

TEACHER PRODUCTION AND UTILIZATION FOR EFFECTIVE TECHNICAL EDUCATION DELIVERY IN NIGERIA

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ABSTRACT

This study examined teacher production and utilization for effective technical education delivery in Nigerian schools. The ex post facto research design was adopted. Four research questions were raised and answered. All the Nigerian tertiary institutions with technical and vocational education programmes between 2001 and 2005 formed the study population. Fourteen tertiary institutions offering technical and vocational education courses in Nigeria with six technical colleges and sixty teachers in Kogi and Kwara States were selected through simple and stratified random sampling techniques as the study sample. Data which were collected with checklists and questionnaires were analyzed using percentage, average and bar charts. The study revealed that there was a steady increase in technical-vocational students' enrolment; that the Colleges of Education produced more vocational teachers than the Universities and Polytechnics; and that graduate teachers with teaching qualification were under-utilized compared with their HND/PGDE and NCE (technical) counterparts. Based on the findings, some workable suggestions are made.

INTRODUCTION

The teacher is the cornerstone of the educational system. Teachers at all levels are very important in the overall development of any nation through their impact in the educational system. Education is the door to civilization and modernization of any country but it is the teachers who hold the key to this door through the performance of their primary functions in the schools, (Nakpodia, 2001). Nwaham, Chukwuma and Ajudeonu (2007) wrote that teachers are indispensable in the entire educational system of any nation. They are the pivot on which education wheels revolve. The quality of any educational system depends greatly on the educational attainment of teachers as no

system of education can be qualitatively higher than the quality and commitment of its teachers. EAQAHE (2005) observed that teachers are the single most important learning resources available to most students. Therefore, the quality of any educational system depends to a great extent on the quality of teachers in terms of academic and professional qualification and experience as well as their level of competency in and their dedication to their primary functions. As such, the knowledge, skills and attitudes a teacher possesses are essential components in the teaching and learning process.

Teacher education faculties are charged to provide students with a comprehensive foundation of content knowledge and pedagogical skills. The newly acquired knowledge and skills provided by quality teacher preparation programmes result in pre-service teachers becoming educational cornerstones who are considered highly qualified, (Boling and White, 2007). This explains the emphasis placed on the production of quality teachers in our educational system. A quality teacher, according to Adegoke (2004) is one who is worthy, efficient, excellent, conforming, relevant, literate and moral. Such a teacher is one who has a quantifiable ability to produce growth in students' achievement, (Obanya, 2004 and 2007).

On the production of teachers in America for instance, a qualified teacher must have (1) a bachelor's degree (2) full state certification or licensure, and (3) prove that they know each subject they teach. Few educational issues have received more attention in recent times than the failure to ensure all classrooms are staffed with qualified teachers, (Ingersoll, 2001). Teacher education programmes strive to ensure that the curriculum for pre-service teachers is grounded in content and pedagogical knowledge, is realistic, and addresses the demands of teaching, (Chen, 2002; Alvy, 2005; Grossman, 2005 and McElroy, 2005).

The production and utilization of teachers in the right quantity is a problem in most countries. For instance, in the United States of America, Gelpi (2007) observed that when school began last year in Richmond and Columbia counties, neither had enough teachers for all of its classroom, a problem experienced by many school systems. He wrote that the University system of Georgia, however, has made gains in reducing the State's teacher shortage as State institutions have produced 40% to 50% more teachers in the past four to five years.

Among the ways the State is ramping up teacher production is by increasing the number of institutions that offer education degrees. Two more schools last year joined the fifteen that were offering education degrees, with three more expected to do so in the near future. Georgia Colleges are trying to double the number of teachers they produce by

year 2010. In 2005, Augusta State University produced 110 newly certified teachers, and it is shooting for 275 by 2010. Also, Fuller and Akin (2002) revealed that the number of teachers obtaining initial certification from Educator Preparation Programmes were 8193, 9778 and 11854 in 2000, 2001 and 2002 respectively from public universities.

The production of teachers in specialized courses seems to be of great concern. For instance, in Kenya, the total enrolment in Technical, Industrial, Vocational and Entrepreneurships Training (TIVET) institutions has increased; and stood at 79,000 in 2003. The teacher training sub-sector has also expanded with an enrolment of 15,708 trainees in public colleges in 2001 up from 14,316 in 1999. There are 21 public and 8 private training colleges with a combined student intake of 18,816 students, (MoEST, 2002 and 2004). Also, the California State University (CSU) has the capacity to build on its strengths in the fields of mathematics, science, engineering, technology and teacher education to address the severe mathematics and science teachers shortage, (California State University, 2006). In 2004/05, CSU awards 651 mathematics, 1,930 biological sciences, and 516 physical sciences undergraduate degrees.

As a system, CSU's goal is to at least double the production of mathematics and science teachers during the next five years. This means increasing from a baseline figure of approximately 750 new mathematics and science teachers produced annually to a minimum of 1,500 new teachers produced in these fields. CSU's Mathematics and Science Teachers Initiative began during the past year through a planning process involving all of its 23 campuses. A central part of the CSU strategy to expand mathematics and science teacher production is the creation of new credential pathways. The intent is to provide multiple points of entry into those fields for individuals at different educational and career stages. New pathways include, for example, blended programmes for undergraduates in which an academic major and teacher preparation are integrated in an articulated programme of study.

American Physical Society (2008) revealed that the United States faces a critical shortage of qualified physics and physical science teacher. Two-thirds of new physics teachers lack a physics degree and the necessary content knowledge to be highly effective in the classroom. In order to address the crisis in physics and physical science education, the American Physical Society and American Institute of Physics developed the Physics Teacher Education Coalition (PhysTEC). The mission of PhysTEC is to improve and promote the education of future physics and physical science teachers.

In Nigeria, government places a high priority on technical vocational education for national development and educational reforms plans. The National Policy on Education

(FRN, 2004) extols the supremacy of teacher education over any other education sub-sector. By implication, if the teacher education is faulty, it will definitely have adverse effects on all other educational sub-sectors, hence the need for capacity building in teacher preparation through programmes that will guarantee successful delivery of vocational technical education. Commenting on the issue of teacher production, Yakubu (2000) observed that teacher production for technical colleges in the country is at best disorganized at present. According to him, there are only eight Colleges of Education (Technical) with a total enrolment of 10,000 and teacher turn-out of about one-third of that figure annually. Also, two polytechnics (Kaduna and Yaba) run B. Ed (Technical) programmes in affiliation with some Universities. There are also some universities running B.Ed (Technical) programmes under the Technical Teacher Training Programme (TTTP) but the programme is bedeviled by lack of funds for expansion and is consequently limited in scope. From everyday experience, it seems that technical vocational education teachers are in short supply in Nigerian schools. For instance, Ogunsola (2003 and 2006), Ogunsola and Dada (2007), FME (2006) and FRN (2007) revealed that qualified teachers are lacking in Nigerian technical colleges. This has led to high qualified teacher-student ratios ranging from 1:79 in electrical installation to 1:281 in plumbing and pipefitting (Ogunsola and Dada, 2007).

Statement of the Problem

The importance of the teacher as an indispensable human resource and the most important element in the school system has long been recognized. The number of qualified technical teachers produced in Nigerian higher institutions appears to be inadequate as there are public outcries from education stake-holders. This situation seems to be as a result of historical hostility against technical vocational education. It therefore becomes pertinent to ask, what is the pattern of technical teacher production in Nigerian tertiary institutions and how are they utilized in our schools?

Research Questions

The following research questions were raised to give direction to the study.

1. What is the trend of students' enrolment in technical, vocational and technical courses in Nigerian tertiary institutions from 2001 to 2005 academic sessions?
2. What is the trend of graduate output of technological, vocational and technical courses in tertiary institutions in Nigeria during the period of study?
3. What is the rate of teacher utilization in technical colleges in Kogi and Kwara States?

4. Which category of the teachers are optimally utilized vis-à-vis the under-utilized?

Methodology

Research Design

The research design adopted for this study was the *ex post facto* design. Data for the various variables were collected from the appropriate sources since they had already occurred.

Study Population and Sample

The population of the study comprised of all the tertiary institutions offering technological, vocational and technical (TVT) courses. All the technical teachers in the technical colleges in Kogi and Kwara States were included in the population. The simple and stratified random sampling techniques were adopted in the selection of fourteen tertiary institutions offering TVT courses in Nigeria and 60 teachers in six technical colleges in Kogi and Kwara States.

Research Instruments

The instruments used in data collection were one checklist and one questionnaire. The instruments were designed by the researcher. The checklist gathered information on students' enrolment and graduate output of the various institutions. The questionnaire was in two sections. Section A sought information on demographic data while Section B gathered information on instructional responsibilities of the technical teachers.

Validity and Reliability of the Instruments

The instruments were subjected to expertise advice of education planners and administrators to ensure the content validity. Also, to test for the reliability of the questionnaire, the split-half method was used and the Pearson product moment correlation co-efficient of 0.88 was obtained.

Administration of the Instruments

The instruments were personally distributed by the researcher and two research Assistants. Data collection lasted for three months on the average. The direct interaction

between the respondents and the researcher/assistants yielded a high return rate as all the instruments administered were returned. This represented a 100 percent rate of return.

Method of Data Analysis

The data generated for the study were analyzed using statistical tools such as percentage, average and bar charts.

Results

The results of data analysis are presented and discussed below:

Research Question One

What is the trend of students' enrolment in technological, vocational and technical courses in tertiary institutions in Nigeria from 2001 to 2004 academic sessions?

The trend of students' enrolment in technological, vocational and technical (TVT) courses in tertiary institutions in Nigeria from 2001 to 2005 academic sessions is shown in Table 1.

Table 1: Trend of Students' Enrolment in TVT Course from 2001 to 2005

Tertiary Institutions	2001/02	2002/03	2003/04	2004/05	Total
Universities	3,732	5,657	6,506	7,384	23,279
Polytechnics	1,346	1,747	2,070	3,177	8,340
Colleges of Education	14,633	19,662	23,406	24,672	82,373
Grand Total	19,711	27,066	31,982	35,233	113,992

Source: Field Survey 2007

The data in table 1 revealed that there was a steady increase in students' enrolment in TVT courses in the Universities, Polytechnics and Colleges of education throughout the period of study. For instance, in the universities, students' enrolment in TVT courses ranged between 3,732 in 2001/02 to 7,384 in 2004/05. Students' enrolment in TVT courses in the polytechnics was 1,346 in 2002/02 and 3177 in 2004/05 while enrolment in the colleges of education ranged between 14,633 and 24,672 during the period of study. The data in table 1 showed that students' enrolment in all the sampled institutions ranged

between 19,711 and 35,233 for the four year study period. Also, the data in table 1 showed that students' enrolment was more in the colleges of education followed by enrolment in the universities and the least students' enrolment was in the polytechnics. For instance, between 2001 and 2005, students' enrolment in TVT courses in the universities was 23,279; 8,340 in the polytechnics and 82,373 in the colleges of education.

The trend of students' enrolment in TVT courses from 2001 to 2005 is shown in figure 1.

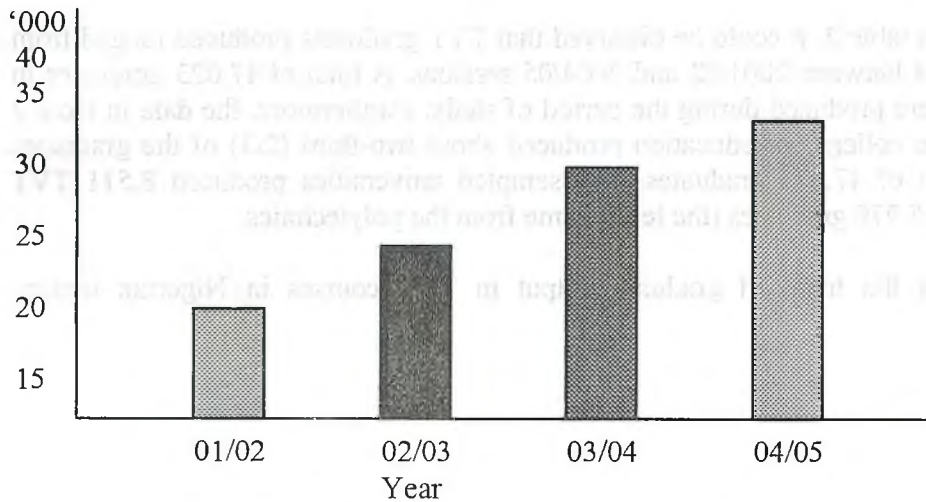


Figure 1: Trend of Students' Enrolment in TVT courses

Research Question Two

What is the trend of graduate output of technical, vocational, and technical courses in tertiary institutions in Nigeria during the period of study?

The results of the analysis are presented in table 2

Table 2: Graduate Output of TVT courses in tertiary institutions

Tertiary Institution	Academic Sessions				Total
	2001/02	2002/03	2003/04	2004/05	
Universities	1,690	2,086	2,239	2,496	8,511
Polytechnics	1,307	1,474	1,581	1,608	5,970
Colleges of Education	7,065	7,675	8,222	9,580	32,542
Grand total	10,062	11,235	12,042	13,684	47,023

Source: Field Survey 2007

From the data in table 2, it could be observed that TVT graduates produced ranged from 10,062 to 13,684 between 2001/02 and 2004/05 sessions. A total of 47,023 graduates in TVT courses were produced during the period of study. Furthermore, the data in table 2 revealed that the colleges of education produced about two-third (2/3) of the graduates with 32,542 out of 47,023 graduates. The sampled universities produced 8,511 TVT graduates while 5,970 graduates (the least) came from the polytechnics.

Figure 2 shows the trend of graduate output in TVT courses in Nigerian tertiary institutions.

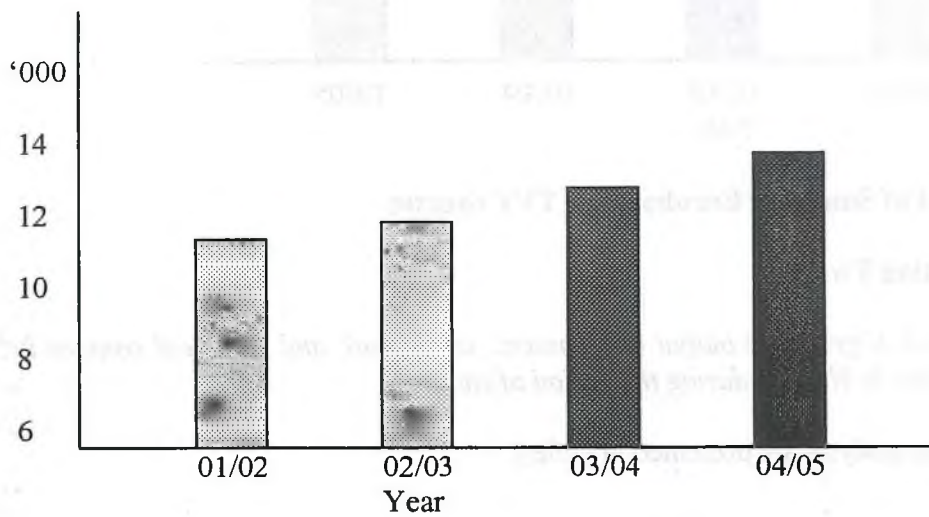


Figure 2: Trend of Graduate Output in TVT courses

Research Question Three

What is the rate of teacher utilization in technical colleges in Kogi and Kwara States?

The rate of teacher utilization in the sampled technical colleges in Kogi and Kwara States is shown in table 3.

Table 3: Rate of teacher utilization in the sampled technical colleges

Teacher Category	Utilization Rate per College in %						Average Utilization rate per category %
	GTC Ankpa	GTC Odu-Dekina	GTC Mopa	GTC Erinle	GTC Oro	GTC Pategi	
GTTQ	100	97	101	95	100	97	98.3
GTQ	101	100	98	96	100	98	98.8
GwTQ	108	106	100	95	104	102	102.5
HND + PGDE	110	108	103	102	103	101	104.5
HND	116	100	104	108	98	118	=107.3
NCEtech	108	105	106	99	104	98	103.3
NCE	100	98	105	103	105	101	102.0
Average utilization per college	106.1	102	102.3	99.7	102	102.1	102.4

GTTQ: Graduate with technical teaching qualification

GTQ: Graduate with teaching qualification

GwTQ: Graduate without teaching qualification

Source: Field Survey 2007

The result of the analysis in table 3 showed that graduates with technical teaching qualification and graduates with teaching qualification had about 98% average utilization rate while graduates without teaching qualification, HND+PGDE, HND, NCE(tech) and NCE holders had over 100% rate of utilization. It was revealed from the data in table 3 that graduates with teaching qualification had the lowest utilization rate of 98.3% while HND graduates had the highest utilization rate of 107.3%. The data also showed a college-wise rate of utilization that GTC Erinle had 99.7% as the lowest while GTC Ankpa had the highest utilization rate of 106.1%.

Research Question Four

Which category of the teachers are optimally-utilized vis-à-vis the under-utilized?

The average utilization rate of the various categories of teachers are presented in table 4

Table 4: Utilization rate of various categories of teachers

Teacher Category	Utilization Rate (%)
GTTQ	98.3
GTQ	98.8
GwTQ	102.5
HND + PGDE	104.5
HND	107.3
NCEtech	103.3
NCE	102.0

GTTQ: Graduate with technical qualification

GTQ: Graduate with teaching qualification

GwTQ: Graduate without teaching qualification

Source: Field Survey 2007

The data in table 4 revealed that the categories of teachers that were optimally utilized include all the teachers with 100% (and above) rate of utilization. These include graduates without teaching qualification, HND+PGDE, HND, NCE(tech) and NCE holders. Moreover, the data showed that graduates with technical teaching qualification and graduates with teaching qualification were under-utilized. They had 98.3% and 98.8% rate of utilization respectively.

Discussion of Results

Data analysis of this study revealed that there was a steady annual increase in students' enrolment in technical, vocational and technological courses in the universities, polytechnics and colleges of education during the period of study. It was observed that a total of 113,992 students were enrolled in the tertiary institutions sampled and that 19,711; 27,066; 31,982 and 35,233 students were enrolled in 2001/02; 2002/03; 2003/04 and 2004/05 respectively. It was also revealed that students' enrolment in TVT courses was more in the colleges of education than in the polytechnics and universities. The result of this analysis has corroborated Adegbile (2002) and Adeyemi & Uko-Aviomoh (2003) that enrolment in TVT courses has witnessed a significant growth. However, the finding of this study is unique and more robust than the findings of the above authors as it revealed in which of the higher institutions was students' enrolment more, that is, the colleges of education.

The finding of this study that there was a steady annual increase in enrolment could imply that the historical hostility against TVT courses is becoming a thing of the past. Moreover, it seems that the general notion that science and technology disciplines are tough to pursue at secondary and tertiary levels is gradually waning down as more students are now enrolling in TVT disciplines. The observed increase in students' enrolment in TVT courses could also be attributed to efforts being made by the Nigeria government both at the Federal and State levels to sponsor students on science and technical courses through the Technical Teacher Training Programme (TTTP).

The study has shown that TVT graduates produced ranged from 10,062 to 13,684 between 2001/02 and 2004/05 sessions and a total of 47,023 TVT graduates were produced during the period. It was revealed that colleges of education produced about two-third of the graduates having 32,542 of the 47,023 graduates. This finding could be as a result of the short duration of NCE courses (3years) compared with polytechnics and universities (4 or 5years). Another reason for the finding could be the problem of getting admission to the universities with limited space on yearly basis. Also, the instability in the university calendar due to strike (and/or cultism) and the fact that NCE holders could go for further training on full time, weekend or sandwich basis could be the reasons for the preference for colleges of education. Moreover, the production of more NCE holders portrays a good omen for the Universal Basic Education (UBE) programme as NCE is the minimum qualification required at this level of education. The finding of this study on improvement in teacher production agreed with MoEST(2002 and 2004) and CSU (2006).

It was revealed by this study that graduates with technical teaching qualification and graduates with teaching qualification had an average utilization rate of 98% which implied under-utilization as some of them were found taken less than the official/recommended 16periods per week. It was shown in this study that graduates without teaching qualification, HND+PGDE, HND only, NCE(technical) and other NCE holders had over 100% utilization rate which connoted over-utilization as some of them took between 18 and 24 periods. It was discovered in the course of data collection that some of the older graduates were involved in administrative duties as Vice Principals, Year Heads, Head of Departments, etc. This probably necessitated the reduction in the number of periods taught by this group of teachers. The effect of this situation is that the experience this group of teachers have garnered over the years is not being fully-utilized in the teaching process as they are involved more in administrative duties.

Conclusion

It is concluded that there is a steady annual increase in students' enrolment and teacher production. The more experienced teachers are under-utilized in the teaching process due to administrative duties leading to over-utilization of other group of teachers.

Recommendations

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

- The tempo of annual increase in students enrolment in TVT courses should be sustained and improved upon. This could be done by granting scholarships, bursaries and repayable loans after graduation to students that are interested in studying TVT courses.
- Technical teachers on the field should be encouraged by placing them on enhanced salary scale. Also, this group of teachers should be paid special allowances tagged "technical teachers allowance".
- Federal and State governments should intensify efforts in training NCE(technical) and other NCE holders through the TFTP.
- To encourage more students in TVT courses, adequate learning materials especially equipment should be provided. This is because TVT courses are skill-oriented in nature.

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