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ASSESSMENT OF THE AVAILABILITYAND UTILIZATION OF TOOLS AND EQUIPMENT IN IMPLEMENTING BLOCKLAYING/ BRICKLAYING AND CONCRETING CURRICULUM IN SECONDARY SCHOOLS IN THE FEDERAL CAPITAL TERRITORY, ABUJA

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ABSTRACT

The implementation of the blocklaying/bricklaying and concreting curriculum in secondary schools requires a lot of facilities which has to be effectively utilized for the realization of aims and objectives of the trade. This study examined the availability and utilization of tools and equipment in implementing the block laying/bricklaying and concreting curriculum in secondary schoolsin the Federal Capital Territory, Abuja.Descriptive survey design was adopted covering a population of 33,551 which comprised of 153 administrators, 64 construction trade teachers and 33,334 senior secondary school students. Purposive sampling technique was used to select 50 senior secondary schools while Taro Yawane's equation was used to determine a sample size of 561. Checklist of tools and equipment requirement as specified by Nigerian Educational Research and Development Council (NERDC, 2010); and a questionnaire titled Utilization of Available tools and equipment for teaching block laying/bricklaying and concreting in secondary schools in the Federal Capital Territory, Abuja; for Implementation of the Curriculum were used as instrument for data collection. Cronbach's alpha technique was used to ascertain the internal consistency of the instrument which yielded a reliability index of 0.83. A descriptive statistics of frequency and percentage was used to answer research questions. Results of data analysed revealed that tools and equipment for teaching and learning of block laying/bricklaying and concreting subjects are inadequate. Furthermore,the available tools and equipment are not often utilized by teachers and students in teaching and learning of block laying/bricklaying and concreting subjects. Based on the findings, the study recommended that Government, Schools proprietors, PTA, NGOs and host communities should be encouraged to provide tools and

equipment for teaching/learning of blocklaying/bricklaying and concreting subjects in senior secondary schools; and school administrators should always ensure that where tools and equipment are provided, they should always be effectively utilized.

Keywords: *Tools and equipment, block laying/ bricklaying and concreting curriculum, senior secondary schools.*

INTRODUCTION

Through the ages, human beings have engaged in the training of younger generation to prepare and equip them with skills for productive living. The acquisition of the right type of attitudes, values and skills is a desirable experience for individual's continued existence in the society in which they live. It is clear that as human beings grow up, the attitudes, values and skills acquired become their guide through life. Education according to Adeyemi and Adu (2010) is widely accepted to be an effective instrument for bringing about these attitudes, values and skills, which are highly needed in the society for human capacity building and socio-economic change. Several definitions of education have been given by experts. Akinseinde (1998) defined education as the process of imparting and acquiring knowledge through teaching and learning while Lawal (2003) viewed education as an instrument for acquisition of appropriate skills, abilities and competencies both mental and physical as equipment for individuals to live in and contribute to the development of his society. Nigeria having realized the effectiveness of education as a powerful instrument for national progress and development reviewed her educational philosophy and methodology to match the ideals and challenges of changing economic and social structure of modern society as seen in the National Policy on Education 1981, reviewed 2004 and 2013. Consequently, Nigeria changed her secondary education system to encompass diversified curriculum that integrates academic with technical and vocational subjects intended to empower the individuals for self-employment or higher studies in technology.

Technical and vocational education as defined in the National Policy on Education, FRN (2013) is that aspect of education process involving in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, knowledge and attitudes necessary for entry into occupation in various sectors of the economic and social life. The goals of technical education as outlined in the

National Policy on Education include: to provide trained manpower in applied science, technology and business particularly at the craft, advanced craft and technical level and to give training and impart the necessary skills to the individual for self-reliance economically (FRN, 2013).

The most significant aspect of the National Policy on Education as noted by Dike (2009) is the new focus it gives to Nigerian educational system, the need for industrialization of the nation in which technical and vocational education plays a crucial role and the realization to change to science, technology oriented education system which prepares individual to be self-reliant and useful to the society. According to Aina (2009), it is an education for skill building and skill acquisition, which ultimately becomes a means of livelihood. The United Nations Educational Scientific and Cultural Organization (UNESCO, 2010) noted that revitalizing vocational and technical education is among the ways to improve economic opportunities for the youth.The 9-3-4 system of education in which technical education holds a prominent place is aimed essentially at equipping students with skills and competencies that will make them not only employable in industries, but also to be self-employed. Part of the efforts toward achieving these aims is the introduction of pre-vocational courses like Basic Technology, Agriculture, Business Studies, Home Economics, Computer Education, Fine Arts and Music at the Junior Secondary school (JSS) level and vocational courses like Agriculture, Applied Electricity, Book Keeping and Accounting, Building Construction, Auto Mechanics, Electronics, Clothing and Textiles and Food and Nutrition at the Senior Secondary school (SSS) level. However, the curriculum structure for senior secondary school education in Nigeria has been reviewed; the new structure which came into effect in September, 2011 has been diversified and consists of core subjects, electives and trade/entrepreneurship studies. The electives are categorized into four distinct fields of study namely; Senior Secondary Education (Science), Senior Secondary Education (Humanities), Senior Secondary Education (Business), Senior Secondary Education (Technology).

At the senior secondary school level, the new curriculum highlighted the criteria for selection of subjects. The compulsory subjects which every student in the school must offer are English Language, General Mathematics, Civic Education and Trade/Entrepreneurship Studies. FRN

(2010) stated further that students are to choose four or five subjects from their field of specialization in any of Humanities, Science, Technology and Business Studies making a total of eight or nine subjects. Students are also to choose their compulsory trade/entrepreneurship subject from thirty-eight trade subjects including Blocklaying/ Bricklaying and concreting (BBC), Painting and decorating, Plumbing and pipefitting, Machine wood working, Carpentry and Joinery, Furniture making and Upholstery, which make up the construction trade subjects which is the focus of this study. Blocklaying and bricklaying is the art and technique of building with blocks and bricks, or of uniting them by cement or mortar into various forms; it is the occupation of laying blocks and bricks. Concreting work includes: preparation of the concrete mix; delivery of the mix to the construction site; feeding, distribution, and compaction of the mix in the formwork (molds); the curing of the concrete while it is hardening; and quality control of the concrete work. Blocklaying, Bricklaying and concreting (BBC) are often inseparable; hence, considered as a single trade in the curriculum.

Curriculum is a sequence of potential experience set up in schools for the purpose of disciplining children and youth in group ways of thinking and acting (Wheeler, 2008). The school curriculum consists of all the experiences that may be selected and consistently organized for the purpose of bringing about changes in the behaviour of the learner and as a means of developing their personalities. It is the total experience involving the school in the process of educating young people. It includes the teacher, subject, content, methods, evaluation as well as the physical and psychological dimension of the experience by which instrument; the schools seek to translate the hopes of the society in which they function into reality (Offorma, 2006). Blocklaying, Bricklaying and Concreting Curriculum (BBCC) refers to the document, plan or blue print used as instructional guide designed by Nigerian Educational Research and Development Council (NERDC) in collaboration with the Federal Ministry of Education (FME). The term curriculum implementation has been defined in different ways by different scholars. Garba (2004) viewed curriculum implementation as the process of putting the curriculum into work for the achievement of the goals for which the curriculum is designed. Okebukola (2004) described it as, the translation of the objectives of the curriculum from paper to practice. Ivowi (2004) sees curriculum implementation as the translation of theory into practice, or into action. Onyeachu (2008) broadly defined curriculum implementation

as, the process of putting all that have been planned as a Curriculum document into practice in the classroom/workshop through the combined effort of the teachers, learners, school administrators, parents in interaction with physical facilities, instructional materials, psychological and social environment. Also implementation takes place as the learner acquires the planned or intended experiences, knowledge, skills, ideas and attitudes that are aimed at enabling the same learner to function effectively in a society (Asebiomo and Sanusi, 2011). In this study, curriculum implementation is the process of putting the planned BBC document into practice in the classroom/workshop through the combined effort of the teachers/instructors, students, administrators, parents in interaction with the physical facilities, instructional materials, psychological and social environment for the realisation of the aim and objectives of the curriculum.

The purpose of BBCoption in secondary schools is not likely to succeed using the "chalk and talk" approach alone except through the effective use of the needed instructional facilities to bring the students in contact with the content of the school curriculum and learning activities. Instructional facilities are vital in the teaching and learning process. One major index for measuring the successful implementation of any curriculum is the provision and management of the facilities available for such programme (Nzekwe, 2013). It is a very good means of measuring the standard and quality of the education to be provided, Nzekwe stressed. Instructional facilities are specifically meant for direct teaching and learning. They include: classrooms, classroom seats, workshops, laboratories, internet facilities, libraries, tools, equipment, chalkboard, audio-visual learning equipment, among others (Lawanson&Gede, 2011). These facilities bear directly on the teaching – learning process. They enable the teacher to carry out his/her work well and also help the learners to learn effectively (Anike& Tari, 2011); therefore, they are an integral component of the conditions of learning. Afangideh in Nzekwe (2013) found that instructional facilities offer reality of experience, provide visual aspects to a process or technique, facilitate the understanding of abstract concepts and provide opportunity for the learner to manipulate. In this study, instructional facilities are those things that enable teachers/instructors to carry out their work well and also help trainees to learn (acquire skills, knowledge and attitude) effectively for the achievement of the aim and objectives of BBC. According to FRN (2013), the BBC programme is both practically and inherently workshop-based; and therefore, calls for

an adequately equipped workshop in each school that offers the course. Among the basic instructional facilities needed for the effective implementation of the BBC are tools and equipment. The availability and effective utilization of the tools and equipment required for implementing the BBC, to a great extent, determines the success or failure of the programme.It therefore, behooves the researcher to examine the availability and utilization of tools and equipment in implementing the block laying/bricklaying and concreting curriculum in secondary schools in the Federal Capital Territory, Abuja.

STATEMENT OF THE PROBLEM

Nigeria's desire for technological development led to the introduction of the Trade/Entrepreneurship subjects in the senior secondary school curriculum with the hope that students having successfully passed through the senior secondary education, should have acquired the skills in a specific trade to make them employable in industries and also to enable them create jobs and generate wealth. Among the thirty-eight compulsory trade/entrepreneurship elective subject from which students are to choose is, Blocklaying/ Bricklaying and concreting (BBC). However, the purpose of the BBC in secondary schools is not likely to succeed without instructional facilities; and among the basic instructional facilities needed for the effective implementation of the BBC are tools and equipment. Unfortunately, the major bottleneck to effective implementation of the Nigeria's educational programmes is lack of instructional facilities for effective implementation of the programmes as designed. Consequently, the availability and effective utilization of instructional facilities, to a great extent, determines the success or failure of programmes. Therefore, the problem of this study is to ascertain gaps the availability and utilization of tools and equipment in implementing the block laying/bricklaying and concreting curriculum in secondary schools in the Federal Capital Territory, Abuja.

Purpose of the Study

The main purpose of the study was to asess the availability and utilization of tools and equipment in implementing the block laying/bricklaying and concreting curriculum in secondary schools in the Federal Capital Territory, Abuja. Specifically, the study determined:

1. Level of availability of the tools and equipment available for teaching Block laying/ Bricklaying and Concretingin senior secondary schools in the Federal Capital Territory, Abuja.

2. The utilization of lextent of equipment for teaching Block laying/ Bricklaying and Concretingin the secondary schools in secondary schools in the Federal Capital Territory, Abuja.

Research Question

1. What are the tools and equipment available for teaching Block laying/ Bricklaying and Concretingin senior secondary schoolsin the Federal Capital Territory, Abuja?
2. What is the extent of utilization of tools and equipment available for teaching and learning blocklaying and concreting in secondary schools in the Federal Capital Territory Abuja.

METHODOLOGY

The study adopted descriptive survey design. The study was carried out in Federal Capital Territory (FCT) Abuja. Federal Capital Territory is made up of six Area Councils namely, Abaji Municipal, Bwari Gwagwalada, Kwali and Kuje. The FCT Secondary Education Board (SEB) regulates the affairs of all the Senior Secondary Schools in the six Area Councils while the Federal Ministry of Education (FME) regulates the Federal Unity Schools. The study covered all the senior secondary schools approved by the government in Federal Capital Territory where BBC is offered.FCT is the seat of government where the Federal Ministry of Education (FME) and the Nigerian Educational Research and Development Council (NERDC) which are the educational policy formulators are situated, it is expected that FCT should be at the forefront of the implementation of the BBCC in secondary schools. The population for this study is 33551 respondents. Whichcomprise 153 administrators (50 Principals, 53 VP Academics, 50 Heads of Departments of Vocational and Technical Education) 64 construction trade teachers, and 33,334 senior secondary school students drawn from 50 secondary schools within the FCT, Abuja, where BBC is offered. Administrators were used because they are in the position to tell how the construction trade subjects are funded. Teachers were used because they are the implementes of the curriculum and students were used because they are the direct beneficiaries of the BBCC. Taro Yamane's equation was used to determine the sample size of 561at 0.05 level of significance. Taro Yamane's equation was used because the population is heterogeneous.

A multistage sampling technique was used. It is multistage because different types of sampling techniques were used at various stages. The first stage was the use of purposive sampling technique to select 50 senior secondary schools. The second stage was the use of Taro Yamane's formula to select 111 administrators, 55 teachers of trade subjects and 395 senior secondary school students. This last stage of sampling technique was used because the population is divided into strata of administrators, teachers and students. Instrumentation is of two types, checklist and questionnaire. Checklist of tools and equipment require for BBC as specified by the Nigerian Educational Research and Development Council (NERDC, 2010) was used to collect data on research question one. A questionnaire titled; Utilization of Resources for Implementation of BBCC developed by the researcher was used to collect data on research questions two. The checklist was answered based on the extent of adequacy or inadequacy for Research question one; while research question twowas constructed with a 4-point rating scale of Most Frequently Used, (MFU) = 4, Frequently Used (FU) = 3, Rarely Used (RU) = 2 and Never Used (NU) = 1.

The instrument was subjected to a reliability test using Cronbach's alpha reliability technique. The reliability coefficient for the instrument was found to be 0.85, for items as contained in research questiontwo.

Method of Data Collection

The researcher with the aid of two research assistants, both graduates visited the schools offering construction trade subjects in Federal Capital Territory, Abuja to take inventory of tools and equipment available for the implementation of BBC so as to answer research questions one. The researcher and the research assistants also administered the questionnaire to the administrators, teachers and students. Data collected were used to answer research question two.

Method of Data Analysis

Descriptive statistics of frequency and percentage was used to answer research question one. The mean and standard deviation wasused to answer research questions two. Items with percentage score of 50% and above were regarded as 'adequate' and those with percentage score of 49% and below were considered inadequate for research questions one. Items with mean score of 2.50 and above were considered as 'Frequently

Used' for research question two, anditems with mean rating score of 2.49 and below were regarded as 'Never Used' for the research question.

Result

Research Question 1

What are the tools and equipment available for teaching Block laying/ Bricklaying and Concretingin senior secondary schools?

Table 2: Frequency and Percentage of Tools and Equipment Available for Teaching Block laying/ Bricklaying and Concreting in Secondary Schools

S/N	Tools/Equipment	No. Required in a Sec. Sch. As specified by NERDC	No. Required in the 50 Sec. Sch.	No. Available in the 50 Sec. Sch.	Percentage (%)	Remarks
1	Block Trowel	40	2000	234	11.7%	Inadequate
2	Steel Square	40	2000	123	6.15%	Inadequate
3	Jointing Board	40	2000	456	22.8%	Inadequate
4	Spirit Level	40	2000	678	33.9%	Inadequate
5	Boat Level	40	2000	123	6.15%	Inadequate
6	Plump Level	40	2000	45	2.25%	Inadequate
7	Straight Edge	40	2000	267	13.35%	Inadequate
8	Gauge Rod Or Rule	40	2000	109	5.45%	Inadequate
9	Line and Pin	40	2000	345	17.25%	Inadequate
10	Corner Blocks	40	2000	309	15.45%	Inadequate
11	Tingle Plate	40	2000	234	11.7%	Inadequate
12	Bolster Hammer	40	2000	107	5.35%	Inadequate
13	Club Hammer	40	2000	256	12.8%	Inadequate
14	Skutch	40	2000	23	1.15%	Inadequate
15	Square and Bevel	40	2000	48	2.4%	Inadequate
16	Cold Chisel	40	2000	24	1.2%	Inadequate
17	Block Axe	40	2000	45	2.25%	Inadequate
18	Mason's Handsaw	40	2000	67	3.35%	Inadequate
19	Pointing Trowel	40	2000	78	3.9%	Inadequate
20	Hawk	40	2000	129	6.45%	Inadequate
21	Plastering Trowel	40	2000	25	1.25%	Inadequate
22	Wooden Float	40	2000	679	33.95%	Inadequate
23	Angle tools	40	2000	89	4.45%	Inadequate
24	Wire Brush	40	2000	32	1.6%	Inadequate
25	Joint Duster	40	2000	68	3.4%	Inadequate
26	Jointer	40	2000	89	4.45%	Inadequate
27	Plumb Bob	40	2000	93	4.65%	Inadequate
28	Folding Rules	40	2000	204	10.2%	Inadequate
29	Pointing Tools	40	2000	84	4.2%	Inadequate
30	Pick Axe	5	250	24	9.6%	Inadequate

31	Tyrolean Machine	10	500	103	20.6%	Inadequate
32	Shovel	10	500	45	2.25%	Inadequate
33	Hand Rammer	10	500	67	13.4%	Inadequate
34	Concrete Mixer	2	100	28	28%	Inadequate
35	Gauge Box	5	250	38	15.2%	Inadequate
36	Head pan and Bucket	10	500	109	5.45%	Inadequate
37	Concrete Vibrator	2	100	53	53%	Adequate
38	Leveling Instrument	2	100	34	34%	Inadequate
39	Scaffolding fittings and Pipes	1	50	27	54%	Adequate
40	Measuring Tape	10	500	201	40.2%	Inadequate
41	Line (Trogin)	5	250	87	34.8%	Inadequate
42	Wheel Barrow	5	250	56	22.4%	Inadequate
43	Water Hoses and Roses	2	100	82	82%	Adequate
44	Builder Square	2	100	23	23%	Inadequate
45	Block Moulding Machine	1	50	25	50%	Adequate
46	Hand Mould for Block Making	5	250	24	9.6%	Inadequate
47	Hand Sieves (various sizes)	10	500	204	40.8%	Inadequate
48	Slump Test App.	1	50	23	46%	Inadequate

Result of data presented in Table 1 show that tools and equipment for the teaching and learning of brick laying, block laying and concreting in senior secondary schools are inadequate as indicated in the percentages respectively.

Research Question Two: What is the difference in the mean responses of students and teachers on the utilization of the available tools and equipment for the implementation of brick laying, block laying and concreting curriculum in the senior secondary schools?

Table 2: Grand Mean and Standard Deviation of Responses of Teachers and Students on the Extent of utilization of available Tools and Equipment for the Implementation of Construction Trade Subjects

S/N	Statement	M_1	M_2	M_t	SD_t	Remarks
1	Available brick/block laying and concreting tools and equipment are used during practical demonstrations in the workshop.	2.15	2.21	2.19	0.84	Rarely Used

Key: M_1 = Mean of teachers, M_2 = Mean of students, M_t = Average mean, SD_t = Average Standard deviation

Results of data presented in Table 2 show that tools and equipment in brick/block laying and concreting are rarely used in senior secondary schools as indicated by the respondents mean scores above.

DISCUSSION OF THE FINDINGS

Findings of the study show that the relevant tools and equipment used for the teaching and learning of brick/block laying and concretingare inadequate. The findings are in line with that of Akinsanya (2010) which revealed that the inadequacy of relevant tools and equipment are hampering the teaching and learning of construction trade subject areas in senior secondary schools. Puyate (2008) noted that the most critical factor leading to the acquisition of vocational skills and knowledge among students is the availability of the requisite facilities such as tools and equipment. The acquisition of construction skills is critical to the development of the infrastructural deficit in the Nation. Also, only when students in secondary schools are provided with the needed tools and equipment will they be able to acquire competency and proficiency in the various construction trade subject areas (Fabunmi, 2003). It should be noted that not all the tools and equipment can be provided most especially now that the nation faces some economic challenges. What is important now is that the relevant authorities should identify the basic tools and equipment that are needed for these various construction trade subject areas and provide them in the schools.

Findings of the study further revealed that teachers and students do not often utilize the available tools and equipment for the implementation of brick/block laying and concretingin senior secondary schools because in the schools where some few do exists, they have become obsolete and

thereby no longer useful for proper teaching Audu, Umar and Idris (2006).

Implications of the Findings

The implication of the findings of the study is that the inadequacy of tools and equipment for the teaching of brick/block laying and concretingin senior secondary schools is that students will not acquire the needed vocational skills and knowledge in these subject areas. Therefore, the aims and goals behind the establishment of the entrepreneurial/trade subject curriculum will be defeated, what is the situation on other trades? The situation at the states?

RECOMMENDATION

Based on the conclusions of the study, the following recommendations were made:

1. Stake holders in deduction government, Proprietors of schools, NGO's, PTA and the host communities should be encouraged to provide tools and equipment for the teaching of construction trade subjects in secondary schools.
2. School principals and education supervisors should always ensure that where tools and equipment are provided, they are always put to use by teachers and students.

CONCLUSION

Based on the findings of this study, it was concluded that, all hands must be on deck by all BBCC implementation stakeholders to ensure that the, tools and equipment for teaching BBC are not only provided, but also effectively utilized.

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