

An Assessment of Workshop Adequacy and Training Facilities in NCE (Technical) Institutions in the North-Eastern States of Nigeria

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Abstract

The NCE (Tech) Education is a training given to Technical Education Teachers based on practical skills relating to occupations this is one of the 2012 National Commission for Colleges of Education's objective for establishing National Certificate in Education (Tech) in Nigeria. It is of paramount important to note that workshop facilities and training materials require careful planning in order to encourage effective teaching and learning of practical skills, generally such planning need certain considerations to prevent sub-standard environment and over crowdedness. This study was under taken to assess workshop adequacy and the training facilities in NCE (T) institutions within the north east sub-region. Four (4) objectives were stated which are in focus with four (4) research questions that guided the study. An inventory checklist of Standard for Evaluating School Shop Facilities was adopted and restructured using five points and four point Likert scale respectively to elicit information from instructors in the Colleges of Education Technical within the north eastern part of Nigeria. The findings revealed that the six colleges within the region failed to comply with the recommended class-size for effective workshop practices due to inadequate workshop space area, storage areas, ventilation, heating system, first aid box and training materials/equipment. This inadequacy of space leads to difficulties in conducting practical to students and the performance of students. Subsequently, the environment will not be conducive for adequate teaching/learning because of the class-size. Finally, both the federal and states government in the sub-region should make enough provision of workshop facilities in conformity with NPE (2004) and NCCE (2012) guidelines in planning the workshop to achieved standard and that the teacher/students ratio of 1:50 as class-size and a theory to workshop practice of 1:3 should be maintained to acquired maximum skills required. The colleges also were short of required volume of text books and other training facilities and should be provided as stated in the curriculum.

Introduction

The acquisition of practical skills relating to occupations is part of the 2012 National Commission for Colleges of Education's objective to provide technical teachers with intellectual and professional background adequate for teaching technical subjects. However, in order to further buttress this fact of skill training, in these colleges the institutions are expected to focus on workshop practices instead of the classroom lectures without adequate practical demonstration which is generally considered being the key for concrete learning. National Policy on Education (2004) further states that for effective participation of students in practical work the teacher-students ratio should be kept at 1:20 and the National Commission for Colleges of Education's Curriculum states that, time distribution between theory and practical periods, in a ratio of 3:1 for a practical to a theoretical class is a point to be considered. Hallack (1990) further stressed that the availability, relevance and adequacy of

these facilities promote academic achievement in the school system; which of course resulted to the production of quality grandaunts.

Yet, the practical skills imply the need for the acquisition of technical and vocational skills necessary for economic growth and sustenance. Also, related to this is the acquisition of fundamental knowledge, skills and attitudes the individual needs to function efficiently in the given society. But are these skills adequately learned in our colleges of education (tech). Two of the aims of National Colleges of Education (Tech) NCCE (2012) are:

1. To produce qualified technical teachers and practitioners of technology capable of teaching introductory technology in the junior secondary schools.
2. To produce Technical NCE Teachers who will be able to inculcate scientific and technological attitudes and values into the society.

The above aims of vocational-technical education teacher were stated about two and half decades ago. Today, the nation still lack quality technical education teachers with adequate practical skills in most of our technical institutions. There is need to establish good colleges of education technical institutions with adequate workshop facilities to provide the required training and impart the necessary skills leading to the production of technical teachers and other skilled personnel who will be enterprising and self-reliant.

To further buttress the above point, educators and the Nigerian populace alike are becoming more and more dissatisfied with the state of the infrastructural facilities in our colleges and polytechnics. Several negative disclosures have been made by different groups as to the physical conditions of Nigerian schools where quality training is expected but than most of the grandaunt lack the skills needed to impart to younger ones, as a scholar and chief source of knowledge, he must work hard, because children normally respect an efficient and effective teacher with small and accurate knowledge (Ali, Sulaiman and Isyaka, 1997).

The above disclosure, though worrisome, portrays the non-channel attitude of Government and the schools managers towards infrastructural facilities, since teaching of a skill involves practical demonstration by the teacher while the pupils watch the demonstration and practices the performance of the operation later on. Therefore, learning practical skills can be difficult to achieve without adequate workshop training through utilization of the needed facilities.

Similarly, Ndomi (2009) proffered that the provision of adequate workshop facilities would enhance the quality of practical skills development. Though the above observations of all point to the importance of physical facilities as they affect teaching/learning, this study therefore aimed at assessing whether the workshop adequacy and the available training facilities in NCE (Tech) institutions in North Eastern states are adequately provided to facilitate effective teaching/learning process.

Statement of the Problem

The acquisition of practical skills relating to occupations is part of the objective of National Commission for Colleges of Education to train Technical Education Teachers in Nigeria. However, in order to further buttress this fact of skill training, technical institutions are expected to focus on workshop practices instead of the classroom lectures. It is amazing therefore to note that most technology courses are taught without adequate workshop space and facilities as revealed by Yoloye (1989). He further added that, there were serious constraints as regard to lack of workshops and studios, in line with lack of equipment for teaching technical subjects in Nigeria schools.

Since, the NCCE (2012) stated that every College of Education shall provide technical teachers with the intellectual and professional background, adequate for teaching technical

subjects and to make them adaptable to any changing situation in technological development not only in the country but also in the world at large, yet this provision is not being met by most of the Granting institutions; The NCCE (2011) pre-accreditation advisory visit to Bauchi State Polytechnic report revealed that the major constraints to the running of the programme include inadequate facilities, underutilization of space, uninstalled machines and many routine equipment and tools are lacking. A situation where there was inadequacy in space and unavailability of equipment and tools for on the job training of students to sustain college operation in these schools has become major concern to this researcher. This is because the need to match the growing student's enrolment with corresponding increase in the provision of basic learning facilities cannot be underestimated. This study therefore aimed at assessing whether the available facilities in NCE (Tech) granting institutions in North Eastern states are adequately provided and utilised to facilitate effective teaching/learning process.

Purpose of the Study

The main purpose of this study was to assess the adequacy of training facilities for teaching technical trades in the National Certificate in Education (Technical) institutions in the North Eastern States of Nigeria. Specifically, the study was set to attain the following objectives.

1. Assess the adequacy of the available workshop space per trade using enrolled students;
2. Determine the space area per shop in each school based on average class-size
3. Assess the adequacy of storage areas for teaching/learning in each school.
4. Assess the adequacy of training facilities available in each of the schools workshop.

Research Questions

The study was guided by the following questions:

1. To what extent does the adequacy of workshop facilities affect student enrolments in technical trades?
2. How does the space allocations compare with the average class-size/population?
3. Are the available storage areas adequately provided to facilitate effective teaching/learning process?
4. To what extent does the facility in the school workshops meet the standard of training of teaching technical students?

Basic Assumptions:-

The study was based on the following assumptions,

1. That the workshop facilities are adequate for teaching the technical subjects.
2. Each workshop practice fulfils NCCE requirement for setting up such trade in terms of provision of standard facilities.
3. The facilities on ground met the training requirement for teaching technical subjects

METHODOLOGY

The study adopted the survey design that implore the inventory method to collect data covering facilities used in teaching technical trades in the colleges of education (technical) granting institutions. Tuckman (1992) explained that in school survey variables frequently are studied using a simple counting procedure with little or no attempt made to determine in a systematic fashion the relationship between them and other relevant variables.

The target population for this study was the facilities used in the various technical trades in the Colleges of Education (Technical) in the North Eastern States Nigeria, These trades include: Automobile mechanic, Building and concreting, Electrical/Electronics, Woodwork, Metalwork,. The population is made up of all the instructors in the eight (8) NCE Technical granting institutions of north eastern Nigeria.

A purposeful sampling technique was employed covering six (6) colleges of education technical. The sample of the instructors under each trades drawn from the six (6) schools within the sub-region, details as presented in Table I below The schools were made up of four (4) state college of education and two (2) federal college of education (tech). The parameter used for the sample was based on the technical aspects of the NCE (T) granting institutions. See Table II for further clarification.

Table I:- Sample Population of the Selected Colleges.

/N	Schools	Location	No of Instructors
1.	Federal College of Education (T) Gombe,	Gombe state.	5
2.	Federal College of Education (T) Potiskum	Yobe state.	5
3.	College of Education Hong	Adamawa state.	5
4.	College of Education Jalingo	Taraba state	5
5.	College of Education Azare	Bauchi state	5
6.	U. E. C. E. S. and T., Bama,	Borno State.	5
Total		6	30

U.E.C.E.T: refer to Umar Elkanemi College of Education, Science and Technology, Bama,

Instrument for Data Collection and Method of Data Analysis

Data were collected using a checklist of standard for Assessing School Shop Facilities adopted and modify from Ohio School Shop Facilities Commission (OSFC) Master Planning Activities (2007), in conjunction with extract from Beynon (1997) checklist of space in educational buildings for large general and technical schools. The instrument was made of three (3) sections A, B and C. Section “A”, covers demographic data, Section “B” ,was based on workshop adequacy and Section “C” was based on the Training facilities and funding. Respondent were expected to select from a list of physical facilities considered important in planning school workshop. Specialists in each trade were selected to determine the final lists of facilities. Member of the jury were asked to decide on the optional standards for each facility. The data secured was analysed to determine the weight given to each item with its standard by the members of the jury. All items in section “B” were arranged under a 5-point rating scale.

The instrument was validated through a pilot study conducted by the researcher using five (5) experts in the area of vocational and technical education from Abubakar Tafawa Balewa University Bauchi and Abubakar Tatari Ali Polytechnic, Bauchi. After the validation of the instrument, a pilot test was conducted at Federal College of Education (Tech), Bichi prior to the commencement of the actual research. Federal College of Education (Tech), Bichi has same characteristics but was not involved in the main study. The sample comprises of five (5) instructors selected from each trades.

Were r_{11} =K-R reliability coefficient
 n = The number of items in the test
 p = Proportion of individuals who passed each items
 q = Proportion of individuals who failed each items
 Σ = Summation of
 Qt^2 = variance of the total score on the test.

The split-half method was used to determine the reliability of the instrument. Consequently, reliability of 0.6 was obtained and that the items were consistent in measuring what they intend to measure. According to Kuder-Richardson (1937) and Cronback (1976). Teacher made test commonly have reliabilities between 0.6 and 0.9 Hence, the reliability obtained is within the range. Thus, the instrument is considered valid and reliable.

The data collected were analysed using mean. Workshop adequacy of rated floor areas was computed in conjunction with enrolled students per trades to derive whether NCCE requirements were achieved by the schools.

RESULTS

Table 1: To what extent does the adequacy of workshop facilities affect student enrolments in technical trades?

Presented in the table, is the result of mean respondents for rated workshop space areas and enrolled students per trade sampled schools. The result revealed that the rated workspace area was inadequate in almost all the schools with the exception of FCE (T) Gombe and COE Hong whose rating was fairly adequate (2.6) and (2.51). The enrolled students failed to meet the recommended class of 24 as stipulated in “Modern School Planning” by Ketcham (1982) and NCCE recommendation of fifty (50) students per class (2008) as indicated in the table for each trades in the colleges under study.

Table 1; Analysis of workshop Adequacy based on Rated and Enrolled students per trades

(ENROLLED STUDENTS PER TRADES).

S/no	Schools	Location	Auto	Building	E/Elect	Metal	Woodwork	Rated G/M Floor areas	Remarks
1.	FCE(T) Gombe	Gombe	70	70	75	67	62	2.6	Fairly adequate.
2.	FCE(T) Potiskum	Yobe	102	49	67	100	30	2.47	Inadequate.
3.	COE Hong	Taraba	25	49	35	25	30	2.51	Fairly adequate.
4.	COE Azare	Bauchi	52	60	45	62	49	2.41	Inadequate.
5.	COE Jalingo	Adamawa	49	70	75	62	67	2.0	Inadequate.
6.	UECST Bama	Borno	30	54	100	102	92	2.45	Inadequate.

U.E.C.S.T in 6 above refers to Umar Elkanemi College of Science and Technology.

Table 2: Mean ratings of Adequacy of Space per Shop Allocations Based on Average Class-size.

Table 2: below summarizes the mean ratings of workshop floor space as perceived by instructors of each college shop. A look at the result one observed that almost all the school workshop space had inadequate space ratings. These ratings revealed that, workshop practice will be done in very difficult conditions and may lead to poor performance of student's actual practical skills. Moreover, the class-size for these activities was more than those recommended for such trades by Ketcham (1982). The findings portrayed that students carry out these activities in inconvenient spaces that failed to encourage effective work and practical skills necessary to operate as skills class room teachers that can technically impact skills training to students.

Table 2: Mean ratings of Adequacy of Space per Shop Allocations Based on Average Class-size.

S/no	Schools	Class-size	Auto Tech	Building Tech	E/Elect Tech	Metal W Tech	Woodwork T	Rated G/M Floor areas	Remarks
1.	FCE(T) Gombe	68.8	2.6	2.2	2.4	2.2	2.6	2.4	Inadequate.
2.	FCE(T) Potiskum	69.6	2	2	2.6	2	2.4	2.2	Inadequate.
3.	COE Hong	32.8	2.4	2.4	2	2.4	2.2	2.3	Inadequate.
4.	COE Azare	53.6	2	2.2	2	2.2	2.2	2.12	Inadequate.
5.	COE Jalingo	64.6	2	2	2	2	2.2	2.04	Inadequate.
6.	U.E.C.S. T	75.6	1.8	1.8	2.4	2.6	2.4	2.2	Inadequate.

U.E.C.S.T in 6 above refers to Umar Elkanemi College of Science and Technology.

Table 3: Mean Ratings of Provision of Workshop Storage Area.

Table 3: presented the uneven mean ratings of the provision of workshop storage area in sampled schools. The grand mean indicates two (2) out of the six schools with mean ratings of 2.9 and 2.7 respectively had inadequate storage area. While the remaining four (4) schools had enough workshop spacing so the tendency of students crowding their instructors is ruled out. However, with the noticeable display room (2.75), finishing room (2.25) and audio visual areas (2), the psychomotor aspect of training is almost absent, as students tend to work in constraint and unhealthy tight environment that hinder free movement..

Table 3: Mean Ratings of Provision of Workshop Storage Area.

S/No	Schools	Provision of store	Space for student's property.	Display room.	Finishing room.	Instructor's office.	Instructional areas.	Provision of lockers.	Gangways.	Audio visual area.	Grand mean.	Remarks
1.	FCE(T) Gombe	3.25	4.2	3.4	3.5	3.5	2.25	2.25	2.25	3	3.1	Adequate.
2.	FCE(T) Potiskum	2.75	3.75	2.75	2.3	3.25	3.25	3	2.25	2	2.8	Inadequate.
3.	COE Hong	3.5	3.75	3.25	3.5	3.5	4	2.25	3.25	4	3.5	Adequate.
4.	COE Azare	2.5	3.75	3.75	3.7	2.75	4.5	2.75	3	3.75	3.4	Adequate.
5.	COE Jalingo	1.75	2.0	2.25	2.2	2.5	4	3	3.25	3	2.7	Inadequate.
6.	Umar Elkanemi Coll of Sci & tech	3.25	3.5	3.5	3.5	2.5	3.25	2.5	2.5	2.75	3	Adequate.

Table 4: Mean Ratings of Adequacy of Available Training Facilities

The analysis on Table 5 revealed that almost all the schools had fairly adequate and inadequate training facilities. In addition, the analysis revealed that, apart from Item two (2) four (4) and nine (9) in the table, almost all the schools had inadequate facilities, leading to the neglect on daily supply of equipment by the government to meet up with the teaming enrolment in our schools system. It is worth highlighting that instance of inadequacy in qualified trainers 2.24: workshops 2.24, classrooms 2.2, class room 2.3, equipment (2.1) and funds 2.2.

Table 4: Mean Ratings of Adequacy of Available Training Facilities

S/no	Items	School 1	School 2	School 3	School 4	School 5	School 6	Grand mean	Remarks
1	Adequacy of qualified teachers	2.4	2	2	1.8	2.6	2.4	2.24	Inadequate
2	Adequacy of workshops.	2.4	2	2	2.4	2.6	2.2	2.6	Fairly adequate
3	Adequacy of textbooks.	2.4	2.3	2.6	2	2.4	2.2	2.3	Inadequate
4	Adequacy of audio-visual aids.	2.8	3.8	3.2	2.8	2.8	2.8	3.0	Adequate
5	Adequacy of equipment.	2.3	2.4	2.2	2.2	2.0	2.0	2.1	Inadequate

6	Adequacy of class room number for instructional needs.	2.4	2.6	2.6	2.0	2.0	2.2	2.3	Inadequate
8	Adequacy of manuals for the various machines.	2.6	2.2	2.3	2.4	2.2	2.4	2.4	Inadequate
9	Adequacy of tools to students.	2.4	2.4	2.3	2.2	2.0	2.2	2.7	Fairly adequate
10	Inadequate funds.	2.4	2.6	2.2	2.0	2.2	2.0	2.2	Inadequate

Discussion of the Study

An analysis of the responses obtained from the different schools in research question one indicates that the following constitutes obstacles to the effective learning. The study revealed that the enrolled students per trade outnumbered the workshop space area provided in almost all of the six colleges this indicate neglect on the part of the Government to improve on the standard of workshop space areas to cater for teaming population of our society to buttress the above findings, Yoloye (1989) observed that most technical skill are thought without adequate workshop space or special room. In research question two on the analysis of adequacy of workspace area based on the average class-size the findings revealed that the respondent indicate inadequate number of classrooms for instructional purpose. Researchers like (Nwoso, 1993, 1998 and 2000; Agusiobo, 1994, Soyibo, 1996 and Bassey, 2000) stated that there are grossly inadequate training facilities in science and technology subjects in public secondary schools in Nigeria, which is also in line with inadequacy of class rooms and laboratories. They further stated that where there is little resource at all, they are not usually in good condition, while the few ones that are in good condition are not enough to go round those who need them. These possess a great challenged to the government on the need to raise the funding needs of the science and technology education subjects, in teaching technology education student required training materials and equipment that are necessary meant to acquire the skills in order to be self-reliant and earn a living.

In research question three the study revealed that adequate provisions were made for workshop storage area in four out of the six colleges this include FCE (T) Gombe, COE Azare, COE Hong and Umar Elkanemi College of Science and Technology Bama, this portrays the relevance of storage area in the sampled colleges. However, the study further discovered that inadequate provision of storage areas was made in FCE (T) Potiskum and COE Jalingo this revelation reveals that one is able to debug the provably reason resorting to inadequate space for instilling machines and other workshop facilities, subsequently practical lesson will be made in tight and difficult condition.

The study in research question four revealed that the training facilities such as the school workshops, machines, equipment and funds were grossly inadequate with the exception of audio-visual aids and the manual for various machines this study further revealed that practical class could not be done adequately and demonstrated as a result of short in supply of training facilities which affect the practical skills of the students. Since the study confirmed gross inadequacy of workshops and could be generalized to all the schools and this includes the workshop inadequacy based on rated and enrolled students per trade, inadequate of floor space per shop based on average class-size and inadequacy of training facilities. The findings, enunciated above, although obtained from observing the facilities both (human and materials) and the state of Colleges of Education Technical in the north eastern states alone may not quite different from what is obtainable in many schools situated in various parts of the country (Nigeria) because the schools are all running the same system. Therefore, whatever remedies are proffered to reduce the effect of the identify obstacles should as well apply to other colleges of education technical in Nigeria.

Educational Implications of the study

Based on the findings the followings were considered relevant implications:-
The study has some implications to the teaching of technical students. The performance of students is seriously affected due to over crowdedness and inadequate workshop practice and workshop facilities for necessary training to take place as observed by Yoloye (1989), Aguisibo (1998) and Arowolo (2003) that poor performance of science and technical students is an indicative of the fact that the students were taught poorly due to inadequate availability of workshop floor area which cannot accommodate all the students at once during practical, inadequacy of training facilities and training materials. Lack of these has cause the death of practical skills among NCE (T) students.

Once of the obvious implication of the introduction of a curriculum that is skilled-based is the need for the provision of infrastructures such as the workshop equipment, tools and instructional facilities. The extent at which these facilities are provided will determine to an appropriate degree, the attainable quality of education, training and good product. The inability to provide them can force the introduction of undesirable alternative measures that will seriously underline the standard of overall goals.

Recommendations

Based on the findings of this study, the following recommendations have been proffered:-

1. Schools Construction Systems Development (SCSD) should endeavour to include such educationally significant components like heating, ventilation air conditioning and overhead lighting in their designs when capturing building systems project for schools. This will enable school Administrators/planners make good judgement as regards educational needs.
2. Improving and maintaining schools physical facilities should not be limited to government alone, instructors, workshop attendance, and the school managers should take good care of the facilities.
3. That the workshop space should be adequate to cater for large population of students the design.
4. From the above findings, federal and state colleges of education technical should be provided with adequate workshop and training facilities to meet the challenges of the new world order of science and technology.

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