



EMPIRICAL DISCOVERY OF THE FACTORS AFFECTING THE MANAGEMENT OF WORKSHOP AND LABORATORY EQUIPMENT IN BAFARAWA TECHNICAL COLLEGE, SOKOTO.

BASHAR, SA'ADU ISA

Department of Educational Foundations, Faculty of Education, Sokoto State University, Sokoto, Nigeria

Abstract

This study investigated the management of workshop and laboratory equipment in Olusegun Obasanjo Technical College, Bafarawa, Sokoto state. The main objectives of the study were to find out factors that affect the management and utilization of workshop and laboratory equipment in the college. Study population involves One Hundred and Ninety-One (191) subjects covering the teaching staff, nonteaching staff and school prefects. The sample size was 97 respondents derived using the Devos's (1998) table for sample size determination. An instrument titled 'Management of Workshop and Laboratory Equipment Questionnaire (MWLEQ)' was developed and its validity and reliability were established at 0.9 and 0.91 respectively. The data was analyzed through the SPSS and the Mean and Standard Deviation were reported in the tables. It was found that the factors that affect the management of workshop and laboratory equipment in the study area include lack of conducive environment, lack of prompt supervision, lack of maintenance culture, and lack of annual report. The study also revealed that the factors that affect the utilization of the college workshop and laboratory equipment include inadequate science and technical education teachers, and inadequate workshop and laboratory technicians. It is therefore recommended that, the Sokoto State Ministry of Science and Technical Education should be deploying workshop and laboratory personnel to the college, post adequate and qualified science and technical education teachers, provide a standby power generator in the college and finally, prompt supervision and general maintenance of the college's workshops/laboratories should be initiated and enhanced.

Keywords: Management, Workshop, Laboratory, Equipment.

Introduction

Management of workshop and laboratory management is one of the areas of school management which if given adequate attention can lead students towards achieving scientific and technical education excellence (Bala, 2012). The term workshop has been defined by Encarta Dictionaries (2009) as a place where manual work is done while facilities refer to something which has particular function designed or created to provide a service or fulfill a need. In this paper, workshop equipment are those machines, engines, apparatus that are solely provided and kept in a specific environment for carrying out specific functions of technical experimentation, research and learning. However, a laboratory is considered to be a facility that provides controlled conditions in which scientific or technological research, experiments, and measurement may be performed (Zayyanu, 2011). It also added that, laboratories that are used for scientific inquiries can be of different forms. For instance, it can be science laboratory for science subjects or courses such as physics, chemistry, Biology and engineering. However, a laboratory can be used for psychological purposes for the observance of clients' behaviors while others might be used by computer scientists for the work of simulation or the analysis of data.

On the other hand, laboratory equipment are all the tools, apparatus and or equipment that are used by scientists working in a laboratory (Kaza, 2011). Some of those equipment include tools like Bunsen burners and microscopes as well as special equipment such as operant conditioning chambers, spectrophotometers and calorimeters. Senchi (2013) also puts it that workshop and laboratory equipment are therefore determined to mean the scientific and technical apparatus that are purposely provided in the technical schools or colleges for the conduct of practical activities and technical or scientific experimentations for making learning concrete. The aim of this study was to find out the factors that affect the management of workshop and laboratory equipment in Olusegun Obasanjo Technical College Bafarawa, Sokoto also find out factors that affect the utilization of workshop and laboratory equipment in the College.

Problem statement

Olusegun Obasanjo Technical College Bafarawa is one of the prominent technical colleges in Sokoto state and the country in general but, however, its academic excellence has been questioned since few years after the establishment of the college, many students started graduating with poor performance especially in science and technical education courses (Bashar, 2014) and poor performance in science or technical education subjects has been perceived by Zayyanu (2011) to

be a consequence of poor management and or poor utilization of workshop and laboratory equipment. It is therefore the thrust of this study to find out factors that affect management and utilization of the available equipment in both the workshop and laboratories of the college.

Literature Review

Workshop and Laboratory management has been viewed by Senchi (2013) as the art of integrating and coordinating the laboratory resources (people, materials, procedures and supplies) so as to provide quality services as efficiently and effectively as possible. However, Bala (2012) posits that it is incumbent on a school management to harmonize, coordinate and direct the available human resources in the school like teachers, students, workshops and or laboratory technicians and attendants towards the smooth operation of the workshops and laboratories. In a study conducted by Kuti (2009) it was asserted that workshop or laboratory management involves a continuous and systematic organization, coordination, and directing the material resources like the facilities, apparatus and equipment available for the proper conduct of practical, experiments and other scientific researches.

Kaza (2011) viewed that workshop and laboratory management is a paramount aspect of management especially in the schools or colleges that offer science and technical education courses. This calls the attention of all the stakeholders especially the school managers to accord it a due consideration for the attainment of the desired goal, central which is achieving scientific excellence. Therefore, ensuring effective management of workshops and laboratories in every level of education and ensuring proper utilization of the facilities and equipment is of great importance for a school manager to pay attention to. Furthermore, Zayyanu (2011) has identified that for better scientific experiments to take place, workshops and laboratories have to be well managed because poor performance in science or technical education courses has been perceived by to be a consequence of poor management and utilization of the workshop and laboratory equipment in schools.

Scholars have varying opinions concerning the factors that affect the management of workshop and laboratory equipment in schools and colleges. A study carried out by Paul (2010) investigated the relationship between laboratory practical and students' academic achievement in Delta state, the finding established that inadequate facilities and equipment, lack of conducive atmosphere, lack of planning and organization are the main factors that bedevil better management practices of the scientific equipment in schools. However, a

study done by Zayyanu (2011) on the impact of laboratory management on Students' Performance in Rivers state, described the inhibiting factors to laboratory management to include lack of proper coordination and lack of supervision of the schools that are in the rural areas. Similarly, Kaza (2011) conducted a research on the perceived effectiveness of management techniques used by secondary school principals in handling School laboratories in Awka, and the findings established that lack of maintenance and lack of reporting system hinders the smooth management of the workshop and laboratory equipment in the schools of the area.

In their various attempts to identify some challenging factors on the utilization of workshop and laboratory equipment, scholars like Bala (2012), Senchi (2013) and Kuti (2009) found in distinctive researches that inadequate science teachers and laboratory personnel, inadequate or lack of orientation, not allowing students to use the equipment for some cultural purposes, poor safety measures and poor electricity supply remain the main problems affecting the utilization of the workshop and laboratory equipment in their study areas.

The gaps in the literature are conceptual, contextual and time gap. This is in the sense that almost all the studies reviewed were conducted outside Sokoto state and did not primarily aim at finding out factors affecting the management and utilization of workshop and laboratory equipment in government technical institutions. For instance, the study of Kuti (2009) was done in Kano on indiscipline and its management techniques in laboratories, Bala's (2012) study was on indiscipline in Nigerian Secondary School laboratories, Kaza (2011) also studied the perceived effectiveness of management techniques used by secondary school principals in handling School workshops in Awka and the study conducted in Taraba by Senchi (2013) was on the Management of laboratories for better practical experiences. There is an insufficient empirical research in the recent on factors affecting the management of workshop and laboratory equipment is carried out in Olusegun Obasanjo Technical College Bafarawa, Sokoto State. This research therefore attempts to bridge these gaps.

Research Methodology

The research was descriptive in nature and therefore survey design was used by the researcher. This is because the researcher was interested in collecting information from certain groups of people with some shared characteristics within the population (Airat, 2014). The population of the study was One Hundred and Ninety-One (191) covering academic staff, nonacademic staff and prefects in the College. The sample size was 97 respondents derived using the

Devos’s (1998) table for sample size determination. An instrument titled ‘Management of Workshop and Laboratory Equipment Questionnaire (MWLEQ) was developed and its validity and reliability were established at 0.9 and 0.91 respectively. The instrument was administered to the Principal, Vice principals, teachers, non-teachers and prefects. The data was analyzed through the SPSS. Mean and Standard Deviation were reported in the tables.

Data Analysis

The two research questions earlier raised were presented and analyzed thus:

RQ1: what are the factors that affect the management of workshop and laboratory equipment in the college?

Table 1: Responses on the factors affecting the management of workshop and laboratory equipment

Table 1: factors that affect the management of workshop and laboratory equipment

SN	Items	Mean	Std. Dev.	Decision
1	There are adequate facilities and equipment in the workshops and laboratories	3.80	1.845	A
2	The facilities and equipment are the type needed for science and technical education	4.13	1.369	A
3	The facilities and equipment are placed in conducive atmosphere	1.97	1.410	D
4	All the activities done in the workshops/labs are timely planned	4.35	.940	A
5	All the workshop facilities and labs equipment are duly organized	3.10	1.384	A
6	All the activities carried out in the workshops/labs are promptly coordinated	2.65	.940	D
7	The management staff of the MSTE always supervise and monitor the workshops and laboratories	1.97	1.410	D

8	There is general maintenance on the workshop facilities and Lab equipments	2.65	.940	D
9	There is an annual report on the conduct of the workshops and laboratories	2.65	.940	D

Source: Field Data (2019)

Table 1 indicates that the factors that affect the management of workshop and laboratory equipment in Olusegun Obasanjo Technical College Bafarawa, Sokoto are that the facilities and equipment are not placed in conducive atmosphere. This is understood from the Mean figures and Standard Deviation (M=1.97, SD=1.410) indicating that majority of the respondents did not agree with the idea that the facilities or equipment are placed in a conducive atmosphere. Lack of proper coordination is another factor that affect the management of workshop and laboratory equipment in the college as pointed by the figures in table 3 (M=2.65, SD=.940). Another factor is the lack of regular supervision by the Ministry of Science and Technical Education in the state. This is lucidly seen from the figures whereby M=1.97, SD=1.410. Lack of general maintenance is also a factor that has been discovered affecting the management of workshop and laboratory equipment (M=2.65, SD=.940). Moreover, lack of annual report on the conduct of workshop and laboratory equipment serves another factor that affect the management of workshop and laboratory equipment in the College (M=2.65, 940).

RQ2: what are the factors that affect the utilization of workshop and laboratory equipment in Olusegun Obasanjo Technical College Bafarawa, Sokoto

Table 2: Responses on the factors affecting the utilization of workshop and laboratory equipment

Table 4: shows the factors that affect the utilization of the workshop/laboratory equipment

SN	Items	Mean	Std. Dev.	Decision
1	There are enough Technical Education Teachers	1.65	.940	D
2	There are enough qualified science Teachers	1.65	.940	D

2	There are enough workshop/laboratory technicians	1.97	1.410	D
4	There are enough workshop/lab Attendants	1.97	1.410	D
5	There is enough orientation on how to use workshop and laboratory Equipment	1.65	.940	D
6	Students are always allowed-in the workshops/labs	3.35	.940	A
7	There are safety measures on the use of workshops/labs	3.35	.940	A
	There is constant supply of electricity for practical with workshop facilities	2.65	.940	D
8				

Source: *Field Data (2019)*

Table 2 reveals that the factors that affect the utilization of workshop and laboratory equipment in Olusegun Obasanjo Technical College Bafarawa, Sokoto, are lack of enough and qualified Technical Education Teachers (M=1.65, SD=.940), lack of enough and qualified science teachers (M=1.65, SD=.940), inadequate workshop and laboratory technicians (M=1.97, SD=1.410), inadequate workshop and laboratory attendants (M=1.97, SD=1.410), lack of enough orientation for students on how to use workshop and laboratory equipment (M=1.65, SD=.940), and lack of constant supply of electricity (M=2.65, SD=.940). The findings are presented in Table 4 as follows:

Discussion of the findings:

This part presents the discussion of the findings of the study. The main aim of the study was to find out factors that affect the management and utilization of workshop and laboratory equipment in OOTC Bafarawa, Sokoto state. The findings of the study revealed that factors that affect the management of workshop and laboratory equipment in the college include lack of conducive environment. This is to say that the workshop and laboratory equipment are not placed in a conducive atmosphere. This finding corresponds to the finding of Paul (2010) who established that lack of conducive environment was one of the problems militating against effective management of Laboratories in Delta State. Improper coordination and lack of prompt supervision by the state Ministry of Science and Technology also serve as factors that affect the management of workshop and laboratory equipment in the college. This finding is in consonance

with the finding of Zayyanu (2011) who found that some of the major problems that face school laboratories' equipment in Sokoto was lack of proper coordination by the staff and at the same time stakeholders in the Ministry of Science and Technology do not normally took a visit or supervision in the local areas for monitoring purpose. Other factors are lack of general maintenance and annual report on the conduct of workshop and laboratory equipment. The finding succeeded in corroborating with that of Kaza (2011) who found in her studies that most of the facilities and equipment that are in government-owned institutions in Awka are not receiving extra care and maintenance from the people of the immediate environments of the schools.

The study also revealed that factors that affect the utilization of the college workshop and laboratory equipment included that there are no adequate science and technical education teachers, inadequate workshop and laboratory technicians, inadequate workshop and lab attendants who are to be guiding and monitoring the practical, scientific and technical inquiries in the college. This finding corroborates with the outcome of the research conducted by Bala (2012) who identified that inadequate science and technical education teachers as well as inadequate or lack of laboratory personnel to man the affairs of the laboratories as some of the major hindrances that affect the proper utilization of the laboratories and equipment therein. Additionally, lack of enough orientation to the students on how to use the available workshop and laboratory equipment and lack of constant supply of electricity are also some factors that hinder the smooth operation of the equipment in the college laboratories and workshop. This finding however tally with the findings of both Senchi (2013) and Kuti (2009) who found that inadequate orientation of the students on how to use the workshop and laboratory equipment and lack of constant supply of electricity suffer the way the equipment is being used in Kano and Rivers states in particular and other technical colleges in general.

Conclusion

From the foregoing, it has been elaborately elucidated that there are factors that affect the management of workshop and laboratory equipment in the study area which include lack of conducive environment, improper coordination, lack of prompt supervision, lack of maintenance culture, and lack of annual report. The study also revealed that the factors that affect the utilization of the college workshop and laboratory equipment included that there are no adequate science and technical education teachers, inadequate workshop and laboratory

technicians, inadequate workshop and lab attendants, lack of enough orientation to the students, and lack of constant electricity supply.

Recommendations

Based on the findings of the study, the researcher therefore recommends that:

1. The school management should ensure that the facilities and equipment are conditioned in a better environment so as to avoid rain hitting the equipment in the rainy season.
2. The Sokoto State Ministry of Science and Technical Education should be deploying workshop and laboratory personnel in the college and post adequate and qualified science and technical education teachers for a better and quality output.
3. Students should be equipped with high-level orientation on the ground of using the available equipment for better understanding.
4. A standby power generator should be provided in the college for constant electricity supply.
5. There should be prompt supervision and general maintenance of the college's workshops/laboratories.
6. The school authority should have a maintenance culture and also be making a report annually on the state-of-affairs of the equipment and make it available to its mother ministry or Ministry of Education in the state.

Reference

- Airat, S. (2014). *Quantitative Research Methods*. An unpublished manuscript, Department of Educational Foundations, Faculty of Education, Islamic University in Uganda.
- Bala, A. (2012). *Indiscipline in Nigerian Secondary School laboratories*. Unpublished manuscript, Shehu Shagari College of Education, Sokoto, Nigeria.
- Bashar, S.I. (2014). *Anomalies of Nigerian Primary Schools' Leadership and Centenary Commemoration*. A paper presented at the 1st International Conference and Centenary Commemoration (ICCC, 2014) organized by the Faculty of Arts and Social sciences, Sokoto State University, Sokoto, Nigeria.
- DeVos, A. S., & Van Zyl, (1998). The grounded theory methodology. In De Vos, A. S. (Eds.) *Research at grass roots: A primer for the caring profession*. Encarta Dictionaries (2009). Computer Software version.

- Kaza, U.F. (2011). *Perceived Effectiveness of Management Techniques used by Secondary School Principals in Handling School laboratories*. Unpublished Masters' dissertation, Nnamdi Azikwe University, Awka, Nigeria.
- Kuti, A.N. (2009): *Indiscipline and its Management Techniques in Laboratories: A case study of a special education school in Kano State*. Unpublished PhD Thesis, Bayero University, Kano.
- Paul, E.D. (2010). *Relationship between laboratory practicals and students' academic achievement*. Unpublished M. Ed Dissertation, Usmanu Danfodiyo University, Sokoto.
- Senchi, T. (2013). *Management of laboratories for better practical experiences*. Unpublished Masters' Dissertation, Usmanu Danfodiyo University, Sokoto.
- Zayyanu, K. (2011). Impact of laboratory management on Students' Performance. *Farfaru Journal of multidisciplinary studies*, 1(5).