBON – registered builders, $\overline{X}_2$ = Mean response of building technology teachers, $\overline{X}_3$ = Mean response of graduates of building technology, $\overline{X}_4$ = Mean response of Industrial technical education lecturers. XG = Grand mean, SD = Standard deviation. F is significant at $p \leq 0.05$.

The analysis reveals that there is no significant difference in the mean responses of CORBON – registered builders, building technology teachers, building construction graduates and industrial technical education lecturers on all 21 items.

Research Question 2

What should constitute the content necessary for achieving the specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) in Nigeria?

The data for answering this research question are presented in Table 3.

Table 3
Mean Responses of the Respondents on the Content of Quality Management skills in the Building Technology Curriculum.

S/N	Content of Quality Management In Building Construction	$N_1 = 75$ X_1	$N2 = 43$ X_2	$N3 = 20$ X_3	$N4 = 23$ X_4	X G	SD	RMK
	Planning skills for quality materials and personnel							
22.	Recruitment of building personnel with the appropriate competencies	3.58	3.79	3.70	3.35	3.62	0.61	VA
23.	Procurement of materials and products from reputable manufacturers or suppliers.	3.35	3.65	3.48	3.25	3.44	0.71	A
24.	Carrying out appropriate tests on materials	3.63	3.49	3.48	3.60	3.57	0.64	VA
25.	Ensuring proper storage of materials	3.53	3.44	3.74	3.60	3.54	3.63	VA
26.	Ensuring proper handling of materials	3.42	3.47	3.61	3.55	3.48	0.65	A
	Planning skills for setting out of buildings							
27.	Analysis of building drawings to determine if they are constructable or not	3.65	3.30	3.26	3.45	3.48	0.78	A
28.	Analysis of building drawings to determine their conformance to codes and standards	3.49	3.56	3.57	3.50	3.52	6.67	VA
29.	Determination of the accuracy of dimensions in building drawings.	3.51	3.58	3.43	3.60	3.53	0.62	VA
30.	Determination of the reliability of setting out equipment	3.35	3.35	3.52	3,40	3.38	0.70	A
31.	Inspection of setting out operations before the commencement of trench excavation	3.52	3.53	3.70	3.60	3.56	0.59	VA
	Planning skills for foundation construction							
32.	Ensuring that the depth and width of foundation trenches are in accordance with design	3.62	3.56	3.52	3.55	3.58	0.64	VA
33.	Ensuring that the floor of the trench is leveled, rammed and blinded before placing the foundation concrete.	3.65	3.35	3.61	3.75	3.58	0.66	VA
34.	Ensuring that the DPC level is well above the natural ground level	3.61	3.51	3.52	3.70	3.58	0.65	VA
35.	Ensuring that the earth or laterite fill is placed in layers and well compacted before placing the hardcore materials	3.41	3.20	3.22	3.30	3.31	0.80	A
36.	Ensuring that materials and standards of workmanship applied are in accordance with specifications.	3.50	3.56	3.43	3.60	3.52	0.62	VA

	Planning skills for concrete production							
37.	Ensuring that specified concrete mixes are strictly adhered to	3.48	3.72	3.52	3.60	3.57	0.63	VA
38.	Ensuring that only a gauge box, not head pan or wheel barrow, is used for measuring concrete materials where weight batching is not practicable	2.99	3.07	2.87	2.70	2.96	1.02	A
39.	Ensuring that the aggregates are properly graded	3.28	3.24	3.26	3.35	3.27	0.76	A
40.	Ensuring that the water content in aggregates is established before determining the water cement ratio of concrete	3.27	2.93	2.74	3.20	3.09	0.94	A
41.	Ensuring that concrete and mortar constituents are mixed on a hard and clean surface if a mixing machine is not affordable	3.34	3.47	3.48	3.30	3.39	0.80	A
42.	Ensuring thorough mixing of concrete to achieve a uniform paste	3.52	3.67	3.57	3.40	3.55	0.69	VA
43.	Ensuring that fresh concrete is transported undisturbed	3.22	3.37	3.43	3.15	3.28	0.85	A
44.	Ensuring that formworks are rigid, strong, water tight, but easy to strike	3.40	3.56	3.22	3.45	3.42	0.75	A
45.	Ensuring that concrete is poured or placed from a height not more than one meter away	3.14	3.35	3.22	2.95	3.18	0.85	A
46	Ensuring that newly placed concrete is compacted until maximum density is achieved	3.34	3.40	3.35	3.37	3.36	0.72	A
47.	Ensuring that concrete is placed and compacted within 30 minutes of mix	3.26	3.35	3.57	3.50	3.36	0.76	A
48.	Ensuring the constant curing of concrete as hardening proceeds	3.37	3.49	3.43	3.35	3.41	0.71	A
49.	Ensuring the use of reinforcement bars that are clean and free from mud, paint, loose rust, grease or retarders	3.50	3.49	3.61	3.50	3.51	0.71	VA
S/N	**Content of Quality Management in Building Construction**	**$\underline{N_1}$ = 75 $\overline{X_1}$**	**$\underline{N2}$ = 43 $\overline{X_2}$**	**$\underline{N3}$ = 20 $\overline{X_3}$**	**$\underline{N4}$ = 23 $\overline{X_4}$**	**$\overline{X\,G}$**	**SD**	**RMK**
50.	Ensuring that the bending schedule prepared by a competent structural engineer is strictly adhered to.	3.58	3.63	3.70	3.70	3.62	0.56	VA
51.	Ensuring adequate concrete cover to reinforcement bars using concrete spacers	3.49	3.58	3.62	3.50	3.54	0.59	VA
52.	Ensuring that concrete attains maximum strength before striking the formwork	3.53	3.56	3.65	3.65	3.57	0.62	VA
	Planning skills for the production and laying of blocks							
53.	Ensuring that only clean and sharp sand is used for moulding blocks	3.29	3.53	3.65	3.40	3.42	0.70	A
54.	Ensuring that the specified proportion of materials is strictly adhered to.	3.53	3.65	3.43	3.47	3.54	0.57	VA
55.	Ensuring that block constituents are mixed on a hard and clean surface	3.34	3.51	3.48	3.50	3.43	0.74	A
56.	Ensuring thorough mixing of block constituents	3.26	3.51	3.39	3.45	3.37	0.73	A
57.	Ensuring that blocks are well compacted and cured	3.47	3.65	3.70	3.45	3.55	0.62	VA
58.	Ensuring that jointing mortar satisfies specified mix proportions	3.33	3.42	3.57	3.20	3.37	0.66	A
59.	Ensuring that interface joints do not exceed or fall below specified thickness	3.27	3.33	3.30	3.15	3.28	0.73	A
60.	Ensuring that every block course is measured, checked, and approved before commencing another course	3.20	3.30	3.09	3.25	3.22	0.88	A
	Planning skills for site supervision							
61.	Ensuring that work instruction forms are used in the execution of every item of work	3.36	3.00	3.09	3.25	3.21	0.81	A
62.	Monitoring the execution of work items to ensure the satisfaction of designers' intentions	3.51	3.53	3.39	3.60	3.51	0.64	VA
63.	Ensuring that where there are conflicts between	3.44	3.16	3.35	3.35	3.34	0.79	A

	designers' intentions and standards/codes, the later prevail							
64.	Ensuring that every completed stage of work is inspected and approved by competent persons	3.46	3.53	3.39	3.55	3.48	0.64	A
65.	Ensuring that no activity takes more time than was allotted to it in the construction programme	3.31	3.19	3.22	3.25	3.25	0.78	A
66.	Keeping accurate financial records to ensure that no activity consumes more money than was budgeted for it	3.50	3.65	3.65	3.20	3.53	0.69	VA
67.	Ensuring that sub-contractors and suppliers are selected on the basis of pre-qualification rather than through competitive bidding.	3.35	3.44	3.39	3.15	3.36	0.73	A
68.	Consulting regularly with top management	3.26	3.33	3.17	3.00	3.23	0.80	A
	Controlling skills for site operations							
69.	Initiation of peer review of every completed item of work	3.41	3.35	3.35	3.25	3.36	0.72	A
70.	Preparation of checklists for phase and whole project quality reviews	3.19	3.30	3.22	3.25	3.23	0.69	A
71.	Reviewing to assure that everything has been done in the correct way in each phase of a project	3.46	3.60	3.57	3.45	3.51	0.59	VA
72.	Reviewing to assure that the correct materials have been used in each phase of a project	3.61	3.58	3.31	3.70	3.58	0.62	VA
73.	Carrying out similar reviews after the completion of the whole project	3.20	3.37	3.26	3.00	3.23	0.78	A
74.	Invitation of independent assessors for the quality audit of the final product	3.05	3.16	3.00	3.05	3.08	0.82	A
75.	Ensuring that every non-conforming item of work is reworked to acceptable standards	3.34	3.44	3.43	3.15	3.35	0.74	A
76.	Ensuring group solutions to identified problems and Challenges	3.28	3.56	3.39	3.35	3.38	0.76	A
	Communication skills for construction activities							
77.	Documentation of every corrective action using technical information	3.33	3.44	3.26	3.20	3.33	0.69	A
78.	Recording, using technical information, changes in drawings and specifications as construction proceeds	3.37	3.42	3.26	3.00	3.32	0.79	A
79	Recording, using technical information, all key work processes undertaken in the course of a project	3.38	2.93	3.13	2.85	3.16	0.76	A
80.	Writing a report of the performance of the final product after a given period of time	3.15	3.26	3.26	3.30	3.21	0.83	A
81.	Documentation of the findings of every field study	3.18	3.37	3.30	3.30	3.26	0.80	A
S/N	**Content of Quality Management In Building Construction**	**$\underline{N_1}$ = 75 X_1**	**$\underline{N2}$ = 43 X_2**	**$\underline{N3}$ = 20 X_3**	**$\underline{N4}$ = 23 X_4**	**$\overline{X}$ G**	**SD**	**RMK**
	Motivational skills							
82.	Taking participants on a study of the activities of the best-performing building construction firms	3.27	3.19	3.17	3.25	3.23	0.81	A
83.	Education and training of all personnel on quality issues on a regular basis	3.32	3.49	3.57	3.25	3.39	0.71	A
84.	Education and training of subcontractors and suppliers on quality requirements	3.25	3.42	3.17	3.25	3.28	0.75	A
85.	Setting quality goals and having every participant key into them	3.32	3.44	3.35	3.35	3.36	0.72	A
86.	Conducting site meetings regularly	3.23	3.19	3.26	3.35	3.24	0.81	A

Cluster mean = 3.39

Key: N_1 = CORBON – registered Builders, N_2 = Building Technology Teachers, N_3 = Building technology Graduates, N_4 = Industrial Technical Education Lecturers. $\overline{X}_1$ = mean response of CORBON – registered Builders, $\overline{X}_2$ = mean response of Building Technology Teachers, $\overline{X}_3$ = mean response of Building technology Graduates, $\overline{X}_4$ = Mean response of Industrial Technical Education Lecturers. $\overline{X}$G = grand mean, SD = standard deviation.

Table 3 shows the mean responses of CORBON – registered builders, building technology teachers, building technology graduates and industrial technical education lecturers on what should constitute the content of quality management skills in building technology. The respondents rated 22 items as being very appropriate and 43 as appropriate. A cluster mean of 3.39 further shows that all the items are appropriate for inclusion into the content of the building technology curriculum.

Again, the standard deviation of each of the items except one was found to be less than 1.00. This means that the responses of each respondent were clustered around the mean. This gives the mean values more validity.

Hypothesis 2 (HO_2)

There is no significant difference in the mean responses of professional builders, building technology teachers in junior secondary schools, building technology graduates of colleges of education (Technical) and building technology lecturers of industrial technical education background on what should constitute the content of quality management skills in the building technology curriculum of Colleges of Education (Tech) in Nigeria.

Analysis of variance (ANOVA) result on hypothesis 2 is presented in Table 4

Table 4
Analysis of Variance of the Responses of the Respondents on the Content of Quality Management Skills in the Building Technology Curriculum of Colleges of Education (Tech) in Nigeria.

S/N	Content of Quality Management Skills in Building Technology:	N1 =75 $\overline{X_1}$	N2 =43 $\overline{X_2}$	N3 = 20 $\overline{X_3}$	N4 = 23 $\overline{X_4}$	$\overline{X}$ G	SD	F-Value	Sig. of F	RMK
	Planning Skills for quality materials and personnel									
22	Recruitment of building personnel with the appropriate competencies	3.58	3.79	3.70	3.35	3.62	0.61	2.74	0.09	NS
23.	Procurement of materials and products from reputable manufacturers or suppliers	3.35	3.65	3.48	3.25	3.44	0.71	2.24	0.86	NS
24.	Carrying out appropriate tests on materials	3.63	3.49	3.48	3.60	3.57	0.64	0.61	0.61	NS
25.	Ensuring proper storage of materials	3.53	3.44	3.74	3.60	3.54	0.63	1.18	0.32	NS
26.	Ensuring proper handling of materials	3.42	3.47	3.61	3.55	3.48	0.65	0.59	0.62	NS
	Planning skills for setting out operations									
27.	Analysis of building drawings to determine if they are constructable or not	3.65	3.30	3.26	3.45	3.48	0.78	2.55	0.06	NS
28.	Analysis of building drawings to determine their conformance to codes and standards	3.49	3.56	3.57	3.50	3.52	0.67	0.15	0.93	NS
29.	Determination of the accuracy of dimensions in building drawings	3.51	3.58	3.43	3.60	3.53	0.62	0.37	0.77	NS
30.	Determination of the reliability of setting out equipment	3.35	3.35	3.52	3.40	3.38	0.70	0.40	0.76	NS
31.	Inspection of setting operations before commencement of trench excavation	3.52	3.53	3.70	3.60	3.56	0.59	0.56	0.64	NS

	Planning skills for foundation construction									
32.	Ensuring that the depth and width of foundation trenches are in accordance with design	3.62	3.56	3.52	3.55	3.58	0.63	0.20	0.90	NS
33.	Ensuring that the floor of the trench is leveled rammed and blinded before placing the foundation concrete	3.65	3.35	3.61	3.75	3.58	0.66	2.56	0.06	NS
34.	Ensuring that the DPC level is well above the natural ground level	3.61	3.51	3.52	3.70	3.58	0.65	0.49	0.69	NS
35.	Ensuring that the earth or laterite fill is placed in layers and well compacted before placing the hardcore materials	3.41	3.21	3.22	3.30	3.31	0.79	0.69	0.56	NS
36.	Ensuring that materials used and standards of workmanship applied are in accordance with specifications	3.50	3.56	3.43	3.60	3.52	0.62	0.33	0.81	NS
	Planning skills for concrete Production									
37.	Ensuring that specified concrete mixes are strictly adhered to	3.48	3.72	3.52	3.60	3.57	0.63	1.39	0.25	NS
38.	Ensuring that only a gauge box, not head pan or wheelbarrow is used for measuring concrete materials where weight batching is not practicable	2.99	3.07	2.87	2.70	2.95	1.02	0.67	0.57	NS
39.	Ensuring that aggregates are properly graded	3.28	3.24	3.26	3.35	3.27	0.76	0.10	0.96	NS
40.	Ensuring that the water content in aggregates is established before determining the water-cement ratio in concrete	3.27	2.93	2.74	3.20	3.09	0.94	2.53	0.06	NS
41.	Ensuring that concrete and mortar constituents are mixed on a hard and clean surface if a mixing machine is not affordable	3.34	3.47	3.48	3.30	3.39	0.80	0.40	0.75	NS
S/N	**Content of Quality Management Skills in Building Construction:**	**N1 =75 $\overline{X_1}$**	**N2 =43 $\overline{X_2}$**	**N3 = 20 $\overline{X_3}$**	**N4 = 23 $\overline{X_4}$**	**$\overline{X}$ G**	**SD**	**F-Value**	**Sig. of F**	**RMK**
42.	Ensuring thorough mixing of concrete to achieve a uniform paste	3.52	3.67	3.57	3.40	3.55	0.69	0.82	0.48	NS
43.	Ensuring that fresh concrete is transported undisturbed	3.22	3.37	3.43	3.15	3.28	0.85	0.70	0.56	NS
44.	Ensuring that formworks are rigid, strong, watertight, but easy to strike	3.40	3.56	3.22	3.45	3.42	0.75	1.08	0.36	NS
45.	Ensuring that concrete is poured or placed from a height not more than one meter away	3.14	3.35	3.22	2.95	3.18	0.85	1.15	0.33	NS
46.	Ensuring that newly placed concrete is compacted until maximum density is achieved	3.34	3.40	3.35	3.37	3.36	0.72	0.05	0.98	NS
47.	Ensuring that concrete is placed and compacted within 30 minutes of its mix	3.26	3.35	3.57	3.50	3.36	0.76	1.26	0.29	NS
48.	Ensuring the constant curing of concrete as hardening proceeds	3.37	3.49	3.43	3.35	3.40	0.71	0.30	0.82	NS
49.	Ensuring the use of reinforcement bars that are clean and free from mud, paint, loose rust, grease or retarders	3.50	3.49	3.61	3.50	3.51	0.71	0.17	0.92	NS
50.	Ensuring that the bending schedule prepared by a competent structural engineer is strictly adhered to	3.58	3.63	3.70	3.70	3.62	0.56	0.43	0.73	NS

51.	Ensuring adequate concrete cover to reinforcement bars using concrete spacers	3.49	3.58	3.65	3.50	3.54	0.59	0.57	0.64	NS
52.	Ensuring that concrete attains maximum strength before striking the formwork	3.53	3.56	3.65	3.65	3.57	0.62	0.33	0.81	NS
	Planning skills for the production and laying of blocks									
53.	Ensuring that only clean and sharp sand is used for molding blocks	3.29	3.53	3.65	3.40	3.42	0.70	2.17	0.10	NS
54.	Ensuring that the specified proportion of materials is strictly adhered to	3.53	3.65	3.43	3.47	3.54	0.57	0.89	0.45	NS
55.	Ensuring that block constituents are mixed on a hard and clean surface	3.34	3.51	3.48	3.50	3.43	0.74	0.60	0.62	NS
56.	Ensuring thorough mixing of block constituents	3.26	3.51	3.39	3.45	3.37	0.73	1.17	0.32	NS
57.	Ensuring that blocks are well compacted and cured	3.47	3.65	3.70	3.45	3.55	0.62	1.42	0.24	NS
58.	Ensuring that every jointing mortar satisfies specified mix proportions	3.33	3.42	3.57	3.20	3.37	0.66	1.29	0.28	NS
59.	Ensuring that interface joints do not exceed or fall below specified thickness	3.27	3.32	3.30	3.15	3.28	0.73	0.27	0.84	NS
60.	Ensuring that every block course is measured, checked, and approved before commencing another course	3.21	3.30	3.09	3.25	3.22	0.88	0.31	0.82	NS
	Planning skills for site supervision									
61.	Ensuring that work instruction forms are used in the execution of every item of work	3.36	3.00	3.09	3.25	3.21	0.81	1.98	0.12	NS
62.	Monitoring the execution of work items to ensure the satisfaction of designers' intention	3.51	3.53	3.39	3.60	3.51	0.65	0.41	0.75	NS
63.	Ensuring that where there are conflicts between designers' intentions and standards/codes, the later prevail	3.44	3.16	3.35	3.35	3.34	0.79	1.09	0.36	NS
64.	Ensuring that every completed stage of work is inspected and approved by competent persons	3.46	3.53	3.39	3.55	3.48	0.64	0.35	0.79	NS
65.	Ensuring that no activity takes more time than was allotted to it in the construction programme	3.31	3.19	3.22	3.25	3.25	3.79	0.22	0.88	NS
66.	Keeping accurate financial records to ensure that no activity consumes more money than was budgeted for it	3.50	3.65	3.65	3.20	3.53	0.69	2.30	0.18	NS
67.	Ensuring that sub-contractors and suppliers are selected on the basis of pre-qualification rather than through competitive bidding.	3.35	3.44	3.39	3.15	3.36	0.73	0.75	0.53	NS
68.	Consulting regularly with top management	3.26	3.33	3.17	3.00	3.23	0.80	0.83	0.48	NS
	Controlling skills for site operations									
69.	Initiation of peer review of every completed item of work	3.41	3.35	3.35	2.25	3.36	0.72	0.25	0.86	NS
70.	Preparation of checklists for phase and whole project quality reviews	3.19	3.30	3.22	3.25	3.23	0.69	0.25	0.86	NS
71.	Reviewing to assure that everything has been done in the correct way in each phase of a project	3.46	3.60	3.57	3.45	3.51	0.59	0.67	0.57	NS

72.	Reviewing to assure that the correct materials have been used in each phase of a project	3.61	3.58	3.39	3.70	3.58	0.62	1.01	0.39	NS
73.	Carrying out similar reviews after the completion of the whole project	3.20	3.37	3.26	3.00	3.23	0.78	1.10	0.35	NS
74.	Invitation of independent assessors for the quality audit of the final product	3.05	3.16	3.00	3.05	3.08	0.82	0.25	0.86	NS
75.	Ensuring that every non-conforming item of work is reworked to acceptable standards	3.34	3.44	3.43	3.15	3.35	0.74	0.81	0.49	NS
76.	Ensuring group solutions to identified problems and challenges	3.28	3.56	3.39	3.35	3.38	0.76	1.23	0.30	NS
	Communication skills for construction activities									
77.	Documentation of every corrective action using technical information	3.33	3.44	3.26	3.20	3.37	0.69	0.68	0.56	NS
78.	Recording, using technical information, changes in drawings and specifications as construction proceeds	3.37	3.42	3.26	3.00	3.32	0.79	1.47	0.23	NS
79.	Recording, using technical information, all key work processes undertaken in the course of a project	3.38	2.93	3.13	2.85	3.16	0.76	4.88	0.15	NS
80.	Writing a report of the performance of the final product after a given period of time	3.15	3.26	3.26	3.30	3.21	0.83	0.27	0.85	NS
81.	Documentation of the findings of every field study	3.18	3.37	3.30	3.30	3.26	0.80	0.49	0.69	NS
	Motivational skills									
82.	Taking participants on a study of the activities of the best-performing building construction firms	3.27	3.19	3.17	3.25	3.23	0.81	0.15	0.93	NS
83.	Education and training of all personnel on quality issues, on a regular basis	3.32	3.49	3.57	3.25	3.39	0.71	1.28	0.29	NS
84.	Education and training of sub-contractors and suppliers on quality requirements	3.25	3.42	3.17	3.25	3.28	0.75	0.70	0.55	NS
85.	Setting quality goals and having every participant key into them	3.32	3.44	3.35	3.35	3.36	0.72	0.28	0.84	NS
86.	Conducting site meetings regularly	3.23	3.19	3.26	3.35	3.24	0.81	0.19	0.90	NS

Key: N_1 = CORBON – registered Builders, N_2 = Building Technology Teachers, N_3 = Graduates of Building Technology, N_4 = Industrial Technical Education Lecturers. $\overline{X}_1$ = mean response of CORBON registered Builders, $\overline{X}_2$ = mean response of Building Technology Teachers, $\overline{X}_3$ = mean response of Building technology Graduates, deviation. F is significant at $p < 0.05$. **Note:** Letters of the alphabet (a, b and c) indicate mean difference as determined using the scheffe test. Means with the same letters of the alphabet are not significantly different while those with different letters are significantly different. The Analysis in Table 4 shows that there is no significant difference in the mean responses of the respondents on all 65 items. $\overline{X}_4$ = mean response of Industrial Technical Education Lecturers. $\overline{X}G$ = Grand mean, SD = Standard.

Discussion of Findings

The findings of the study showed that all 21 items identified for specific objectives of quality management skills in building technology were rated as appropriate by the respondents. This is not unconnected with the fact that all the respondents are professionals in their various areas, and living witnesses to the crises rocking the building industry in Nigeria. As such, they saw all the items as being essential for repositioning the industry for better service delivery. This indicates that the integration of the specific objectives into the building technology curriculum of Colleges of Education (Tech) in Nigeria will help in the production of quality-conscious graduates who have the capacity to ensure quality performance in construction activities. This, if achieved, will go a long way in addressing the many challenges facing the building construction industry in Nigeria. This finding is in line with the opinions of Onyemerekeya (2004) and Okorafor (2004) who opine that instructional

objectives should be selected on the basis of their ability to address current societal challenges. The Nigerian building industry today is beset with challenges of building collapse, defective structures, time and cost overrun, project failure or abandonment and so many other issues. Therefore, if the building technology curriculum of Colleges of Education (Tech) in Nigeria is reinforced with the identified quality management specific objectives, the institutions will be able to instill quality management consciousness into the students so that on graduation, they will be able to impart same to future construction workers. This finding is also in line with the opinions of Mkpa (1987) and Offorma (1994) who opine that the learner as the ultimate recipient of instruction should be able to use what he learns to better himself and the society. This implies that the seemingly different professional backgrounds of the respondents did not have significant effect on their mean responses. It can therefore be confidently said that there was no significant difference in their mean responses as shown in the overall ANOVA result. This shows that the specific objectives of quality management skills in building technology determined in this work are considered appropriate.

The findings of the study showed that all sixty-five (65) items identified for inclusion in the content of the quality management skills component of the building technology curriculum of Colleges of Education (Tech) in Nigeria were considered appropriate by the respondents. Again, this is likely because the respondents, as professionals who have seen it all in the Nigerian building industry, saw the continuous absence of quality management skills content from the building technology curriculum of Colleges of Education (Tech) in Nigeria as not only dangerous but retrogressive in these modern times. Hence the rating of all the items as appropriate. These items were grouped under nine sub-headings as follows: Planning skills for quality materials and personnel, planning skills for setting out of buildings, planning skills for foundation construction, planning skills for concrete production, planning skills for the production and laying of blocks, planning skills for site supervision, controlling skills for site operations, communication skills for construction activities, and motivational skills.

The indication of the respondents is that if the above skills are integrated into the content of the building technology curriculum, it will help in producing quality – conscious graduates who will have a competitive advantage in the building industry. This finding is in line with the opinion of Nwachukwu (2001) who opined that whatever should find its way into a vocational and technical education curriculum, such a thing must be capable of addressing real-life situations. Therefore, the finding of the study with respect to the content of quality management skills for the building construction curriculum is in line with Moore (nd) who proposed that the logical elements of quality management should include: planning, applying quality methods, phase quality review, project quality review, and quality audit. The finding is also supported by Atkinson (1995) who compiled a list of issues to be covered in any quality performance approach in building construction. The list includes: a workforce with sound skills, materials of specified quality, satisfaction of designers' intentions and expectations (unless such intentions and expectations are, themselves, contrary to codes and standards), recording of changes in design, observance of quality standards, and an improved information flow.

The finding is also in line with Hoonakker, Carayon and Looushine (2010) who found in a study that the best way to improve quality is through education and training, and that lack of skilled workers and the low bid mindset in awarding contracts are among the greatest barriers to quality improvement in construction. Also supporting the present finding are the findings made by Lombard (2006) which include, that: 1) designs should conform to owner's requirements, and to codes and standards 2) teamwork impacts positively on construction quality 3) quality-based selection of contractors shouldbe preferred to cost-based selection 4) quality audit is a condition for construction

quality 5) quality is improved when reputable suppliers are engaged, 6) design changes should be carefully managed,
7) design should be audited for constructability. It is also in agreement with the recommendation made by Lombard (2006) that research be carried out to develop a comprehensive guide for quality improvement practices across the entire construction value chain.

Recommendations

1) Further research should be conducted to identify the instructional methods/activities, instructional resources and evaluation techniques for integration into the building technology curriculum of Colleges of Education (Tech) in Nigeria.
2) The National Commission for Colleges for Education (NCCE) should review the minimum standards to include the identified quality management skills in the Building Technology Programme of the Curriculum.
3) Experts should be encouraged to produce textual materials for the quality management skills component of the building technology curriculum.

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