

ENTREPRENEURIAL SKILLS REQUIRED BY BUILDING TECHNOLOGY GRADUATES IN BUILDING MAINTENANCE ENTERPRISE FOR SELF-RELIANCE IN ENUGU STATE.

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Abstract

Lack of knowledge and entrepreneurial skills based on global best practices among building technology graduates in Nigeria is alarming and has discouraged growth in building maintenance (BM) enterprise. This study identifies entrepreneurial skills required by building technology graduates in BM enterprise for self-reliance in Enugu state. Two research questions and hypotheses guided the study. The study adopted survey design and was carried out in Enugu state. The population for the study was 112 respondents made up of 77 building construction personnel in Nsukka and Enugu towns, and 35 lecturers of building technology courses from the two government owned tertiary institutions in Enugu state. Instrument for data collection was a 30-item entrepreneurial skill structured questionnaire validated by 3 experts from building construction unit of industrial technical education department University of Nigeria Nsukka. Cronbach alpha method was used to test the internal consistency of the items given a reliability coefficient of 0.84. A total of 112 copies of the instrument were administered to the respondents by 3 research assistants and 110 valid copies were returned representing 98.21% response rate. The instrument was analyzed using weighted mean and standard deviation while the hypotheses were tested at 0.05 level of significance, using t-test statistics with the aid of Statistical Package for Social Sciences (SPSS) software, There was no significant difference in the responses of building construction lecturers and personnel on the 30 entrepreneurial skills identified in BM enterprise. The study found that all the 30 entrepreneurial skill identified in BM enterprise based on global best practices are desirable and were all required by building technology graduates. The study therefore, recommended that the identified entrepreneurial skill be inculcated into a manual and used in the training of building technology students in Enugu state for self reliance after graduation.

Key Words: Building Technology, Vocational Technical Education, Entrepreneurship Education, Building Maintenance.

Introduction

The construction industry contributes immensely to the national economy as it is responsible for providing the needed infrastructure for every sector of the economy to function effectively. By achieving this infrastructure development, the construction industry brings together a variety of professionals comprising Architects, Builders, quantity surveyors, and civil, electrical and mechanical engineers, among others, from the project inception to project completion. The roles played by construction professionals and the competency they possess are significant in successfully executing and completing the project (Agnes, 2021). The construction industry seeks competent and qualified products of tertiary institutions to join its workforce to achieve productivity and remain competitive and innovative (Okoroma, 2017). Therefore, training provided by tertiary institutions is meant to equip students with competencies in hard skills, which are technical knowledge to perform effectively in the job, and soft skills, which are personal and behavioral attributes that

will enable students to relate in the building technology workplace.

Building Technology is one of the academic programmes in Polytechnics and Universities in Nigeria. In building technology, individuals are trained with relevant materials such as curriculum, tools, equipment and machines to enhance their skill acquisition for employment. Building technology is directly related to preparation of individuals for paid or self-employment or for additional preparation for a career. Noor, (2015) explained that the essence of building technology in the curriculum of colleges of education and as parts of technical education is to equip students with knowledge and psychomotor skills. The individuals who graduated in building technology after meeting the requirements for graduation in polytechnics, universities and other tertiary institutions are called building technology graduates (Nwaeze et al, 2012). These graduates are expected to be skilled and knowledgeable in building technology in order to become creators of employments

in the society. They are expected to work as employees in relevant industries or owners of their enterprises or ventures and employ others. Building Technology, as a vocational and technical education programme is aimed at producing technicians who will be able to perform basic functions in Building Technology practice both in the private and public sectors, (Ogunmilade, 2016). Similarly, technical education is that aspect of education which leads to the acquisition of practical and applied skills as well as basic scientific knowledge (Ogbuanya & Bakare, 2017).

The Federal Government of Nigeria is aware of the need for technical education in the country as a means of attaining the much desired technological growth. This awareness is clearly reflected in the goals set for technical education as highlighted in the National Policy on Education (FRN, 2013). The policy also stated that the quality of instruction at all levels has to be oriented towards inculcating values for the common good of the society; promotion of physical, emotional, and psychological development of all children and acquisition of competencies necessary for self-reliance. Vocational and technical education equips learners with appropriate skills, abilities and competencies that contribute to the development of the society (Osuala, 2010). Onuh, (2005) described Vocational and technical education as a form of education, which emphasizes the development of entrepreneurial and occupational skills needed as preparation for work, which makes the worker more adaptive to challenges of the society. The need for entrepreneurial skills has become more obvious as a result of automation, advances in science and technology, increasing specialization of functions, human resources shortages and the changing nature of jobs (Otuaya, 2008).

However, from recent observations, it was seen that most graduates in Enugu State are found to be lacking in the area of skills acquisition making it uneasy for them to secure paid employment in the world of work or become self-reliant after graduation. According to Igberadja (2014), the Nigerian labour market reports that Nigerian graduates do not possess the requisite employable skills due to poor implementation of educational curriculum. In a related study, Okwelle and Owo (2017) reported that most technical courses in Nigerian institutions are taught almost theoretically due to poor state of practical training facilities. Most building construction graduates still roam the street without work skills. Amaewhule, (2014) opined that lack of entrepreneurial skill among building technology graduate in Enugu State is shooting up unemployment among youths the sky. This has

arisen due to little or no entrepreneurial skill acquired by the students during training in tertiary institutions.

Entrepreneurial skill helps individual become self-reliant having acquired ideas and skills. Skill is the ability to do a given task expertly. Ottih, (2014) posited that skill is the art of possessing the ability, power, authority, or competency to do the task required of an individual on the job. Michael (2004) defined skill as individual's capability to control elements of behaviour, thinking and feeling within specified contexts and within particular domain. Skills are divided into domain-general and domain-specific. In the domain of work, some general skills include: time management, self-motivation, teamwork and leadership whereas domain-specific skills are useful for training in certain jobs. Two fundamental issues are involved when a skill is to be acquired. According to Okoro and Ursula (2012), the first is the conditions which promote acquisition and the second is the change that occur when the skill is acquired. Lemo and Olakotan (2016) posited that skill acquisition is preeminently the cultivation of overt employable skills which tend towards self-reliance in different kinds of occupation. Ogbuanya and Ohanu (2010) stated that when one possesses adequate skills in carrying out a task, he/she does the work accurately within the minimum possible time and the work will always attract the attention of people.

Entrepreneurship education contributes greatly to the growth of national economy because it involves a process of training that is designed to give the required knowledge, acquire skills and capabilities that could lead to the development of mental alertness and the right approach to life. Entrepreneurs are individuals, corporate bodies or government agencies who have the capabilities, background, skills and utilize their enterprises to begin a new trade as well as to run an existing commerce (Nwaeze et al, 2012). The entrepreneur bears all the risks that may arise in his quest towards achieving the company's set objectives. Consequently, an entrepreneur organizes, control and bear the burden of the risk of a business undertaking (Ayonmike, & Okeke, 2015). Entrepreneurship remains a vital element for the economic growth of any nation of this world. This realization prompted the Federal government of Nigeria to initiate deliberate policies aimed at developing private business ownership.

The Government has also encouraged tertiary institutions to include innovative enterprise programmes in their various schools. Such innovative enterprise includes courses that will make the learners to become employers of labour after graduating from school (FRN, 2013). Consequently, the school system is challenged to encourage its products to turn into path of

entrepreneurship as a career choice. It is a venture that can make the students of building technology to be self-employed and move them away from endless quest for non-existing white collar jobs; this makes them job creators instead of job seekers (Nande, Awua, & Mlumun, 2017). However, it is also the role of schools to prepare students of building technology for the world of work. Hence, technical and vocational education students who may find employment later through the creative ingenuity of entrepreneurship must abide by rule of works and be absorbed in work ethics, work orientation and be able adapt to the constant changing skills, which have become imperative due to technological changes. In order for the building technology students to succeed in the industry and attain positions that they may be yearning for themselves, total commitment to their chosen career is imperative. One good way of helping graduates of building technology for self-reliance in the society is by training building technology students in building maintenance enterprise.

Building maintenance includes a set of activities designed to prevent sudden breakdown of equipment and facilities in the building/house (Shi & Zeng, 2016). Building maintenance is an optimal way to achieve a satisfactory level of reliability, in order to reduce costs during the useful life of the building (Das, Lashkari & Sengupta, 2007). Building maintenance is a set of activities carried out to prolong the lifespan of the building including repairs which are carried out when building equipment and components fails, does not function properly, or its operation is delayed. The main purpose of building maintenance is to extend the lifespan of the house and reduce the costs in the most efficient manner that is defined from the time of installation of equipment and during operation (Golchi et al., 2018). Building maintenance helps to optimize the capability of building equipment and elements to achieve maximum efficiency, reduce failure and breakdown. Its minor objectives include increasing readiness and reliability, as well as reducing additional costs. Proper utilization of buildings increases their useful life. The cost of maintaining and repairing buildings increases exponentially from the time of construction. When buildings are not regularly inspected and evaluated, building maintenance could lead to exorbitant costs; thus planning a maintenance management system can be especially important in reducing maintenance costs (Moriconi & Naik, 2010).

Various building codes and regulations have been provided to improve the quality of the building in terms of design, construction, repair, and maintenance. These codes assess building quality based on different

criteria. Criteria are used to compare and rank maintenance policies; different classifications of these criteria have been proposed (Dokubo, 2017). According to several experts, these criteria are grouped into four main groups: cost, value added, safety, and feasibility (Okwelle, & Owo, 2017). Some criteria such as hardware, software and costs of training, reliability, and equipment reliability are measurable and quantitative; however, others such as safety, flexibility, acceptance by workers, and product quality are qualitative and face problems in measurement. Quantitative and qualitative criteria are classified into four main categories: economic, technical, social, and environmental (Shafiee, 2015). Since the codes related to buildings change over time, according to the costs of buildings, for their proper maintenance and repair, new criteria should be proposed to develop these codes and finally determine the appropriate strategies for maintenance and repair of the building (Martin, Tognetti & Hill, 2016). The main criteria for selecting appropriate maintenance policies that have been most emphasized in previous research are profitability, accessibility, environment, safety, and reliability. It is imperative for building technology students to engage in building maintenance and repair enterprises as one major way of self-reliant after graduation.

Statement of the Problem

Building construction programme in tertiary institutions is aimed at producing skilled craftsmen who will be able to perform basic functions in work skill requirements. Building construction skill oriented programme is aimed at producing graduates who will be self employed or have saleable skills in construction industry. However, from recent observations, it was seen that most graduates in Enugu State are found to be lacking in the area of skills acquisition making it uneasy for them to secure paid employment in the world of work or become self-reliant after graduation. According to recent studies, the Nigerian labour market reports that Nigerian graduates do not possess the requisite employable skills due to poor implementation of educational curriculum. In a similar report, most technical courses in Nigerian institutions are taught almost theoretically due to poor state of practical training facilities. Most building construction graduates still roam the street without work skills. Studies show that lack of entrepreneurial skill among building technology graduate in Enugu State is shooting up unemployment among youths the sky. This has arisen due to little or no entrepreneurial skill acquired by the students during training in tertiary institutions.

This development increases the rate of criminal activities in the society. The consequences of

unemployment by youths are most grievous; they indulge into social vices such as burglaries, robbery, prostitution, kidnapping, drug abuse among others. Building maintenance enterprise is one area that should be explored by building technology graduates for self reliance. Therefore, there is need to carry out a study on the entrepreneurial skills which these graduates need in order to establish and succeed areas of building maintenance enterprises in Enugu State. Thus, the desire to see graduates becoming self-reliant through engaging in building maintenance services and enterprise necessitated the researchers' desire to carry out this study to assess the entrepreneurial skills required by building technology graduates in building maintenance enterprise for self-reliance in Enugu State.

Purpose of the Study

The main purpose of the study is to determine the entrepreneurial skills required by building technology graduates in building maintenance enterprise for self-reliance in Enugu State. Specifically, the study determined:

1. The entrepreneurial skills required by building technology graduates for self-reliant.
2. The building maintenance skills required by building technology graduates for self-reliant.

Research Questions

1. What are the entrepreneurial skills required by building technology graduates for self-reliant?
2. What are the building maintenance skills required by building technology graduates for self-reliant?

Hypothesis

The following null hypothesis was tested at 0.05 level of significance:

Ho₁: There is no significance difference between the mean responses of building construction personnel and lecturers of building technology on the entrepreneurial

skills required by building technology graduates for self-reliant.

Ho₂: There is no significance difference between the mean responses of building construction personnel and lecturers of building technology on the building maintenance skills required by building technology graduates for self-reliant.

Methodology

The study adopted survey design and was carried out in Enugu state. The population for the study was 112 respondents. The population is made up of 77 building construction personnel in Nsukka and Enugu towns, and 35 lecturers of building technology courses from the two government owned tertiary institutions in Enugu state. These tertiary institutions include; the University of Nigeria Nsukka and Enugu state University of Technology. Due to the manageable size of the population, no sampling was done as the entire population of 112 respondents was used as the sample of the study. The instrument for data collection was a 30-item entrepreneurial skill structured questionnaire which was validated by 3 experts from building construction unit of industrial technical education department University of Nigeria Nsukka. Cronbach alpha method was used to test the internal consistency of the items, which yielded a reliability coefficient of 0.84. A total of 112 copies of the instrument were administered to the respondents by the researcher with the help of 3 research assistants and 110 valid copies were returned representing 98.21% response rate. The instrument was analyzed using weighted mean and standard deviation while the hypotheses were tested at 0.05 level of significance, using t-test statistics with the aid of Statistical Package for Social Sciences (SPSS) software.

Results

Data for answering research questions 1 to 2 were presented in table 1 to 4

Table 1: Mean responses of respondents on the entrepreneurial skills required by building technology graduates for self reliant.
N = 110

S/N	Item Statements	\bar{X}	SD	Remarks
1	Ability to work within restricted timelines and in controlled environments.	4.38	0.82	Agreed
2	Ability to manage, control one's self and cope with stress in some unprecedented situations.	3.95	0.86	Agreed
3	Ability to communicate essential information needed for decision making and basic computer skills.	4.04	1.09	Agreed
4	Ability to communicate with facilities management about any work that requires outside expert assistance.	4.52	0.54	Agreed
5	Ability to document work performance and materials procurement as directed, using work order system.	4.46	0.50	Agreed
6	Ability to follow instructions both, written and verbal to carry out given job or task.	3.96	0.86	Agreed
7	Ability to follow standardized methods and approved practices in carrying out works.	3.83	1.28	Agreed
8	Ability to initiate documents to obtain formal approval of work required and basic mathematics skills.	4.10	1.01	Agreed
9	Ability to interpret a variety of instructions furnished in written, oral or schedule form.	4.04	1.09	Agreed
10	Ability to involve movement between departments, floors, and properties to facilitate work.	4.94	1.15	Agreed

\bar{X} = Mean SD =Standard Deviation

Data in Table 1 reveal that all the 10 items have their mean values ranging from 3.95 to 4.94. This shows that the mean value of each item was above the cut-off point of 3.50, indicating that the items were agreed by the respondents as the entrepreneurial skills required by

building technology graduates for self reliant. The SD ranged from 0.28 - 1.15 which showed that the respondents are not too far from each other in their responses.

Table 2: Mean Responses of Respondents on the building maintenance skills required by building technology graduates for self reliant.
N= 110

S/N	Item Statements	\bar{X}	SD	Remarks
11	Ability to ensure building equipment/components and grounds are safe and in good repair at all times.	3.63	1.16	Agreed
12	Ability to assist as the on-site coordinator for contractors and general site setup and preparedness.	4.67	0.47	Agreed
13	Ability to assist and serve as back-up to other facilities employees.	3.82	0.99	Agreed
14	Ability to check and repair basic plumbing fixtures, including spigots, traps and washers, and pipe fittings.	4.03	1.13	Agreed
15	Ability to check safety equipment and replaces components such as washers and gaskets.	3.97	1.06	Agreed
16	Ability to check on a regular basis for insects, pests, and rodents and escalate as necessary.	4.17	1.08	Agreed
17	Ability to use safety equipment to replace components such as washers and gaskets.	3.95	0.86	Agreed
18	Ability to clean HVAC coils, change HVAC filters and belts.	4.04	1.09	Agreed

19	Ability to complete all required safety training as scheduled annually.	4.52	0.54	Agreed
20	Ability to complete hazard assessments as necessary.	4.46	0.50	Agreed
21	Ability to complete miscellaneous cement and asphalt work and repairs.	3.96	0.86	Agreed
22	Ability to conduct daily, weekly, monthly, quarterly, and bi-annual preventive maintenance.	3.83	1.28	Agreed
23	Ability to assist in the implementation of preventative maintenance (PM) program.	4.10	1.01	Agreed
24	Ability to ensure work completed meets quality, contract response and all other requirements.	4.04	1.09	Agreed
25	Ability to ensure work is completed in a timely manner, within budget and to safety standard.	3.95	0.86	Agreed
26	Ability to evaluate, repair and maintain plumbing, electrical and HVAC systems in the building.	4.04	1.09	Agreed
27	Ability to execute and monitor the preventative and predictive maintenance program for all.	4.52	0.54	Agreed
28	Ability to maintain all assigned tools and arranges for repair and replacement where required.	4.46	0.50	Agreed
29	Ability to maintain and repair locks, locking mechanisms, closers, doors, controllers.	3.96	0.86	Agreed
30	Ability to maintain, repair non-technical facility components such as walls, floors, and also repair residential building appliances, outlets, and fixtures.	3.83	1.28	Agreed

\bar{X} = Mean SD =Standard Deviation

Data in Table 2 reveal that all the 20 items have their mean values ranging from 3.63 to 4.64. This showed that the mean values of each item was above the cut-off point of 3.50, indicating that all the items were agreed upon as the building maintenance skills required by building technology graduates for self reliant. The SD ranged from 0.47 - 1.16 which showed that the respondents are not too far from each other in their responses.

Hypothesis

HO₁: There is no significance difference between the mean responses of building construction personnel and lecturers of building technology on the entrepreneurial skills required by building technology graduates for self reliant.

Table 3: T-test analysis of building construction personnel and lecturers of building technology on the entrepreneurial skills required by building technology graduates for self reliant.

S/N	Respondents	N	\bar{X}	SD	Df	t-cal	t-tab	Remark
1.	Building technology Lecturers	46	3.81	0.49	50	0.53	1.12	Not Significant
2.	Building construction personnel	6	3.41	0.80				

Key: N= No of respondents, \bar{X} = mean, SD= standard, Df = degree of freedom, t-cal = calculated value, t-tab = tabulated value, ns = not significant.

Table 3, shows that the t-calculated value is 0.53 which is lower than the tabulated value, therefore, there was no significant difference between the mean responses of the two categories of respondents on the entrepreneurial skills required by building technology

graduates for self reliant. So the null hypothesis in the mean scores of the two groups was not rejected.

HO₂: There is no significance difference between the mean responses of building construction personnel and lecturers of building technology on the building

maintenance skills required by building technology graduates for self reliant.

Table 4: t-test analysis of building construction personnel and lecturers of building technology on the building maintenance skills required by building technology graduates for self reliant.

S/N	Respondents	N	\bar{X}	SD	df	t-cal	t-tab	Remark
1.	Building technology Lecturers	46	3.71	0.3	50	0.22	3.01	Not Significant
2.	Building construction personnel	6	3.42	0.86				

Key: N= No of respondents, \bar{X} = mean, SD= standard deviation, df = degree of freedom, t-cal = calculated value, t-tab = tabulated value, ns = not significant.

Table 4 revealed that the t-calculated value is 0.22 which is lower than the table value 3.01. This shows that there is no significant difference between the mean responses of the groups of respondents on the building maintenance skills required by building technology graduates for self reliant. Therefore, the hypothesis of no significant difference in the mean scores of the groups of respondents was not rejected.

Discussion of the Findings

The finding of this study revealed the entrepreneurial skills required by building technology graduates for self reliant. Some of those skills include: ability to work within restricted timelines and in controlled environments, ability to document work performance and materials procurement as directed, using work order system and ability to initiate documents to obtain formal approval of work required. The finding agreed with the finding of Amaewhule, (2014) who found that building technology graduates with entrepreneurial skill training performed better than those trained without entrepreneurial skill training. One important aspect of an individual's entrepreneurial skills is his or her own possession of certain work-related skills which are primarily cognitive and psychomotor in nature but seem to be comprised mainly of affective factors. Ottih, (2014) also supports the findings by stating that keyboard skills, well developed interpersonal and written communication skills; records maintenance; and file management skills are some of the essential entrepreneurial skills required by graduates.

The finding also disclosed building maintenance skills required by building technology graduates for self reliant. Some of them include; ability to ensure building component/equipment and grounds are safe, and in good repair at all times, ability to check and repair basic plumbing fixtures, including spigots, traps and washers, and pipe fittings, ability to maintain, repair non-technical facility components such as walls,

floors, and also repair residential building appliances, outlets, and fixtures. This result is symptomatic to the contention of Ayomike and Okeke, (2015) who stated that individual competence: communication skills, comprehension, computation and culture; personal reliability skills: personal management skills, ethics and vocational maturity; economic adaptability skill: problem solving, learning employability and career development are very important skills for building maintenance and repair. This result is in consonance with Amaewhule, (2014) who states that good human relations will be important as long as people remain the heart of the workings in the building industry. Education, training and experience can increase the supply of entrepreneurs by making available more skills, which are suitable for entrepreneurial endeavours. Building Technology in Nigeria should stress and create entrepreneurship awareness for it to be relevant in achieving the national educational objectives of inculcating the right type of values and attitudes for the survival of the individual and the Nigerian society.

Conclusion

If Nigeria must achieve the desired technological advancement, students of building technology must acquire entrepreneurial skills that will make them self reliant. The researchers through this study advocates that building graduates can become self reliant by engaging in maintenance and repair enterprise which will also help them become job creators instead of being perpetual job seekers. It is imperative that the operators of entrepreneurship curriculum must make regular reviews in a way that the programme would become dynamic and sustainable. This is because the economic activities of societies are on a rapid track, and this implies that entrepreneurship programmes in all disciplines require regular modifications. To empower building technology students for economic survival after graduation, teaching and learning of entrepreneurship education

must shift away from their present positions to psychomotor level. This is because physical strength and energy are needed as the world economic development is turning the youths of our societies fast into entrepreneurship age. For this strategy to work effectively, all the stakeholders in entrepreneurship education and building technology programme must cooperate together.

Recommendations

The following recommendations were made:

1. Since Nigeria is at the threshold of technological revolution, the Nigerian youth, particularly building technology students should be exposed to more and better technological and non-technological education for them to acquire the needful entrepreneurial skills for enhancement into the world of work or self reliant.
2. The building technology curriculum should be reviewed to include courses in entrepreneurial skill, encompassing; individual competence building, adaptability/responsibility, interpersonal/human relations, work ethics and entrepreneurship development skills among others.
3. The present academic staff of the tertiary institutions should under-go immediate re-training so as to be abreast with the modern office and industrial

requirements, and other areas that may need their attention for subsequent transfer of such knowledge so acquired to their students.

4. Building technology programme should be adequately funded by both the Federal and State governments, as well as communities, well-established firms and wealthy individuals.
5. Modern instructional facilities should be supplied to all schools involved in the training of building technology students irrespective of the level, as this would enhance the teaching and learning of building technology programmes.
6. All the stake holders in entrepreneurship education and building technology programme must co-operate together. The curriculum developers, lecturers and the students must play their roles effectively. Entrepreneurship education curriculum should be developed in a way that will enhance functionality of building technology programmes.
7. There is a need to match technical vocational education with labour demands of the society and industry. Students of building technology education programme should undergo practical parts of his semester courses with functional builders within the host community.

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