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Effective Technological Delivery in Nigerian Polytechnics: Need for Academic Manpower Development Policy

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Abstract

Technical education, especially as provided in the Nigerian polytechnics, leads to the acquisition of practical and applied skills as well as basic scientific knowledge. The production function of the polytechnics in terms of producing quality middle-level manpower through effective teaching delivery depends largely on the quantity and quality of teachers available. However, teacher adequacy is a function of many factors, which include funding, student enrollment overtime, and staff turnover. This article, however, revealed a mismatch between enrollment and available teachers, with huge staff shortfall over the years when the student enrollment was matched with the available teachers, using the ideal teacher-student ratios. Student and teacher projections were carried out based on five-percent annual increase and average teacher-student ratio of 1:12, so as to meet the vision 2010 target year set by the Nigerian government for total development. The projection showed that the polytechnics would require a large additional number of teachers. An all-inclusive funding approach for the polytechnics was recommended so as to increase their financial status, which would allow for improved facilities, workshops, equipment and also improved conditions of service of teachers. We believe that if this was done, more teachers would be attracted from across the

world, those who left would return, and new and younger ones will be encouraged to join the teaching force. Such development would to a great extent meet and sustain the anticipated growth for the target year.

Introduction

Technical education is that aspect of education, which leads to the acquisition of practical and applied skills as well as basic scientific knowledge. Encyclopedia Britannica (2001) described it as the academic and vocational preparation of students for jobs involving applied science and modern technology. The general objectives are the preparation of graduates for occupations that are classed above the skilled craft but below the scientific or engineering profession. The National Policy on Education (FRN 1981, 1998) identified five types of technical education institutions outside the universities. They are pre-vocational and vocational schools at post-primary levels; technical colleges, polytechnics and colleges of technical teacher education at post-secondary school.

In Nigeria, technical education had a slow start and developed less quickly than other forms of education. In fact, the first technical college was established in 1948 at Yaba, Lagos (Fafunwa, 1992). This was partly due to the fact that the Europeans, who were the harbingers of western learning, were unable to popularize it on the same scale as literary, religious and pedagogical form of education when they colonized the sub-Sahara Africa, including Nigeria. Batagarawa (2001), who was a minister of state for education in Nigeria, however, adduced the low pace of technical education in the country to the fact that it is expensive to develop and sustain, partly because of its high resource requirements.

Nevertheless, the importance of technical education and technology to sustainable development cannot be overemphasized. This is because tomorrow's world will demand highly qualified specialists and increasingly flexible generalists (World Bank, 2000). No wonder the National Policy on Education believes that technical education would provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development through the provision of well trained sub-professional grade and middle-level manpower (NPE, section 6, sub section 49). In fact, recognising that technical education forms the basis of the nation's technological development, the Federal Government had substantially increased its expenditure in this field in the Third National Development Plan period (3rd National Development Plan, 1975 – 1980).

Consequent upon the earlier neglect of technical education and sudden realization of this type of education by government as the panacea for technological emancipation and national development, the National Board for Technical Education was created in 1977 through decree number 9. The board is saddled with the responsibility of coordinating technical education by setting standards for schools in term of facilities, teaching manpower and accrediting courses from time to time. It is also to advise government on all aspects of technical education that fall outside the universities. Nigerian government has finalized plan to establish the National Polytechnics Commission to manage only the polytechnics (The Guardian, Tue, 18/3/2003).

Ever since, there has been a phenomenal expansion in technical institutions. From one technical college in 1948, the country now has 46 polytechnics, with various programmes for both the pre-National Diploma and Diploma students as of 1997/98 session. In addition, there are 89 monotechnics, 8 colleges of Education (Technical) for training teachers for post-primary technical and vocational education programmes and 138 technical colleges (FOS 1999/2000, NBTE, 2000; Federal Ministry of Education, 2000, Yakubu, 2000; and Aina 2000). Enrollment has also witnessed a significant growth. For example, Polytechnic enrollment has risen from 17,485 in 1986/87 to 104,686 in 1990/91 and to 192,979 in 1997/98 and 237775 in 1999/2000 (Joint Admission and Matriculation Board, 2000, Adegbile, 2000). There is no gainsaying that curriculum planning and physical expansion without adequate and sustainable human and material resources would definitely fail to produce the desired results. This brings us to the thrust of this discourse, which are the teaching manpower requirements for technical education, especially in the country's polytechnics.

Teachers play great facilitative role in teaching-learning process. In spite of the advancement in science and technology, the teacher is not yet displaced in the classroom nor has his important role in education diminished (Aghenta, 1998). Even Fredenco Mayo, Director-General of UNESCO emphasized the important role of teachers in technical and vocational education programmes at the

second international congress in Seoul, South Korea (26 April, 1999). Similarly Tarpeh (1994) remarked that academic staff are the mainstay of any institution and their number and quality affect the efficiency of teaching and learning process. He described them as a crucial input in the transformation of students and research into graduates and knowledge and solutions of societal problems.

Unfortunately, the situation with technical education teachers, especially in terms of quantity is highly precarious in Nigeria. In 1980, the Nigerian Educational Research Council (NERC) set an indicative targets for teaching staff and student enrollment for the nations polytechnics and technical colleges. The council's teaching staff target by 1997/98 was put at 66800, with about 1.3 million student enrollment; and for 2000 AD, teaching staff target was put at 72900, with about 1.4 million student enrollment with teacher-student ratio of 1:20. (NERC, 1980). Unfortunately the targets were far from being met. As of 1997/98, actual teaching staff in the polytechnics and technical colleges was 9370, student enrollment was 248080, given an average teacher: student ratio of 1:27. According to NERC, "the enormity of such a venture is without question, but we have no choice in the matter if we must develop" (NERC, 1980:52). The situation on the ground is, however, not promising.

Corroborating the situation, (Ogunnowo, 1992; Nwaokolo, 1997; Olaitan, 1997; principals' annual report for Federal Technical Colleges, 1998; and Aina, 2000) all submitted that there is problem of inadequate qualified teachers at almost all levels and types of education in Nigeria. In fact the technical colleges' principals' annual report stated in the following words:

> The picture of staffing depicts total weakness in all trade areas… This low level teaching faculty cannot formulate and deliver adequate skill training no matter the pretensions to the contrary … the dearth of adequately qualified teachers for the technical colleges is already a national crisis.

The national policy on education seemed to have envisaged this problem. It is stated in section 6, sub-section 5 that "*government is aware that only limited facilities exist for technical teachers' education*" and that "*a conscious effort to expand the facilities for the training of technical teachers shall be made, particularly since the new structure … will require many more teachers".* The extent to which this has been done is part of the thrust of this paper.

In a survey on teacher supply-demand carried out by the Nigerian Educational Research and Development Council (NERDC) as reported by Onugha (1997) revealed a high student: teacher ratios in all the technical disciplines - a pointer to inadequate teachers. Even the World education report by UNESCO (1995) identified the sub-Sahara Africa of which Nigeria is a part, as the worst in term of number of teachers available for the third level education, where we have the polytechnics. The report showed that in 1992, of the 5.19 million teachers available, the region shared 0.09 million; while Arab states, 0.14 million; Latin America/Caribbean, 0.67 million; Eastern Asia/Oceanic 0.77 million; China, 0.39 million; Southern Asia, 0.53 million; India, 0.42 million and so on. Not to mention the developed countries.

Many problems have be-deviled the educational system in recent past. The problem of under-funding has alone inhibited the development of teaching manpower programmes. According to Aina (2000), in the past, technical teachers were trained abroad, but this has ceased due to the fallen value of the country's currency and dwindling economy. There is problem of brain drain too, either to foreign countries to seek greener pastures or to lucrative industries within the country (NUC, 1995; and Adeyemi 2000). Sofolahan (1991) had expressed concern that many of the technical teachers sent abroad never returned, and those that returned found their ways into industrial and commercial sectors, in spite of the bond signed with government.

This portends a looming crisis that could definitely affect the quality of middle level manpower produced in the technical institutions, especially in the polytechnics, and consequently the nation's technological development. This paper is therefore premised on the contention that there is disequilibrum in the demand-supply of technical education teachers. Therefore the article analyzed the degree and pattern of the dis-equilibrum; projected for future needs; and also made useful suggestions; making the nations polytechnics as reference point.

Teacher demand-supply mix for technical education

It is recognized that with the best of educational policy and design, and even high fiscal input to education, the ultimate achievement of educational objectives depend largely on the quantity and quality of teachers. The quality and quantity of graduates produced would also reflect the worth of the available teachers. Therefore to determine the demand-supply gap in the production and allocation of teachers to any institution, student enrollment trend must be ascertained. This is necessary for reasonable projection for future development.

For this paper, teacher demand connotes the ideal number of teachers required for the polytechnics. On the other hand, supply connotes the actual number of teachers available during the years of study. Two planning models are very relevant to this discourse. They are: Higbee's demand models (Higbee, 1981) and the Cobb-Douglas production function models used by Manga and Silver (1983). The Cobb-Douglas production function model suggested that in order to obtain an equilibrium state in any production system, the growth in output can be increased only by increasing either the number of its productive workforce or their powers. In the school system, to establish equilibrium, growth in student enrollment must be accompanied by a proportionate growth in staff strength (Osahon, 1997). This is because according to Zymelman (1993) and World Bank (1995), disequilibrium in the enrollment-staffing relationship weakens the efficacy and quality of the school system's production functions.

On the other hand, Higbee (1981) in his demand models for academic staff planning identified some form of formula for determining the number of academic staff required by an academic unit-college, faculty, school, department, etc. He divided these into two types: student/faculty ratios and work load formula. The student faculty/college ratios is adapted for this paper in determining the academic staff need of the nation's polytechnics. It consists of either simple ratio or more sophisticated ones containing weighting co-efficient for various types of students. This is simplified inform of student:teacher ratio as prescribed by World Bank (1995), which described the model as one overall measure of staff efficiency in schools.

By this model, there are ideal (demand) and actual (supply) ratios. Where the actual ratio is found to be greater than the approved ratio, which is statutorily recommended in most cases implies over-utilization of academic staff, vise versa, with attendant consequences on production function.

According to National Board for Technical Education (NBTE) (1981), the following teacher: student ratios are recommended:

- for practice-oriented trade courses, such as woodwork, metalwork, electronics etc., the ideal ratio is 1:15 and 1:20 as the upper limit;
- for practice-oriented core courses in the general science department such as Biology, Chemistry, Physics, the lower limit of teacher: student ratio of 1:18 and upper limit of 1:25.
- For other courses in the general education department in which classes are held in classrooms, the normative teachers: student ratio of 1:40 is recommended.

The above is, however, for technical colleges. For the Monotechnics and Polytechnics, the ratios recommended are:

- 1:8 for technological-based disciplines and
- 1:16 for management and art disciplines: This gives a 1:12 average ratio.

Today, there is a phenomenal rise in student enrollment at all levels of education, which (Omoregie and Hartnett, 1995; UNESCO, 2000) observed could not be matched by the growth in the number of teachers.

Table 1 shows the trend in student enrollment and teaching staff between 1993/94 and 1999/2000 sessions. The table reveals that the annual average percentage growth of 10.75 for student enrollment is higher than that of teaching staff, which is 7.3%. This is an indication of academic mismatch (Osahon, 1997).

Table 1. Trend in student enrollment and teaching staff in Nigerian Polytechnics:1993- 2000

Year	Enrollment	% Growth	Teaching staff	% Growth	Overall Teacher:student ratio
1993/94	124000	-	4960	-	1:25
1994/95	151247	21.9	5258	6.0	1:29
1995/96	150391	-0.7	5371	2.2	1:28
1996/97	178456	18.7	609	13.7	1:29
1997/98	192699	8.1	6483	6.1	1:30
1998/99	216159	12.0	6755	4.2	1:32
1999/2000	233612	8.00	7536	11.6	1:31
Average		**10.75**		**7.3**	

Source:

1. Federal Office of Statistics (1995, 1999, 2000) Annual Abstract of statistics, Abuja, FOS.
2. Federal Ministry of Education (2000) Statistics on Student Enrollment in Technical Colleges, Colleges of Education, Monotechnics and Polytechnics, Abuja, FME
3. National Board For Technical Education (1999) Digest of Statistics, Kaduna, NBTE.
4. Yakubu, N.A. (2000) “Identification and Assessment of Resource Requirements in Technical and Vocational Education in Nigeria” A Seminar paper.

Table 2 compares the ideal teacher: student ratios as recommended by the National Board for Technical Education for the science/technological-based and Management/Art-based courses (NBTE, 1981); The table shows a general wide gap between the recommended and actual ratios in most of the courses. The gap is phenomenal with the management courses, such as Accountancy/Financial studies, Business Administration/Management; Banking and Finance and Insurance. Their ratios range between 1:33 for Insurance to as high as 1:119 for Accountancy/Financial studies as against the recommended ratio of 1:16. This implies a very high enrollment that is not matched with the required teaching staff. The implications of such development could be inimical to effective teaching-learning process. The same goes for some technologically based disciplines, such as Chemical Engineering, Mining Engineering, Electrical/Electronics with average of about 1:28 teacher: student ratio. The pattern of observed ratios in most disciplines suggested an over-utilization of teachers in the polytechnics. No wonder, the academic union of the nation’s polytechnics, like their university counterparts have demanded for the payment of excess workload allowance, which they are now earning. But the question is can one teacher perform the duty of two teachers effectively? This paper does not believe that there could be effective delivery.

Another problem traceable to high ratios observed for the management disciplines is the trend in the country today, whereby most applicants to polytechnics and even universities tend to prefer management disciplines so as to eventually work in banks, insurance companies, finance houses, oil companies, etc. which pay better than most other sectors. These institutions in most cases admit the students irrespective of the rules guiding admission and even the available resources, especially teachers. For instance, Adeyemi (2001) found that there was no Nigerian university that was complying with the 60:40 admission ratio for science/technology and Art/Social Sciences/Humanities as recommended by the National Policy on Education (FGN, 1998). The ratio is 70:30 for the Polytechnics (FGN, 1998). The problem of compliance with the admission could be attributed to the low level of interest the post-primary students show for the science and technical education. This seemingly low interest can also be attributed to many factors, such as inadequate science materials, poor laboratories, and inadequate and dysfunctional workshops. Such situation could have contributed to the tendency for most Nigerian school leavers to prefer management courses, social sciences and humanities.

Table 2. Teacher: student ratios by selected discipline for Nigeria Polytechnics

Discipline	(Ideal) Recommended NBTE ratios	Actual ratios						
		'93/94	'94/95	'95/96	'96/97	'97/98	'98/99	'99/2000
Accounting/Financial studies	1:16	1:114	1:111	1:112	1:116	1:118	1:120	1:119
Agricultural Engineering	1:8	1:9	1:9	1:10	1:9	1:10	1:11	1:11
Architecture	:8	:13	:12	:14	:14	:16	.:15	.17
Business Admin. /Management	1:16	1:67	1:73	1:78	1:51	1:83	1:80	1:81
Building Tech./Quantity surveying	1:8	1:12	1:12	1:13	1:75	1:17	1:17	1:16
Chemical Engineering	1:18	1:30	1:28	1:25	1:31	1:34	1:32	1:33
Catering/Hotel Management	1:16	1:19	1:21	1:23	1:23	1:25	1:25	1:26
Civil Engineering	:8	:10	:10	:9	:11	:12	:10	:11
Education (Technical)	1:16	1:38	1:36	1:36	1:39	1:43	1:43	1:44
Electrical/Electronics Engineering	1:8	1:20	1;25	1:24	1:28	1:32	1:32	1:31
Environmental Science	1:8	1:14	1:15	1:13	1:15	1:17.	1:17	1:18
Food Technology	:8	:26	:25	:25	:29	:34	:31	:33
Mass Communication	1:16	1:28	1:28	1:30	1:31	1:33	1:33	1:32
Marketing/Purchasing and Supply	1:16	1:23	1:27	1:29	1:31	1:31	1:30	1:31
Mining Engineering	1:8	1:31	1:35	1:37	1:40	1:41	1:41	1:42
Computer Science/Maths, Statistics	1:8	1:16	1:18	1:18	1:21	1:21	1:21	1:23
Printing Technology	1:8	1:4	1:4	1:3	1:5	1:3	1:4	1:4
Secretarial Studies	:8	:23	:25	:25	:30	:32	:32	:32
Social Development/Cooperatives	1:16	1:13	1:14	1:15	1:15	1:14	1:15	1:15
Textile Technology/Polymer Sc.	1:8	1:5	1:3	1:5	1:4	1.4	1:4.	1:5
Urban Planning	1:16	1:20	1:21	1:20	1:22	1:26	1:25	1:26
Banking & Finance	1:16	1:81	1.85	1:88	1:91	1:93	1:95	1:94
Arts & Design	1:16	1:4	1:4	1:5	1:6	1:6	1:6	1:7
Insurance	1:16	1:35	1:33	1:33	1:38	1:42	1:42	1:45
Music Technology	1:16	1:17	1:19	1:19	1:20	1:20	1:20	1:22

Sources:

1. Federal Office of Statistics (1995, 1999, 2000) Annual abstract of statistics, Abuja, Nigeria.
2. Olu Aina (Ed) (2000) "Technical and Vocational Education in Nigeria: Vision and mission, seminar proceedings, Abuja, 50 – 53.
3. National Board for Technical Education (1990 – 2000) Digest of statistics, Kaduna, NBTE

However, table 2 also shows that few courses have very low ratios, thereby giving room to under-utilization of teachers. They include Textile technology, Arts & Design and Printing technology with ratios that are far less than the recommended ones.

The calculated ratios in table 2 reveal a high shortfall in the stock of the teaching staff available to the polytechnics for the years under review. This shortfall is shown in table 3, based on the average teacher: student ratio of 1:12.

Table 3. Student enrollment, actual and ideal teaching staff difference

Year	Student enrollment	Actual teaching staff	Ideal teaching staff based on average teacher:student ratio of 1:12	Ideal/Actual difference (shortfall)
1993/94	124000	4960	10333	5373
1994/95	151247	5258	12604	7346
1995/96	150391	5371	12533	7162
1996/97	178456	6109	14871	8762
1997/98	192699	6483	16058	9575
1998/99	216159	6755	18013	11258
1999/2000	233612	7536	19468	11932

- Calculated by the authors from Table 2.

Table 3 shows a huge shortfall for the years, ranging from 5373 teachers for 1993/94 to 11932 teachers for 1999/2000. In all the years, the shortfall is higher than the actual. This observation should be a serious concern to educational managers.

Causes of shortage of technical teachers

The adequacy of teaching staff to any level of education is strategic to the quality of instructional delivery. And in Nigeria the above data analysis has shown a drastic downward trend in respect to adequacy of polytechnic teachers. A lot of factors can be adduced. These include the admission explosion, under-funding of higher education and technical education in particular; dwindling national economy; issue of brain-drain and perception of technical education disciplines as tough.

The urge for admission into higher education in the country has phenomenally increased enrollment. Most institutions do not respect the admission guidelines and quotas. The income to be generated from certain fees paid seems to be over-riding the sense of judgement. This has led to situations where enrollment far outstrips the available resources, including teachers. It takes a long time to produce teacher for this level of education.

Secondly, the downturn in the nation's economy has been identified as the major cause of all educational problems for the past one and half decades. Ten years ago, the country could only allocate about 1.4% of her GNP to education; while countries like Ghana, Zimbabwe and Malaysia allocated 4%, 8.5% and 7.1% respectively of their GNP to education. (Daily Times, 2-12-93). The situation still remains the same as of 2003. The country could only allocate 1.8% of the 2003 budget to education (Academic Staff Union of Universities, 2003). This is why the union has been on strike to protest this near neglect of education by successive governments. The Academic Staff Union of Polytechnics has equally expressed its displeasure. The low allocation has seemingly affected all aspects of education in general and technical education in particular.

The poor allocation has led to under-funding of the polytechnics and other institutions. Facilities have degenerated and teaching equipment to the dissatisfaction of teaching staff. In addition the condition of service became unattractive to newcomers and repulsive to serving teachers. All these either discouraged brilliant young scholars from taking up teaching job or led to the "brain-drain" syndrome.

Many teachers are either leaving the polytechnics for greener pasture outside the country or even lucrative industries that require in large number the skill and services of technological-oriented scholars within the country. In a study conducted on the phenomenon of brain-drain in two polytechnics in Nigeria by Giwa (2000), it was revealed that withdrawal/transfer of service and resignation of teaching staff were tested to be significant and that their directions were mainly to cross to universities, manufacturing industries, while some went on private business. Describing the pathetic picture of Nigeria's higher education, polytechnics inclusive, Yesufu (1996) as cited in Opatola (2001:2002) stated:

> "…the student: teacher ratios are worsening in virtually all disciplines. Laboratories are either non-existence or completely demanded of essential equipment and experimental consumables, libraries cry out for funding. Teachers are grossly underpaid and many have had to seek how to keep body and soul together. Many others have abandoned academics to the greener pastures of the private industry, the banks, and consultancies. Part-time jobs and moonlighting have become the rule than exception."

Today, teachers in the tertiary institutions are moving out en-mass to join politics, which has been made so lucrative in the country.

The implications of under-funding on teaching staff turnover portend danger to the future of technical education in general and polytechnics in particular. The technological take-off of the country could be in disarray. The high rate of staff attrition is not good for quality assurance in the polytechnics. More experienced teachers are leaving, while brilliant young graduates are not encouraged by the situation. At the same time, less qualified people are being recruited to fill the gap. In this case, the delivery system of quality technological education would definitely be in jeopardy. Onokherhoraye and Nwoye (1995) corroborated this as they asserted that the attrition of quality and experienced academic staff could result in poor standard.

Another probable cause of shortage of teaching staff in the nation's polytechnics could be attributed to the general notion that science and technological disciplines are tough to pursue right from secondary schools, not to mention of pursuing them to post-graduate level that could qualify one to be a teacher at this level. In addition, it is not an easy task to pursue post-graduate programs in Nigerian universities nowadays because of the poor state of laboratories and workshops. At the same time the poor state of the nation's economy has affected overseas sponsorships.

Projecting for future teaching staff requirement for the polytechnics

From the above analysis, the dearth of technical teachers in the polytechnics seems to have reached a crisis proportion judging from the huge figures representing the shortfall for various years. The analysis also showed a steady yearly increase in student enrollment, which ***ceteris paribus*** is likely to continue. And bearing in mind the place of technical education in the transformation of a nation, it is important to project into the future needs of this type of education. For instance, the "***vision 2010 plan document"*** that was prepared in 1997 by the Federal Government is aimed at putting the country on the path of radical future development. Its scope covers all sectors, including technological and educational sectors. On education, the document is mainly on students, increased funding and adequate teachers (FGN, 1997).

Based on the nation's vision, the paper projected the yearly additional teachers that would be required in the nation's polytechnics from 2000/2001 to 2009/2010. To achieve this, student enrollment during this period was first projected, using UNESCO (1969) formula, as used by Osahon (1997) and Adeyemi (2001). The formula, states:

$$P^n = P^o (1 + r),$$

Where, P^n = Enrollment in year n,

P^o = Enrollment in year proceeding n

r = Annual rate of growth

For the higher education, r is held constant at 5% (Onokerhoraye and Nwoye, 1995:118). To project the number of additional teachers required for the period, the average teacher:student ratio of 1:12 recommended by the NBTE was used and held constant. The finding is shown in Table 4.

In Table 3, it is shown that the actual teaching staff as of 1999/2000 was 7536, while the ideal teaching staff was 19468, given a shortfall of 11932. From this situation, one can easily predict a very gloomy future with regard to teaching manpower in the nation's polytechnics and technological education in general if radical and aggressive approaches are not employed. The problems entail coping and filling the shortfall before dealing with the additional projected figure. As shown in table 4, to achieve optimal efficiency and effectiveness of technical education delivery in our polytechnics, it would require 31711 teachers for 380532 students by the target year, all things being equal, with average annual additional teachers required. This implies that an additional 12243 teachers plus the stock of 19468 in the base year (1999/2000) will be required for year 2010, which is the target year.

Table 4. Student enrollment and teaching staff projection for Nigerian Polytechnics: 2000/01 to 2009/10

Year	Student Enrollment (Projection)	Ideal Teaching Staff (Projection)	Additional Teaching Staff required annually.
1999/2000	233612	19468	- (P^o)
2000/2001	245293	20441	973
2001/2002	257558	21463	1022
2002/2003	270436	22536	1073
2003/2004	283958	23663	1127
2004/2005	298156	24846	1243
2005/2006	313064	26089	1243
2006/2007	328717	27393	1304
2007/2008	345153	28763	1370
2008/2009	362411	30201	1438
2009/2010	380532	31711	1510
		Average	**1224**

Conclusion and recommendations

Human resource has been the hub on which other resources in any organization revolve. In any school system, especially the polytechnics, which are centres for technical and technological education, the place of teaching manpower is very crucial in qualitative and quantitative production of middle-level manpower for the development of the nation. Incidentally, the country rests her hope on technology as a pad for developmental take-off. Unfortunately, one can conclude from the foregoing analysis that there is an overall gross inadequacy of teachers in the nation's polytechnics. This situation cannot be, however, divorced from the downturn in the nation's economy that has lowered financial allocation to education sector; especially technical education, thereby affected the training and re-training of teaching staff in all the polytechnics, both within and outside the country. This situation has created a high teacher:student ratios across most discipline, which could seriously jeopardize the effectiveness of technical education delivery, especially in the nearest future if urgent solution is not proffered.

It is therefore recommended that an all inclusive funding arrangement be made to solve the problem of under-funding of the polytechnics; since it seems that government allocation alone could no longer cope with the running of the polytechnic education. Reasonable school fees should be charged to augment government allocation. Private and public companies should be made to contribute certain percentage of their annual profit after tax to technical education in general, and polytechnics in

particular because they are the primary beneficiaries of their products. In addition, government should increase its allocation to the polytechnics. With increased funding, the conditions of service of the teachers can be adequately improved and the teaching facilities, especially the workshops, equipment and laboratories would be well developed and modernized. Such development could attract teachers from other countries and those that have left the system. It will also encourage many brilliant young scholars to join the teaching staff, as well as retaining the ones on the ground. By this, the shortfall in the teaching staff of the polytechnics could be greatly reduced, while the hope of meeting the target for the first ten years of this century could be brightened.

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