School Facilities and Student’s Performance in Metal Work Practicals in Technical Colleges in Akwa Ibom State

Samuel Amos Ikpe
Department of Technical Education, College of Education, Afaha Nsit

Abstract
The intent of this investigation was to ascertain the relationship between School Facilities and Students’ Mean Performance in Metalwork Practicals. Two research questions and Two null hypotheses were formulated to guide the investigation. This study involved a population of 249 Senior Technical three Students (ST3) in the Six Technical Colleges in Akwa Ibom State. The sample that participated in the study consisted of 150 randomly sampled subjects. A 25-item questionnaire developed by the researcher, tagged “School Facilities Questionnaire” (FSQ) was employed to obtained data from the sample. Pearson Product Moment Correlation (PPM), was used to analyze the data generated for the study. The findings of the study indicated that significant relationships existed between School Facilities and Students’ Mean performance in Metalwork Practicals. The result indicated that there is a significant relationship between combined School facilities, training materials and students’ mean performance in metalwork Practicals. Sequel to the findings of the study, it was concluded that school facilities are strong predictors of students’ performance as variations in School Facilities are followed with variations in Students’ mean performance. It was recommended among others that Akwa Ibom State government should supply adequate School Facilities and training materials to all the technical colleges to enhance students’ effective performance in metal workshop practicals.

Keywords: School Facilities, Metal Work, Student’s Performance, Practical Works, Technical Colleges

Introduction
School facilities constitute a major educational concern because of their impact on the effectiveness of the training programme. It is generally believed, that training programme bears a lot of evidence of the influence of facilities on the achievement of training objectives. Technical College training is essentially hinged on the availability and use of school facilities which facilitate students’ skills acquisition.

Facility therefore could be referred to as a building, a space, a piece of equipment or machine that is provided at a place for people to use (Rundell, 2007). In the context of this...
report, the term facilities refers to workshop library, safety equipment, training materials and power supply provided in the school for teachers and students to use for teaching and learning purposes. Technical College being a workshop-based institution is designed to develop skills, abilities, understanding, attitude, and impart knowledge on a useful and productive basis.

The students’ acquisition of the marketable skills is based on the availability of quality instructional facilities needed to improve learning. Dawodu (2007) pointing out that school facilities provide concrete experiences and enable students integrate prior experiences with new learning. Dawodu further maintained that students’ concrete experiences facilitate cognitive learning and skills acquisition, retention and usability of abstract symbols. Adamu and Abdullahi, (2017) also shared in the foregoing observation by expressing that to buttress skills training in technical colleges, the institution is expected to focus on workshop practices which is generally considered to be the key for concrete learning instead of classroom teaching without adequate practical demonstration.

Consequently, educational resources and facilities available in a given technical college environment do influence teaching, learning and students’ performance. Ndomi, (2009) expressed that the provision of adequate workshop facilities would enhance the quality of practical skills development in learners. Research evidence has also revealed the relational value of facilities to students’ academic performance. According to Ibe-Bassey (1994) observed and pointed out that the teacher cannot have effective instructional process except the participants of the process are engaged in the utilization of school facilities. He further outlined facilities to include: basic machines, tools, laboratory equipment, computer, library, safety equipment, power plant, consumables and well-equipped workshops.

Technical Colleges use lots of equipment, teaching aids and a wide range of training materials (consumables). With the recent advancement in technology in the world of work, it becomes imperative for schools to embrace these changes for effective teaching and learning. Eventually, this has called for the updating of school curriculum and programmes with accompanying introduction of these facilities in order to improve the learning experiences of the students. These school facilities could be regarded as all the moveable and stationary equipment and tools, library shelves and books, laboratory storage racks, generating set, safety equipment, workshop space, consumable and non consumable materials, furniture and fittings, which are not integral part of the building but which are constantly used in school administration, instruction, practical operation and maintenance of school (Nkang, 2002).

Akpan (2003) regarded school facilities as those things of education which enable a skilful teacher to achieve a level of instructional effectiveness that far exceeds what is provided. Thus, the ‘things of education’ or educational facilities are numerous. They are numerous in the sense that teaching or training materials which facilitate teaching and learning come under the term and school facilities.

Metalwork option in Technical Colleges offer many job skills based on laboratory tools and machines for such activities as welding and fabrication, foundry, forging, machine work (e.g. lathe turning, milling, buffing, grinding, drilling and so on), metal project designing and other similar activities. These skills cannot be properly taught in the absence
of tools, machines and materials in the process. In the absence of the needed facilities, students cannot acquire skills in accordance with the objectives of the National Policy on Education (FRN, 2004). The objectives provided in the National Policy on Education are as follows:

(a) Give training and impart the necessary skills to individuals who shall be self-reliant economically
(b) Provide trained manpower in the applied science, technology and business particularly at craft, advanced craft and technical level
(c) Provide the technical knowledge and vocational skills necessary for agriculture, commercial and economic development.

It is expected that a student pursuing technical training programme in Technical College should be adequately equipped with practical skills in any trade to become a craftsman. A craftsman is a skilled worker in a trade or industrial occupation. In line with the foregoing, the quality and the success of the Technical Colleges depend largely on the proper use of school facilities, which is capable of awakening learners’ interest and arousing their curiosity to learn more (Onyejemezi, 1996 and Enem, 2005). In the same vein, Udoutin (2004) posited that the availability and effective utilization of basic facilities, equipment, materials and supplies as well as adequacy of funding are necessary to make the implementation of Technical College programmes stimulating and goal-directed. On the contrary, if the technical training programmes lack the basic school facilities, the curriculum will be ineffective. Therefore, any school environment lacking adequate facilities and supplies, always experiences students’ poor performance.

The provision of workshop facilities for students’ practical demonstration is one of the cardinal goals of the technical colleges. Orikpe (1994) related skills development in students to the effectiveness of all technological programmes. He further stressed that skills can only be acquired when suitable technical tools and equipment are procured and prudently utilized. Still stressing the need for effective use of workshop facilities, Okoro (1999) pointed out that demonstration and practical activities develop students’ manipulative skills, aroused intellectual ability, argument and internalizing what has been learnt theoretically. He further added that practicals help students to understand better what has been learned theoretically in the classroom. White (1996) maintained that students’ frequent and active participation in workshop activities promotes their learning outcomes in cognitive and psychomotor objectives.

However, it is a common belief that technical college programme is a workshop-based programme designed to equip learners with affective work competencies which constitute a crucial component of work skills needed in the world of work (Usoro and Ekong 2010). Ibe-Bassey (1994) affirmed that when the human potentials are developed by constant manipulation of workshop tools and equipment, they are capable of manipulating industrial machines and tools in technical institutions to produce the right caliber of manpower. In order to win the respect of industries and public, they must be adequately equipped for expected performance in the world of work. Research evidence indicates that the impact of Workshop facilities on students’ learning is enormous as illustrated by the researcher in Figure 1.
Figure 1: Illustration of Importance of Workshop Facilities on Learners

Figure 1 is an illustration of the importance of Workshop facilities on teaching and learning. Ukoha, (1996) confirmed that facilities have the potency for motivating, attracting, directing and holding learners’ attention on the lesson taught.

Students’ performance in Metalwork practicals is associated with the availability and utilization of functional workshop facilities within the school environment. In order to facilitate the task of practical demonstration in the workshop, the teacher or instructor must create an environment where the students will not only be passive listeners but also active participants in order to arouse their mental attitudes towards learning. Okoro, (1999) and Inwang, (2001) noted that poor conditions of school facilities constitute serious challenges to school management in attaining the set goals of Technical College programmes.

Training materials constitute a major factor in effective practical training in vocational technical education programme. No matter how rich a school might be with experts, sophisticated equipment and tools, they do not serve the purpose until they are properly utilized. Training cannot be realistic until training materials are provided. Nwachukwu (2006) affirmed the fact that consumables are materials that are utilized for skills development and the production of observable job outcomes. In addition, Idika (1997) and Okeke (2002) observed that the non-provision and unavailability of consumables is a major constraint in the implementation of technical and vocational education (TVE) programmes.
The Federal Ministry of Education (FME, 2001) has also stated that presently, Technical Colleges and Polytechnics suffer from gross infrastructural dilapidation, staff shortages and inadequate facilities, books and instructional materials resulting in lack of quality technical teacher education training programme. The development of appropriate skills in metalwork practicals through the use of appropriate consumable materials has become very imperative and unavoidable. Consequently, if workshops, tools and equipment are provided with very qualified technical teachers but without the consumable materials required for practical work, technical training still suffers, leading to the production of unskilled personnel who may never be self reliant in their chosen trade (Onweh, 2007). Inspite of the efforts of the government, Industrial Training Fund (ITF), Education Trust Fund (ETF) and other agencies to improve the learning of Metalwork, there are still setbacks plaguing psychomotor learning.

**Statement of the Problem**

Metalwork Technology is one of the major options in the Technical College Programmes (Federal Republic of Nigeria, 2004). It is a workshop – based course designed to equip students with cognitive, affective, psychomotor and perceptual skills which constitute balanced work behaviour. The availability and utilization of school facilities have been associated with students’ performance in psychomotor skills in Technical Colleges (Onyejemezi, 1996 and Enem, 2005). Any reported notion on the situation, so far, is based on opinion and not on empiricism. As a matter of facts, Metalwork students who are expected to acquire the needed cognitive, affective, psychomotor and perceptual skills for self-employment have suffered a disadvantage especially in the aspect of psychomotor skills.

The students of Metalwork trade cannot cope with the societal demands because they lack the skills that could satisfactorily serve the society and employers of labour. Many students graduate from Technical Colleges without acquiring the competencies needed to satisfactorily serve the society and employers of labour. Their practical and intellectual skills deficiencies have been the cause of failure of products from Technical Colleges to venture into self employment (Ogwo, 2004). If the school facilities (Workshop facilities, Safety facilities, Training materials and Regular power supply) are available and effectively utilized the students are apt to be motivated towards improving their cognitive and psycho-productive learning. The question raised at this juncture then is: what is the relationship between school facilities and students’ performance in metalwork practicals in Akwa Ibom State Technical College? There is no ready answer to the foregoing question because little or no research evidence exists on the issue. Even if any research evidence was available, it would still be necessary to replicate the study in order to confirm earlier efforts. However, it is the lack of or limited research evidence regarding the relationship between school facilities and students’ performance in Metalwork practicals in Akwa Ibom State Technical Colleges that provided the focus of the problem for this investigation.

**Purpose of the Study**

The purpose of this study was to determine the relationship between school facilities and students’ performance in Metalwork practicals in Akwa Ibom State Technical Colleges. The study was specifically designed to meet the following objectives:
1. Determine the relationship between workshop facilities and students’ performance in Metalwork practicals.

2. Determine the relationship between training materials (consumables) and students’ performance in Metalwork practicals.

Research Questions

The study was designed to provide answers to the following research questions:

1. What is the relationship between workshop facilities and students’ performance in Metalwork practicals?

2. What is the relationship between Training materials (consumables) and students’ performance in metalwork practicals?

Null Hypotheses

On the bases of the research questions, the following null hypotheses were formulated and tested at 0.05 level of significance:

1. There is no significant relationship between workshop facilities and students performance in Metalwork practicals.

2. There is no significant relationship between training materials (consumables) and students’ performance in Metalwork practicals.

Methodology

A survey design was employed in this investigation. This design was found appropriate because the study involved the use of questionnaire to seek the opinion of the respondents (sample) representing the target population. This study focused on the six technical colleges in Akwa Ibom State. Akwa Ibom State is located in the South – South geopolitical zone of Nigeria and is made up of 31 local government areas. It has a population of about 2.5 million and is divided into three senatorial districts with different linguistic distinctions (Ibibio, Ananng, Eket, Oron, Obolos etc), culture and customs. Akwa Ibom State is one of the educationally advantaged states of Nigeria. It is mainly a civil service state having some small scale ventures and relatively few large scale enterprises.

The population of the study consisted of all the 277 final year students of Metalwork programme in the seven Technical Colleges in Akwa Ibom State. The colleges with the students erollmen are as follows: Technical College, Abak 27, Technical College, Ewet 31, Technical College, Ikot Akata 51, Technical College, Ikot-Ika, 49, Mainland Technical College (MTC)-Oron 46, Union Technical College (UTC)-Ikpa-Esit Eket, 45, and Government Technical college Mbioto , Etinan 28. The sample that participated in the study was 150 students randomly selected through balloting from the six Technical Colleges under investigation. A 25-item questionnaire tagged School Facilities Questionnaire (SFQ) developed by the researcher and based on the five attribute variables was employed to collect data from the sample. The questionnaire consisted of two sections; A and B. Section A contained questions on personal data while Section B contained statements based on the
school facilities and students’ performance in Metalwork practicals. Each questionnaire item was followed by five response options namely: Strongly Agree (SA), Agree (A), Undecided (U) Disagree (D) and strongly Disagree (SD). Students’ Performance scores in Metalwork practicals in the Technical Colleges were obtained from 20016/2017 college records. The instrument was subjected to content validation by three experts in the Department of Vocational Education, University of Uyo, Uyo. Their inputs were utilized to modify the instrument. The validated version of the instruments was then subjected to reliability test. Sequel to the establishment of the validity and reliability of the instrument, 150 copies of questionnaire were produced and distributed by the researcher to the 150 respondents in the seven Technical Colleges under investigation. To facilitate the distribution and retrieval of the completed forms, the researcher sought the assistance of staff in the institutions.

Students’ scores on their practical performance in Metalwork constituted the data on the dependent variable. The students’ scores (in %) were converted into Grade Points to facilitate statistical computations. The guidelines on score transformation into grade point as used in the colleges are as presented, 70 – 100 = A, (5points), 60 – 69 = B (4points) 50 – 59 = C (3points), 45 – 49 = D (2points), 40 – 44 = E (point), 1 - 39 = F (0)

Method of Data Analyses

The data generated from the responses were analyzed using the Pearson Product Moment Correlation (PPMC) and Multiple Correlations or Multiple R in SPSS computer package. Multiple R was subjected to F-ratio test for significance of correlation.

Research Question 1: What is the relationship between Workshop facilities and students’ performance in Metalwork Practicals?

The relationship between workshop facilities and students’ performance in metalwork Practicals is presented in Table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>$\sum X$</th>
<th>$\sum X^2$</th>
<th>$\sum XY$</th>
<th>Pearson r</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\sum Y$</td>
<td>$\sum X^2$</td>
<td>$\sum XY$</td>
<td>Pearson r</td>
<td>Remarks</td>
</tr>
</tbody>
</table>

Table 1: Relationship between Workshop Facilities and Students’ Performance
Result of data analysis as presented in the Table 1, shows that a calculated correlation coefficient of 0.59 which is a moderate positive relationship between workshop facilities and students’ performance. The result shows that workshop facilities have a moderate positive relationship with students’ performance in metal work practicals in technical colleges in Akwa Ibom State.

**Research Question 2:** What is the relationship between training (consumables) materials and students’ performance in Metalwork practicals?

The relationship between training materials and students’ performance in Metalwork practical is presented in Table 2:

<table>
<thead>
<tr>
<th>Variables</th>
<th>$\sum X$</th>
<th>$\sum X^2$</th>
<th>$\sum X_Y$</th>
<th>Pearson r</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training Materials (X)</td>
<td>313.63</td>
<td>661.07</td>
<td></td>
<td>1269.94</td>
<td>0.65</td>
</tr>
<tr>
<td>Students performance (Y)</td>
<td>5994</td>
<td>251690</td>
<td></td>
<td></td>
<td>Moderate positive</td>
</tr>
<tr>
<td>(n=150)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>correlation between X and Y</td>
</tr>
</tbody>
</table>

Result of data analysis as presented in the Table 2, shows that a calculated correlation coefficient of 0.66 which is a moderate positive relationship between training materials and students’ performance. The result shows that training materials have a moderate positive relationship with students’ performance in metal work practicals in technical colleges in Akwa Ibom State.

**Null Hypothesis 1:** There is no significant relationship between Workshop Facilities and Students’ Performance in Metalwork Practicals.

The summary of results of testing null hypothesis one is presented in Table 3:

<table>
<thead>
<tr>
<th>Variables</th>
<th>$\sum X$</th>
<th>$\sum X^2$</th>
<th>$\sum X_Y$</th>
<th>Pearson r</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>W/shop facilities (X)</td>
<td>356.74</td>
<td>856.35</td>
<td></td>
<td></td>
<td>Reject</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>$\sum X$</th>
<th>$\sum X^2$</th>
<th>$\sum X_Y$</th>
<th>Pearson r</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students performance (Y)</td>
<td>5994</td>
<td>251690</td>
<td></td>
<td></td>
<td>Moderate positive</td>
</tr>
<tr>
<td>(n=150)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>correlation between X and Y</td>
</tr>
</tbody>
</table>
**Null Hypothesis 2:** There is no significant relationship between Training Materials and students’ performance in Metalwork Practical.

The results of testing the null hypothesis 2 are summarized in Table 3:

**Table 4: Analysis Showing the Relationship between Training Materials and Students’ Performance (n = 150)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>ΣX</th>
<th>ΣX^2</th>
<th>ΣXy</th>
<th>Pears on r</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training Materials</td>
<td>313.63</td>
<td>661.07</td>
<td></td>
<td>.65*</td>
<td>Reject (Ho₁)</td>
</tr>
<tr>
<td>Students performance</td>
<td>5994</td>
<td>251690</td>
<td>1269.94</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at .05 level, df 148; critical r=.195.

Data analysis in Table 6 indicates a greater computed r (.646) than the tabled value of r (.195). The null hypothesis four was rejected in favour of the alternative hypothesis. Showing that significant relationship exists between training materials and students’ performance in Metalwork Practicals.

**Summary of the Findings**

The application of Pearson correlation coefficient (r) has yielded Moderate positive correlation values between school facilities and students’ mean score in Metalwork.

The findings of this investigation are summarized as follows:

1. There is a significant relationship (r_{xy}=.59) between workshop facilities and students’ performance in metal work practicals.
2. There is a significant relationship (r_{xy}=.65) between training materials and students’ performance in metal work practicals.

**Discussion of the Findings:** Findings of the study are discussed based on the specific objectives of the study.

**Workshop Facilities and Students’ Performance**
Findings of the study revealed that there is a significant relationship between workshop facilities and students’ performance in Metalwork practicals. The findings of the study go in line with that of White (1996) who maintained that students’ frequent and active participation in workshop activities promote their learning outcomes in cognitive and psychomotor objectives. The findings of study also confirm the findings of Okoro (1999) who pointed out that demonstration and practical activities develop students’ manipulative skills, arousing intellectual ability, argument and internalizing what has been learned theoretically. He further added that practicals help students to understand better what has been learned theoretically in the classroom.

Besides, the findings of the study also corroborate with that of Ibe-Bassey (1994) who affirmed that when the human potentials are developed by constant manipulation of workshop tools and equipment, they are capable of manipulating industrial machines and tools in technical institutions to produce the right caliber of manpower. In order to win the respect of industries and public, they must be adequately equipped for expected performance in the world of work. Research evidence indicates that the impact of workshop facilities on students’ learning is enormous.

Training Materials and Students’ Performance

The result of data analysis revealed that there is a significant relationship between training materials and students’ performance in metal work practicals. The findings of the study support that of Nwachukwu (2006) that consumables are utilized for skills development and the production of observable job outcomes. The findings of the study also go in line with the works of Idika (1997) and Okeke (2002) who observed that the non-provision and unavailability of consumables is a major constraint to the implementation of technical and vocational education (TVE) programmes.

The findings of the study is in accordance with Onweh’s (2007) findings that if workshop tools and equipment are provided with very qualified technical teachers but without the consumable materials required for practical work, technical training still suffers, leading to the production of unskilled personnel who never be self-reliant in their chosen trade. However, it must be noted that consumable materials in practical work performance are just like instructional materials in practical work performance are first like instructional materials in ordinary teaching and learning. It is therefore pertinent that where workshop facilities are provided in addition to qualified teachers, then consumable materials can be utilized to the advantage of students’ skills acquisition for self employment and the world of work.

Conclusions

Based on the data analyzed, findings and discussion made, it is concluded that there is an association between School facilities and students’ academic performance be it cognitive or psycho-productive.

Variations in the availability of School facilities are likely to be followed by variations in students performance be it negative or positive. There is also a relationship between all School facilities considered together and students’ performance in Metalwork Practicals.
**Recommendations**

On the bases of research findings, the following recommendations may be proffered:

1. The Akwa Ibom State government should supply adequate training materials and workshop facilities to all the technical colleges in Akwa Ibom State to enhance their practical work performance.

2. The Akwa Ibom State government should assume that the learning environment is safe by providing personal protective equipment (goggles, hand glove, face shields) safety signs, fire extinguishers, proper ventilation and lighting, emergency exit doors in all the shops, buckets of sand, and metal cans for storing consumable wastes.

3. The Akwa Ibom State government should supply to all the technical colleges generating plants to enhance the utilization of power-driven machines in the event of black-outs during practical demonstrations for skills development.

4. Technical teachers should be retrained to update their knowledge and skills for improved classroom performance. This can be achieved through government in-service training, sponsorship of teachers to attend workshops, seminars, and conferences in technical areas covering occupations in Metal, Wood, Building Automobile Technology and Electrical Electronics engineering, Information Communication Technology (ICT), Technical Drawing etc.

5. Greater attention should be directed by metal work teachers to equalize emphases on the acquisition of skills in the four domains of work behaviour. Up to this moment training emphases have been on cognitive, and psycho-productive skills development to the detriment of skills development in affective and perceptual domains.

**References**


