



Performance Evaluation of N.C.E. (Technical) Graduates of Federal College of Education (Technical), Potiskum in Junior Secondary Schools in North-Eastern, Nigeria

Dr. BABA, Mohammed Rabiu¹ & BAKOJI, Bala²

**Department of Metalwork Technology,
Federal College of Education (Technical), Potiskum, Yobe State, Nigeria**
¹E-mail Address: mohammedrabiubaba@gmail.com; Phone No: 07035274798
²E-mail address: Balabakoj5@gmail.com; Phone No: 07060543435

ABSTRACT

The purpose of this study was to evaluate the performance of N.C.E. (Technical) graduates of Federal College of Education (Technical), Potiskum in Junior Secondary Schools. Three specific purposes and three research questions were formulated to guide the study. Similarly, one hypothesis was formulated and tested at 0.05 level of significance. The research design adopted was a survey design. The population of the study was The population for this study consisted of 602 TE Graduates of FCE (T) Potiskum that graduated between 2010 and 2016 who are teaching Basic Technology in Yobe state. Out of this number 420 were teaching with the Yobe state government. A sample of 204 representing 49% of the population was considered for the study. The sampling technique adopted was simple random sampling technique. This technique is appropriate because it makes all members have equal chances of being selected, going by the size of the population. The instrument used for data collection for the study was a Technical Education Graduates of FCE (T), Potiskum From 2010-2016 Follow-Up Questionnaires (TEGFUQ). The TEGFUQ was developed by the researcher and validated by experts in the department of Technology Education, Modibbo Adama University of Technology, Yola and FCE (T), Gombe and FCE (T), Potiskum. The instrument was trial tested using 15 TE Graduates in three Junior Secondary schools in Bauchi state in other to determine its reliability. The reliability coefficient of the instrument was found to be 0.834. Mean was used to answer research questions while One-way ANOVA was used for testing the hypotheses at 0.05 level of significance. The findings of the study revealed that some of the TE graduates of FCE (T), Potiskum teaching basic technology do not adequately acquire all the basic knowledge in some areas of the subject matter under question. This is has revealed in the grand mean of TG Graduates, Principals and Heads of Department of Basic Technology in JSS in Auto-mechanic technology, Metalwork Technology and Technical Drawing. Generally, the findings of the study indicated that there was significant difference in the mean responses of TE Graduates, Principals and Heads of Department of Basic Technology in the competencies acquired by the TE Graduates in the three technical subjects. The findings imply that effort should be made effort to improve the strategies in the teaching of these aspects of the subject matter.

Keywords: Technical education, competencies, teaching, TE graduates

INTRODUCTION

The aim of Education is to make an individual to become a better citizen, relevant to his host environment. Technical education as a form of education has that purpose. It is an education which is directed towards developing the learner to become productive in a self or paid employment. Some of

the goals as stated by the Federal Government of Nigeria (FGN) in the national policy on education (2004) are:

1. To provide trained manpower in applied sciences, technology and business particularly at craft, advanced craft and technical levels;
2. To provide people who can apply scientific knowledge to the improvement and the solution of environmental problem for the use and convenience of man;
3. To give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant (FGN, 2004).

In pursuance of the above goals the federal government of Nigeria (2004) has restructured and divided secondary education into junior and senior secondary schools (JSS and SSS); where in each segment technical subject is incorporated. Introductory technology (Basic Technology) is a core course in the JSS curriculum while technical subjects like metalwork, woodwork, electrical/electronic, building technology etc as electives in the SSS curriculum. This according to Bulus (2010) brought about the then 6-3-3-4 system of education. Basic technology is an integrated subject comprising metalwork, woodwork, electrical/electronic, auto-mechanic, building technology and technical drawing. The teachings of introductory require technical teachers.

To have teachers who can teach this subject, the Federal Government of Nigeria established Colleges of Education (Technical) in the 1980s for the training of Nigerians at NCE (Technical) level. The objectives of NCE (Technical) according to the National Commission for Colleges of Education (NCCE), (2012) shall be:

1. To produce qualified technical teacher and practitioners of technology capable of teaching introductory (Basic) technology in the JSS;
2. To produce NCE (Technical) teachers who would be able to inculcate scientific and technological attitude and values into the society;
3. To produce qualified technical teachers motivated to start to start the so much desired revolution of technological development right from the Nigerian schools ; and
4. To produce technical teachers so as to qualify them for a POST-NCE degree programme in technical education (NCCE, 2012).

In 1990 the United Nations Educational, Scientific and Cultural Organisation (UNESCO) organised a world conference tagged, "Education for All" in Jomtien, Thailand to chart a course for access to universal primary education and to bring an end to illiteracy (Sule and Bawa, 2012). It is this conference that brought about the re-adjustment of 6-3-3-4 system of education and expanded the scope to 9-3-4 system. In the 9-3-4 system the introductory technology was referred to as Basic technology which has the same content with introductory technology. Basic technology was defined by the federal government of Nigeria as education given to children aged 0-15 years. It encompasses the early childhood care and development education (0-4) and 10 years of formal schooling. During the Obasanjo regime, Nigeria introduced the Universal Basic Education (UBE) Programme which was signed into law in 2004. The UBE according to Omokhodion, (2008) was the Nigeria's affirmation of the declaration on education for all.

Based on the stated objectives of NCE (Technical) programme, it is clear that graduates of the programme must possess adequate technological and professional competencies, if they must performed effectively. It was in furtherance of the technical teacher competency needs that graduation requirement for NCE (Technical) is categorised into General education components, Technical/trade components, General studies, Teaching practice and Industrial Works Experience Schemes (SIWES) (NCCE,2012). The training process should guarantee the production of a well trained craftsman who has a thorough knowledge for identifying, integrating and using appropriate skills for interpreting drawings. The programme for producing such a competent and performance-based teacher must not compromise quality. Inadequacies and deficiencies, if allowed to exist in any curriculum components, the objectives of such programme will be defeated leading to a state of wastage in terms of human and material resources. In order to avoid failure and ensure programme effectiveness, the programme must be frequently evaluated.

Evaluation is a systematic analysis of completed or on-going programme or activities to ascertain their effectiveness and efficiency. Performance evaluation can be defined as a formal determination of

an individual's job-related actions and their outcomes within a particular position or setting. Armstrong (2006) described the role of performance appraisal as a tool for looking forward to what need to be done by people in the organization in order to achieve the purpose of the job to meet new challenges. Performance appraisal is described as a search for better, more accurate, more cost-effective communication techniques for measuring job performance and job satisfaction. Performance appraisal is considered to be an important technique for improving the performance of an organization. From the foregoing definitions it can be summarised that performance evaluation is concerned with determining the effectiveness or efficiency of personnel in relation to a programme or organisation.

Statement of the Problem

Based on the objectives of Technical Education as outlined above, a technical teacher must be properly trained and equipped. If inadequately, improperly trained technical teachers are employed to teach in the Junior Secondary Schools are allowed to continue unchecked, it then means that the dream of achieving the objectives of technical education will not be a reality.

The level of teaching competencies of graduates of this programme specifically NCE (Technical) graduates of Federal College of Education (Technical), Potiskum has however not been determined before now. Ascertaining the level of competency of NCE (Technical) graduates of Federal College of Education (Technical), Potiskum in Yobe state in relation to delivering the content of the curriculum to their students is therefore the concern for this study.

Purpose of the Study

The objectives of the study are:

1. To determine how effective the Technical Education Graduates of FCE(T) Potiskum are in demonstrating the knowledge of Auto Mechanics in their teaching activities;
2. To determine how effective are the Technical Education Graduates of FCE(T) Potiskum in demonstrating the knowledge of Metalwork in their teaching activities;
3. To determine how effective the Technical Education Graduates of FCE(T) Potiskum are in demonstrating the knowledge of Technical Drawing during their teaching activities;

Hypothesis

H₀₁: There is no significant difference in the mean response of Technical Education Graduates, Principals and Heads of Departments on how Effective Technical Education Graduates of FCE (T) Potiskum demonstrate knowledge of technical subjects in their teaching activities

METHODOLOGY

The study adopted survey research design. The survey design seems to be suitable and appropriate because it involves assessment of attitude, opinion and activities through a questionnaire from a representative sample of the population (Uzuagulu, 2013). The study was carried out in Yobe state. Yobe state is located in North East, Nigeria, and borders four Nigeria states as well as Republic of Niger. It has geographical boundary of latitude 12⁰ 00' 00" North and longitude 11⁰ 30' 00" East of the equator with total area 46,609 sq/m (GPS Coordinates of Yobe state, Nigeria, 2015). The study will cover all the Junior Secondary Schools in the state. The population for this study consisted of all the technical education graduates of FCE (T) Potiskum that graduated between 2010 and 2016 who are teaching Basic Technology in Yobe state. A breakdown of the total number of Technical Education graduates of FCE (T), Potiskum between 2010 and 2016 shows that out of the 844 graduates, 602 are residing within Yobe state; these represents 71 percent of the total graduates (Table 1). Out of this number 420 were teaching with the Yobe state government. A sample of 204 representing 49% of the population was considered for the study. The sampling technique adopted was simple random sampling technique. This technique is appropriate because it makes all members have equal chances of being selected, going by the size of the population. Therefore, 204 TE Graduates were randomly selected from the 131 Junior Secondary Schools in the state. A total of 131 Principals of all the junior Secondary Schools and 131 Heads of Departments of Basic Technology were used for the study. This number represented the whole sample. Therefore, there is no sampling in the case of principals and Heads of Departments.

Table 1: Technical Education Graduates of FCE (Technical) Graduates 2010-2016

NCE (Technical) Graduates of FCE (T) Potiskum Between 2010 and 2016				
Year of Graduation	Total No of Graduates	Number of Graduates Residing in Yobe State	Total no of Graduates Residing in other states	Percentage of Graduates Residing in Yobe State
2009/2010	119	76	43	63
2010/2011	106	78	28	74
2011/2012	100	80	20	80
2012/2013	110	77	33	70
2013/2014	130	91	39	70
2014/2015	143	102	41	71
2015/2016	136	98	38	72
TOTAL	844	602	242	71

Source: Academic Office, FCE (T), Potiskum (2019)

The instrument used was a structured questionnaire that was designed by the researcher to elicit information from the respondents. The questionnaire was structured into four-point response category of:

- Very Effective = 4 Points
- Effective = 3 Points
- Ineffective = 2 Points
- Very Ineffective = 1 Point.

The data for the research was collected by the researcher using a structured follow-up questionnaire with the help of two research assistants that help in administering the instruments.

Data obtained from the respondents were analysed using computer programme of statistical package for social sciences (SPSS). Grand mean of responses of TE Graduates, Principals and Heads of Departments was used to draw inferences. According to Uzoagulu (2013), when the response category has four-level ranging from 4 to 1 the mean is 2.50. Hence, any item with a mean value of 2.50 and above was accepted while item with a mean value less than 2.50 was rejected. With this study therefore, any item with a value of 2.50 or above was considered effective while item less than 2.50 was considered ineffective.

RESULTS

The following are the results of the study:

Research Question 1: *How effective are the Technical Education Graduates of FCE(T) Potiskum in demonstrating the knowledge of Auto Mechanics during their teaching activities?*

Table 2: Mean responses of Technical Education Graduates, Principals and Heads of Department of Basic Technology on how effective Technical Education Graduates demonstrate knowledge of Auto Mechanics in teaching.

Item No	Auto-mech. Technology competencies	TEG Mean N=204	Principal Mean N=131	HOD Mean N=131	Grand Mean	Remarks
1	Ability to use Auto-mech. Engine	2.7941	3.1908	3.1145	3.0330	Effective
2	Using Auto-mechanic testing and diagnostic Tools	2.2341	2.2231	2.0212	2.1595	Ineffective
3	Knowledge of automobile hand tools and machines	3.8725	3.0458	2.9084	3.2756	Effective
4	Knowledge of breaking system					
5	Knowledge of breaking system	2.7745	3.0458	2.8931	2.9045	Effective
6	Knowledge of suspension system	2.7843	2.8931	2.9160	2.8545	Effective
7	Ability to repair or adjust automobile parts	2.2821	2.1101	2.2023	2.1981	Ineffective
8	Ability to replace worn parts	2.8922	3.1221	2.9237	2.9793	Effective
9	Ability to carry maintenance on	2.8137	2.9847	2.8931	2.8972	Effective
10	automobile equipment	2.9608	2.8473	2.6947	2.8343	Effective
	Knowledge of wheel balancing	2.7157	3.0458	2.7405	2.8340	Effective

Table 2 indicates that Technical Education (TE) graduates demonstrated the knowledge of Auto-mechanics effectively in eight (8) out of the ten (10) competency items itemised. They were rated ineffective in two items that is items 2 and 6. The highest grand mean of 3.2756 was on knowledge of Auto-mechanic hand tools while the lowest mean of 2.1595 was on using Auto-mechanic testing and diagnostic tools.

Research Question 2: *How effective are the Technical Education Graduates of FCE(T) Potiskum in demonstrating the knowledge of Metalwork Technology during their teaching activities?*

Table 3: Mean responses of Technical Education Graduates, Principals and Heads of Department of Basic Technology on how effective Technical Education Graduates demonstrate knowledge of Metalwork Technology in teaching.

Item No	Metalwork Technology Competencies	TEG Mean N204	Principal Mean N=131	HOD Mean N=131	Grand Mean	Remarks
1	Knowledge of welding equipment	3.0098	2.9084	3.0382	2.9855	Effective
2	Ability to carry out welding practical	3.0049	3.1374	2.7863	2.9762	Effective
3	Use of meal machine tools and equipment	2.8039	3.0763	3.1221	3.0008	Effective
4	Ability to operate Lathe machine	2.5196	3.1832	3.1069	2.9366	Effective
5	Ability to drill a hole with a drilling machine	2.6176	3.0687	3.0763	2.9209	Effective
6	Ability to operate Power Hacksaw	2.6667	3.0763	3.1985	2.9805	Effective
7	Use of casting tools and equipment	2.7647	3.0534	3.1679	2.9953	Effective
8	Use of metalwork work-holding devices	2.8627	2.9695	3.1527	2.9950	Effective
9	Ability to carry out maintenance of machine tools and equipment	2.9804	2.8931	3.1221	2.9985	Effective
10	Ability to develop complex sheet metal pattern	2.4902	3.0763	3.0763	2.8809	Effective
11	Machinability and Practical analysis of metal chips structures selecting relative speeds for common steels	2.3411	2.5336	2.1431	2.3393	Ineffective
12	Selecting appropriate cutting fluids for specific materials particularly for grinding operations	2.7157	3.0229	3.0305	2.9230	Effective
13	Ability to apply all criteria and condition for selecting all carbide tipped tools and all raw materials tools	2.3235	2.4542	2.4405	2.4061	Ineffective
14	Ability to use gang drill machine to perform operations such as drilling, reaming, counter boring, hand tooling with the use of jigs and fixtures	2.9118	3.0763	2.8931	2.9604	Effective
15	Grinding different lathe tools with different tool geometry	2.7696	3.0458	3.0153	2.9435	Effective

Table 3 indicates the knowledge of metalwork technology acquired by TE Graduates effectively contributes to their professional teaching activities in thirteen (13) out of fifteen (15) questionnaire items. The highest grand mean being 3.008 that measured TE Graduates' Use of meal machine tools and equipment. Areas of weakness includes Machinability and Practical analysis of metal chips structures selecting relative speeds for common steels and Ability to apply all criteria and condition for selecting all carbide tipped tools and all raw materials tools that were measured 2.3393 and 2.4061 respectively.

Research Question 3: *How effective are the Technical Education Graduates of FCE(T) Potiskum in demonstrating the knowledge of Technical Drawing during their teaching activities?*

Table 4: Mean responses of Technical Education Graduates, Principals and Heads of Department of Basic Technology on how effective Technical Education Graduates demonstrate knowledge of Technical Drawing in teaching.

Item No	Technical Drawing competencies	TEG Mean N=204	Principal Mean N=131	HOD Mean N=131	Grand Mean	Remarks
1	Use of lettering	2.5245	3.0763	3.1679	2.9229	Effective
2	Ability to draw boundary lines and title block	2.6029	3.0916	3.1527	2.9491	Effective
3	Knowledge of forms of lines	2.6324	3.0763	3.1221	2.9436	Effective
4	Ability to construct cam and gears	2.8186	3.1089	3.1527	3.0267	Effective
5	Ability to determine the true angle of an inclined line to the principal line	1.7353	3.1081	2.2123	2.4190	Ineffective
6	Ability to construct various angles of 30 ^o , 60 ^o , 45 ^o etc.	2.6176	3.1221	3.1374	2.9590	Effective
7	Ability to draw variety of isomeric blocks	2.5686	3.0458	3.0611	2.8918	Effective
8	Ability to draw an Orthographic views	1.7353	3.1089	3.0305	2.6249	Effective
9	Ability to explain 1 st angle and 3 rd angle	2.5569	3.1756	3.0153	2.9159	Effective
10	Projections Knowledge of geometrical drawings	2.5392	3.1603	3.1679	2.9558	Effective

Table 4 indicates that TE graduates demonstrated the knowledge of Technical Drawing effectively in nine (9) out of the ten (10) competency items itemised. They were rated ineffective in one questionnaire item that is items 5. The highest grand mean of 3.0267 was on Ability to construct cam and gears while the lowest mean of 2.4190 was on Ability to determine the true angle of an inclined line to the principal line.

Testing of Hypotheses

Three null hypotheses in this study were tested as follows:

Hypothesis: There is no significant difference in the mean response of Technical Education Graduates, Principals and Heads of Departments on how Effective Technical Education Graduates of FCE (T) Potiskum demonstrate knowledge of technical subjects in their teaching activities.

Table 5: Analysis of variance (ANOVA) of the mean responses of graduates of FCE (T) Potiskum, Principals and HOD’s on knowledge of technical subjects of Basic Technology.

Source of variation	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	11.650	2	5.825			Reject Ho
Within Groups	297.364	483	.642	9.070	.000	
Total	309.014	465				

Note .000 is significance at P<0.005

From table 5 the value of F which is 9.070 with associated exact probability value of 0.000 was obtained. This exact probability value of 0.000 was less than 0.05 level of significance set as bench mark and it was found to be significance. The null hypothesis which stated that There is no significant difference in the mean response of Technical Education Graduates, Principals and Heads of Departments on how Effective Technical Education Graduates of FCE (T) Potiskum demonstrate knowledge of technical subjects in their teaching activities was therefore rejected and interference drawn was that there is a significant difference in the mean response of Technical Education Graduates, Principals and Heads of Departments on how Effective Technical Education Graduates of FCE (T) Potiskum demonstrate knowledge of technical subjects in their teaching activities.

Post Hoc Tests

Multiple comparisons

Table 6: Dependent Variables: Mean of Technical Subjects

(I) Sample	(J) Sample	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Principals	HODs	.00359	.9902	.999	-.2396	.2468
	FCE (T) Pot Grad	.30249*	.08973	.002	.1001	.5408
HODs	Principals	-.00359	.09902	.999	-.22468	.2396
	FCE (T) Pot. Grad.	.31680*	.08973	.002	.0966	.5372
FCE (T) Pot. Grad	Principals	-.32049*	.08973	.002	-.5408	-1001
	HODs	-.31690*	.08973	.002	-.5372	-.0966

* The mean difference is significant at 0.05 level

DISCUSSION OF FINDINGS

According to the findings of the study, it is observed that TE Graduates of FCE (T), Potiskum teaching basic technology possess most of the knowledge in question in all the three technical subjects as well as knowledge of general studies and that of lesson planning. These include auto-mechanic technology, metalwork technology and technical drawing.

The findings of this study relate to research question one to eight as presented in tables 2-4. In table 2 it revealed that TE Graduates of FCE (T) Potiskum effectively demonstrate the knowledge of Auto-mechanic Technology in eight (8) out of the ten (10) items in their day-to-day teaching activities. But, there are certain areas of the subject that the graduates are ineffective. These areas include the knowledge of auto-mechanic testing and diagnostic tool and the knowledge of suspension system.

The results that relate to metalwork technology as presented in table 3 revealed that TE Graduates effectively demonstrate the knowledge of the subject matter in 13 out of the 15 areas. The findings further revealed that TE Graduates are ineffective in demonstration of the knowledge of machinability and Practical analysis of metal chips structures selecting relative speeds for common steels and ability to apply all criteria and condition for selecting all carbide tipped tools and all raw materials tools.

The results that relate to table 4 revealed that Technical Education Graduates effectively demonstrate the knowledge of Technical Drawing nine out of the 10 areas of the subject matter. It also revealed that TE Graduates are ineffective in Ability to determine the true angle of an inclined line to the principal line.

This means that some of the TE graduates of FCE (T), Potiskum teaching basic technology do not adequately acquire the basic knowledge in some areas of the subject matter under question; therefore effort should be made to improve the strategies in the teaching of these aspects of the subject matter. The findings of this study agrees with Yalams (2003) and Aminu (2015) who independently observed that teachers of technical subjects must possess knowledge and skills of the subjects they teach to enable them, teach the subject effectively to their learners; and most teachers of Basic Technology in Gombe State do not adequately possess most of the basic competencies for implementation of Basic Technology Programme at JSS level respectively.

CONCLUSION

Based on the findings of this study, the following conclusions were drawn:

It has been observed that the performance level of TE Graduates in the knowledge and demonstration of technical subjects is generally effective, except in some few areas of the subject matter (automobile technology, metalwork technology and technical drawing) which need improvement.

RECOMMENDATIONS

Going by the findings of the study the following recommendations were made:

1. Technical education trainers should ensure adequate coverage of course outline of their courses at every semester. Skipping some topics can lead to what was revealed in the findings of this study.
2. Technical teacher training should emphasize the use of instructional materials during training to inculcate to the students the habit of using instructional materials.
3. Adequate instructional materials should be provided during training of technical teachers and the skills of improvisation should be encouraged.

REFERENCES

- Aminu, T.U. (2015). *Teachers' Competence in the Implementation of Basic Technology Curriculum. ATBU Journal of Science, Technology and Education (JOSTE)* Vol. 3(1), 135-141.
- Armstrong, M. (2006). *Blending Formal and Informal Approaches to Management Learning*. New York McGraw Hill Book Co.
- Bulus, I (2010 *Teacher Technical Education: A Roadmap to Achieving Vision*): 20:2020. Paper delivered at the Convocation Lecture of Federal College of Education (Technical), Potiskum, Yobe State.
- Federal Government of Nigeria (2004). *National Policy on Education*. Abuja: Federal Ministry of Education.
- Federal Government of Nigeria (2013). *National Policy on Education*. 6th Ed. Abuja: Federal Ministry of Education.
- GPS Coordinates of Yobe state, Nigeria (2015): Yobe State Nigeria-Geographical Name Retrived at www.https://geographic.org>name=n...
- National Commission for Colleges of Education (NCCE) (2012). *Minimum Standards for Nigerian Certificate in Education: Vocational and Technical Education* 3rd Edition. Abuja; NCCE.
- Omokhodion, J. O. (2008). Assessing the preparedness of Nigeria for her Universal Basic Education Programme. *Pakistan: Journal of Social Sciences*, 5, (9), 866-870.
- Sule, M.N. and Bawa, A.G. (2012). 9-3-4 School Curriculum in Nigeria: Verification for its Accommodation of Kanuri Culture in Maiduguri Metropolis Area of Borno State, Nigeria. *Journal of Research in Education and Society*; 3(1), 22-40.
- Uzoagulu, A. E. (2013). *Practical guide to writing research project reports in Tertiary Institutions*. Enugu. John Jacob's.
- Yalams, S.M. (2003). Analysis of Students' Performances in Metalwork at NCE Technical Level within Bauchi, Gombe and Yobe states of the North-East Sub-region of Nigeria. *Journal of League of Researchers in Nigeria* 4(2), 137-145.