AFRICAN JOURNAL OF EDUCATIONAL ASSESSORS

ISSN e-2536-7501, ISSN p-2536-751x

Benchmark Journals

Utilization of Technical College Students in the Maintenance of Institutional Facilities: A Panacea for Curbing Wastages and Rebuilding Trust in Technical College Education in Nigeria

Alexis Malachy Robert
Department of Mechanical Engineering,
Akwa Ibom State Polytechnic,
Ikot Osurua, Akwa Ibom State, Nigeria

Abstract

The need to pay attention to technical college education in order to improve students' skills has been a serious concern to many educational stakeholders in Nigeria in recent time. This is because lack of skills among products from technical colleges, and the high level of dilapidated infrastructures in technical colleges have been widely noted. The effects of these are high level of unemployment across the country and gross wastage of public fund leading to lack of trust in technical college education as a vehicle for sustainable development. One of the ways of rebuilding trust in technical college education is the utilization of technical college students in the maintenance of facilities in technical colleges. The paper identified different types of maintenance; and those that the students should be engaged in a school environment. Various facilities that require students' participation in the maintenance process were identified. Also identified are how maintenance programme for students should be planned and the problems affecting maintenance culture in Nigeria. Conclusions were drawn and Suggestions were also offered amongst them are: Federal and State governments should be proactive in funding technical college education; Federal and state governments should ensure that only skilled and sufficient manpower are always employed in technical colleges

Key words: Curbing, education, facilities, Rebuilding trust, wastage.

Introduction

It is the primary obligation of the state and federal governments to ensure that technical colleges are well equipped with the necessary facilities and to ensure effective maintenance of the facilities for optimum productivity, just as it is a pedagogical responsibility of the training institutions to train and produce competent craftsmen for the world of work. Thus, the government and the training institutions have vital roles to play in ensuring that the goals of technical college education are achieved.

Technical college education is described by FRN (2012) as a secondary institution in Nigeria concerned with the production of craftsmen and other personnel at sub professional level. Robert (2018) noted that technical college education is a secondary level of education

designed to teach skills, develop attitudes and competencies that are requisite to success in a given occupation. It is interesting to note that FRN (2012) in its National policy on education stated that trainees completing technical college education shall have three options, namely, (i) Secure employment either at the end of the whole course after completing one or more modules of employable skills; (ii) Set up their own business and become self-employed and be able to employ others; (iii) Pursue further education in advanced craft/technical programme and in post secondary institutions such as the polytechnics, colleges of education (technical) and universities. These options as contained therein are encouragement for parents to see technical college education as a true path for employment opportunities for the youths. Thus many parents send their children and wards to technical colleges with the hope that their children and wards will at the end of their training programme become useful citizens. The Federal and state governments believe that through technical college education, there will be sufficient man-power to address and boost sustainable economic development in the country.

Unfortunately these expectations have not been met. Researchers such as Okwelle (2011), Robert (2018) have confirmed lack of skills among technical college products in Nigeria. Also Robert (2018) expressed little satisfaction regarding the quality of technical college products. The author noted that school and work were not sufficiently linked to one another; hence most technical college products lack employment skills in their area of specialization.

One of the major factors that determine sufficient link between school and work is the learning environment. Thus learning environment should be a replica of the work environment. Learning environment should have the necessary institutional facilities. Institutional facilities are the required needs that guarantee effective teaching and learning. In other words, institutional facilities are those special assets and items provided in academic institutions to enhance effective teaching and learning. Specifically, institutional facilities are the physical structures, equipment, machineries, the classroom, workshops, laboratories and office needs. They also extend to other utilities such as games and sports, convenience among others. Thus technical colleges should have the necessary institutional facilities and such facilities should be in good working condition to enable effective teaching and learning to take place.

Regrettably, dilapidated facilities and lack of equipment in our technical colleges have been reported. For instance, Puyate (2008) noted that equipment, tools, and workshop facilities in Technical and vocational institutions in Nigeria are either broken down, damaged, or dilapidated and are not replaced, or renovated. Akpan and Okorie (2015), also stressed that most technical and vocational institutions in Nigeria lack workshop facilities and training materials. There is enough evidence to show that most roofs of buildings in technical colleges leaks.

Some of the buildings have their roofs blown –off by wind. Some buildings have their foundations washed off as a result of erosion. There are also cracks on walls of some buildings, while other buildings have over hanging electrical cables, broken windows and doors. More often, broken-down vehicles, equipment and other machineries are found all unattended to.

Eneyoh and Thomas, (2012) noted that maintenance culture in our technical colleges are poor. The authors maintained that where facilities and equipment are available, there are many that are obsolete and non-functional as they need repairs and replacement.

These defects constitute poor teaching and learning with attendant effect of poor performance among students. The situations where the facilities in technical colleges are left unattended to, apart from having effects on the students, also leads to waste of public funds, and in addition, would cause the society to have distrust on the integrity and functionality of technical college education. This is because with the deficiencies in place, technical colleges are deemed to have failed in serving the purpose for which they were established. Similarly, Akpan and Okorie (2015), reported absence of practical activities in technical colleges in recent time. According to the source, management of technical colleges is no more providing training materials for students' practical work. The effect of this is that students are graduated without sufficient skills. This trend therefore calls for other alternatives that could provide the students opportunities to acquire skills. Following this poor development, it is therefore very vital that various policies on cultivation of maintenance culture in our educational institutions and on effective engagement of students in practical activities for effective acquisition of skills in their trade areas be looked into.

The Need to Curb Wastages in Technical Colleges

Technical colleges are institutions where practical activities are carried out by qualified personnel. By implication, school facilities can better be cared for because of the availability of skilled personnel. But it is unfortunate that assets in these colleges are left to rot away as noted by Eneyoh and Thomas (2012). Also, a trip by the researcher to some of these technical colleges in Akwa Ibom state revealed that some of the workshop buildings in these colleges are in a regrettable state of disrepair. More regrettably is the way lathes, and other expenses engineering machines are exposed to direct contact with rain, and sun, thus leaving serviceable assets unserviceable which in turn results in waste of funds. The increase in the cost of these buildings and machines and the decline in the purchasing power of the naira have stressed the need for prudent management of available assets. Prudent management of assets in technical colleges is a process of curbing wastages. Thus curbing wastage is a systematic process adopted to prevent unwarranted deterioration, lost, or out of service of asset or system. Ogwo and Oranu (2006) observed that why school facilities do not last is essentially because of lack of proper care. Thus keeping school facilities in good working condition are desirable educational experience for technical colleges and the society. This is because there is need to rebuild the trust the society had on technical college education as a path for employment opportunities. Thus one of the ways of curbing wastages and rebuilding trust in technical college education and technical college students is the utilization of technical college students in the maintenance of facilities in technical colleges.

Concept of Maintenance

Most often, maintenance is erroneously associated with the art of bringing a broken down machine or system back to its functional state. This conceptual framework to a very large extent is misleading as maintenance does not end at that. Resting the definition there only of course resulted in a situation in Nigeria where people or organizations would wait until a costly acquired asset reach a state of malfunctioning before attention is given. Maintenance is a general term used to describe the process of ensuring that a system, structure, equipment or other asset is in a functional state. In a very simple sense Eti, Ogaji and Robert (2006) opined that maintenance means cause to continue. The authors maintained that maintenance exist because there are physical assets which deteriorate. Thus these assets must continue to function and serve the purpose they were meant to serve. Such assets in educational institutions such as technical colleges include classroom buildings, workshop buildings, offices, hostels, equipment and so on. Generally speaking, system failure in technical education institutions can negatively affect several areas such as: (i) Students academic performance (product quality) (ii) Students' and staff safety (iii) Staff output (iv) Operating cost of the school (v) Public view about the schools among others.

Maintenance as actions intended to ensure the functionality of a system, can be divided into various types. These include Breakdown maintenance, Preventive maintenance, Corrective maintenance; Productive maintenance, Total productive maintenance, Total quality maintenance, or better still, planned maintenance and Unplanned maintenance (Eti et al, 2006) However, this paper discusses three types of maintenance that are relevance to this study; they are, breakdown maintenance; preventive maintenance, and corrective maintenance.

Breakdown maintenance is a process of carrying out the replacement of items/units of a system, machine or equipment as a result of fault or seizure. Breakdown maintenance takes place when there is total or partial collapse of a system. In breakdown maintenance, faults are sometime not immediately known, they are traced or diagnosed. It is often expensive to carryout breakdown maintenance in addition, breakdown maintenance is time consuming. Thus it affects the productivity and profitability of the organization.

While breakdown maintenance should not be encouraged, organizations including technical college institutions should not wait until system failure, before maintenance is carried out on a system. There should be prompt attention to a system whenever there is any sign of malfunctioning. However, sometimes, breakdown maintenance is unavoidable due to accident, or natural disaster. In such circumstance, the maintenance on the system should commence as soon as possible to avoid further deterioration and or vandalism on the system.

In other hand, Preventive maintenance (PM) is a maintenance programme widely adopted by organizations that want to maintain continuous production. Eti, Ogaji, and Robert (2006) stated that preventive maintenance is the process of replacing a deteriorating part or unit of a system or structure which is highly; likely to exhibit a fault before the failure is actually allowed to occurs. Thus preventive maintenance does not take place when the system has stopped

functioning; rather, it takes place even before a warning is noticed. For instance, oiling of moving parts of a machine is a kind of PM policy, and it is a good practice, if the machine is to continue serving its purpose. Also, routine inspection of a system enables a part with a warning sign to be discovered and is subsequently replaced. When students are exposed to this kind of maintenance programme, it creates in them critical thinking skills. Eti, Ogaji and Robert (2006) opined that preventive maintenance has two forms, namely scheduled/time based and condition-based maintenance (CBM).

Scheduled preventive maintenance is carried out on a system at scheduled time irrespective of its actual working condition. By scheduled PM, the scheduled time for maintenance actions are often drawn up on supplier's recommendations. However, it is ideal for the scheduled time to be drawn up by the users of the system or equipment based on the frequency at which the system is used. In scheduled PM, some components of a system are replaced at scheduled time irrespective of whether the components are good. The only drawback of this method is that a component may be replaced when actually it is not entirely bad. However, Eti, et al (2006) maintained that preventive maintenance schedules that minimize resource consumption or maximize availability can be determined through the use of quantitative decision-modules, based on factual information such as time to failure distributions, cost of intervention and consequences of failure.

In other hand, Condition-based PM is a kind of preventive maintenance policy in which maintenance actions are carried out only when failure is judged to be eminent. Thus, maintenance actions are not applied at pre-determined time as in scheduled PM maintenance. Certain factors that guide good judgments include quality of the system, frequency at which the system is used, condition under which the system is used, and age of the system.

Some of the techniques employed in condition-based maintenance include vibration monitoring; oil analysis; and performance parameter analysis (Eti, Ogaji, and Robert 2006) When these techniques are employed specific faults that would have led to system failure will be revealed for immediate correction. For instance, oil analysis will detect non circulation of oil, leakage, or damaged oil seal or gaskets. Similarly, vibration monitoring will revealed loosened assembles, wear, misalignment, in-balance, turbulent in plants with reciprocating or rotational parts. Employment of these techniques makes condition based PM more adaptable and rewarding than scheduled or time-based maintenance which often characterized with premature replacement of components or components being over maintained. Thus CBM is ideal for maintenance of facilities in educational institutions as it is a policy that can minimize resource consumption and exposes students to analytical thinking.

Similarly, corrective maintenance has to do with innovation of a system or equipment to enable it perform optimally and with longer life span. In other words, it is a maintenance process aimed at improving the reliability of a machine, equipment or system. This could be by introducing a feature or altering the existing feature of the system with short life cycle in order to

enhance its life expectancy, thereby reducing the frequency of damage. Corrective maintenance is adopted only when there is need to improve the efficiency and reliability of a system, especially when the system frequently breakdown or exhibits poor performance. Students' involvement in this type of maintenance programme while in school can cause them to acquire in-depth knowledge and sufficient skills that would make them productive in the industries.

Some Trade Areas in Technical Colleges and Corresponding Facilities the Students could Render Maintenance services.

There are various trades areas offered in Nigerian technical colleges, and they are divided into two groups of engineering trades and construction trades (National Board for Technical Education 2002). But not all the trade areas could be mounted in each of the technical colleges because of various reasons. Such reasons include funds, and availability of manpower among others. For instance, in Akwa Ibom state, the available trade areas according to Akwa Ibom State Technical Schools Board (2017) are: Motor vehicle mechanics work; Welding and Fabrication; Mechanical craft practice; Electrical Installation and maintenance practice; Air-conditioning and Refrigeration work; Brick laying and concreting; Carpentry and joinery work; Furniture making and plumbing and pipe fitting.

Thus students should be properly guided and involved in the maintenance of facilities in their respective trades as follow:

Engineering Trades:

a. **Motor vehicle mechanics' work:** Maintenance of mobile vehicles and generating sets
b. **Fabrication and welding:** Maintenance of vehicle body and parts; and general metal fabrication, and manufacturing; repair of metal windows, doors, and other metal products, including equipment and tools.
c. **Mechanical craft practice:** maintenance of worn out equipment and machine parts through machining operations, and also general fitting jobs
d. **Electrical installation and maintenance practice:** Maintenance of electrical systems; repair of installation lines; lighting units. Repair of fans, electric motors, lamps, switches, outdoor lightings, and other electrical services.
e. **Air conditioning and refrigeration work:** Repairs of air-conditioners, and refrigerators, and their units. Air compressor, boiler tubes, thermostats, unit ventilators
f. **Electronics work:** Maintenance of electronic systems such as radio and television; public address systems, burglary alarm, computer systems and hardware, and so on.

Construction Trades:

a. **Brick laying/block laying and concreting:** Maintenance of buildings such as offices, workshops, staff quarters; classrooms, gutters, and other structures.
b. **Carpentry and joinery work:** Repairing of leak roofs; broken wooden windows and doors, lockers, ceiling tiles, louvers, and minor renovations.
c. Furniture making: Maintenance of writing desks, tables, furniture, and making of furniture for offices, classrooms, and hostels

d. **Plumbing and pipe fitting:** Maintenance of pipes, fixtures, equipment, faucets, strainers and other plumbing accessories

The Need for Students' Participation in the Maintenance of Facilities in Educational Institutions

In Nigeria, maintenance of facilities generally is seen as a non-issue until there is a total collapse of the structure or system. This luke-worm attitude cuts across all facet of Nigerian life, and this has negatively affected the economic growth of the nation. For instance, Eti, Ogaji, and Robert (2006) reported that in most companies in Nigeria, repair and replacement only occur after a break down. The authors added that, in the traditional general management of companies, maintenance is regarded as an exercise that can easily be reduced in relation to overall business cost, particularly in the short term. The source, also added that, even though more often, system failure gives prior warning that a fault is about to occur, these warnings have often been ignored. This assertion can easily be attested to. For instance cracks on walls, leaking roofs, crack pipes that converse water and wears on machine parts are some of the warnings that have been taken for granted in our educational institutions until collapse occurs. Several factors have been attributed to inability to fix these costly assets. Some of these factors are poor funding of technical colleges, lack of policies that encourage maintenance of school facilities; lack of maintenance knowledge among management of educational sector. Students' participation in the maintenance programme in our technical colleges is an ideal concept that should be initiated and sustained to ensure that college assets are maintained throughout their expected useful life through preventive maintenance.

Specifically, participation of students in maintenance programme if adhered to will provide the followings benefits:

1. Continuous use of college facilities without disruption to educational activities.
2. Quality management of maintenance projects such that attention is given to individual facility on time, and funds are properly managed.
3. Buildings and equipment will function safely and optimally
4. Guarantees conducive environment for teaching and learning.
5. Increase in students' acquisition of practical skills.
6. Increase in students' enrolment in technical college education is guaranteed.
7. Positive public perception on technical college education.
8. Elimination of wastages with respect to facilities in technical colleges.
9. Reduces cost of maintenance of school facilities.

Planning of Maintenance Programme for Students in Technical Colleges:

The following are suggested steps for maintenance programme that will incorporate students' participation in technical colleges.

1. Appoint qualified staff in various trade areas
2. Arrange maintenance team for each trade area

ISSN e-2536-7501, ISSN p-2536-751x

3. Determine maintenance units in relation to number of students (workshop, equipment, machine and tools)
4. Identify and streamline sources of income for materials and other services
5. Determine days and duration for engagement of students
6. Define tasks to be executed
7. Define performance standard required
8. Define safety standard to be adopted
9. Define incentives and frequency at which it shall be applied to staff and students
10. Determine logistic supports
11. Determine assessment processes to ascertain students achievement in acquisition of skills and knowledge.

AFRICAN JOURNAL OF EDUCATIONAL ASSESSORS

ISSN e-2536-7501, ISSN p-2536-751x

Benchmark Journals

Problems Affecting the Utilization of Students in the Maintenance of Facilities in Technical Colleges.

Utilization of students in the maintenance of facilities in technical colleges is affected by many problems, among them are:

1. **Lack of Maintenance Education Courses in Nigerian Education System:** Eti Ogaji and Robert (2006) noted that there is no maintenance education course in Nigerian universities. This according to the authors has affected the attitude of most managers of business organizations negatively toward maintenance culture. Therefore, a country driving towards sustainable development should envisage the need for introducing maintenance courses in her educational system to enable graduates from the system cultivate maintenance culture in their administrative prowess. Thus, the lack of maintenance courses in our educational system prevents technical college education administrators from having the requisite knowledge, skills and attitude in maintenance processes. In this circumstance, the desire for engaging students in the maintenance of school facilities is a mirage.
2. **Management of Educational Institutions Regard Maintenance as a cost Center Rather than Business Centre**: Maintenance of facilities in educational institutions is seen as capital intensive where funds are heavily wasted or misappropriated. As such, management of technical educations fails to give maintenance of facilities a place in their budgeting, whereas, according to Ogwo and Oranu (2006) maintenance of facilities yields high productivity with corresponding interest.
3. **Lack of Maintenance Culture:** Eneyoh,Thomas and Ekeng (2012) noted poor maintenance culture in most technical colleges in Nigeria. Maintenance of facilities in technical colleges is often seen as an action that should be taken when facilities or asset has failed to function, but not as a process of preventing the asset from failure. Thus, maintenance of school facilities should only be contracted out since it is assumed to be more complicated and would involve huge fund.
4. **Political Influence:** Distribution of funds by governments to educational institutions has often been influenced by political consideration. Such considerations include political affiliation of a given region, state, senatorial district, or local government area, as the case may be. This often affects allocation of grant or subvention to technical colleges for effective planning for maintenance of school facilities. This is in line with the view of Ogumbe and Ebeten (2019) who noted that most Nigerian politicians play prank with education. The authors stressed that politicians pay lip service to education especially technical education.
5. **Lack of Maintenance Plan for Educational Institutions:** The lack of maintenance plan is one of the key reasons why government at various levels could not carryout maintenance of school facilities. For instance, there are no records to show the up-to-date

condition (good or bad) of various assets provided by the government. This can hinder effective planning for engagement of students in maintenance programme.

Conclusion

The problems in our technical college education in recent time are conspicuous. These include lack of skills among technical college products, deplorable state of the facilities which leads to waste of public funds and lack of trust in technical college education. In order to increase students practical skills, curb wastages and rebuild trust in technical college education in Nigeria, the government, management of technical college education the principals, and teachers should be willing to invest resources, effort, and quality time in the utilization of students in the maintenance of facilities in technical colleges. Utilization of students in the maintenance of school facilities can indeed be an effective means of improving student's acquisition of practical skills and exposing students to industry work environment.

Suggestions

In order to achieve the aforementioned, the researcher suggested that:

1. Federal and state governments should give technical college education sufficient budget allocation so as to address students' practical activities and the maintenance of college facilities.
2. Federal and state legislative organs of government should formulate policy on the utilization of students in the maintenance of facilities in technical colleges and other technical education institutions.
3. The National University Commission and other relevant bodies should introduce maintenance courses in tertiary educational institutions to enable graduates from these institutions to cultivate maintenance culture in their places of work.

References

Akpan, N. A & Okorie, L. B. (2015). Vocational Education and training – Panacea to youth Education and Unemployment issues in Niger Delta States of Nigeria. *Journal of sustainable Education. 6 (*1) 197-208Akwa Ibom State Technical Schools Board (2017). *Annual Report* of 2016/2017.

Eneyoh, E. S., Thomas, J. O. & Ekeng, E. (2012). Vocational and Technical Education: A catalyst for Economic Transformation in Nigeria. *International Journal of Educational Research. Vol ii, 1, 110-114.*

Eti, M. C.; Ogaji, S. O. T. & Robert, S. D. (2006). Development and Implementation of Preventive Maintenance Practices in Nigerian Industries. *Applied Energy, vol. 83 (10) 1163-1179*

Federal Republic of Nigeria (2012). *National Policy on Education*. Lagos: NERX Press.

Ogumbe, B. E. & Ebeten, B. O. (2019). Revtalizing Technology Education: A Catalyst for sustainable National Development in Nigeria. *Journal of Educational Realities. Vol. 9 (1) 10-17*

Ogwo, B. A., & Oranu, R. N. (2006). *Methodology: Informal and Non-Formal Technical /Vocational Education.* Enugu: University of Nigeria Press Ltd.

Okwelle, P. C. development and Validation of instrument for assessing practical skills in radio and television systems in technical colleges. Unpublished Doctoral Dissertation. Nnamdi Azikiwe University. Awka, Anambra State, Nigeria.

Puyate S. T. (2008). Constraints to effective implementation of vocational education programme in private secondary schools in Port Harcourt Local Government Area. Assian-Pacific *Journal of Cooperative Education. 9 (1), 59-71.*

Robert, A. M. (2018). Development and validation of competency-based assessment instrument in motor vehicle mechanics' work for assessing students in technical colleges in Akwa Ibom State, Nigeria. Unpublished Doctoral Dissertation. University of Nigeria, Nsukka, Nigeria