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CONSTRUCTION MANAGEMENT COMPETENCIES NEEDED BY BLOCK LAYING AND CONCRETING STUDENTS AT RIVERS STATE TECHNICAL COLLEGES FOR ENHANCING ENTREPRENEURSHIP DEVELOPMENT

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Abstract
This study looked at the construction management competencies needed by brick/block-laying and concreting students at Rivers State to enhance entrepreneurship. The study was based on two research questions and two hypotheses. The design of the study was based on a survey. The study population consisted of 15 Brick/block laying and Concreting teachers and the fifty builders registered with the Ministry of Works of Rivers State bringing the total population of the study to sixty-five persons. As the population is small, sampling was not conducted. Therefore, the entire population was utilized for the study. The study was conducted using a structured questionnaire to be responded to in a 5-point Likert scale. The questionnaire is titled Construction Management Competencies Needed of Brick / Block-Laying / Concreting Students for Enhancing Entrepreneurship. The validity of the tool was verified by three lecturers, belonging to the Department of Industrial and Technical Education at Ignatius Ajuru University of Education, who conducted a face and content validity on the questionnaire items. The reliability of the instrument was also verified by administering the instrument to fifteen teachers of block-laying and concreting in technical colleges in Akwa Ibom and contiguous States. The internal consistency of the instrument was determined by the Cronbach alpha reliability coefficient. Research questions were answered using mean and standard deviation while null hypotheses were tested by z-test at .05 levels of significance. The findings of this study showed that: Using CAD in drawing; using building information modeling; using self-healing concrete; working with fast hardening cement; offsite construction techniques; operating and using machines in construction; where time management skills required by brick/block-laying and concreting students for entrepreneurship at Rivers state technical collages.

Keywords: Construction management, competencies, skills. Brick/block-laying and concreting entrepreneurship.

Introduction

Just as water is highly vital to the life of a human, so also is the skill required in the life of every serious-minded individual. Skills can do a lot of great work in the life of every living soul. Thus, the importance of skill acquisition and competency to the development of the nation is of no small measure. According to Abubakar (2016) construction industries, manufacturing industries, and production industries, amongst others are in daily need of competent skilled personnel, technicians, technologists, engineers, and so on to carry out one job or the other. The industries in Nigeria need men and women with competent skills and well-trained workers to ensure that goods manufactured in Nigeria are as good as those manufactured in other parts of the world. Skills are required in all aspects that will lead to economic development. Skills are required in trading, road construction, building of houses, health services, education, security, agriculture, mining, tourism, and so on. The productive capacity of any nation depends on its ability to harness the skills of its citizens (Igbuzor, 2019). Skill is used to denote expertise that has been developed through training and experience, and includes trade and craft skills acquired by apprenticeship, as well as the high-level performance found in many domains, such as professional practice, the arts, games, and athletics (Breivik, 2016). Skills are classified as literacy skills, technical skills, sports skills, artistic skills, communication skills, and managerial skills (Radhika, 2018). Skills are acquired in various educational institutions such as universities, colleges of education, polytechnics, and technical colleges.

The technical college system was adopted as the first level of post-basic education with a common curriculum in all the technical colleges accredited by the National Board for Technical Education (NBTE) in Nigeria. According to

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Ogundu (2017), technical colleges are established institutions where students are trained to obtain relevant knowledge and skills in different occupations for employment in the world of work. In technical colleges, individuals are groomed to acquire manipulative skills, basic scientific knowledge, and attitude required of craftsmen and technicians at sub professional level. The education provided at the technical college is based on the fundamentals of industrial production (Umunadi, 2013). Some of the programs offered at the technical colleges include Mechanical Engineering Craft Practice, Refrigeration and Air Conditioning, Carpentry and Joinery, Plumbing and Pipe Fitting, Brick/Block-Laying, and Concreting amongst others. Brick/Block-laying and Concreting is the application of applied technology in the construction industry (Amobi, 2015, Vareba & Igweagbara, 2021). Brick/Block-laying and concreting depend on natural materials obtainable from the soil which includes stone, sand, clay, and other materials like metal, timber, and iron sheets. The students are also trained on performing workability tests on concrete, slump tests, placing of concrete, applying admixtures to concrete, compacting fresh concrete, curing of concrete and fixing concrete, joint materials, foundations, walls, construction of staircases, concreting, drainages, roofs, and so on. (FRN, 2013, David, and Jude 2017). For the Brick/block-laying and Concrete students to be successful entrepreneurs, it becomes imperative that these students acquire pertinent skills in construction management. Construction management or construction project management is the overall planning, coordination, and control of a construction process from beginning to completion (Maksimović, 2014). Construction project management is aimed at meeting a client's requirements to produce a functionally and financially viable project. Construction management involves planning management, cost management; contract administration, safety management, time management; and quality management.

Time management is important in any construction project. Without proper time management, many problems will occur such as extension of time or time overrun. Some researchers describe time overrun as a delay while others see it as an effect of the construction delay, no matter what it was described, time overrun become the most general problem in the construction industry worldwide (Olawale & Sun 2010). Time overrun occurs when the actual progress of a construction project is slower than the planned schedule (Ibrahim, 2011). Delays or time overruns will affect all parties involved in the project. It will affect the profits that would be obtained if the project can be completed on the schedule. However, due to the time overrun, contractors had to spend more money on labour, and plant and may lose the opportunity to get the next project. Hence, effective time management is very important and crucial to achieve successful completion of construction projects. (Aftab et al., 2014).

In addition to time management, quality is an essential part of construction projects. It becomes a competitive advantage and, has a large impact on an organization's success and profit. There are three constraints in construction projects, cost, schedule, and scope. Mosab (2011) asserted that quality in construction entails that projects should be completed within the predetermined timeline, cost, and scope and should meet the agreed specifications. The concept of quality management is to ensure efforts to achieve the required level of quality for the product which are well planned and organized. From the perspective of a construction company, quality management in construction projects should mean maintaining the quality of construction works at the required standard to obtain customer satisfaction that would bring long-term competitiveness and business survival for the companies (Chin-Keng & Abdul-Rahman, 2011). Quality management is critically required for a construction company to sustain itself in the current construction market which is highly challenging and competitive.

Statement of the Problem

Brick/Block-laying and Concreting students ought to be equipped with saleable or entrepreneurial skills. The entrepreneurial skills are meant to launch craftsmen of Brick/Block-laying and Concreting into wealth by equipping these craftsmen with skills that will enable them to sell their products and render services to make a profit and earn a living. Craftsmen of Brick/Block-laying and Concreting graduates seek unavailable white-collar jobs, instead of being self-employed or employers of labor. The state of joblessness has created a lot of problems for society, ranging from youth restiveness, vandalization of developmental projects, and over-dependence on the society for better livelihood and finally landing the society into poverty and recession (Omofonmwan & Igweagbara, 2017). Orji (2020) lamented the inability of many graduates of technical colleges who fail to perform simple tasks the low quality of work performed by most craftspeople, technicians, and artisans, and the strident complaints by members of the organized private sector over the unavailability of skilled workforce. This trend may be a result of Brick/Block-laying and concrete students do not possess skills in construction management. To that end, the researcher sought to determine

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the construction management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship.

Aim and Objective of the Study

The purpose of the study is to assess the construction management skills required of Brick /Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship. Specifically, the study sought to

1. Access the time management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical collages for entrepreneurship
2. Access the quality management skills required of Brick/Blocking-Laying and Concreting students of Rivers State for entrepreneurship

Research Questions

The following five research questions were posed to guide the study

1. What are the responses of the teachers and the builders on the time management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship?
2. What are the responses of the teachers and builders on the quality management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship?

Hypotheses

The following five null hypotheses were formulated and tested .05 level of significance

Ho1: There is no significant difference between the mean responses of Brick/Blocking Laying and Concrete teachers and builders on the time management skills required of Brick/block laying and concreting students of Rivers State Technical College for entrepreneurship.

Ho2: There is no significant difference between the mean responses of Brick/Blocking Laying and Concreting teachers and builders on quality management skills required of Brick/Block-Laying and Concreting students of Rivers State technical colleges for entrepreneurship.

Methodology

The study will adopt a survey design. This design is appropriate for the research because survey design according to Ogundu (2018) is a type of descriptive survey research whose purpose is to collect data from a large or manageable sample of a population to determine the distribution, occurrence, and interaction of educational and sociological phenomena. The population of the study consisted of fifteen teachers in the Brick/Block-Laying and Concreting department in the five technical colleges in Rivers State and fifty builders registered with Rivers State Ministry of Works bringing the total population to sixty-five. No sampling was carried out since the population was small. Thus, the entire population was used for the study. A structured five-point Likert scale questionnaire titled Construction Management Competencies Needed by Block Laying and Concreting Students for Enhancing Entrepreneurship (CMCNBCSEE) was used for the study. The validity of the instrument was carried out by three lecturers in the Department of Vocational and Technical Education at Rivers State University who carried out a face and content validity of the questionnaire items. Their suggestions and corrections were incorporated in the drafting of the final copy of the instrument that was issued to the respondents. The reliability of the instrument was determined by administering the instruction to fifteen teachers of Block-Laying and Concreting in Akwa-Ibom State a contiguous State, who are not part of the main population and sample of the study. Thereafter, the internal consistency of the instrument was determined using the Cronbach Alpha reliability coefficient. The research questions were answered using mean while an independent sample t-test was used to test the null hypotheses at a .05 level of significance. The data was analyzed using Statistical Package for Social Sciences (SPSS) version 23. For answering the research questions, a criterion mean of 3.5 will be established. Mean responses of 3.5 and above are agreed while mean responses below 3.5 are disagreed. For testing the null hypotheses, if the significant value at two-tailed is equal or greater than .05 the null hypotheses were accepted. If the significant value at two-tailed was less than .05 the null will be rejected.

Results

Research Questions 1: What are the time management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship?

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Table 1: Mean scores of teachers and builders on the time management competencies required of Brick/Block-Laying and Concreting students of Rivers State Technical collages for enhancing entrepreneurship

S/N	ITEM	Teachers			Builders		
		$\bar{x}$	SD	RMK	$\bar{x}$	SD	RMK
1.	Write and prepare a project plan	4.67	.49	A	4.50	.51	A
2.	Prioritize task	4.50	.52	A	4.88	.33	A
3.	The use of CAD in drawing	4.33	.65	A	4.38	.49	A
4.	Application of Building Information Modeling	4.42	.52	A	5.00	.00	A
5.	Use self-healing concrete	4.17	.58	A	4.38	.49	A
6.	Working with rapid hardening cement	4.42	.52	A	4.72	.54	A
7.	Use of offsite construction techniques	4.17	.94	A	4.38	.49	A
8.	Operate and use of machines in construction	4.17	.39	A	4.72	.45	A
9.	Working with quality construction materials	4.83	.58	A	4.12	.33	A
10.	Adopt the right construction techniques	4.17	.58	A	4.70	.46	A
	Grand Mean	**4.39**	**.58**		**4.58**	**.41**	

Source: Field Survey 2023

Table 1 shows the mean scores of respondents on the time management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship. The respondents agreed on all the items in the table as time management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship as the mean scores of the respondents exceeded the criterion mean of 3.50.

Research Question 2: What are the quality management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship?

Table 2: Mean scores of teachers and builders on the quality management competencies required of Brick/Block-Laying and Concreting students of Rivers State Technical collages for enhancing entrepreneurship

S/N	ITEM	Teachers = 15			Builders = 50		
		$\bar{x}$	SD	RMK	$\bar{x}$	SD	RMK
11	Use quality construction material	4.33	.49	A	4.18	.39	A
12	Engage qualified persons in construction	4.67	.49	A	4.46	.50	A
13	Use the right and proper equipment	4.33	.49	A	4.28	.61	A
14	Adherence to statutory regulations	4.25	.45	A	4.70	.64	A
15	Conduct regular site inspection	4.67	.49	A	4.40	.51	A
16	Conduct on-site inspection of materials	4.75	.45	A	4.52	.51	A
17	Conduct slum test for concrete	4.58	.52	A	4.44	.64	A
18	Properly cure concrete	4.08	.29	A	4.58	.49	A
19	Adhere to specification	4.59	.52	A	4.38	.64	A
20	Ensure proper mixture of concrete	4.42	.52	A	4.60	.50	A
	Grand Mean	**4.47**	**.47**		**4.45**	**.54**	

Source: Field Survey 2023

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Table 2 shows the mean scores of respondents on the quality management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship. The respondents agreed on all the items in the table as quality management skills required of Brick/Block-Laying and Concreting students of Rivers State technical colleges for entrepreneurship as the mean scores of the respondents exceeded the criterion mean of 3.50.

Hypotheses

H01: There is no significant difference between the mean responses of Brick/Blocking Laying and Concrete teachers and builders on the time management skills required of Brick/Block Laying and Concreting students of Rivers State Technical College for entrepreneurship.

Table 3: Z-test between the mean scores of Brick/Blocking Laying and Concreting teachers and builders on the time management skills required of Brick/Block-Laying and Concreting students of Rivers State technical colleges for enhancing entrepreneurship.

Respondent	NO	$\bar{x}$	SD	DF	Z-cal	Z-crit	p-value	Decision
Teachers	15	4.39	.58	63	.95	1.67	.05	Accept
Builders	50	4.58	.41					

Table 3 is the result of the z-test between Brick/Blocking Laying and Concreting teachers and builders on the time management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship. The table revealed that the z-test which is .95 is less than the critical table value of 1.67 at a .05 level of significance hence the null hypothesis was accepted. Thus there is no significant difference between the mean scores of Brick/Blocking Laying and Concreting teachers and builders on the time management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship.

H02: There is no significant difference between the mean responses of Brick/Blocking Laying and Concreting teachers and builders on quality management skills required of Brick/Block-Laying and Concreting students of Rivers State technical colleges for entrepreneurship.

Table 4: Z-test between the mean scores of Brick/Blocking Laying and Concreting teachers and builders on the quality management skills required of Brick/Block-Laying and Concreting students of Rivers State technical colleges for enhancing entrepreneurship.

Respondent	NO	$\bar{x}$	SD	DF	Z-cal	Z-crit	p-value	Decision
Teachers	15	4.39	.58	63	.077	1.67	.05	Accept
Builders	50	4.58	.41					

Table 4 is the result of the z-test between Brick/Blocking Laying and Concreting teachers and builders on the quality management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for enhancing entrepreneurship. The table revealed that the z-calc which is .077 is less than the critical table value of 1.67 at a .05 level of significance hence the null hypothesis was accepted. Thus there is a significant difference between the mean scores of Brick/Blocking Laying and Concreting teachers and builders on the quality management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for entrepreneurship.

Discussion

Table 1 shows the mean scores of respondents on the time management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical Colleges for enhancing entrepreneurship. The respondents all agreed that writing and preparing a project plan, prioritizing tasks, the use of cad in drawing, application building information modelling, using self-healing concrete, working with rapid hardening cement, use of offsite construction techniques, operating and use of machines in construction, working with quality construction materials and adopt right construction techniques. The findings of the study also revealed that there is no significant difference between the mean scores of Brick/Blocking Laying and Concreting teachers and builders on the time management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical collages for entrepreneurship. The findings of the study are in harmony with Zuo et al. (2017) when timelines are closely managed, project members are likely to

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discuss how best to approach tasks, which can lead to increased team morale, better collaboration, and improved creativity. As a result, teams can work more effectively and efficiently.

In research question two, the study revealed that the use of quality construction materials, engaging qualified persons in construction, using the proper equipment, adherence to statutory regulations, conducting regular site inspections, conducting an on-site inspection of materials, conducting slum tests for concrete, properly cure concrete, adhere to specification and ensure proper mixture of concrete. The findings of the study also revealed that there is a significant difference between the mean scores of Brick/Blocking Laying and Concreting teachers and builders on the quality management skills required of Brick/Block-Laying and Concreting students of Rivers State Technical collages for entrepreneurship. The findings of the study are in harmony with the works of Yisa (2013) who also revealed that the ability to work with trained professional bodies for the prevention of building collapse, the ability to plan with building designers for the prevention of building collapse, ability to test materials to ascertain of its quality for prevention of building collapse.

Conclusion

The use of CAD in drawing, application of building information modelling, use of self-healing concrete, working with rapid hardening cement, use of offsite construction techniques, and operating and use of machines in construction, are time management strategies required for skills required of Brick/Block-Laying and Concreting students of Rivers State technical collages for entrepreneurship. The use of quality construction materials, engaging qualified persons in construction, use of the proper equipment, adherence to statutory regulations, conducting regular site inspection, and conducting on-site inspection of materials are quality management strategies required for skills required of Brick/Block-Laying and Concreting students of Rivers State technical collages for entrepreneurship.

Recommendations

The following recommendations were made based on the data analyzed for the study

1. Brick/Block-laying and concreting teachers should train the students on the use of modern tools and equipment as well as advanced construction techniques to improve time management on construction sites.
2. Brick/Block-laying and concreting students should be trained on the identification and application of quality materials to enhance quality management in construction.

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