

Assessment of the Functionality of Workshop Facilities for Teaching in Industrial and Technology Education Programme

Usman, G. A., Kareem, W. B. & Akinpade, O. A

Department of Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna

Abstract: This study assessed the functionality of workshop facilities for teaching in industrial and technology education programme. The study adopted a descriptive survey design. A structured questionnaire was used to collect data for the study. Data collected were analyzed using percentages. The study revealed that most of the facilities in different schools' workshop are poorly managed and hinders effective instructional activities in Technical Education. The improper management and maintenance of workshop facilities is manifested in the large number of obsolete and unserviceable equipment prevalent in school workshops. The outcome of improper maintenance of workshop facilities result in the malfunction of the tools and equipment and this cripples effective teaching and acquisition of skills. Lack of functioning tools and equipment in most Nigerian universities seems to be worsened by the non-challant attitude of workers towards public property, and corruption. Indeed, most Nigerian workers feel since it is not a personal property, it should not be cared for properly. These situations have resulted to a lot of damages on equipment and facilities as well as wastages of money on repairs and purchasing of new equipment with the finance which could have been used for other things. The paper recommended that the maintenance of workshop facilities include employing experts who will be responsible for servicing and carrying out maintenance work on universities' equipment during and after usage.

Keywords: Assessment, Teaching, workshop facilities

I. INTRODUCTION

Technical institution is an organized school where specialized type of education aimed at providing skills and knowledge required for employment in an occupation is conducted. One of the major aims of technical education as a programme offered in technical institutions is the acquisition of appropriate skills for the individual to live and contribute to the development of the society (Federal Republic of Nigeria, 2004). To achieve this, it therefore means that an individual will pass through a formal training programme in any of the technical institutions where technical trade related programmes in welding, electrical works, building, radio and television, mechanical, maintenance work; mechanical craft practice and pipefitting are offered. Industrial and technology education is that aspect of vocational and technology education which leads to the acquisition of technical skills that tend to produce skilled manpower to handle the complexities of modern technological inventions.

According Orikpe (1994) skills are not learnt in a vacuum and in isolation of tools, facilities and equipment. To this end, Orikpe (1994) added that equipment, tools, and facilities make up the learning environment for skill acquisition. In addition, these facilities and equipment are very expensive to purchase and as such many universities and colleges are financially handicapped to get adequate number of facilities for their students.

Coupled with the fact that these facilities and equipment are subject to depreciation as they are being used daily in the teaching-learning process, it becomes absolutely necessary to maintain them or face out-right replacement. The problem facing Nigerian universities and other institutions is how to maintain equipment and facilities to ensure their longevity (Tijani, Adeyemi, & Omotehinshe, 2016). As a result of the economic recession in Nigeria, the educational system has been confronted with new cuts and these cuts are in most cases result in a reduction in overall government expenditure on education (Bamigboye, Ede, & Adeyemi, 2016, March). Indeed, the cuts take place in the financing of education and these include reduction in pay roll costs, administration costs, capital costs as well as the cost of buying new equipment and facilities in general and those of technical education in particular. The habit of regularly and consistently keeping a building, machine, facilities, equipment, infrastructures etc in good working condition will enable them function perfectly.

According to Udofia and Udo (2011), educational facilities include technical workshops which include automobile, mechanical, metal, wood, building, electrical and electronics units which are set for professionally qualified technical teachers and other technical personnel to exhibit their technical know-how and for the learners to acquaint themselves with the facilities available, and as well as imbibing the required skills, like the theatre for medical professionals, practicing farm of agriculturists, laboratories for scientists. Hassan and Hassan (2010) stressed the importance of workshop facilities; they said that workshop facilities are those goods and services that help to facilitate teaching and learning process in educational set up. Kpanep (2011), posited that quality technical /vocational workshop facilities assures student learners competency in practical knowledge, skill and mastery of their chosen career which

finally will translate into technological education development.

The source of any instructional activities is a function of the availability of the necessary workshop facilities. It is a well-known fact that there is no way a technological teacher can teach effectively the practical aspect of a technical subject when there are no functional required tools, machine or equipment. Ogbonaya and Okoli (2014) maintained that the main thought of technical/vocational education training is to develop skills in the learners. Skills that is practical in nature. The acquisition of relevant skills of constructing, designing and repair can only be acquired in a well functional workshop stocked with relevant equipment and facilities.

The type of training to be given to students in the technical training institutions cannot survive without functional workshop tools and equipment (McCarthy, Jones & Smith, 2012). Fafunwa (1996) argued that one major setback in the teaching of technical subjects in many technical institution is the lack of training facilities. As it is the case in some technical institutions, workshop building hardly exist let alone the materials for the workshop.

Statement of the Problem

One of the major aims of technical education is the acquisition of appropriate skills by individuals to live and as well contribute meaningfully to the development of the society. These aims can only be achieved in a conducive learning environment where training facilities are available and functioning well. But carefully look at most of the technical institutions in Nigeria, it reveals that training given to students are not adequate enough as to help them acquire better skills due to lack of modern facilities, and consequently acquire poor skills. This poor skill acquisition is evident in poor performance of students in the industries when they are employed to work.

Objectives of the Study

The study assessed the functionality of workshop facilities for teaching in Industrial and Technology Education (ITE) in Federal University of Technology Minna. Specifically, the study determined;

1. The functionality of the workshops facilities for teaching in the ITE department workshop?
2. The frequent utilization of workshops facilities for teaching in the ITE department workshop?
3. The strategies to improve in provision and regular maintenance workshop facilities in ITE department workshop?

Research Questions

The study answered the following research questions;

1. What is the functionality of the workshops facilities for teaching in the ITE department workshop?

2. How frequent is the utilization of workshops facilities for teaching in the ITE department workshop?
3. What are the strategies for improving in provision and regular maintenance workshop facilities in ITE department workshop?

II. METHODOLOGY

The study adopted a descriptive survey design. The study was carried out in the Department of Industrial and Technology Education, Federal University of Technology Minna in Niger State. The population of the study consisted of 26 academic staff in the department.

Table A: Percentage of questionnaires returned

| S/N | Option | NO OF RESPONDENT USED | | Number Returned | % |
|-----|------------------------|-----------------------|-----------------|-----------------|-------|
| | | Lecturer | Technical staff | | |
| 1. | Automobile | 6 | - | 6 | 100 |
| 2. | Building | 4 | 1 | 5 | 100 |
| 3. | Electrical/Electronics | 6 | 1 | 6 | 85.71 |
| 4. | Metalwork | 3 | - | 2 | 66.67 |
| 5. | Woodwork | 5 | - | 4 | 80 |
| | Total | 24 | 2 | 23 | 86.48 |

As shown in Table A, a total of twenty-six Staff was given questionnaires and only 23 or 86.48% were returned which were used for data analysis.

Questionnaire was drafted by the researcher and validated by five staff, each from Automobile, Building, Electrical/Electronics, Metalwork and Woodwork options were used for the study. The instrument was administered and retrieved personally by the researcher. Data collected were analyzed using percentage count.

III. RESULTS

Research Question 1: What is the functionality of the workshops facilities for teaching in the ITE department workshop?

Table 1: Percentage ratings of the respondents on functionality on the types of Facility Programme for teaching in Industrial Technology Education Department Workshop

| S/n | Type of Facility | Programme | % | Remark |
|-----|------------------|------------------------|--------|--------|
| 1 | Safety Kits: | Automobile | 60% | F |
| | | Building | 37.14% | NF |
| | | Electrical/Electronics | 42% | NF |
| | | Metal work | 95% | F |
| | | Wood work | 55% | F |
| | | Mean Percentage | 58.83% | F |
| 2 | Hand tools: | Automobile | 53.13% | F |

| | | | | |
|---|---------------------|------------------------|--------|----|
| | | Building | 35% | NF |
| | | Electrical/Electronics | 62.22% | F |
| | | Metal work | 70.31% | F |
| | | Wood work | 88% | F |
| | | Mean Percentage | 62% | NF |
| 3 | Portable Hand tools | Automobile | 18.06% | NF |
| | | Building | 11.43% | NF |
| | | Electrical/Electronics | 23% | NF |
| | | Metal work | 25% | NF |
| | | Wood work | 33.33% | F |
| | | Mean Percentage | 22.16% | NF |
| 4 | Equipment: | Automobile | 17% | NF |
| | | Building | 34.29% | NF |
| | | Electrical/Electronics | 16% | NF |
| | | Metal work | 33.33% | NF |
| | | Wood work | 60% | F |
| | | Mean Percentage | 32.12% | NF |

*F = Functional, NF = Not Functional

Results in Table 1 shows that the functionality of the safety kits in the Industrial and Technology Education Department Workshop had a percentage mean rating ranged between 37.14% to 92% and a grand mean rating of 57.23%. Any items with a percentage mean rating from 50% and above were regarded as functioning. Thus, the safety kits for effective teaching and learning delivery in workshop of Industrial and technology Education Department of the Federal University of Technology Minna, Niger state are functioning. The functionality of the hand tools in the Industrial and Technology Education Department Workshop had a percentage mean rating ranged between 29% to 88% and a grand mean rating of 57.06%. Any items with a percentage mean rating below 50% were regarded as not functioning. Thus, the hand tools for effective teaching and learning delivery in workshop of Industrial and technology Education Department of the Federal University of Technology Minna, Niger state are functioning.

The functionality of the portable hand tools in the Industrial and Technology Education Department Workshop had a percentage mean rating ranged between 11% to 33.33% and a grand mean rating of 22.16%. Any items with a percentage mean rating below 50% were regarded as not functioning. Thus, the portable hand tools for effective teaching and learning delivery in workshop of Industrial and technology Education Department of the Federal University of Technology Minna, Niger state are not functioning.

Results also shows that the functionality of the equipment in the Industrial and Technology Education Department Workshop had a percentage mean rating ranged between 16%

to 60% and a grand mean rating of 30%. Any items with a percentage mean rating below 50% were regarded as not functioning. Thus, the equipment for effective teaching and learning delivery in workshop of Industrial and technology Education Department of the Federal University of Technology Minna, Niger state are not functioning.

Research question 2: How frequent is the utilization of the following workshop facilities for teaching in ITE workshop?

Table 2: Percentage ratings of the respondents on frequent utilization of Facilities for teaching in ITE Workshop

| S/n | Type of Facility | Programme | % | Remark |
|------------------------|---------------------|------------------------|---------|--------|
| 1 | Safety Kits: | Automobile | 60% | Fr |
| | | Building | 37.14 % | NFr |
| | | Electrical/Electronics | 42% | NFr |
| | | Metal work | 95% | Fr |
| | | Wood work | 55% | Fr |
| | | Mean Percentage | 58.83% | Fr |
| 2 | Hand tools: | Automobile | 53.13% | NFr |
| | | Building | 35% | NFr |
| | | Electrical/Electronics | 62.22% | Fr |
| | | Metal work | 70.31% | Fr |
| | | Wood work | 88% | Fr |
| | | Mean Percentage | 62% | NFr |
| 3 | Portable Hand tools | Automobile | 18.06% | NFr |
| Building | | 11.43% | NFr | |
| Electrical/Electronics | | 23% | NFr | |
| Metal work | | 25% | NFr | |
| Wood work | | 33.33 % | Fr | |
| Mean Percentage | | 22.16% | NFr | |
| 4 | Equipment: | Automobile | 17% | NFr |
| Building | | 34.29% | NFr | |
| Electrical/Electronics | | 16% | NFr | |
| Metal work | | 33.33 % | NFr | |
| Wood work | | 60 % | Fr | |
| Mean Percentage | | 32.12% | NFr | |

Results in Table 2 shows that the frequency in the utilization of the safety kits in the Industrial and Technology Education Department Workshop had a percentage mean rating ranged between 37.14% to 95% and a grand mean rating of 58.83%. Any items with a percentage mean rating below 50% were regarded as not frequent. Thus, the safety kits for effective teaching and learning delivery in workshop of Industrial and technology Education Department of the Federal University of Technology Minna, Niger state are utilized frequently. The frequency in the utilization of hand tools in the Industrial and Technology Education Department Workshop had a

percentage mean rating ranged between 35% to 88% and a grand mean rating of 62%. Any items with a percentage mean rating below 50% were regarded as not frequent. Thus, the hand tools for effective teaching and learning delivery in workshop of Industrial and technology Education Department of the Federal University of Technology Minna, Niger state are utilized frequently.

Likewise the frequency in the utilization of potable hand tools in the Industrial and Technology Education Department Workshop had a percentage mean rating ranged between 11.43% to 33.33% and a grand mean rating of 22.16%. Any items with a percentage mean rating below 50% were regarded as not frequent. Thus, the portable hand tools for effective teaching and learning delivery in workshop of Industrial and technology Education Department of the Federal University of Technology Minna, Niger state are not utilized frequently.

Results also shows that the frequency in the utilization of equipment in the Industrial and Technology Education Department Workshop had a percentage mean rating ranged between 16% to 60% and a grand mean rating of 32.12%. Any items with a percentage mean rating below 50% were regarded as not frequent. Thus, the equipment for effective teaching and learning delivery in workshop of Industrial and technology Education Department of the Federal University of Technology Minna, Niger state are not utilized frequently.

Research Question 3: What are the strategies for improving in provision and regular maintenance workshop facilities in ITE department workshop?

Table 3: Percentage ratings of the respondents on the strategies to improve on the provision of workshop facilities for teaching in ITE Workshop

| S/N | ITEMS | % | Remark |
|-----|---|----|--------|
| 1 | Procurement of all necessary equipment in the workshop by the government. | 91 | A |
| 2 | Assistance form community and private sector to technical education by donating relevant equipment to the workshop. | 87 | A |
| 3 | Keep appropriate records of all equipment to ensure sufficiency and avoid the duplication of supply. | 87 | A |
| 4 | Adequate infrastructural facilities for each option such as electricity supply, building structure etc. | 91 | A |
| 5 | Replacement of outdated equipment in the workshop. | 87 | A |
| 6 | Availability of standard and functional workshop. | 91 | A |
| 7 | Allow students to have enough time to get acquainted with the tools and machine in the workshop for effective skills acquisition. | 82 | A |
| 8 | Appropriate records of all equipment kept in the store for skills acquisition. | 91 | A |
| 9 | Adequate technological tools for improving skills acquisition. | 82 | A |
| 10 | Proper maintenance of tools and equipment. | 91 | A |
| 11 | Yearly assessment of available tools and equipment in the workshop. | 78 | A |
| 12 | Cordial relationship between the department and industries. | 87 | A |

| | | | |
|----|---|-------|---|
| 13 | Not more than 30 students per equipment. | 78 | A |
| 14 | Provision of safety kit in the workshop. | 80 | A |
| 15 | Orderliness and enough space in the workshop. | 80 | A |
| | Total | 74.47 | A |

Results presented in Table 3 shows that the strategies for improving the utilization of workshop facilities in Industrial and Technology Education Department range from 78% to 91% and a grand mean rating of 74.47%. Any items with a percentage mean rating below 50% were regarded as disagreed. Thus, the strategies to improve utilization of workshop facilities for teaching-learning in Industrial and technology Education Department workshop of the Federal University of Technology Minna, Niger State.

IV. FINDINGS OF THE STUDY

1. The Industrial and Technology Education Department of the Federal university of Technology Minna, Niger State of Nigeria do not a lot of workshop facilities that are not functioning.
2. The Industrial and Technology Education Department students of the Federal university of Technology Minna, Niger State of Nigeria are not utilizing most of the workshop facilities.
3. The strategies for improving on the provision and maintenance of workshop facilities in Industrial and Technology Education Department of the Federal university of Technology Minna, Niger State of Nigeria workshop for effective teaching.

V. DISCUSSION OF THE FINDINGS

Findings indicated that most of the available equipment in the workshop were under- utilized. Non utilization of available workshop facilities might be due to what Shittu (1988) attributed to as lack of providing enough practical periods in the time table. The equipment then would be kept in the store and later found missing. Again, human as well as, material resources wastage will be the consequence of this under-utilization of available equipment (Salami, 1993). In order to achieve the objectives of technical education, workshop equipment must not only be properly used during and after practical lesson but must also be maintained.

On the measures to be taken for effective utilization of workshop equipment, the findings indicated that training seminars and workshop should always be organized for technical teachers and that only qualified and well experienced teachers should handle students' practical lessons.

The finding on strategies to improve on the provision and utilization of workshop facilities showed that the responsibility of supplying tools and equipment to schools should not rely solely on the government. Other non-governmental agencies should also share such responsibility for smooth running of vocational/technical education programme. This finding agreed with reports by Ariyo (1987)

and Ibe-Bassey (1995) on alternative financing of education and Olaitan (1987) on how to overcome some problems pertaining to vocational/technical education in Nigeria.

In addition, the investigation revealed that the use of appropriate records of all equipment was an important step to ensuring adequacy of workshop facilities. For a technical teacher to be successful, he/she must possess both, the teaching method as well as the practical knowledge of the trade. San Juan (1985) earlier noted the importance of the two trades to a technical teacher. While Ariyo (1987) found that majority of his respondents were in support of training and workshops for technical teachers to update their knowledge.

VI. CONCLUSION

The achievement to be made by students and the quality of education that the students will receive is directly related to the availability or lack of physical facilities and overall atmosphere in which the learning will take place.

Other factors may include adequacy of space for instruction, workshop space areas for each option are among the major obstacles which the study revealed as inadequate.

VII. RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

1. Improving and maintaining schools' workshop facilities should not be limited to government alone, instructors, workshop attendants, and the school managers should take good care of the facilities.
2. That the workshop space should be adequate to cater for large population of students the design.
3. Federal and state technical institutions 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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