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Research Article

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Utilization of Workshop Equipment and Tools for the Improvement of Teaching and Learning of Technical Vocational Education and Training (TVET) in Technical Colleges in Nigeria

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Abstract The study investigated the utilization of workshop equipment and tools for the improvement colleges in Nigeria. The population of the study consisted of both students and teachers in Rivers State. A total of 400 respondents (280 students and 120 teachers) was the sample of the study selected through simple random sampling technique. One research question was posed and one hypothesis formulated for this study. A structured questionnaire validated and with reliability coefficient of 0.78 was the instrument used for data collection. Data collected were analyzed using statistical mean to answer the research question while z-test was used to test the null hypothesis at 5% level of significance. The result showed that non-utilization of the available workshop equipment and tools would not promote or enhance the manipulative skills acquisition expected in teaching and learning of TVET programme. It was therefore recommended that workshop equipment and tools should be made available in technical colleges in order to facilitate effective teaching and learning of TVET; among others.

Keywords Utilization, equipment and tools, improvement, TVET

Introduction

The survival of any nation depends on the premium attached to the education of its citizen. Education whether general, vocational or technical is the corner stone of technological, political and economic development. [1] defined TVET as the training of individual at the adult post-secondary and higher school level and highly skilled technicians for entrance into employment in occupation which are defined as technical by industrial, scientific, commercial and government agencies. This means that TVET is that segment of education charged with preparing people for work. It is the backbone of the nation's employment related education and training programmes [2]. Consequently, TVET is a practice-oriented course where practical application of day-to-day learning is enforced for proper technological awareness and skill development [3]. In the same vein, [4] pointed out that TVET demands that its teaching and learning should include both classroom instruction and workshop practical.

In other words, [5] identified TVET institutions at the post – primary level as pre – vocational and vocational schools whereas technical colleges, technical teacher colleges and polytechnics are identified as post – secondary level. He put forward that students interested in TVET either leave for technical college after the primary school education to Junior Secondary School (JSS) level, the Senior Secondary School (SSS) level or higher institution (university, polytechnics and monotechnics).

Since TVET is that segment of education charged with preparing people for work, the acquisition of diverse TVET skills calls for the utilization of diverse instructional materials such machine tools and equipment. Thus, Equipment and tools [6] are described as all the portable or heavy instrument or mechanical devices for

performing special operation in teaching and learning state of affairs of TVET. [7] described machine, tools and equipment as the instruments devices that can be handled easily while carrying out special activities. He emphasized that these machines, tools and equipment should be present and must be used in teaching, so that creativity and occupation orientation of TVET career be effectively developed in the students.

[8] remarked that the use of workshop machines tools and equipment help in the development of occupational choice, cognitive and psychomotive learning of students. He further stated that it allows the students to learn and creatively observe the practical items of TVET. Convincingly, TVET is a programme that the theory aspect of it should be taught in the classroom while the practical should be taught in the workshop. It is therefore essential to use tools in demonstration practices for the teaching and learning of TVE so that occupational exploration, awareness, and orientation will be adequately developed in the students.

Statement of the Problem

Technical education aimed at providing students with knowledge, attitude and skills leading to gainful employment in the world of work. Inadequate utilization of workshop equipment in the teaching and learning of TVET is one of the factors militating against the achievement of the goals of the National Policy on Education on TVET programme in the technical schools in Nigeria [9-10]**.** Commenting on this issue, [11] remarked that due to this problem of inadequate utilization, students have developed a poor attitude toward technology education in many secondary schools in Nigeria.

The National Policy on Education states that proper utilization of TVET will enable students acquire further knowledge and develop skill. Hence, teaching of TVET requires the use of workshop equipment and tools. When the subject is taught theoretically, the aim of inclusion [12] explained that effective use of workshop equipment in the teaching and learning of TVET will bring about a change in behavior of students towards TVET and will help the students' interest in their respective chosen trade.

The high rate of unemployment among the technical college graduates has been attributed to lack of skills and competencies required in the world of work. The social evil and economic handicap of unemployment can only be stemmed if technical college graduates acquire adequate technical and entrepreneurial competency that will enable them be self-reliant [11, 13-14]. This study was therefore designed to investigate the utilization of workshop equipment and tools for the improvement of teaching and learning of technical vocational education and training in technical colleges in Nigeria.

Research Questions

One research questions guided the study:

What are the ways of enhancing effective utilization of workshop equipment and tools for the improvement of teaching and learning of technical vocational education and training in technical colleges in Nigeria?

Hypothesis

Also, one null hypothesis was tested at 0.05 level of significance:

There is no significant difference in the mean responses of students and teachers on the utilization of workshop equipment and tools for the improvement of teaching and learning of technical vocational education and training in technical colleges in Nigeria.

Materials and Methods

The study employed descriptive survey design. A sample of four hundred (400) copies of structured questionnaires with sixteen (15) items were administered to two hundred and eighty (280) students and one hundred and twenty (120) of teachers in the technical colleges in Rivers State.

The instrument used for the collection of data was a structured questionnaire tagged 'Utilization of Workshop Equipment and Tools for Improvement of Teaching and Learning of Technical Vocational Education and Training in Technical Colleges in Nigeria (UWETITLTVETTCN)' with 15 items on a 4-point scale of Strongly Agree (SA) =4, Agreed (A) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1. The instrument 'UWETITLTVETTCN' was validated by three experts. The reliability of the instrument was ascertained using

the Spearman's rank order correlation coefficient on the data collected through a pilot test on 35 respondents selected from technical colleges in Rivers State who were not part of the sample of the study. The coefficient of reliability obtained was 0.86. This was adjudged high enough for the instrument to be used for the main study.
The researchers personally went to the schools to administer the 400 copies of the questionnaire. All were properly completed and retrieved on the spot. The statistical mean was used to answer the research question. An item with a calculated mean value equal or greater than 2.50 (2.50 – 4.00) was regarded as agreed, while the calculated mean of an item less than or equal to 2.49 (0 - 2.49) was regarded as disagreed. An inferential statistics of z-test was used to test the only null hypothesis at 0.05 level of confidence. It was decided that where z-calculated value was equal or greater then table z-value, it indicates significance difference, so reject the null hypothesis but otherwise, accept the null hypothesis.

Results

The results of the analysis of the study are presented in Tables 1 and 2

Table 1: Respondents' Mean Score and Standard Deviation on the Utilization of Workshop Equipment and Tools for Improvement of Teaching and Learning of Technical Vocational Education and Training in Technical Colleges in Nigeria

S/N	ITEMS	$\bar{X}_1$	SD_1	Rmks	$\bar{X}_2$	SD_2	Rmks
1.	More periods should be allocated to students' practical exercise in the workshop	3.86	0.90	A	3.10	0.62	A
2.	Workshop should be provided with display board for teachers demonstration	3.67	1.04	A	2.91	1.95	A
3.	Adequate provision and installation of work benches, machines and hand tools in the workshop would facilitate effective use of workshop equipment for introductory technology	3.87	0.73	A	2.51	0.91	A
4.	Adequate spacing of installed equipments, teaching aids, safety poster in the workshop encourages effective utilization of workshop equipment	3.91	0.62	A	3.24	1.88	A
5.	Students should be allowed to practice taught skills	3.99	0.85	A	3.36	1.07	A
6.	Students should be involved in routine maintenance of hand tools	3.90	0.72	A	3.21	1.10	A
7.	There should be provision for storage facilities and display of project in the workshop	3.94	0.60	A	2.81	0.66	A
8.	Preliminary orientation to students enhances effective utilization of workshop equipment	4.03	0.61	A	3.10	0.78	A
9.	Excursion/field trips to resource centres encourage the effective use of workshop equipment	4.25	0.62	A	3.23	0.72	A
10.	Giving simple projects to students would facilitated effective use of workshop equipment	3.81	0.71	A	2.68	0.74	A
11.	Provision of consumables regularly is required for effective use of workshop equipment	3.86	0.55	A	2.56	0.48	A
12.	Availability of fund for financing practical work improve the effective use of workshop	3.67	0.72	A	3.21	0.90	A

	equipment						
13.	Teachers who use workshop equipment regularly for lesson should be rewarded	3.87	0.61	A	3.32	0.48	A
14.	Prompt repair and maintenance workshop equipment is essential for effective use of workshop equipment	3.91	0.62	A	3.10	0.72	A
15.	Training and retraining of teachers enhances effective use of workshop equipment	3.99	0.52	A	2.51	0.66	A
	Grand mean	**3.90**	**0.65**	**A**	**2.99**	**0.91**	**A**

KEY: *No. of Students,$N_1 = 280$, No. of teachers, $N_2 = 120$, $\overline{X_1}$ = mean of Students, $\overline{X_2}$ = mean of Teachers, Rmks = Remarks, SD_1 = Standard Deviation for Students, SD_2 = Standard Deviation for Teachers; A = Agreed; D = Disagree.*

Table 1 revealed that students agreed with all the items having the grand mean values of 3.90 which is above 2.50. On the other hand, teachers also agreed with all the items having the grand mean values of 2.99 which is above 2.50.

Table 2: z-test of respondents' on the Utilization of Workshop Equipment and Tools for Improvement of Teaching and Learning of Technical Vocational Education and Training in Technical Colleges in Nigeria

Respondent	N	$\bar{X}$	SD	z-cal	z-crit	P	Df	Remarks
Students	280	3.90	0.65	0.41	±1.96	0.05	588	NS
Teachers	120	2.99	0.91					

KEY: *NS= Not significant*

From Table 2, since the calculated value of z-ratio (0.41) was lesser than the critical value of z-ratio (±1.96); the null hypothesis was accepted indicating that there is no significant difference in the perception of respondents on the Utilization of Workshop Equipment and Tools for Improvement of Teaching and Learning of Technical Vocational Education and Training in Technical Colleges in Nigeria.

Discussion

The study indicated that most of the available workshop tools and equipment were under-utilized. This means that non-utilization of the available workshop equipment and tools would not promote or enhance the manipulative skills acquisition expected in teaching and learning of TVET programme. This result has strong congruence with the findings of [15] who noted that non-utilization of the existing workshop tools and equipment as wastage of material resources which is detrimental to the development of the TVET. Thus, aiming towards achieving the desired skills acquisition goals as expected in labour market, workshops and equipment must not only be made available, but most be properly utilized during practical lessons he added.

The study also revealed that effective utilization of workshop equipment for the teaching and learning of TVET can be improved through organizing regular training and retraining, seminars and workshops for technical teachers in order to update their knowledge and also equip them professionally. This finding was in total agreement with the study of [16] who pointed out that sound professional knowledge of the operators (technical teachers) would positively enhance effective utilization of the workshop equipment and tools in technical colleges.

Conclusion

The implications of under-utilization and non-utilization of the available workshop equipment and tools cannot be overemphasized. The paper therefore concludes that workshop tools equipment were not made available and adequate in Secondary Schools studied for effective teaching and learning of TVET programme. More so, tools

and equipment were under utilized in the Secondary Schools where they were available. The paper therefore recommends the followings among others:

1. Workshop equipment and tools should be made available in technical colleges in order to facilitate effective teaching and learning of TVET programme.
2. Technical colleges should be provided with technical personnel who are practically competent for the teaching of TVET programme.
3. Government should make fund available to technical colleges for the purchase of consumable items.
4. In service training, seminars and workshops should be opened to technical teachers to update their knowledge.

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