

Full Length Research Paper

Strategies for evaluation of students' proficiency in practical skills in NCE (Technical) building technology education

Auta, M. S. A.

Nihaad Investment Nigeria Limited, Jalingo, Taraba State, Nigeria.

Received 30 June, 2015: Accepted 12 September, 2015

This study was conducted to identify strategies for evaluation of students' proficiency in practical skills in NCE (technical) Building Technology Education. Questionnaire was the instrument used in collecting data from respondent. The population for the study comprises of all Technical Teachers in the School of Technical Education, Federal College of Education (Technical), Potiskum. There was no sampling employed for this study due to small size of the population. The data obtained were analyzed through the use of means and standard deviation. The study findings revealed that non-availability of practical materials, in adequate training facilities, and the limited time allocated to practical activities are some of the problems often encountered in the evaluation of students' proficiency in practical skills. It also shows that pre-determination of objectives, preparation of checklist, assessing students' safety considerations, and assessing students independence in handling practical task, assessing students ability in following the proper steps of procedure, assessing the overall quality of the completed task were some of the strategies that could be adopted for the effective evaluation of students proficiency in practical skills. Based on the finding, conclusion was drawn and it was recommended that two third of a subject involving practical should be allocated to practical, government should make training facilities and materials adequate to technical teachers training institutions, safety education should be emphasized in the teaching and learning of practical skills, Technology Teacher Education should be kept abreast on the new trends of evaluation procedures through continue professional development (CPD).

Key words: Strategies, students' proficiency, practical skills, vocational and technical education.

INTRODUCTION

The different levels of vocational and technical education, according to Okoro (1993) "do not only required different teaching methods, they also require different teachers". There exist three years programme that prepare teachers

for the pre-technical courses (introductory technology) offered in junior secondary schools, and the vocational craftsmen training offered in technical colleges as well as practitioners of Technology at Technician level.

E-mail: muhammadauta@gmail.com.

Author agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

The programme is referred to as the Nigerian Certificate in Education (Technical). The philosophy of the programme according to the Minimum Academic Standard (2008) "is to provide technical teachers with intellectual and professional background adequate for teaching technical course/subject and to make them adaptable to any changing situation in technological development not only in the country but in the world at large".

The objectives of the programme include:

- i. To produce qualified technical teachers and practitioners of technology capable of teaching Introductory Technology in junior secondary schools.
- ii. To produce N.C.E (Tech) Teachers motivated to start the so much revolution of technological development right from the Nigerian schools.
- iii. To prepare technical teachers so as to qualify them for degree programmes in technical education (minimum academic standard, 2008).

The programme is usually offered at the various Colleges of Education (Technical), some conventional Colleges of Education, and some Polytechnics. At the end of the programme, a student specializes in any of the following areas, namely: Automobile Technology, Building Technology, Electrical/Electronic Technology, Metal Work Technology, and Wood Work Technology (Minimum Academic Standard, 2008).

At inception Colleges of Education, and other institution awarding N.C.E (Tech.) usually had their programme and course affiliated to a university of their choice. The universities to which the colleges were affiliated controlled the quality of academic programme of the affiliated institution. According to Ughamadu (1992), the diverse curricula used by the affiliated colleges lead to a variation in quality of the graduates. This variation led to some universities discriminating applicants seeking for admission into their respective degree programmes.

The federal government in its effort to address the aforementioned problem according to Ughamadu (1992), promulgated decree No 3 of 13th January, 1989 which established the National Commission for Colleges of Education (NCCE) to regulate all teachers education programme outside the universities.

Technical teachers' preparation according to Aina (1990) is very fundamental if and only if such teachers are to perform the necessary and acceptable task in the methodology of inculcating knowledge, practical techniques in student. They should be fully trained and be proficient craftsmen with reasonable period of industrial and practical experiences (Ma'aji, 2002).

Supporting Aina (1990)'s assertion, Okoro (1993) declared that "..... All practical courses must stress practical activity (so that the student can be proficient in their respective field of specializations). Any technical course in which a large portion of the allotted time is not

devoted to practical work, projects, and experiment is not likely to be very successful"

The realization of the above mentioned objectives as outlined in the Minimum Academic Standard (2008) lies on the use of appropriate evaluation techniques; as "...evaluation is a learning process" (Enemali, 2010). Unfortunately, in Nigeria, one of the problems associated with skills training is evaluation (Okorie and Ezeji, 1988; Okoro, 2000). This situation necessitates this study to identify strategies for evaluation of students' proficiency in practical skills in NCE (Technical) Building Technology Education.

Propose of the study

The propose of the study was to identify strategies for evaluation of student' proficiency in practical skills in N.C.E (Technical) Building Technology Education. Specifically, the study intends to:

1. Determine the problem often encountered in the evaluation of students proficiency in practical skills.
2. Identify strategies which could be adopted to ensure effective evaluation of students' proficiency in practical skills.

Research question

The researcher posed the following question to guide the study.

1. What are the problem often encourage in the evaluation of student proficiency in practical skills?
2. What are the strategies that could be adopted to ensure effective evaluation of students' proficiency in practical skills?

METHODOLOGY

The research was a survey type. A survey research is a research that employs the study of large and small population by selecting and studying sample chosen from the population in their natural setting without interference so as to discover the relative incidence which by impact can easily serve as forecast (Uzoagulu 1998).

Area of the study

The area of the study was Yobe State of Nigeria and was limited to Federal College of Education (Technical) Potiskum. It was selected based on the fact that it was the only post secondary institution offering Nigeria Certificate in Education (Technical) Building Technology Education.

Population of the study

The population was made of Technical Teachers (lecturers) in the

Table 1. Means and standard division of problem often encourage in evaluating students' proficiency in practical skills.

S/N	Problems	5	4	3	2	1	N	X	SD	remark
1	Non availability of practical materials	16	11	3	3	3	36	3.96	1.28	Accept
2	Students unwillingness to participate in practical	9	6	5	12	4	36	3.11	1.41	Reject
3	Inadequate training facilities	9	18	3	3	3	36	3.75	1.18	Accept
4	Limited time allocated to practical	9	15	3	5	4	36	3.56	1.32	Accept

School of Technical Education Federal College of Education (Technical) Potiskum, Yobe State

Sample and sampling technique

There were fifty-one (51) Technical Teachers (lecturers) teaching in the School of Technical Education, Federal College of Education (Technical) Potiskum, Yobe State. Since the population was small, there was no sampling. Thus, the entire population was studied.

Research instrument

A five point likert scale questionnaire was developed for the study by the researcher. Seventeen (17) items questionnaire was titled "EVALUATION OF STUDENTS' PRACTICAL SKILLS QUESTIONNAIRE (ESPSQ)". A total of forty-two copies of the questionnaire were distributed to the respondents by hand to elicit their responses. A total of thirty-six copies were collected back from the respondents, representing 86% return. The research questions were answered using mean and standard deviation (SD). A cut off point was determined by finding the mean of the nominal value assigned to the option; strongly agreed (SA=5), agreed (A=4), undecided (UD=3), degree (DA=2) and strongly disagree (SDA=1). Any response therefore, with a mean of 3.50 or above was regarded as *accept*, while those below were regarded as *reject*.

Validation of research instrument

The instrument was validated by experts in Vocational and Technical Education who are lecturers from the Department of Technology Education, Modibbo Adama University of Technology, Yola.

RESULT

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

Research question 1

What are the problems often encountered in evaluating students' proficiency in practical skills?

Table 1 shows answers to the first research question which was obvious. But for items 2, the respondent agreed that students' unwillingness to participate in practical activities is not one of the problems often

encourage in evaluating students' proficiency in practical skills.

Research question 2

What are the strategies that could be adopted for effective evaluation of students' proficiency in practical skills?

Table 2 shows that the respondent agreed with items 5, 6, 8, 9, 10, 14, 16, and 17 as strategies that could be adopted for effective evaluation of students' proficiency in practical skills. They (respondents) however disagreed with 7, 11, 12, 13, 14, and 15

DISCUSSION OF THE FINDINGS

The analysis on Table 1 shows that non availability of practical materials, inadequate facilities and limited time allocated to practical were some of the problems often encourage in evaluating student's proficiency skills. This is in line with the work of Abdullahi (2003) that every training school faces the problem of providing and maintaining workshop and appropriate facilities for technical and vocational training programme. There finding were also supported by Umar and Abdullahi (2010). According to Umar and Abdullahi (2010), the problems of technical and vocational education (TVE) in Nigeria are made worse by the poor condition/inadequacy of training facilities. Adequate workshop facilities are necessary for any quality learning to take place; and evaluation is part of the learning process (Enemali, 2010). The limited time allocated to practical is also not helping matters, practical activities required adequate time to come to fruition. It involves preparation, execution and evaluation. Student should be given enough time to exhibit their dexterity in handling practical task so that the teacher's evaluation would have a high degree of validity and reliability.

With reference to strategies that could be adopted for effective evaluation of student's proficiency in practical skills, finding on table 2 revealed that objectives to be achieved at the end of the practical session should be determined before time. Assessing student's ability in

Table 2. Means and standard deviation of strategies that could be adopted for effective evaluation of students' proficiency in practical skills.

S/N	Strategies	5	4	3	2	1	N	X	SD	Remark
5	Determining the objectives to be achieved at the end of the practical session before time	7	17	4	4	4	36	3.53	1.25	Accept
6	Assessing students ability in identification of appropriate tools and materials needed for the job at hand	11	13	4	5	3	36	3.67	1.28	Accept
7	Assessing students plan (blue print) reading ability	5	8	13	6	4	36	3.11	1.19	Reject
8	Observing and assessing how the students manipulate tools and /or equipment while working	11	14	3	5	3	36	3.70	0.97	Accept
9	Assessing students ability in following the proper step of procedure	11	10	7	4	4	36	3.56	1.34	Accept
10	Preparing a checklist for the assessment	7	16	4	6	3	36	3.50	1.23	Accept
11	Assessing students promptness in starting work	6	12	8	5	5	36	3.25	1.29	Reject
12	Assessing students safety considerations	11	10	7	4	4	36	3.56	1.34	Accept
13	Making the checklist available for the students to see prior to the commencement of the practical	6	14	6	7	3	36	3.36	1.22	Reject
14	Assessing students conservation of materials and supplies	5	15	6	6	4	36	3.31	1.23	Reject
15	Assessing the speed at which the task is completed	7	14	4	8	3	36	3.38	1.07	Reject
16	Assessing the overall quality (performance, durability etc) of the completed task	9	16	4	4	3	36	3.67	1.21	Accept
17	Assessing Students independence in handling practical task	6	17	4	6	3	36	4.16	1.39	Accept

identification of appropriate tools and materials needed for the job at hand, observing and assessing how the students manipulate the tools/equipment while working, assessing student's accuracy in following the proper step of procedure, preparing a checklist for the assessment, assessing student's safety, consideration, assessing student's independence in handling practical task, and assessing the overall quality of the product should be adopted for effective evaluation of student's proficiency in practical skills. The result is in consonance with observation made by Miller (1990) that the teacher should establish the criteria against which the student's performance will be judge; observation check list should be used by the instructor to make a fair and consistent appraisal of the students.

Similarly, Mohammed et al. (2002) stressed the need for safety measure while undertaking practical activities in the laboratory. According to them, safety measure in view of the negative consequence when not observed, one cannot measure the amount of suffering and unhappiness caused by various avoidable accidents in laboratories and/or workshops. Therefore assessing student's safety consideration as shown in item 12, should be emphasize when evaluating student's proficiency in practical skills.

The study also revealed that student's independence in handling practical task should also be assessed. This strategy for assessing students' independence handling practical task is in agreement with the work of cooper (2006). Cooper stressed that the workers of tomorrow (students) must not only know how to make decisions for

his own work roles, but they must also understand how the decision they make may affect others on how they perform their roles, as Independent thinking enhances creativity. Observing and assessing how students manipulate tools/equipment while working and the quality of the finished product or task was also revealed by the study. This revelation is in line with ma'aji (2002) that process and product evaluation should be combined together in assessing students' practical skills. Because if the product is not in line with the objectives set out in the first place, then the students' proficiency is in doubt (Okoro, 2000). The findings were also supported by ughamadu, (1992). Ughamadu, who, while classifying psychomotor domain, said skilled movement from the fifth level emphasized manipulative skills.

Conclusion

The findings of the study serve as the basis for making the following conclusions.

1. Non-availability of practical materials, inadequate facilities and limited allocated to practical are the problem often encountered in evaluating students proficiency skills.
2. Pre-determination of objectives, uses of checklist, assessing student safety consideration, independence in handling practical task, assessing the overall quality of the product or completed task, observing how the student

manipulate the tools and equipment while working, are some of the strategies that could be adopted for effective evaluation of student's proficiency in practical skills.

Limitation of the study

In the course of carrying out this study, the researcher experience many limitations namely:

1. The respondent was not free with the researcher as many thought the research was worthless.
2. The researcher was unable to collect back some of the questionnaires from the respondents; thus, only 86% of the questionnaires were collected.

Recommendations

Based on the finding of this study, the following recommendations have been proffered.

1. Planners of programmes involving practical skills acquisition should allocate adequate time for practical. In a particular course, the ratio 1:3 in terms of theory and practical respectively is recommended.
2. Government should provide adequate facilities and training materials to technical teachers training institution to ensure effective acquisition of relevant skills, knowledge and experience and for smooth evaluation exercise.
3. Safety education should be emphasized in teaching and learning of practical skills.
4. Continuing professional development (CPD) should be encouraged so as to keep technical teachers abreast of the dynamic of evaluation.
5. School administrator should ensure that a checklist is always used in the evaluation of students' proficiency in practical skills.

Conflict of Interests

The author has not declared any conflicts of interest.

REFERENCES

- Abdullahi SM (2003). Evaluation of Vocational and Technical Training programme on Northern Nigeria prisons. *Journal of League of Researchers in Nigeria. (JOLORN)* 8:1.
- Aina O (1990). Technical and Vocational Teacher Training as a Strategy for Technical Development. *J. Teacher Educ.* 1:1
- Cooper JW (2006). Journal writing in career and technical education: A tool to promote critical thinking skills. *J. Ind. Teacher Educ.* 43:2
- Enemali JD (2010). *Education and Training for Industrialization*. Ibadan: Striling-Horden Publishers Ltd.
- Mohammed UT, Gayus BJ, Ikwuakam OT, Solomon RJ (2002). *Fundamental of Vocational and Technical Education*. Owerri: versatile publishers.
- Miller WR (1990). *Instructors and their Jobs*. Illionios: American technical society.
- Ma'aji CZ (2002). *Strategies for effective Evaluation of student's practical skills in technical education subject through process/product evaluation techniques in Kaduna state Nigeria*. Unpublished PGDTE project. Department of Vocational Teachers Education University of Nigeria Nsukka.
- Minimum academic standard (2008). *Minimum standard for N. C. E. 4th edition*. Kaduna: N.C.C.E.
- Okorie JU, Ezeji SCOA (1988). *Elements of Guidance, Vocational and Career Education*. Onitsha: Summer Educational Publishers.
- Okoro OM (1993). *Principles and Methods in Vocational and Technical Education*. Enugu: University Trust Publishers.
- Okoro OM (2000). *Measurement and Evaluation in Education*. Enugu: pefic publishers.
- Olaitan SO, Nwachukwa CE Onyemechi G, Igbo CA, Ekong AO (1999). *Curriculum Development and Management in Vocational Technical Education*. Onitsha: Cape Publishers International Limited.
- Ughamadu KA (1992). *Curriculum: Concepts, Development, and Implementation*. Onitsha: Emba Printing and Publishing Company.
- Uzoagulu AE (1998). *Practical guide to Writing Research Project Report in Tertiary Institutions*. Enugu: John Jacobs' Classic Publishers Limited.
- Umar IY, Abdullahi SM (2010). *Repositioning of Facilities in Technical Colleges Workshop for efficiency: A Case Study of North Central Nigeria*. *J. Sci. Technol. Maths. Teachers Educ.* 47:3.