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Full Length Research Paper

Technical and vocational skills depletion in Nigeria and the need for policy intervention

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The study was carried out to assess the impact of erosion of technical and vocational education and training (TVET) on technological capability building in Nigeria by commercial motorcycling transportation mode. The study used primary and secondary data sources. The number of respondents sampled was 500. Structured questionnaires were administered on commercial motorcyclists. This was supplemented with field observations and interviews. A total of 500 questionnaires were administered on the respondents with 72% response rate. The data were analysed using descriptive statistics. The study showed that the active population was heavily involved in commercial motorcycling which has no technical value addition to the nation's economy. About 8% of the commercial motorcyclists had at least a University Degree (Masters and Bachelor Degrees), about 54% of them had at least a senior secondary school education, 36% had junior secondary education and below, while about 2% had no formal education. The study also revealed that majority (about 85%) of the commercial motorcyclists were tradesmen or craftsmen before: auto-mechanics (25.88%), carpenters (14.12%), bricklayers (8.24%), painters (7.06%) and panel beaters (5.88%). Of these, more than half had graduated from their chosen trades or crafts, while 15% were civil servants. However, the respondents who are now commercial motorcyclists make at least twice the income they made in their former trade per day, hence the drift. The study concluded that drift from crafts and trade to commercial motorcycling will speedily erode the indigenous technology capacity of Nigeria if there would not be urgent government intervention to reverse the situation.

Key words: Training, vocational, technical, education, motorcycling.

INTRODUCTION

Background

Few decades back, Okada Air was the most popular Nigerian local airline. The commercial motorcycle transporters were nicknamed after the airline, because they could manoeuvre through the heavy traffic of Lagos, and take passengers to their destinations in a timely manner, in the same way as the airline. The ironic humour of an airline's name being used for commercial motorcycling, as well as the local familiarity with Okada Air, caused the nickname of Okada to outlive the airline from which it originated, and which many Nigerians no longer even remember. Until about 20 years ago, commercial motorcycling, popularly known as *Okada* was alien to the South-western part of Nigeria. Taxi cabs and mini buses were the common means of commercial transportation. Though individuals owned motorcycles, they were not used for commercial purposes. With the stringent economic climate, which necessitated the government policy of structural adjustment programme

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(SAP), many vehicle owners could not replace them, and coupled with the gradual degradation of roads and the need of communities to access non-motorable areas, commercial motorcycling became a necessity.

Commercial motorcycling has been accepted by the populace and is gradually being integrated into the urban life of the country. This mode of transportation has continued to enjoy increasing acceptance relative to the other modes (Ogunsanya and Galtima, 1993; Adesanya, 1998; Layode, 1998a,b; Fasakin, 1999). An estimated 25% of total traffic in major roads within South-western Nigeria is represented by commercial motorcycling. One thing that enhances the sustainable operations of the commercial motorcyclist is the relatively high level of daily profits usually posted by operators compared to daily operational cost (Layode, 1998).

However, apart from the immediate profits it brings, commercial motorcycling has very little or no impact on the indigenous technological capability building in the country. This is because there is no value addition coming out of this business. On the contrary, it has reduced the quantity of workmanship in technical and vocational education and training (TVET) in Nigeria. A few decades ago, technical and vocational education and training (TVET) formed a central part in the development strategies of many developing countries. Due to the emphasis on basic education TVET became marginalised within the educational landscape, and constrained by negative perceptions, which portray TVET as a low status, low quality educational pathway (Asogwa and Diogwu, 2007; Edukugho, 2004; Oranu, 2010).

Broadly defined, TVET is concerned with the acquisition of knowledge and skills from the world of work (Grunwald *et al.,* 2004a,b; Grunwald *et al.,* 2005). TVET can be defined as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupants in various sectors of economic and social life (UNESCO, 2010). Technical education is the theoretical vocational preparation of students for jobs involving applied science and modern technology; compared to vocational education (which focuses on the actual attainment of proficiency in manual skills). Technical education emphasises the understanding of basic principles of science and mathematics and their practical applications; delivered at (usually) upper secondary and lower tertiary levels to prepare students for occupations that are classified above the skilled crafts but below the scientific or engineering professions (Tripney *et al*., 2012). Vocational education is organised activities designed to bring about learning as preparation for jobs in designated (manual or practical) trades or occupations usually, non-theoretical and focused on the actual attainment of proficiency in manual skills. It is usually considered part of the formal education system thereby falling under the responsibility of the Ministry of Education (Tripney *et al*., 2012). Vocational training, on the other hand, prepares learners for jobs that are related to a specific trade or occupation (Tripney *et al*., 2012). On-the-job training refers to workplace-based training that uses real jobs as a basis for instruction and for practical purposes while apprenticeship training combines on-the-job training for a highly skilled craft or trade (from someone who is already a skilled leader in the field) with academic/theoretical instruction; also called dual-training programmes (Tripney *et al*., 2012).

A key requirement for development in the modern technological age is a population that is well educated and trained in science and technology and capable of being readily mobilized to meet changes in technology (ILO, 2004). The prime example of this is seen in the technological and industrial might of Japan. TVET may be seen both as a vehicle for the development of marketable and entrepreneurial skills and as an engine for development (ILO, 2004, 2005).

According to ILO (2004), the total number of young people within 15-29 age group in developing countries increased by 12.4% between 1993 and 2003, while youth employment rose by just 0.6%. This is a serious unemployment situation but unemployment can possibly be reduced by facilitating and promoting job-seekers' access to the formal and informal labour market through technical and vocational education and training (Bennell, 1999; IIEP, 2006).

It is important for Nigeria to include a variety of courses for disciplines such as technical, vocational, professional, agricultural, and so on, in the education curriculum so as to achieve development. To achieve this development, the vast population of Nigeria must contribute to economical growth by participating in all professions through TVET. Therefore, TVET systems play a crucial role in the social and economic development of a nation (Grootings and Nielsen, 2006; King and Palmer, 2006). TVET provides students with "life skills" to become productive entrepreneurs as it engenders creative and innovative ideas, enlarges the economic pie, and increases personal freedom. Most of the expatriate engineers who are being paid millions of dollars to build Nigeria's roads and bridges are graduates of technical and vocational colleges abroad.

The problem

The government, over the last few decades, has disused TVET. This situation, coupled with the migration of skilled technicians to commercial motorcycling poses a dangerous situation for the future. Subsequently, society is deficient in skilled technicians: bricklayers, carpenters, painters and auto-mechanics; laboratory and pharmacy technicians, electrical/electronic technicians and skilled vocational nurses, etc. The major difference between the

nations of the North and the South is essentially disparities in the levels and degrees of technological (indigenous and imported) progress. Economic development in our context is the process of accumulation of real capital brought about by the application of indigenous and advanced production methods which raise productivity and, thus, income and investment possibilities. Without the development of indigenous technologies and adoption of imported technologies, it is difficult to imagine how the problems of economic, social and political development can be solved within a reasonable span of time.

Literature has shown that enrolments in vocational education and level of economic development are related (Olaitan, 2010; Famiwole *et al*., 2012). In Nigeria, the demand for vocational education remains very low and the economy remains low. However, demand for vocational education seems to exist in catching-up countries, with growth and diversification of industrial structure. Much growth in vocational education took place in countries like Korea during early industrialisation processes, when employment opportunities could increase. Unemployment rates in the East Asian economies remained low essentially because the population possessed employable vocational and technical skills (Jin, 2008; Haq and Haq, 1998; VanArk, 1992). However, this paper acknowledges that the relationship between demand for vocational education and economic development may not be linear. This paper, therefore, assesses the impact of the gradual erosion of technical and vocational education and training (TVET) on technological capability building in Nigeria by commercial motorcycling transportation mode.

LITERATURE REVIEW

The concept of TVET

Technical and Vocational Education and Training (VTET) has been misunderstood in the Nigerian context to mean that type of instruction and training given to people that could never study science or arts in the school system and are therefore regarded as drop outs from the system or those that are not intelligent enough to pass good examinations for entry into higher institutions such as universities. Olaitan (2010) defined TVET as education given to an individual in order to enable him or her to develop the creative and scheming potentials inherent in him or her for the use of man. According to Olaitan (1996) it is established that formal Western education in Nigeria started with vocational education when the first Europeans that came to Nigeria employed our ancestors as gardeners, laundry men, carpenters, cooks, stewards, tailors and even house builders etc. Although these new trades or occupation were not called vocational, they form a major part of what we know today as vocational education (Famiwole et al., 2012). Then these forms of skill training were given to the handicapped, physically or mentally retarded people. The missionaries provided them with training in handicraft, shoe-repair, broom-making, etc. This was a critical land mark in the development of vocational education because those that were handicapped were trained in skills and gainful occupations. Ever since, such trainings given were associated with the handicapped; and hence vocational education was therefore professed to be the education for the handicapped or mentally retarded individuals (Famiwole et al., 2012). As a result of this misconception, the meaning and definition of what vocational education is all about have not been clearly understood by majority of people. The assertion here, therefore, is that the confusion and problems encountered in vocational education in Nigeria today be it organizational, administrative, educational or otherwise; seem to emanate from the lack of understanding of the concept of vocational education and its purposes (Famiwole et al., 2012).

TVET is usually defined as the type of education that emphasizes the application of skills, knowledge and attitudes required for employment in a particular occupation or cluster of related occupations in any field of social and economic activity (Fien *et a*l., 2009). The role of training in human capital development for economic growth cannot be overemphasized. Nowadays, work place training is recognized as highly important while previously vocational education is now relegated to the background. However, there is strong argument that the skills needed in a developing country like Nigeria, especially in the development of indigenous products and in new processes, cannot be got through formal education, which further shows that TVET may be the primary contribution to poverty reduction and economic development efforts (Fien *et a*l., 2009).

TVET for education for sustainable economic development

To build and sustain economic development in third world countries, it is important to combine human capital (technical knowledge) with social skills (Wals, 2009). TVET is expected to equip the people with the life-skills necessary for the labour market and also to provide technical support to keep up with the fast changing market by expanding necessary skills and competencies. This type of education is seen as a means to ensure sustainable lifestyles and occupations through the development of knowledge and skills that can meet the needs for a specific position in the labour market and result in an overall improvement of the quality of life of people. The more sustainability concepts that workers are exposed to, the better chances they will have to increase their productivity at their workplace. This

orientation must be given at the start of a profession and continuous training must be done while in the profession in order to up-skill and retain workers (UNESCO-UNEVOC, 2009). For example, the UN's International Centre for Technical and Vocational Education and Training (UNEVOC) highlights the importance of TVET combined with education for sustainable development: *"The dynamics of the world of work, due to industrialisation and technological innovation, stress that TVET develops a skilled, committed and motivated workforce that understands how global changes impact upon local opportunities for business and industry and how these changes impact upon the quality of local social, economic and environmental conditions"* (UNESCO-UNEVOC, 2009).

Technical and vocational education and training systems

TVET systems are increasingly becoming recognized by governments as very important to economic development through their agenda on skills for the labour market. They are also seen as policy instruments for social inclusion, e.g. the poor and the uneducated (Basu, 1997). TVET is also recognized as an effective means of empowering young people to engage in productive activities to earn livelihoods (UNESCO, 2005). In this framework, TVET refers to deliberate interventions to bring about learning which would make people more productive in designated areas of economic activity e.g., economic sectors, occupations, specific work tasks (Lauglo, 2009).

Unfortunately, TVET has failed to achieve the level of social recognition that is needed to establish a profession in many countries. The reason for this may be connected with the fact that teaching has always had problems gaining professional recognition and has been referred to as a semi-profession (Etzioni, 1969). Attracting qualified staff into teaching and teacher training in technical and vocational education was a problem for most countries (including Nigeria), often because salaries and work ergonomics were better in the industry (Hostmark, 1988). To salvage the status quo, several countries had therefore taken steps to improve the salaries of this category of teachers. Some governments also allow technical and vocational education teachers to undertake consultancy services that may raise their capacity building of knowledge and skills, keep them up-to date, and supplement their incomes sufficiently to make them more satisfied with their salaries (Kerre, 1997). Hence, the employer plays a vital role in helping to meet the need of effective technical and vocational education and technical and vocational teacher education (UNEVOC, 1997).

Since the objectives of TVET were to raise the standard of formal education and to provide professional skills, teacher trainees should be given a more adequate cultural foundation (mother tongue, modern languages, social sciences, etc). There should also be more emphasis on pedagogical skills. This is not to say that TVET can substitute for effective classroom teaching, particularly in catering for the wide range of abilities and backgrounds characteristic of classes today (Banks, 1996). The problem of how technical and vocational teachers could best keep their professional skills up-to-date became more intractable with the increasing pace of technological change. In the extreme case teachers had to be totally re-trained because the profession changed radically or even disappeared (Newman, 1994).

One of the most profiting approach to make available in-service training for teachers was to give them direct industrial or commercial training and experience. This also had the advantage of raising teacher's motivation and self esteem. However, such industrial experience should not be too narrowly tied to a particular commercial product, and in-service training should be better linked with initial training. Therefore, it could be better to draw attention to the types of TVET teacher training and their qualifications (UNESCO, 2005; UNEVOC, 1997).

Categories of TVET teachers

The term teacher in vocational training and trainer in initial vocational training are used loosely to refer to two large occupational groups: the teachers, who work mainly in technical or vocational institutions, and the trainers, who work in firms or in non-academic training institutes (Cordova *et al.,* 1995). In Germany, teachers work mainly in technical or vocational schools, while trainers are skilled workers in enterprises, who provide trainees with the knowledge and practical skills required for an occupation (Schneider et al., 2009). According to Hortsch (1999) teachers can be divided into three groups as follows:

Teacher of theoretical lessons

This category gives theory and general job-related lessons in classes. The qualification for a teaching appointment of this kind is a course of study followed by an examination for a senior teaching appointment and a two years post qualification teacher training period (Cordova et al., 1995). The teacher here must be capable of imparting knowledge of sciences relevant to the subject being taught to the trainees, precise information on vocational practice is also required to enable the teacher to draw on the occupational experience of trainees and assess practical impact of the vocational theory that is being taught. According to Schneider *et al*. (2009) those teachers provide young people with the necessary subject-specific theoretical knowledge and with in-depth and extended general education in the

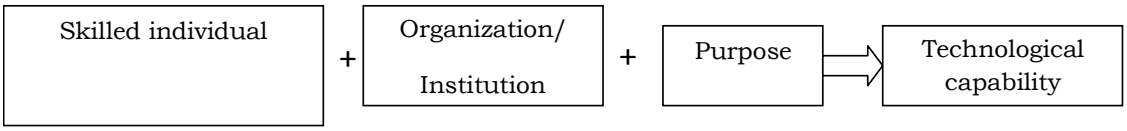

Figure 1. Technological capability building theory (Enos, 1991).

context of their future occupation. They teach both vocational subjects (e.g. metalworking techniques, electrical engineering, home economics, and healthcare) and general subjects (e.g. German, English, mathematics, politics, and physics).

Teachers of theoretical-inter professional teaching

Teachers have got special professional educational courses aimed at becoming a TVET-teacher – the concurrent model. Students choose already at the beginning of higher education TVET-teaching as their career and to be a TVET-teacher is the primary and maybe only aspect of these teachers' professional identity (Moos *et al.,* 2006). Their task is to provide young people undergoing in-company training with subject specific practical teaching.

Teachers teaching occupation-related practical subject

Hortsch (1999) described the third category of TVET teachers as mostly master craftsmen or technicians with additional further training imparting practical skills. They teach in industrial/technical and home economics schools and in business schools. In vocational schools (industrial/technical schools), state-examined technicians or certified masters are used to teach vocational practice. In home economics schools, specialized teachers teach home economics and crafts. In business schools, specialized teachers are trained to teach word processing and office management (Schneider et al., 2009).

Challenges facing the implementation of TVET in Nigeria and other developing countries

Some of the challenges facing implementation of TVET in most developing countries as identified by Famiwole *et al.* (2012) are:

i. Local governments' inability to prioritize community needs: Every community in Nigeria has so many problems per time e.g. unemployment, poor electricity, bad roads, lack of skilled labour etc. The available centres cannot take off with all these at the same time. Therefore, the standard suggested will be a guide to enable the community identifies the most essential in the short term, which they can conclude shortly, so as to generate fund for another project of a longer term. When these objectives are achieved within a definite period, all other programmes will be made functional.

ii. Lack of entrepreneurial spirit: It has been a difficult task to identify people with good leadership skills to manage the entrepreneur–oriented projects in Nigeria without politicking. Effective management of an occupational centre requires less politicking but high quality leadership, and entrepreneurial management skill by the administrator.

iii. Funding: The TVET centres in Nigeria are often underfunded. Since the project is community-based, the community as well as the government (through insurance cover on the equipment that could be used for training for production) should fund the TVET centres.

METHODOLOGY

The main methodical concept adopted for this study is based on what has been established in literature on technological capacity building. The development of a model brings a concept into focus as a model is a simplification of an abstraction. The build-up to the model employed for this research is developed from Enos' (1991) work where he stated that an individual with skills requires an organization or institution, and purpose to express himself. This has been expressed diagrammatically in Figure 1 with the output being technological capability (TC).

Enos' model for technological capability is adopted with some modifications. The modifications are in the form of adding Dropouts $D_1(t)$ as leakages apart from Death $D_2(t)$. This is premised on the assumption that it is not only death that may create depletions in the training of labour and stock of skilled labour. This model is shown in Figure 2.

Based on Figure 2, the various conditions governing the model output, TC, are expressed below.

If:

1. $M(t) - (D_1(t) + D_2(t)) > (D_1(t) + D_2(t)) = TC +$
2. $M(t) - (D_1(t) + D_2(t)) < (D_1(t) + D_2(t)) = TC -$
3. $M(t) - (\delta(t) + D_1(t) + D_2(t)) > (\delta(t) + D_1(t) + D_2(t)) = TC +$
4. $M(t) - (\delta(t) + D_1(t) + D_2(t)) < (\delta(t) + D_1(t) + D_2(t)) = TC -$
5. If $(D_1(t) + D_2(t)) = 0$

$M(t) - \delta(t) > \delta(t) = TC + M(t) - \delta(t) < \delta(t) = TC -$

The study focused on three states (Osun, Ogun and Lagos) in South-western Nigeria. These states were randomly selected. The main research instrument was a set of structured questionnaire designed to collect information from the targeted commercial

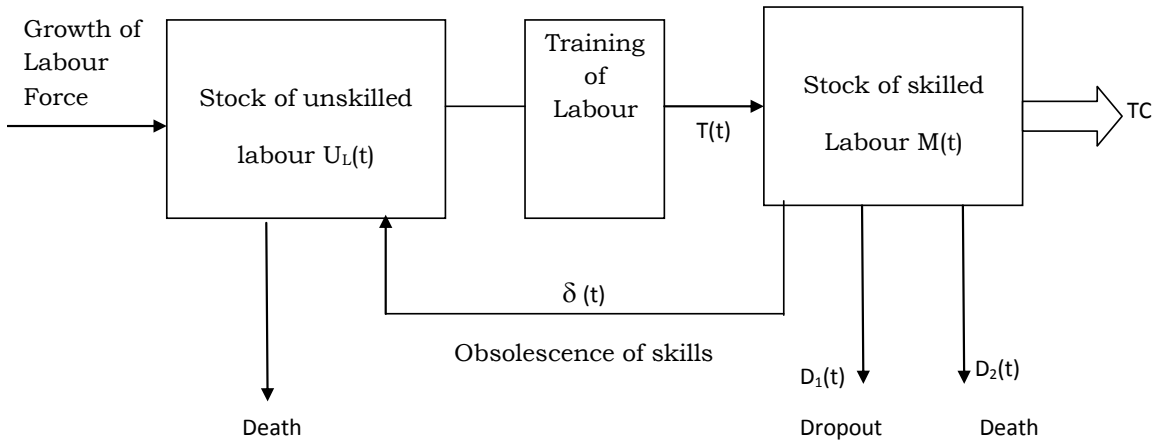

Figure 2. Model expressing the creation of technological capability (Modified after Enos (1991).

motorcyclists. Others included guided interviews and field observations. The questionnaire was designed to obtain information on the socio-economic backgrounds of the commercial motorcyclists, their educational/vocational backgrounds, duration of training in previous jobs, income in previous jobs versus income in commercial motorcycling job, and their reasons for leaving the vocations they were trained for. The data collected were subjected to content analysis and benchmarked with existing literature. A total of 500 questionnaires were administered on the commercial motorcyclists, randomly selected in the three states; a total of 355 questionnaires which were completed with accuracy were used in the analysis. Data were analysed using descriptive statistics.

RESULTS AND DISCUSSION

The empirical and qualitative findings of this study are discussed in this section. First, the socio-economic backgrounds of the respondents are outlined. Then, the empirical findings on their professional backgrounds and their income (in both present and past vocations/jobs) are discussed. These findings are based on detailed quantitative studies that draw extensively on the interview of commercial motorcyclists in the study area.

Table 1 shows that majority (above 85%) of the respondents which are all males fall below 40 years while very few of them (less than 15%) fall above 40 years. This study corroborates previous findings in Ibadan where it was discovered that about 73% of commercial motorcyclists fall below 40 years (Adesanya, 1998). This shows that the active population are heavily involved in commercial motorcycling which does not have so much knowledge addition for the economy. Table 1 further shows that about 8% of the respondents have at least a university degree (Master and Bachelor's Degrees), about 40% had above secondary school education while not less than 85% had primary school leaving certificates and above. This indicates that the bulk of the people, primarily youths, that are involved in commercial motorcycling are people who have some levels of absorptive capacity to be trained formally and/or informally for jobs with value addition in the informal sector. In addition, not less than 95% of the respondents indicated that they can read and write. This shows that a large proportion of the educated youths that are without office jobs are involved in commercial jobs that are of no value addition to the nation.

It can be deduced from the study that majority of the commercial motorcyclists were creative people who have been trained in various vocations. Table 2 shows that as many as 68% had learnt a trade or craft before embarking on commercial motorcycling; the period of learning the trade mostly ranging between 3 and 4 years. These respondents which now operate as commercial motorcyclists were formally engaged in trades and crafts such as auto-mechanic (25.88%), carpentry (14.12%), bricklaying (8.24%), painting (7.06%) and panel beating (5.88%). Only about 15.29% were formerly civil servants, an indication that majority (about 85%) were tradesmen or craftsmen before. Of these, more than half had graduated from their chosen trades or crafts while some left before the completion of their trades.

The main reasons for leaving their chosen trades were low income from businesses and lack of equipment (35.6 and 33.9%, respectively). These were closely followed by lack of business or clientele which accounted for about 2%. About 8% of the respondents indicated that they dropped out as a result of financial problems, 26.09% due to masters' highhandedness, while 10.87% left because they considered the trade difficult and a similar number left because they lost interest. The reasons why ex-civil servants left service were quite different; this was due to attainment of retirement age.

From the interviews conducted, it was found that majority (25.79%) of the part-time commercial motorcyclists were auto-mechanics, about 22% were carpenters, while as few as 14.47% were civil servants. In all, about 85% of the part-time operators were artisans,

Table 1. Socio-economic background of the commercial motorcyclists.

	Osun	Ogun	Lagos	Total	Total in %
Age					
Below 20	14	11	4	29	8.17
21-25	46	20	36	102	28.73
26-30	40	25	34	99	27.88
31-35	32	22	20	74	20.85
36-40	7	11	9	27	7.6
41-45	2	3	6	11	3.1
46-50	3	5	1	9	2.54
51-55	0	3	1	4	1.13
Total	144	100	111	355	100
Gender					
Male	144	100	111	355	
Female	0	0	0	0	
Educational Qualification					
Master's Degree	0	1	0	1	0.29
B.Sc/B.A./HND	8	10	8	26	7.43
NCE	9	7	3	19	5.43
Technical Certificate	9	2	4	15	4.29
Trade Test	0	0	0	0	0
Modern 3 Certificate	0	1	6	7	2.0
City and Guilds	0	0	0	0	0
WASSCE/NECO	72	42	41	155	44.29
JSSCE	14	25	27	66	18.86
Primary School	26	10	19	55	15.71
No formal education	3	0	3	6	1.71
Literacy					
Can Read	134	98	104	336	94.65
Cannot read	10	1	8	19	5.35
Can write	135	98	105	338	95.21
Cannot write	10	7	7	24	4.79

Table 2. Technical background of the respondents.

	Osun	Ogun	Lagos	Total	Total in %
Learning of a trade or craft before					
Those who have learnt	89	67	70	226	68.07
Those who have not learnt	48	28	30	106	31.93
Duration of Training					
1-2yr	2	16	10	28	13.08
3-4yrs	77	40	43	160	74.77
5-6yrs	6	8	11	25	11.68
Above 6yrs	1	0	0	1	0.47
Type of operator					
Full time	39	36	73	148	42.77
Part time	105	56	37	198	57.23
Full time Motorcyclists					
1.Kind of work engaged in before					
Civil Servants	0	5	8	13	15.29
Carpenter	6	3	3	12	14.12
Panel beater	0	2	3	5	5.88

Table 2. Contd.

	Osun	Ogun	Lagos	Total	Total in %
Mechanic	6	9	7	22	25.88
Auto-electrician	1	1	0	2	2.35
Battery Charger	4	0	0	4	4.7
Welder	1	1	2	4	4.7
Blacksmith	0	0	0	0	0
Vulcanizer	1	2	1	4	4.7
Bricklayer	2	3	2	7	8.24
Electrician	0	2	0	2	2.35
Aluminium worker	2	1	1	4	4.7
Painter	6	0	0	6	7.06
2. Graduate of trade or craft					
Graduated	29	10	12	51	57.3
Didn't graduate	10	18	10	38	42.7
3. Reasons for leaving trade					
Lack of tools/equipment	10	5	5	20	33.9
New technologies replaced old ones	0	0	0	0	0
Low income/ Lack of finances	7	7	7	21	35.6
Many competitors	0	1	1	2	3.39
No business to do	6	3	4	13	22.03
Work too difficult	0	2	1	3	5.08

Table 3. Respondents income in previous trade versus income as commercial motorcycling.

	Osun	Ogun	Lagos	Total	Total in %
Income/day (N) in commercial motorcycling					
100-500	1	7	16	24	10.53
600-1000	5	19	35	59	25.88
1100-1500	56	27	9	92	40.35
1600-2000	37	0	1	38	16.67
Above 2000	14	0	1	15	6.58
Income/day in former job					
100-500	5	19	6	30	19.35
600-1000	24	14	3	41	26.45
1100-1500	17	4	9	30	19.35
1600-2000	2	1	7	10	6.45
Above 2000	31	0	13	44	28.39

NB: N160 equivalent to US$1.

which is similar to the values obtained from full-time operators (Table 2). The prevalence of auto-mechanics as full time and part-time operators may not be unconnected with the advantage that their experience as auto-mechanics provides in economically maintaining their motorcycles especially in cases of faults and breakdowns. The interview also gathered that most (88.69%) of these part-time commercial motorcyclists were engaged in the business to augment their jobs.

Information gathered from the survey showed that the income generated by most (about 40%) of the commercial motorcyclists ranged from a daily income of between N1100 and N1500 (Table 3). This was closely followed by about 26% who generated between N600 and N1000 daily. Comparing these with income generated daily in former trades: about 19% generated between N1100 and N1500 while the remaining 81% generated less than N1000. This translates to the fact that about twice the percentage of commercial operators earned daily average wage of N1100 to N1500. The above fact is behind the drift from trades and crafts toward commercial motorcycling since there are quick

returns on a daily basis as majority (34.03%) of the non-owners also make between N100-N1500 daily. It is also not difficult to learn as many as 92% of the motorcyclists had experience averaging 3 years in commercial motorcycling; this is an indication of a fairly experienced group.

The drift from crafts and trades to commercial motorcycling is fast eroding the indigenous technology capacity of Nigeria. It can be predicted that the situation would have worsened by 100% in the next 5 years if there is no urgent government intervention to redress the situation.

Conclusion

The study showed that the active population are heavily involved in commercial motorcycling which may have little or no value addition for the nation's economy. Majority (85%) of the respondents had above a primary school certificate. This indicates the bulk of the people, primarily youths, that are involved in commercial motorcycling are people who have some levels of absorptive capacity to be trained formally and/or informally for jobs with value addition in the informal sector. Only about 15.29% of the respondents were formerly civil servants, an indication that majority (about 85%) were tradesmen or craftsmen before. The main reasons for the respondents leaving their chosen trades were low income from businesses (35.6%) and lack of equipment (33.9%) respectively. Consistent higher income may explain the drift from trades and crafts toward commercial motorcycling. However, the massive continuous drift from crafts and trades to commercial motorcycling will fast erode the indigenous technology capacity of Nigeria if there is no urgent government intervention.

RECOMMENDATIONS

There should be a clear mission and vision in articulating the role of VTE within the national education and training system. There should be a closer cooperation and greater collaboration between education and employment particularly self-employment in order to help the youngsters acquire the necessary skills from the onset. Entrepreneurship development should become part and parcel of tertiary institutions' curriculum. Teaching pre-vocational subjects in the primary and junior secondary schools should be taken more seriously to raise the interest of students for these vocational programmes. All stakeholders, especially those within the private sector, should provide more funds for the purchase of instructional facilities. The Educational Tax Fund should consider vocational education as a priority area for funding. Training and retraining of craftsmen should be well-established in the nation's education policy. There should be a stronger linkage between the knowledge institutions and the craftsmen. Also, an attractive wage regime should be worked out among the craftsmen to discourage the current drift. In addition, there should be less emphasis on certificates/examinations in implementing the curricula content of the various programmes. Acquisition of practical skills should be stressed on the final outcome.

REFERENCES

Adesanya A (1998). The use of motorcycles for public transport. The situation in Ibadan. NISER Monograph Series, No 6. NISER, Ibadan pp 57.

Asogwa O, Diogwu GO (2007). Vocational and Textile Education in Nigeria in the 21st century, J. Nigerian Acad Forum, 12 (2): Awka, National Association of the Academics.

Banks F (1996). Approaches and Models in Technology Teacher Education, an overview. J. Design Tech. Educa. 1 (3): 197-211.

Bennell P (1999). Learning to change: skills development among the economically vulnerable and socially excluded in developing countries, Employment and Training Papers 43. Employment and Training Department, ILO: Geneva.

Cordova PG, Melis A, Nixon K, Rümpker W (1995). Teachers and trainers in Vocational Training. Berlin: CEDEFOP.

Edukugho E (2004). "UNESCO tackles decline in technical, vocational education;" The Vanguard, Nov 25.

Etzioni A (1969). The Semi-Professional and their Organization. London: Collier-Macmillan.

Famiwole RO, Oke JO, Amadi NS (2012). Potentials of Vocational Technical Education: Empowering Youths and Vulnerable Adults for Poverty Reduction in Nigeria. J. Sci. Manage. 1(2):157-162.

Fasakin J (1999). The operational characteristics of the commercial motorcycles in Urban Nigeria – a bilateral analysis of a megacity experience and a township situation. J. Urban and Envl Research, Federal University of Technology, Akure (1): 1-18.

Fien J, Rupert M, Man-Gon P (2009). Work, Learning and Sustainable Development: Opportunities and Challenges. Dordrech: Springer.

Grootings P, Nielsen S (2006). Skills Development for Poverty Reduction. Lessons for policy learning in transition countries. ETF Yearbook 2006. Turin. European Training Foundation.

Grunwald E, Nell M, Shapiro J (2005). Projects / Programmes aimed at Economic Improvement and Poverty Alleviation through non-formal training in Sub-Sahara Africa, GTZ: Eschborn. June 2004 version.

Grunwald E, Nell M, Shapiro J (2004a). Towards Skills Development for Pro-Poor Growth: Enhancing the chances for gainful (self-) employment and improved quality of life, GTZ: Eschborn.

Grunwald E, Nell M, Shapiro J (2004b). Making the Case for Skills Development in the Context of Pro-Poor Development – Looking for Sustainable Approaches, GTZ.

Hostmark TA (1988). The Training of Teachers for Technical and Vocational Education, Council of Europe: Council of Cultural Cooperation, CC-TE (88)1. Strasbourg: Council of Cultural Cooperation, CC-TE (88)1.

Hortsch H (1999). Analysis the technical teacher training in Ethiopia-a study conducted in Nazareth Technical College in Ethiopia. Dresden, Germany: Technical University of Dresden.

ILO (2004). Global Employment Trends for youth. Information available in http://www.ilo.org/wcmsp5/groups/public. retrieved 09-06-2013.

IIEP (2006). Building skills for poverty reduction. IIEP Newsletter XXIV(3), July-September 2006, IIEP: Paris.

ILO (2005). Vocational training and skills development in the Poverty Reduction Strategy Papers - A preliminary review, Skills and Employability Department, ILO: Geneva.

Jin Y (2008). General or Vocational? The Tough Choice in the Chinese Education Policy, Int. J. Educa. Deve.8 (4) (July): 289-304.

Kerre WB (1997). Challenges and Prospects in the Training of Technical and Vocational Education Teachers/trainers in Africa. the International Round Table on Training of Teachers/Trainers in Technical and Vocational Education (pp. 67-75). Curitiba, Brazil:

UNESCO-UNEVOC.
King K, Palmer R (2006). Skills development and poverty reduction: the state of the art, Post-basic education and training working paper no. 7, Centre of African Studies, Edinburgh University.
Lauglo J (2009). Research for TVET Policy Development. NORRAG Conference on Policy Transfer or Policy Learning: Interactions between International and National Skills Development Approaches for Policy Making. Geneva: NORRAG.
Layode MI (1998a). Managing the urban transport problems in Lagos – Introduction of the motorcycle/3-wheeler. Seminar paper, Department of Urban and Regional Planning, Federal University of Technology, Akure, May 31.
Layode MI (1998b). Managing the urban transport problem – the introduction of public motorcycle in Lagos metropolics B. Tech. Essay, Federal University of Technology, Akure, pp 10-36.
Moos L, Cort P, Sorensen M, Laursen P (2006). Training of VET Teachers and Trainers in Europe -A Comparative Perspective. Frimodt. The Netherlands: the Danish University of Education and Rasmus Frimodt. The Danish Institute for Educational Training of Vocational Teachers.
Newman S (1994). 'The Council of Europe and Teacher Education'. In M. A. Galton, Handbook of Teacher Training in Europe: Issues and Trends. London: The Council of Europe and David Fulton Ltd.
Ogunsanya AA, Galtima M (1993). Motorcycle in public transport services in Nigeria: a case study of Yola town. In Ikya SG (Ed.) Urban Passenger Transport in Nigeria.
Olaitan SO (2010). The potential by Vocational and Te c h n i c a l E d u c a t i o n f o r empowering y o u t h a n d vulnerable adults with work-skills for poverty reduction in Nigeria: J. Voc. Edu. 1 (7): 1-8.
Olaitan SO (1996). Vocational and Technical Education in Nigeria: Issues and Analysis Onitsha: Noble Graphic Press.
Oranu RN (2010). Vocational and technical education in Nigeria; http://www.ibe.unesco.org/curriculum/AfricaPdf/lago2ora.pdf, retrieved August, 2013.
Schneider UH, Schober K, Toth B, Woll C (2009). The German Vocational Education and Training (VET) System 7th edition. BIBB. CEDEFOP.
Tripney J, Newman M, Hovish K, Brown C (2012). Post-basic Technical and Vocational Education and Training (TVET) Interventions to Improve Employability and Employment of TVET Graduates in Low- and Middle-income Countries. Available online at The Campbell Collaboration, www.campbellcollaboration.org Accessed 03 November, 2012.
UNESCO-UNEVOC (2009). TVET and ESD. http://www.unevoc.unesco.org/wiki.0.html?andno_cache=1andtx_drwiki_pi1 (Accessed 11 January 2013).
UNESCO (2010a). Education for All Global Monitoring Report 2010. Reaching and teaching the most marginalised. Paris: UNESCO.
UNESCO (2010b). Guidelines for TVET policy review. ED/ESB/TVET/2010/02. UNESCO.
UNESCO (2005). Skills for sustainable livelihoods- Implementing the UNESCO normative instruments concerning technical and vocational education and training. A Sub-regional Seminar for TVET Policy-Makers and UNEVOC Centre Coordinators. Nairobi, Kenya.
UNEVOC (1997). "Training of Teachers and Trainers in Technical and Vocational Education: major trends, issues and their implications. Curitiba, Brazil : UNEVOC .
Van Ark B (1992). "Vocational education and productivity in the Netherlands and Britain." National Institute Economic Review.
Wals A (2009). Review of Contexts and Structures for Education for Sustainable Development. Paris: UNESCO.

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Full Length Research Paper

Availability and adequacy of resources for skill acquisition in digital electronics repairs in the National Open Apprenticeship Scheme in Edo State, Nigeria

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This study was carried out to assess the availability and adequacy of provision of resources for skills acquisition in maintenance and repairs of digital electronics for the National Open Apprenticeship Scheme in Edo State. The study was guided by four purposes, from which four research questions were raised. The descriptive survey research design was employed for the study. The population of the study was 312. A sample size of 220 was drawn, which consisted of trainees, trainers and supervisors of the scheme. All the trainers were selected while proportionate random and convenience sampling techniques were used in selecting the trainees and supervisors respectively. A close ended questionnaire, validated by three experts with an alpha value of 0.74, was used for data collection. Simple percentage, mean and standard deviation were employed for data analysis. The findings showed that there are human resources for the scheme but tools and equipment are not sufficient as required, and are not provided at all by government in some cases. Recommendations were made, one of which is that state and local governments should unanimously join the federal government to run the scheme.

Key words: Skills acquisition, digital electronics, Technical and vocational education, technical-vocational skills.

INTRODUCTION

Skills acquisition is as old as the existence of man. Its usefulness is so imperative that it is meant to be acquired through the informal, non-formal and formal sectors. In every human endeavour there are skills acquisitions but the emphasis on skills acquisition in Technical and Vocational Education and Training (TVET) cannot be overemphasized, since it aims at producing individuals who can be self-reliant or be employable in one industrial business sector or the other.

Technical and vocational education and training is the comprehensive term used to describe the integration of the formal and non-formal sector of vocational education. The non-formal, as well as the formal sectors has specific skills, competencies and attitudes that the learners should acquire in order to survive the occupational trend in our society. According to Ogwo and Oranu (2006), the general skill training given in the study of vocational subjects enhances occupational mobility. Thus training obtained from TVET qualifies one to change from one occupation to another in order to face and withstand the existing unemployment situation in our society.

The situation of unemployment is Nigeria is on the increase such that many youths remained unemployed after graduation (Industrial Training Fund, ITF, 2007). In order to curb this ugly situation, the Federal Government of Nigeria made several attempts, with the introduction of some intervention programmes to help youths, both graduates and non-graduates acquire necessary skills

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for survival. One of such programmes established by the government is the National Directorate of Employment (NDE). The NDE is a federal government programme established to help curb or reduce the problem of unemployment. The NDE was established through a committee, which was under the auspices of the Federal Ministry of Employment, Labour and Productivity, appointed on 26th March, 1986 (Ekpenyong, 2011).

The recommendation of the committee led to the establishment of NDE on 22nd November, 1986. The scheme was officially launched on 30th January, 1987.

The objectives of the NDE, as identified in Adebisi and Oni (2012) are

1. To design and implement programmes to combat mass unemployment;
2. To articulate policies aimed at developing work programmes with labour intensive potentials;
3. To obtain and maintain a data bank on vacancies and employment agencies; and
4. To implement any other policy as may be laid down from time to time, by the Directorate.

As a federal government organization and agent toward the development of technical-vocational skills as a means to reducing youth unemployment, it has several schemes. Some of its core schemes and programmes include the National Youth Employment Programme, small scale industries and Graduate Programme, Agricultural Sector Employment Programme, Special Public Works Programme, Youth Employment and Vocational Skills Development Programme, and Rural Employment Programme (Akintoye, 2008; Ekpenyong, 2011, Adebisi & Oni, 2012).

The Vocational Skills Development Programme is meant to provide vocational and technical skills to unemployed graduates and non-graduates through the following schemes:

1. Resettlement Loan Scheme – meant to assist graduates with the necessary tools and equipment to start their own business
2. National Open Apprenticeship Scheme (NOAS)
3. Entrepreneurship Creation (Small Scale Enterprise)
4. School-on-Wheels – a rural version of NOAS meant to extend skills acquisition training programmes to unemployed youth in the rural areas through the use of well-equipped mobile training workshop
5. Trainer Capacity Upgrading – introduced to assist NOAS master trainers to equip their workshops with modern tools and equipment.

The NOAS aims at providing unemployed youths who could not transit into secondary and higher schools with basic skills that are needed in the economy. This is achieved by attaching them as apprentices (trainees) to professional craftsmen and women (trainers), under the supervision of NDE officials (supervisors/principals) (Youth Employment Inventory, YEI, n.d.). The YEI reported that the NOAS is a part of the National Youth Employment and Vocational Skills Development Programme and it provides vocational education and training to unemployed youth in over 100 occupations. According to YEI (n.d.) and Ekpenyong (2011) the NOAS is supposed to be based on 80 and 20 percent for practical learning and theory, respectively.

In order to provide the practical learning, the trainees are trained through the usual working days, while the theoretical learning is supposed to be taught in groups of allied trades centrally through Saturday Theory Classes (STC). The theoretical component of skills acquisition is provided in vocational training centres established by the various arms of the government. In line with that, the apprentices are also taught management, business and administrative skills to reinforce their understanding of the trades in which they are involved and to complement the practical training received.

The NOAS provides different trades, some of them include candle making, soap and detergent marking, foundry, metalwork fabrication, hair dressing, vulcanizing, carpentry, agricultural processing, printing and publishing, block and concrete making, butchering and cold storage, refrigeration and air conditioning, auto-engineering services, textile and garment making, entrepreneur training, welding, computer business, training/repairing and electrical and electronics repairs (Ekpenyong, 2011; Adebisi and Oni, 2012).

These skills are acquired from the non-formal sector where the trainees are attached to establishments belonging to government and private owners. The trainees are expected to be trained between the periods of six months to three years under a reputable master craftsman. The present growth in electrical/electronic technology necessitated the training needs for repairs in electronics products. Electronics are products and appliances which work on the principle of flow of electrons by the absorption or emission of electricity. Electronics can generally be classified into analogue, digital or photon. Most of the modern electronic products available in our country today are digital electronics which work on the principle of logic gates and make use of integrated circuits. According to Theraja and Sedha (2009), modern electronic products such as pocket personal computer (PC), personal digital assistant (PDA), MP3 players, digital cameras, digital camcorders, mobile phones, digital dictionaries and digital translators, compact disk (CD) players, digital versatile disk (DVD) player, Liquid crystal display(LCD) and Light emitting device (LED) televisions also make us of ICs extensively.

Statement of the problem

The functionality of electronic products is not eternal and

without breakdown. These circuits can breakdown through one or more of their components, hence the need for maintenance and repairs of these products when there is breakdown. This equally calls for manpower requirements for maintenance and repairs, and could be achieved through training and equipping students. Ogbuanya et al. (2009) and College Board (2008) explained that in electronics, students learn basic skills needed to operate, maintain, install and repair electrical and electronic equipment. It therefore means that the transfer of these knowledge, skills and attitudes requires resources for effective and efficient skill acquisition. This paper therefore focuses on resources available for digital electronics repairs such as mobile phone repairs, laptop/Desktop computer repair and LCD/DVD repairs, with emphasis on availability and provision of resources to acquire the skills needed to carryout repairs of the identified digital electronic appliances.

Purpose of the study

The main purpose of the study is to assess the level of availability of resources and how adequately the resources are provided in NOAS for skills acquisition in the repairs of mobile phones, LCD television/DVD and laptop/desktop computers. Specifically, the study intends to:

1. Determine the available resources for the repairs of digital electronics for the NOAS
2. Determine the extent to which tools and equipment are available at the training centres
3. Determine the extent to which tools and equipment are adequately provided at the training centres by NDE
4. Identify how often the scheme is supervised by NDE officials and supervisors

Research questions

The following research questions are raised to guide the study.

1. What are the available human resources in the area of repairs of mobile phones, laptop/desktop computer and LCD television/DVD?
2. To what extent are tools and equipment available at the training centres for the repairs of laptop/desktop computers, LCD television/DVD and mobile phones?
3. To what extent are tools and equipment adequately provided for the repairs of laptop/desktop computers, LCD television/DVD and mobile phones?
4. To what extent do NDE officials supervise the programme?

METHODS

This study employed descriptive survey design. This is suitable because it sought the opinion of the representative of the entire population with specific emphasis on NOAS of NDE in Edo State in order to describe the outcomes for generalization. The sample size of the study was 220 consisting of 147 trainees, 59 trainers and 14 supervisors drawn from a population of 312, consisting of 232 trainees (62 for mobile phone repairs, 74 for laptop/desktop computer repairs and 96 for LCD television/DVD repairs), 59 trainers and 21 supervisors. The proportionate random technique was adopted in selecting the trainees, while convenience sampling technique was adopted in selecting the supervisor. All the trainers were used as the sample. A closed ended questionnaire validated by three experts was used for data collection. The reliability of the instrument was determined using Cronbach alpha method and the alpha value obtained was 0.74.

The questionnaire used for this study was made up of two sections. Section one elicited demographic information, while section two was divided into three subsections, A, B and C. Subsection A was scaled Available More than Required (AMR), Available As Required (AAR), Available Lower than Required (ALR) andNot Available At-all (NAA). Subsection B was scaled Provided More than Required (PMR), Provided As Required (PAR), Not Aware if Provided (NAP), Provided Lower than Required (PLR) and Not Provided At-all (NPA). Subsection C was scaled Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD).The instrument was administered and retrieved personally by the researchers. The responses were scored and the data obtained were analysed using mean and standard deviation for the research questions.

Table 1. Percentage distribution of the human resources available for repairs of laptop/desktop repairs, LCD television/DVD and mobile phones.

Variables	Frequency	Percentage
Respondents		
Trainees	147	66.8
Trainers	59	26.8
Supervisors	14	6.4
Total	220	100
Job type		
Mobile phone repairs	52	23.6
Laptop/desktop repairs	71	32.3
LCD television/DVD repairs	97	44.1
Total	220	100

Source: field work.

RESULTS

The results of the data analysed in this study are presented in Tables 1, 2, 3 and 4.

Research Question 1

What are the available human resources to run the NOAS in the area of repairs of mobile phones, laptop/desktop computer and LCD television/DVD?

The results of Table 1 show the available human

Table 2. Mean and standard deviation of extent of availability of tools and equipment for the NOAS in repairs of mobile phones, laptop and LCD TV.

S/N	Tools and equipment	Mean	SD	Decision
1	Screw Driver	2.02	.337	ALR
2	Pliers	2.04	.268	“
3	Cutter	2.00	.262	“
4	Hard and Flexible Boards	1.94	.280	“
5	Multi-metres	2.68	.522	AAR
6	Soldering Iron	2.66	.474	“
7	Soldering Lead	2.60	.490	“
8	Lead Sucker	1.95	.228	ALR
9	Soldering Paste	1.97	.293	“
10	Testing Lamp	1.93	.253	“
11	Hand Drilling Machine/Puncher	1.95	.228	“
12	Allen Key/Torxy Driver	2.17	.421	“
13	Blower	1.96	.329	“
14	Brushes	2.09	.406	“
15	Spirit	1.98	.514	“
16	Magnifying Lens	1.45	.499	NAA
17	Laptop/Desktop Computer	1.11	.312	“
18	Table Lamp	1.61	.609	ALR
19	Microscope	1.13	..339	NAA
20	Hand Glove	2.01	.523	ALR
21	Board Holder	1.91	.439	“
22	Adjustable DC Power Supply	1.79	.408	“
23	Lamp Magnifier	1.29	.455	NAA
24	Battery Booster/Converter	1.22	.414	“
25	Forceps	1.77	.622	ALR
26	Copper Wire	2.55	.614	AAR
27	Unlocking Kits	1.42	.625	NAA
28	Rework/Fire Station	1.40	.584	“
29	Software Drives	1.09	.282	“
30	Signal Generator	1.04	.188	“
31	AC Generator	1.57	.496	ALR
32	Oscilloscope	1.03	.163	NAA

Source: fieldwork. Key: NAA is Not Available At-all, ALR is Available Lower than Require, AAR is Available as Required.

resources in skill acquisition in the repair of selected digital electronics in the NOAS in Edo State. The percentage of the respondents ranged from 6.4 to 66.8, while that of the number of human resource available in each job type ranged from 23.6 to 44.1. The trainee is 66.8 percent, trainer is 26.8 percent and supervisor is 6.4 percent. The table shows that there are 23.6, 32.3 and 44.1 percent of human resources in mobile phone repairs, laptop/desktop repairs and LCD television/DVD repairs respectively

Research Question 2

To what extent are tools and equipment available at the training centres for the repairs of laptop/desktop computers, LCD television/DVD and mobile phone?

Table 2 shows the extent of availability of the required tools and equipment for skills acquisition in the repairs of mobile phones, laptop/desktop computers and LCD/DVD. The mean ranged from 1.03 to 2.68, while the standard deviation ranged from .163 to .625. The table shows that the trainees, trainers and supervisors perceived the availability of the tools and equipment at the training centres as lower than required for some of the tools and the equipment, while few are not available at all to carry out the training, with respect to the number of trainees available for the scheme at each training centre. Few tools/equipment are however available as required.

Table 3. Mean and standard deviation of the extent of provision of tools and equipment for the NOAS in repairs of mobile phones, laptop/desktop computer and LCD television/DVD.

S/N	Tools and equipment	Mean	SD	Decision
1	Screw Driver	1.62	.701	PLR
2	Pliers	1.55	.664	“
3	Cutter	1.54	.636	“
4	Hard and Flexible Boards	1.42	.633	NPA
5	Multimetres	1.47	.705	“
6	Soldering Iron	1.39	.575	“
7	Soldering Lead	1.59	.594	PLR
8	Lead Sucker	1.30	.541	NPA
9	Soldering Paste	1.42	.592	“
10	Testing Lamp	1.40	.658	“
11	Hand Drilling Machine/Puncher	1.42	.654	“
12	Allen Key/Torxy Driver	1.58	.701	PLR
13	Blower	1.40	.636	NPA
14	Brushes	1.36	.560	“
15	Spirit	1.47	.672	“
16	Magnifying Lens	1.31	.555	“
17	Laptop/Desktop Computer	1.16	.428	“
18	Table Lamp	1.35	.580	“
19	Microscope	1.26	.524	“
20	Hand Glove	1.35	.590	“
21	Board Holder	1.24	.513	“
22	Adjustable DC Power Supply	1.25	.564	“
23	Lamp Magnifier	1.19	.487	“
24	Battery Booster/Converter	1.18	.449	“
25	Forceps	1.50	.692	PLR
26	Copper Wire	1.74	.794	“
27	Unlocking Kits	1.68	.689	“
28	Rework/Fire Station	1.21	.516	NPA
29	Software Drives	1.23	.552	“
30	Signal Generator	1.10	.338	“
31	AC Generator	1.70	.754	PLR
32	Oscilloscope	I.03	.162	NPA

Source: fieldwork. Key: NPA is Not Provided At-all, PLR is Provided Lower than Required.

Research Question 3

To what extent are tools and equipment adequately provided for the repairs of laptop/desktop computers, LCD television/DVD and mobile phones?

The results of Table 3 show the extent at which government, through NDE, provides the tools and equipment for the scheme at the various training centres, as perceived by the trainees, trainers and supervisors. The table shows that majority of the available tools and equipment are not provided at all by government to the training centres, while few of the available tools and equipment are provided lower than required. The results show that there is negligence on the part of government in the provision of tools and equipment to the private owners of the various training centres.

Research Question 4

1. To what extent do NDE officials supervise the programme?

The results in Table 4 show the extent of agreement by the trainees and trainers of the various training centres on the extent at which NOAS is supervised by the NDE officials. The mean response of the respondents ranged

Table 4. Mean and standard deviation of the extent at which NOAS is supervised by NDE officials.

S/N	Item statement	Mean	SD	Decision
1	Daily	1.38	.620	Disagree
2	Weekly	1.87	.717	"
3	Interval of two weeks	2.19	.751	"
4	Monthly	2.81	.751	Agree
5	Interval of six months	3.34	.766	"
6	Yearly	3.71	.766	"
7	When there is difficulties at the training centre	3.10	.658	"
8	During trainees graduation	3.68	.508	"

Source: fieldwork. Key: SD is Strongly Disagree, D is Disagree, A is Agree, SA is Strongly Agree.

from 1.38 to 3.71, while the standard deviation ranged from .508 to .766. The table shows that the programme is not frequently supervised. The respondents are in consensus that it takes relatively long before the supervisors visit the various training centres. Thus it may be inferred that scheme is not properly supervised.

DISCUSSION

The findings of research one reveals that there are available human resources in skills acquisition for the repairs of mobile phones, laptop/desktop computers and LCD televisions/DVD players in the NOAS of the NDE in Edo State. This agrees with the result of Adebisi and Oni (2012) which revealed that there are various schemes with available trainees and trainers in the various schemes of the NDE in South western Nigeria. It is important to state here that Edo State government, in conjunction with the federal government, has tried to encourage trainees to engage in the NOAS by paying their training fees.

The results of research question two revealed that tools and equipment are available lower than required at the various training centres. This means that fewer tools and equipment are sheared among many trainees to perform a job or task in their related job areas. This finding is in agreement with that of Enuku and Mgbor (2005) which showed that NOAS is still storm with the problem of resources, and therefore describe it as new wine in old wineskin. This result is also in consensus with the findings of Ogbuanya et al. (2010) which found that tools and equipment were not enough for teaching and learning of motor vehicle mechanic works at the technical colleges in south western Nigeria.

The findings of research question three showed that some tools and equipment are provided lower than required while others are not provided at all. The finding is in agreement with that of Ofor (2001), which shows that government does not adequately provide tools and equipment to run the NDE schemes for effective skills acquisition. Finally the results of research question four showed that the NDE supervisory officials do not frequently checkmate the activities that are going on at the various training centres, thus leaving more burden to the owners of the training centres in terms of supervising the trainees' activities.

CONCLUSION AND RECOMMENDATIONS

The need to reduce unemployment among youths has led to the establishment of NDE with NOAS as one of its schemes. This has made some individuals to find it relevant to serve as trainees and others trainers in this scheme to respectively acquire and transmit skills necessary for survival; however tools and equipment are not enough for the trainees and trainers to perform and achieve this beneficial task. The findings show that the available tools and equipment are usually provided by the trainers. This means that government on their own part has failed in ensuring that tools and equipment are made adequately available at the various training centres. Hence it can be concluded that the objective of NOAS is not being effectively attained since availability tools and equipment, where there are trainees, is the hallmark of the scheme to ensure effective skills acquisition in digital electronics maintenance and repairs.

As a result of that, the following recommendations are proffered in this study;

1. State and local government should support the federal governments to fund and finance the NDE schemes to provide adequate resources. This is because the benefactors of this schemes are closer to the state and local governments, and the federal government may not give better attention to the programme alone,
2. Federal government should involve competent non-governmental agencies in the NDE programmes to reduce negligence on the part of government as the NGOs' commitment may add significantly to the growth of this scheme; and

3. The trainers, trainees and NDE officials should be financially encouraged so as to motivate them in carrying out their duties diligently. If any form of financial or material benefit is available, it should be given without delay, but if not, it should be provided.

REFERENCES

Adebisi TA, Oni CS (2012). Assessment of relevance of the national directorate of employment (NDE) training programmes to the needs of the trainees in Southwest Nigeria. Int. J. Vocational Technical Educa. 4(3): 29-37. Available at http://wwwacademicjournals.org/IJVTE.DOI;10.5897/JVTE11.034.

Akintoye IS (2008).Reducing Unemployment through the informal sector: A case study of Nigeria. European Journal of Economic Finance and Administrative Sciences, 97-106. Available at http://www.eurojournalsn.com

Anaele E, Alade IA (2009).Availability and Utilization of Educational Resoruces in the Teaching and Learning of Technical subjects in Secondary Schools for Quality Assurance.Nigerian vocational J. 13(1): 39-47.

Enuku EU, Mgbor MO (2005). The national directorate of employment's open apprenticeship scheme in Nigeria: New wine in old wineskin? Education and Training, 47(4/5), 325-336. Available at http://www.uniben.edu/sites/default/files/abstracts/The_National_Directorate_of_Employments_Open_Apprenticeship_Scheme_in_Nigeria_New_Wine_in_Old_Wineskin.pdf

Ekpenyong LE (2011). Foundations of Technical vocational education: Evolution and practice for Nigerian students in TVE and adult education, policy makers &practioners, Benin City: Ambik Press.

Ofor B (2001). Evaluation of manpower requirement of the national directorate of employmentin F.C.T., Abuja (Master's thesis).University of Nigeria, Nsukka, Nigeria. Available at http://unn.edu.ng/sites/unn.edu.ng/files/unn.edu.ng/files/%5Buser%5D/OFOR_BONAVENTURE_%20A_2001_25359.pdf

Ogbuanya TC, Bakare PA, Igweh AU (2010). The level of availability of recommended tools and equipment for teaching motor vehicles mechanic works in technical colleges in South Western States, Nigeria. Nigerian Vocational J. 14(2): 92-103.

Ogbuanya TC, Ogundola PI, Ogunmilade JO (2010). The level of availability of recommended tools and equipment for teaching motor vehicles mechanic works in technical colleges in South Western States, Nigeria. Nigerian Vocational J. 14(2): 92-103.

Ogwo BA, Oranu RN (2006).Methodology in formal and non-formal technical/vocational education.Nsukka: University of Nigeria Press.

ITF (2007).Students' industrial work experience scheme (SIWES): Students guideline. Lagos: NEDRC

Theraja BL, Sedha RS (2009). Principles of Electronic Devices and Circuits: Analog and digital. New Delhi: S. Chand & Company Ltd.

Youth Employment Inventory, YEI. (n.d.).National Open Apprenticeship Scheme (NOAS). Available at http://www.youth-employment-inventory.org/inventory/view/177/

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Full Length Research Paper

Information and communication technology: The pivot of teaching and learning of skills in electrical and electronics technology programme in Nigeria

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The polymorphous nature of teaching and learning has contributed to the quest for skills delivery and acquisition at any place and pace. Teaching and learning of skills in electrical and electronics programme cannot be restricted to the traditional classroom settings, but should adopt favourable and acceptable technological dynamism. The inadequacy in the supply of facilities and qualified manpower perhaps has contributed to the need for skills delivery and acquisition in electrical and electronics programme through other technological means. One of such means found achievable is information and communication technologies (ICTs). This paper therefore reviewed ICTs as the pivot of globalizing teaching and learning of skills in electrical and electronics technology programme. The paper identified some of the skills in this programme, and ICTs that can be used to teach and learn the skills, by both normal and impaired teachers and learners. The findings from the survey questioning revealed that learners unavoidably support their teaching-learning situation with ICTs. It was therefore concluded that ICTs are pivot of teaching and learning of electrical and electronic skills.

Key words: ICTs, teaching, learning, skill, electrical and electronic technology, TVET.

INTRODUCTION

Education is meant to inculcate the adequate skills, values and attitude to the learners to enable them function effectively in a dynamic society. In the educational institutions, the process of acquisition of these attributes is teaching and learning. Every educational institution obviously cannot impart skills to learners without teaching-learning process. This makes teaching and learning one of the most important aspect of the educational institutions, of which technical vocational education and training (TVET) is one of such institutions.

There are various programmes in TVET and one of them is technical, industrial, industrial arts, technology or industrial technical education. These are related and can be used interchangeably as the same field of study. Industrial technical education is made up of different areas of specialisation. In all of the areas of industrial technical education, emphasis is placed on skills acquisition. Electrical and electronics technology is one of its areas of specializations. This area of specialisation in TVET (electrical and electronics technology) is one of the skills oriented programmes that must be acquired through teaching and learning (Bassauldo and Toby, 2004).

Electrical and electronics programme in TVET covers some content areas in electrical technology and in electronics technology. Some of these contents include *circuit theory and analysis, electrical installation, electrical devices and machines, digital logic circuits, electronic communication, semiconductor devices and circuits,*

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electrical and electronics drafting, integrated circuits, microprocessors, transistors, amplifiers and electronic instruments, just to mention a few. These content areas are made up of various tasks involving numerous skills which can be taught and learnt in the traditional classroom, laboratory/workshop or with the use of appropriate technologies.

Teaching should be understood as a polymorphous activity. Many think of it as an activity which ends up in the classroom (Offorma, 2002), but in the modern time and of its sincerity, teaching is beyond that. Therefore teaching involves the process of impartation of appropriate, functional and related skills to learners, in any form, place and/or time, to enable them function effectively towards meeting the demands of the dynamic society.

The central purpose of teaching is to effect desirable changes in the learner's behaviour, (Ogwo and Oranu, 2006). This desirable change is termed learning. According to Farrant in Aleburu and Olunsanya (2007) learning is a process by which we acquire and retain attitude, knowledge, understanding, skills and capabilities that cannot be attributed to inherent behavioural patterns of physical growth. Learning thus is the process of change in behaviour of an individual through the acquisition of appropriate and related functional skills to enable him or her function in and explore the society he or she lives. Skills learnt in electrical and electronics programme enable the learner to exhibit such related skills when the need arises for electrical and electronics tasks or challenges.

The teaching and learning of skills or contents in electrical and electronic technology programme of TVET cannot be achieved only through the traditional classroom setting. In Nigeria there are insufficient human and material resources to acquire desirable skills in electrical and electronic technology programme of TVET. For this reason, other means such as ICTs are very necessary because it helps learners irrespective of location and time. In addition, many electrical and electronics devices, tools, equipment and appliances are not produced in Nigeria, hence the need to support learners with ICTs without waiting until there is sufficient human and material resources to facilitate teaching of the programme.

Skills can be broadly seen as the ability to do something well. According to Osinem (2008) skill refers to expertness, practiced ability or proficiency displayed in the performance of a task. Those series of learned activities or acts requiring simultaneous or sequential coordinated pattern of mental or physical or both activities in relation to an object and other displayed information, usually involving both the preceptor and effector process in electrical and electronics can thus be referred to as skills in electrical and electronics programme. The cognitive (theoretical or abstract), affective (values) and psychomotor (practical) related skills can be taught through the internet, satellite, CD and DVD recorded videos.

The aforementioned technologies are termed information and communication technologies (ICTs). According to Wonacott (2001), the use of ICTs in distance education has resulted in a pedagogy, which is constructivist, collaborative and interactive, and that the increased use of ICTs in TVET has resulted in a major paradigm shift, from a total dependence in the objectivist paradigm to a growing adherence of the cognitivist and constructivist paradigm. ICTs therefore can serve as effective tools towards the enhancement of the quality and quantity of skills acquisition at any place and pace (Chinien, 2003).

Statement of the problem

Electrical and electronic technology in TVET programmes in Nigeria has suffered insufficient supply of and perhaps less competent human resources to impart the skills to the learners. The insufficient supply, non-functional and/or lack of material resources such as tools, equipment and workshop have also limited the extent of skill acquisition in electrical and electronic technology programme because the school system lays more emphasis on the traditional classroom setting. This study therefore critically x-rayed ICTs as the basic support for electrical and electronic students so far in skill acquisition.

Purpose of the study

The main objective of this paper was to critically review the ICTs that have influenced skills acquisition in TVET in general, and then imply them to skill acquisition in electrical and electronics technology. Secondly, this paper was meant to report the survey of the opinion of electrical and electronic TVET students in Nigeria on the valuable support of ICTs to their skill acquisition.

REVIEW OF LITERARTURE

Information and Communication Technologies (ICTs): An Overview

Networking of computers gave birth to information technology (IT), and UNESCO considered IT as scientific, technological and engineering disciplines and management techniques used in information handling and processing, their applications, computers and their

interaction with men and machines, and associated social, economic and cultural matters (Sansanwal, 2009). IT was only limited to the textual mode of transmission of information (Sansanwal, 2009), and it is usually done with ease and fast. As a fact, the need for other means of transmission of information was explored because the transmission of information is not limited to textual form but also in audio, video or any other media or a combination of two or more of these forms. Individually, there are technologies for transmitting different information, but a good combination can be used to transmit data in order to give them better meanings and clear pictures. This means that ICTs = IT + other media (Sansanwal, 2009).

ICTs have their application in different areas of life. Oladipupo and Ilaboye (2006) identified areas where ICTs are applicable in human endeavours, and such areas include business, science, research, engineering, office automation, accounting, medicine and education. In the field of education, ICTs have played significant roles in virtual libraries, teaching, learning and research. Ogunsola (2005) asserted that apart from acquisition and absorption of knowledge, ICT could offer developing countries unprecedented opportunities to change educational systems, improve policy formulation and execution, and widen the range of opportunities for business and for the poor.

The dramatic nature of application of ICTs in education has made teaching and learning accessible anywhere, any place and any time. These technologies have made teaching and learning very flexible, irrespective of the nature of the learners, regarding their cognitive and learning styles (Chinien, 2003). Imel (1998) identified four different applications of ICTs in adult education, and these are technology as curriculum, technology as delivery mechanism, technology as a complement to instruction and technology as instructional tool. These applications of ICTs in education indicate their abilities to be used for teaching and learning cognitive, affective and psychomotor skills.

There are varieties of technologies that can be used in TVET, especially in electrical and electronics technology, to impart skills to learners. Some of these tools as identified by Chinien (2003) include audio-cassette tapes, radio, videotapes, compact disc read-on-memory, CD-ROM and digital versatile disc, DVD, internet, audio-conferencing, audio-graphics, interactive television, videoconferencing, satellite, interactive white-board, closed circuit television (CCTV), telephones. Majority of these tools are computer or internet based, and can be enhanced with the aid of software to enable both the normal and disabled learners acquire skills.

Software is a set of related programmes, and with it we turn the computer the servant of man in almost every profession (Onibere, 2011). In use, software can be classified as system software and application software. In most cases, the application software cannot function without the system software.

Examples of software that can be used for teaching and learning of electrical and electronics skills are *voice recorder, speech recognition, Microsoft Word, CorelDRAW, Adobe Reader, facebook, e-mail, skype, starboard, caspoc* - for power electronics, *Bin Hex Dec Converter*- for converting binary to hexadecimals in digital electronic circuits, *proteus*, *circuit maker* or *electronic workbench*-for design of electronic circuits, and *auto-cards*-for electrical drafting.

Skills in electrical and electronics technology

The teaching-learning process classification of skills is usually based on cognitive, psychomotor and affective. Skills can however be classified as basic, cognitive, psychomotor or manipulative, technical, human, conceptual, marketable, adaptive, occupational, transferable and/or process.

Ogbuanya and Ohanu (2010) stated that when one possesses adequate skill in carrying out a task, he/she does the work accurately within the minimum possible time and the work will always attract the attention of people.

The acquisition of skills in electrical and electronic technology programme should be supported with sufficient ICTs in order to widen the skill-horizon of both teachers and students

Some of the skills required in electrical and electronics technology include ability to define basic concepts in electrical and electronics, apply appropriate formulae in electrical and electronic calculations, read and interpret electronic schematics and wiring, may be regarded as cognitive skills.

The skills that can be regarded as psychomotor skills include assembling, or installing electrical and electronic devices and systems, designing logic circuits, identifying appropriate tools, equipment and materials for a specific task, installing satellite dishes, using test instruments to read the numerical values of components, voltages, current and resistance, applying appropriate trouble shooting techniques, e.g. in televisions, connecting electric machines to power source, connect cells in series, parallel and series-parallel, disassembling electrical or electronic devices or systems, e.g. mobile phones. Skills such as ability to avoid horse play when working in the workshop, ability to avoid the use of unkempt hairs in the workshop and using the right workshop wears and goggles can be regarded as affective domain (Ogbuanya and Ohanu, 2010; Ogbuanya, 2009; Theraja and Sedha, 2009; Bassauldo and Toby, 2004).

Teaching and learning of skills in electrical and electronics technology

The teaching and learning of skills in electrical and electronics technology programme can be achieved in the formal, non-formal and informal settings, but these skills are commonly acquired through formal and non-formal education. ICTs can also serve as support in order to bridge the gaps that might have been created in the technical competency of both teachers and learners, irrespective of the type of education (formal or non-formal). It is equally taught and learnt by both normal and impaired students, even old and young. In the non-formal setting, these skills are acquired through apprenticeship programme, and thus require more psychomotor and affective skills but little or no emphasis is laid on cognitive skills.

According to the Federal Government of Nigeria (FGN, 2004), non-formal education is all the form of functional education given to youths and adults outside the formal school system such as functional literacy, remedial and vocational education. It is linked with community groups, training institutions and other organisations (Ogwo and Oranu, 2006). In this system, electrical and electronics skills are learnt under a short term, and it is specific. One of such bodies through which such skills can be acquired in Nigeria as non-formal is the National Directorate of Employment, NDE.

Electrical and electronic skills are equally taught and learned in the formal educational system. This is where emphasis is placed not only on cognitive skills but also on psychomotor and affective skills. Here the skills are learnt in long term, and it is specific. Anetoh in Ogwo and Oranu (2006) referred to formal Technical Vocation Education, TVE, as the systematic training and instruction especially of the young learners in schools and colleges. Though the demand for formal education system is high, the increasing failure of it in terms of practical skills in Nigeria has made members of the society to still rely on skills of the non-formal system in electrical and electronic devices maintenance and repairs. If formal education is highly supported with ICTs and other necessary variables, large number of Nigerians will rely and depend on its graduates for services.

It is important to note that be it formal or non-formal, the teaching and learning of psychomotor and affective skills involve stages or processes. These stages can be achieved with appropriate and related ICTs. For teaching and learning of psychomotor skills, Chinien (2003) identified five main categories of taxonomy or approaches to be adopted. These approaches in turn influence the choice of selecting the appropriate ICTs for teaching psychomotor skills. The approaches include;

1. Imitation: the learner goes through a period of trial and error to perform an act.
2. Manipulation: the learner continues to practice to attain some level of proficiency.
3. Precision: the learner continues to practice to attain the competency required.
4. Articulation: the learner attains higher level of competency to solve problems.
5. Naturalization: the learner reaches a stage where response is automatic.

The teaching and learning of affective skills, e.g. safety rules, also takes five approaches, which are democratic approach, indoctrination approach, group discussion, dramatic involvement and role modelling (Chinien, 2003). A better understanding of these approaches enhances appropriate choice of ICTs for the teaching and learning of skills in electrical and electronics, as a good selection of the ICT gadgets will help to effect teaching and learning notwithstanding the nature of the teacher and the learner, the location and the time.

METHODS

This paper reported the literature analysis of ICT for skill acquisition in TVET, with the researchers' contributions on their implication in electrical and electronic technology. A survey questioning was also employed in order to reconcile the opinion of the students with literature analysis. Five basic questions were used for the survey.

RESULTS AND DISCUSSION

ICTs for teaching and learning of skills in electrical and electronics technology

Many ICT tools exist for teaching and learning of skills, and these include audio-cassette tapes, radio, video, DVD, CD-ROM, internet and assistive technologies such as CCTV, optical character recognition (OCR), text enlarger software and voice recognition software, to mention a few of them. Some of the ICTs and their applications in the teaching and learning of these skills, with their implication in electrical and electronic technology, are as follows:

1. Audio-cassette tapes can be used extensively in teaching and learning of some kinds cognitive skills (Perraton et al., 2002). It can equally be applied in affective domain but its use in psychomotor skills has great restriction. Nunes and Gaible (2002) affirmed that it is difficult to present complex concepts using tapes. Recorded information in audio-cassette can be uploaded to the internet for accessibility. Skills in electrical and electronics, such as definition of concepts and stating safety rules, recorded in an audio-cassette and uploaded

to the internet can be accessed by any learner. The use of *voice recorder* software in the computer can serve similar purpose as audio-cassette tapes.

2. Video tapes and DVD are good ICT tools for teaching and learning. They can be applied in teaching and learning of skills (Hampton, 2002). Just like the audio-cassette, information recorded with video tapes and DVD can be accessed online, depending on the format in which the information is uploaded and/or the software needed to access the information, for instance the use of you-tube. Video-tapes and DVD can help to give detailed steps of performing a task since they have the capacity of storing relatively large amount of information. Skills such as definition of concepts, design of circuits, and workshop safety rules in electrical electronic technology programme can be taught and learnt through these tools, even when uploaded to the internet.

3. Radio is one of the oldest technologies used for distance education and it can be used to broadcast programmes. It can be used to create interactive mode (Oujo, in Chinien, 2003). Hence it can be used for teaching and learning cognitive skills and attitudinal issues. Radio programmes, live or recorded, can be uploaded to the internet and then listen to by the users by using the web address that will facilitate the accessibility, e.g.www.bbc.co.uk if one wants to listen to education programmes in the internet.

4. Interactive White Board is usually used along-side a computer system and a projector to teach in a classroom. The lesson can be recorded (textual and audio) and saved for future purposes. It can be used for effective teaching of cognitive skills. Recorded information from the interactive white board can be transformed into DVD or video or even uploaded to the internet. The software that facilitates this operation is the *starboard*. Information in electrical and electronic technology can be saved with the aid of interactive white board in order to revisit the information or uploaded to the internet.

5. Television is another old type of technology for teaching and learning. It can be used as interactive television where instruction occurs over broadcast television (Chinien, 2003). Television can be effective for teaching and learning cognitive, affective and psychomotor skills in electrical and electronic technology. Television programmes can equally be accessed through the internet using appropriate address, e.g. www.cnn.com. Gbadebo et al. (2011) found that the amount of time spent on viewing television influences students' academic performance.

6. Telephone is another ICT tool for teaching and learning. It is a good interactive medium for acquisition of cognitive skills. In recent time, Nigerian students use telephone to discuss both abstract and concrete concepts. Three or more students can engage in conference calls for teaching and learning of electrical and electronic skills to take place

7. Audio-conferencing is another technology that allows two-way, real-time communication between instructors and learners through audio (Steven, 2001). This medium can be used for teaching and learning cognitive and affective skills in electrical and electronic technology programme.

8. Audio-graphics is essentially audio conferencing accompanied by visual and graphical aids (Chinien, 2003). There is limitation of its application to teaching and learning psychomotor skills but it is applicable in teaching and learning of cognitive and affective skills. This tool can be used to show a designed circuit diagram e.g. logic circuits in electrical and electronic technology.

9. Video-conferencing allows for individuals in different locations to see and hear each other in real-time through its equipment (Steven, 2001). This tool in combination with other media can enhance acquisition of skills (Perraton et al., 2002). Attitudinal skills, cognitive skills and psychomotor skills in electrical and electronics technology can be acquired through video-conferencing.

10. Simulation is a computer based instruction. This may be used to demonstrate psychomotor and affective skills. Simulation lectures can be uploaded to the internet to enable leaners access it. It is a tool that can show detail step by step of performing practical tasks. Skills such as connection of electric machines to power source, assembling and disassembling of devices, and safety rules while working at the workshop can be taught and learnt through this means.

11. Assistive technologies are computer based software that enhance teaching and learning to disabled or impaired learners. They include braille systems, screen reader and voice synthesizers, OCR, CCTV, text enlargement software, voice recognition software, keyboard alternatives, mouse alternatives, on-screen keyboards and teletypewriter (Australian National Training Authority, ANTA, 2002).

12. Internet is a computer based technology which is apparently more versatile probably because it can be used to disseminate information or perform tasks of the other technologies. Onugha (2009) stated that the internet is a vast resource for learning, and it operates on the principle of World Wide Web (www). It can be accessed by users anywhere provided there is availability of server. Its importance is far reaching that every human endeavours tend to depend on it for information processing, transmission and reception. The internet incorporates so many of the software for teaching and learning of affective, cognitive and psychomotor skills in electrical and electronics technology.

Obviously, these technologies can be used to teach and acquire skills at anyplace and pace, especially in electrical and electronic technology programme. The review analysis shows that face to face interaction

Table 1. Percentage distribution of responses from survey questioning.

Survey questions	Collated responses	
	Yes; F (%)	No; F (%)
Do you rely only on classroom/laboratory for learning any skill in electrical and electronic technology? And What are the ICTs you employ for learning elect/elect skills?	17 (63.0)	10 (37.0)
Radio programmes	-	27 (100)
Television programmes	6 (22.2)	21 (77.8)
Satellite programmes	8 (29.6)	19 (70.4)
CD, DVD videos	5 (18.5)	22 (81.5)
Use of internet	23 (85.2)	4 (14.8)
Multimedia	21 (77.8)	6 (22.2)
Do you learn abstract concepts in electrical and electronic technology through ICTs? and	19 (70.4)	8 (29.6)
Which of the following do you prefer to learn practical skills in electrical and electronic technology?		
Classroom/workshop interaction with the teacher	16 (59.3)	11 (40.7)
The use textbooks	5 (18.5)	22 (81.5)
The use of ICTs	10 (37.0)	17 (63.0)
Combination of two or more	24 (88.9)	3 (11.1)
Do you consider learning workshop safety/other affective domain in electrical/electronic technology through ICTs necessary?	17 (63.0)	10 (37.0)

between the teacher and the student cannot be completely replaced by ICT alone, but a combination will produce a better result in terms of skill acquisition. It can therefore be derived that ICT is unavoidable pivot of teaching and learning of skills in electrical and electronic technology programme. Though limitations exist in their use and accessibility, their benefits in skills acquisition cannot be over-emphasized.

The analysis of the responses collated from the survey questioning

The data collated from the survey questioning were analysed with frequency (F) and simple percentage (%). The results are presented in Table 1.

The results of Table 1 show that 27 electrical and electronic learners of TVET programmes were surveyed, and the results show that the student make use of ICTs for learning skills in electrical and electronic technology programme, though face to face interaction with the teacher in the traditional classroom/workshop and the use of textbooks cannot be ruled out in learning such skills. The results show that a combination of ICTs and other means makes learning effective. This paper therefore reports that ICTs serve and will continue to serve as pivot of teaching and learning of skills in electrical and electronic programme.

CONCLUSION AND RECOMMENDATIONS

Skills in electrical and electronic technology programme of TVET are so vast that a traditional classroom or workshop cannot serve as the only means through which such skills should be taught and learnt. Learners (normal or impaired) in Nigeria are faced with the challenges of insufficient resources, hence the need to up-date their knowledge beyond what is learnt in the classroom or workshop.

This paper therefore concludes that in order to improve the skills, knowledge and attitude of teachers and

learners in electrical and electronic technology programme of TVET, ICTs are unavoidable tools. These technologies have proved to be the supportive device of learners irrespective of their classroom or workshop exposures in terms of skill acquisition in electrical and electronic technology. ICTs are therefore indispensable tools in education.

Based on the foregoing, the following recommendations are made;

1. The use of video should be encouraged in teaching and learning of any kind of skill since it is cheaper, made up of visual and audio and can be uploaded as you-tube,
2. Every academic staff in the tertiary institutions of learning should develop internet lectures so that students can access information through the institution's website or other means.

REFERENCES

Aleburu JO, Olusanya RN (2007). Use of ICT to Enhance Teaching and Learning of Technical and Vocational Trades In Primary Schools. Available at http://www.devilfinder.com

Australian National Training Authority (ANTA) (2002). Strategies 2000, Access and Equity in Online Learning. Report on Assistive Technologies for Online training Delivery. Available at http://aflr.flexiblelearning.net.au/pdf/product_dev_plan_guide_2002.pdf

Bassauldo EA, Toby TU (2004). Instructional Development and Methods in Trades and Industrial Education. New York: Health and Company Publishers.

Chinien CO (2003). Analysis Survey: The Use of ICTs in Technical and Vocational Education Training.UNESCO Institute for Information Technologies in Education. Available at http://www.devilfinder.com

Federal Government of Nigeria (FGN) (2004). National Policy on Education (4th ed). Lagos: NERDC Press.

Gbadebo CT, Babayeju AA, Obalowu MA (2011). Influence of Television on Academic Performance: A Case Study of Senior Secondary School Students in Kaduna State. J. Educa. Health Technol. Res. 1(1): 12-20.

Ogbuanya TC (2009). Energy and Technology of Home Appliances. Enugu: Cheston Ltd.

Ogbuanya TC, Ohanu IB (2010). Entry level Skills Required by Technical College Electrical Graduates in Electrical Installation Trade. Nigerian Vocational Association J. 15(1): 342-352.

Ogunsola LA (2005). Information and Communication Technologies and The Effect of Globalization: Twenty-first Century "Digital Slavery" for Developing Country- Myth or Reality? Electronic Journal of Academic and Special Librarianshi, 6(1-2). Available at http://www.devilfinder.com

Ogwo BA, Oranu RN (2006). Methodology in Formal and Non-formal Technical/vocational Education. Nsukka: University of Nigeria Press Ltd.

Oladipupo AO, Ilaboye, OJ (2006). Information and Processing System: Theory and Practices. Benin City: Mindex Press.

Onibere EA (2011). Software: The Changing Changer. Inaugural Lecture Series 119, October 20, University of Benin. Benin City: University of Benin Press.

Onugha IU (2009). Internet-aided literature review. In E. U. Anyakoha (Ed), Developing Research Skills: Concepts and Conceptual Framework (pp. 69-84). Nsukka: Great AP Express Publishers Ltd.

Osinem EC (2008). Managing Agricultural Education and Training: Resources, Principles & methods. Enugu: Belony International Publisher.

Sansanwal DN (2009). Use of ICT in Teaching - Learning & Evaluation. Available at http://www.devilfinder.com

Sharrifudin RS, Mislan N, Wong CK, Julia GCH (2011). Teaching Psychomotor Skills with E-sports Courseware. International Journal of e-Education, e-Business, e-Management and e-Learning, 1(4). Available at http://www.ijieeee.org/papers/048-Z0045.pdf

Steven D (2001). Distance Learning for Technical and Vocational Education in Sub-sahara Africa. Available at http://www.gtz.de/wbf/bibliothek/detail.asp?number=1431

Theraja BL, Sedha RS (2009). Principals of Electronic Devices and Circuits: Analog and Digital in S.I. units. Ram Nagar. New Delhi: S. Chand and Company Ltd.

Wonacott ME (2001). Keeping Vocational/career-technical Education Current Trends and Issues Alert. Available at http://ericacve.org/ocgensp?tbl&ID=145

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Full Length Research Paper

Students' academic performance in the transition period before choosing areas of specialization in Nigeria Certificate Education (Technical) programme

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The study examined the level of academic performance in the compulsory and related courses offered by all the students in technical education during the transition period of the first and second years of a three years NCE Technical programme before choosing their area of specialization. The study comprises 237 students: 22 Automobile students; 8 Building students; 21 Electrical/Electronics students, 24 Metalwork students and 4 Woodwork students admitted into year one in 2002/2003, 2003/2004 and 2004/2005 academic sessions and who transited to third year of NCE (Technical) programme in 2004/2005, 2005/2006 and 2006/2007 academic sessions, respectively. Data consisted of raw examination scores of 20 compulsory and related courses offered by all the students. The arithmetic, F-test (one-way ANOVA) and the Scheffe's test were used to analyze the data. The study established that, the Electrical/Electronic students performed better than their counterparts in Automobile, Building, Metalwork and Woodwork, and the academic performance of the five groups of students differed significantly.

Key words: Academic, performance, transition, specialization, technical, automobile, building, electrical/electronics, metalwork, woodwork.

INTRODUCTION

The Nigeria Certificate in Education (NCE) Technical Programme is a three-year post-secondary education aimed at providing technical teachers with the intellectual and professional background adequate for teaching technical subjects and making them adaptable to any changing situation in technological development (NCCE, 2008). There are basically five departments namely Automobile, Building, Electrical/Electronics, Metalwork and Woodwork Technology (NCCE, 2008). The technical teachers produced from this programme are expected to offer all the courses listed in the first and second years of the programme from all the five departments in Technical Education. The purpose is to enable the students acquire a basic knowledge of all the course in the various departments which they shall later teach in either the junior secondary school or junior technical colleges as introductory technology. The junior secondary school or junior technical college is the first three years of a post-primary school programme of six years. However, in the third year, the students shall specialize in their departments or transfer to any other department in the School of Technical Education based on the performance of the students in the related courses leading to an area of specialization to enable them fit into a profession in the industry. For the purpose of this study, the first two years of the three years NCE Technical programme where a

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student may decide to continue in the department he/she was initially admitted or transfer to any other department based on academic performance is the transition period.

The students in the five different departments (Automobile, Building, Electrical/Electronics, Metalwork and Woodwork Technology) were taught all the listed compulsory courses during the first and second years of the NCE (Technical) programme even though they were admitted into the various departments. It is therefore assumed that, all the students had equal exposure to the listed courses and therefore, their performance in the related compulsory courses offered together in the transition period was not expected to differ significantly.

From the foregoing, researcher became interested in finding out how these five groups of students (Automobile, Building, Electrical/Electronics, Metalwork and Woodwork Technology) would perform academically in the listed compulsory courses during the transition period of the first and second years since transfer to any other area of specialization depends on performance in the related courses. Further, the study became relevant considering the fact that, qualitative technical teachers are the pivot of any technical education. Therefore, the level of academic performance of students going through the NCE (Technical) Programme is an index of the quality of technical teachers in the system (Ihiegbulem, 1992).

Purpose of the study

The purpose of the study is to find out:

1. the level of academic performance of the groups of students in five departments in the listed courses offered together in the first and second years, and are used for this study.
2. whether the academic performance of the five groups of students in the listed courses offered together in the first and second years shall differ significantly.

Research questions

The study shall find answers to the following research questions:

1. What are the levels of academic performance of the five groups of students in the listed compulsory courses offered together in the first and second years?
2. Will the level of academic performance of the five groups of students in the listed compulsory courses offered together in the first and second years differ?

Based on the above research questions, a null hypothesis was postulated thus: there is no statistically significant difference in the level of academic performance of students in Automobile, Building, Electrical/Electronics, Metalwork and Woodwork Technology in the listed compulsory courses offered together in the first and second years of the NCE Technical programme.

RESEARCH METHODOLOGY

The research was a descriptive survey, and was conducted in School of Technical Education, Federal College of Education (Technical), Omoku, Rivers State, Nigeria. The School of Technical education has five Departments namely: Automobile, Building, Electrical/Electronics, Metalwork and Woodwork Technology.

List of courses used for the study

A total of twenty (20) courses which were taught in the transition period of year one and two in the NCE Technical programme were use for the study. The choice of the listed courses was made because they are the core technical and related courses offered by all the students in the five departments. Table 1 shows the distribution of the courses according to semesters and year of study.

Population and sample

The study population comprises all the students admitted in the School of Technical Education in 2002/2003, 2003/2004 and 2004/2005 academic sessions who are expected to transit to third year in their departments or to transfer to other departments of their choice based on academic in choose an area of specialization in 2004/2005, 2005/2006 and 2006/2007 academic sessions respectively. A total of two hundred and sixty-nine (269) students were admitted within this period as indicated in Table 2.

The number of students who transited year three to choose their areas of specialization are shown in Table 3. A total of two hundred and thirty-seven (237) students who were in their third year of NCE (Technical) programme in 2004/2005, 2005/2006 and 2006/2007 academic sessions were selected for the study. The selection was done alphabetically for the five groups of students according to how the names appear in the mark and attendance register for convenience. That is, Automobile, 22; Building, 8; Electrical/Electronics, 21; Metalwork, 24; and Woodwork, 4.

Data collection

The data for the study were collected as follows:

1. All the students admitted in the 2002/2003 academic session who are expected to be in their third year in 2004/2005 session had their raw examination scores obtained for 2002/2003 (first year: first and second semesters), and 2003/2004 (second year: first and second semesters).
2. All the students admitted in the 2003/2004 academic session who are expected to be in their third year in 2005/2006 session had their raw examination scores obtained for 2003/2004 (first year: first and second semesters), and 2004/2005 (second year: first and second semesters).
3. All the students admitted in the 2004/2005 academic session who are expected to be in their third year in 2006/2007 session had their raw examination scores obtained for 2004/2005 (first year: first and second semester), and 2005/2006 (second year: first and second semesters).

Data analysis

Data were analyzed by calculating the mean scores of the students

Table 1. Distribution of listed courses.

Year one	Year two
First semester courses	First semester courses
TED 111- Introduction to metalwork	TED 211- Foundry and forging
TED 112-Introduction to woodwork	TED 212-Machine wood working I
TED 113-Introduction to electrical /electronics	TED 213-Electrical circuits and electrical measuring instruments
TED 114-Introduction to building construction	TED 214- Construction methods I
TED 115-Introduction to automobile	TED215-Auto braking, suspension and technology electrical systems
Second semester	Second semester
TED 121-Sheet metalwork	TED 221-Machine shop practice I
TED 122-Woodwork technology	TED 222-Woodwork design, construction and finishing
TED 123-Magnetism and electro magnetism	TED 223 Electrical and electronic devices
TED 124-Building science/materials	TED 224-Special methods
TED 125-Auto mechanics I (Transmission systems)	TED 225-Automobile engines

Source: School of Technical Education, Federal College of Education (Technical), Omoku, Rivers State, Nigeria.

Table 2. Students' year of admission and expected year to transit to third year.

Academic session	Automobile	Building	Electrical/ Electronic	Metalwork	Woodwork	Total
2002/2003	22	14	26	27	4	93
2003/2004	25	14	25	30	5	99
2004/2005	20	8	21	24	4	77
Total	67	36	72	81	13	269

Source: School of Technical Education, Federal College of Education (Technical), Omoku, Rivers State, Nigeria.

Table 3. Number of students who transited to the year to specialize.

Academic session	Automobile	Building	Electrical/ Electronic	Metalwork	Woodwork	Total
2002/2003	22	8	21	24	4	73
2003/2004	22	8	21	34	4	73
2004/2005	22	8	21	72	4	73
Total	66	24	63	72	12	219

Source: School of Technical Education, Federal College of Education (Technical), Omoku, Rivers State, Nigeria.

for the three consecutive years. The raw scores obtained for the 20 courses offered by each student in the five groups (Automobile, Building, Electrical/Electronics, Metalwork and Woodwork Technology) were summed up and divided by 20 to get the mean score for each student. The mean scores will be used to determine the level of academic performance of each of group of students in the first two years of the programme. A mean pass mark of 50% for each student for all the courses offered was used as bench mark. A mean pass mark of 50% and above indicates a good performance; and that below 50% is a poor performance.

Further, the F-test (one-way analysis of variance) was used to test for significant difference and the Scheffe's test to determine which of the groups brought about the significant difference in the level of academic performance if there was any.

RESULTS

The results in Table 4 showed that, the average mean scores of the students in Automobile, (51.69); Building (52.38); Electrical/Electronics (56.76); Metalwork (52.95)

Table 4. Group mean scores for two academic sessions for students admitted in 1991/92, 1992/93 and 1993/94 academic sessions.

	Automobile		Building		Electrical/Electronic		Metalwork		Woodwork	
	(X_1)	(X_1^2)	(X_2)	(X_2^2)	(X_3)	(X_3^2)	(X_4)	(X_4^2)	(X_5)	(X_5^2)
Total	827	42,787	419	21,975	1,192	67,771	1,271	67,457	185	8,571
No. of Students	16		8		21		24		4	
Mean score(X)	51.69		52.38		56.76		52.95		46.25	

Table 5. Test of significance in group performance.

Source	SS	df	MS	F-Cal.	Significance level	F-critical	Decision
Between groups	56.88	4	14.22	2.81	0.05	2.53	Reject H_o
Within groups	343.84	74	5.06				
Total	400.72	78					

indicated good performance while Woodwork (46.25) indicated poor performance. This result further revealed that, the Electrical/Electronic students performed better than their counterparts in other departments followed by Metalwork, Building, Automobile and woodwork respectively. This means that, students in Automobile, Building, Electrical/Electronics and Metalwork may wish to transfer to any department of their choice because they have performed above average in all the courses related to the other departments. However, the woodwork group does not have the privilege of transferring to any other department because their performance was below average.

In testing the hypothesis, the F-test (One-way ANOVA) was used to test whether there was any significant difference in the academic performance of the five groups of students. The test was conducted at 0.05 level of significance with 4 degree of freedom for numerator and 68 for the denominator respectively with an expected critical F-value of 2.53.

The results of the ANOVA test in Table 5 revealed that, the calculated F-value of 2.81 is more than the expected critical-value of 2.53. The result therefore indicated that, there was a statistically significant difference in the level of academic performance of the Automobile, Building, Electrical/Electronics, Metalwork and Woodwork Technology groups of students. Hence the hypothesis was rejected.

Further, Scheffe's test was used to determine which of the groups brought about the significant difference in the level of academic performance.

From table 6, the results of the Scheffe's test indicated that there was significant difference in level of academic performance of Electrical/Electronic group of students over their counterparts in Automobile, Building, Metalwork and Woodwork Technology. There was also significant difference in the level of academic performance of Automobile, Building, and Metalwork over Woodwork Technology. In addition, no significant difference in the level of academic performance only occurred in Automobile, Building, and Metalwork groups of students.

DISCUSSION

The findings showed that, the Electrical/Electronic students performed better than their counterparts in the other departments. While Automobile, Building and Metalwork Technology students performed above average when the mean scores were considered, the woodwork technology students performed below average.

There was also a significant difference in the level of academic performance of the groups. Further, the direction of difference showed that, the level of performance of the Electrical/Electronic students was significantly higher than the Automobile, Building, Metalwork and Woodwork Technology students. However, there was no significant difference in the performance of Automobile, Building and Metalwork Technology students. But, there was a significant difference in the performance Automobile, Building and Metalwork Technology students over their Woodwork

Table 6. Scheffe's test for direction of difference.

Comparison of groups	MS_w	MS_b	F- Cal.	F-Critical	Decision
Automobile with Building	1.00	0.95	1.05	10.12	Not significant
Automobile with Elect/Elect	25.71	0.57	45.11		Significant
Automobile with Metalwork	1.59	0.53	3.00		Not significant
Automobile with Woodwork	29.59	1.58	18.73		Significant
Building with Elect/Elect	16.56	0.87	19.07		Significant
Building with Metalwork	0.07	0.84	0.08		Not significant
Building with Woodwork	41.47	1.90	21.83		Significant
Elect/Elect with Metalwork	14.52	0.45	32.27		Significant
Elect/Elect with Woodwork	110.46	1.51	73.15		Significant
Metalwork with Woodwork	44.89	1.48	30.00		Significant

counterparts. While the other groups of students performed above average; it was the woodwork technology groups of students that performed below average. Thus, no student from the other departments will be made to transfer to woodwork technology after the transition period on account of low academic performance; and the woodwork students cannot transfer to any other department because of their below average academic performance.

It is relatively difficult to adduce reasons for the below average performance of the woodwork students when compared to above average performance their counterparts because the study was not conducted to determine the likely reasons for above or below average performance of the different groups of students but was to determine the academic performance of the students in the different departments using their examination raw scores. However, studies have established various factors such as parents' socio-economic status, entry qualification/ admission points, prior school background, peer group influence as well as students' effort as factors that may influence students' academic performance (Ali et al., 2013; Farooq et al., 2011; Dill, 2006; Considine and Zappala, 2004; Jeynes, 2002; Kwesiga, 2002; Graetz, 1995; Comb, 1985). However, the only viable assumption for the below average performance of woodwork technology students is because of their performance in the entry cut-off point as well as the low entry qualification for students seeking admission in the NCE (Technical) programme. Further, students applying for admission prefer other departments but only accepted woodwork technology as a last resort they would have also performed below average during transition period.

The admission points, entry qualification or prior academic performance to select students for admission have influenced students' academic performance at the post-secondary schools. Thus admission point which is a reflection of previous performance may influence future academic performance (Geiser and Santelices, 2007; Ali et al., 2013). Further, the Universities Admission Centre (2006) reported that, tertiary institutions in Austria have found that a selection rank based on a student's overall academic achievement is the best single predictor for tertiary success for most tertiary courses. Kyoshaba (2009) and Farooq et al. (2011) also observed that measures of prior educational performance are the most important determinant of students' performance; and this implies that the higher the previous performance, the better the students will perform academically

In addition, there have been evidences that high school grades were without doubt the best predicators of academic performance (Geiser and Santelices, 2007). In agreement, Waller and Foy (1987), Mohammad and Alhmeed (1988) opined that secondary school scores proved to be instrumental in predicting university performance.

In the same vein Mlambo (2011) reported that, for a number of institutions, student admission is based on a number of different qualifications to the extent that students receiving instruction in the same course differ widely in terms of their prior knowledge. Learning is a cumulative process, thus a student recruited with higher entry requirements will be well prepared for the course material compared to a student admitted based on the bare minimum qualifications.

The implication of this finding is that, the level of qualitative woodwork technical teachers supplied to the world of work will be suspected. In the same vein Banjo (1974) opined that, the success or failure of any system of technical education is dependent on the quality of technical. Ihiegbulem (1992) further stated that, the level of academic performance of students going through the NCE (Technical) Programme is an index of the quality of technical teachers in the system. From the foregoing, it was imperative that, every student admitted into the NCE Technical programme should perform above average in the related courses offered in the various departments that constitute technical education so that graduates apart from effectively teaching their areas of specialization, should also be able to effectively teach Introductory Technology at the secondary schools or junior technical colleges.

Conclusion

The study established that, the Automobile, Building, Electrical/Electronics and Metalwork Technology students performed above average while the Woodwork Technology students performed below average. The implication of the finding is that, the woodwork technology department may not produce the required qualitative technical teachers to teach technical education.

It is therefore pertinent for every student admitted into the NCE Technical programme to perform above average in the courses offered in their areas of specialization and the other compulsory courses offered from the various departments during the transition period that constitute technical education. This would make graduates, apart from effectively teaching their areas of specialization, able to teach Introductory Technology at the secondary schools or junior technical colleges effectively. This is one of the major objectives of the NCE Technical programme (NCCE, 2008).

REFERENCES

Ali S, Haider Z, Munir F, Khan H, Ahmed A (2013). Factors contributing to student's academic performance: A case study of Islamia University Sub-campus. Am. J. Educa. Res. 1(8): 283-289. Retrieved December 4, 2013 from http://pubs.sciepub.com/education/1/8/3/

Banjo JA (1974). Reshaping Technical education in Nigeria. West Afr. J. Educa. 18(4): 8-15.

Comb HP (1985). The world crisis in education: The view from the eighties. New York; Oxford Press.

Considine G, Zappala G (2002). Influence of social and economic disadvantage in the academic performance of school students in Austria. J. Sociol. 8:129-148.

Farooq MS, Chaudry AH, Shafiq M, Berhanu, G. (2011). Factors affecting students' quality of academic performance: A case of secondary level. Journal of Quality and Technology management, 7(2): 01-14. Retrieved December, 4, 2013 from https://www.gu.se/english/research/publication%3FpublicationId%3D157715

Geiser S, Santelices VM (2007). Validity of high school grades in predicting student success beyond the freshman year. Retrieved December 4, 2013 from http://cshe.berkeley.edu/publications/docs/ROPS.GEISER SAT 6.12.07.pdf

Graetz B (1995). Socio-economic status in educational research and policy. In Graetz, B., Long M, Batten M (Eds.), Social and economic status and school education. Canbbera: DEET/ACER.

Ihiegbulem OT (1992). Academic performance of Nigerian Certificate in Education (Technical) students with different entry requirements: A case study of Federal College of Education (Technical), Omoku, Rivers State. J. Technical Teacher Educa. 1(1): 79-86.

Jeynes WH (2002). Examining the effect of parental absence on the academic achievement of adolescents: The challenges of controlling for family income. J. Family and Econ. Issues, 23(2): 56-65.

Kyoshaba M (2009). Factors affecting academic performance of undergraduate students at Uganda Christian University. Retrieved December 4, 2013 from http://mak.ac.ug/documents/Makfiles/theses/Kyoshaba%2520Martha.pdf

Kwesiga CJ (2002). Women's access to higher education in Africa: Uganda's experience. Kampala: Fountain Publishers Ltd.

Mohammad YHS, Alhameed MA (1988). An evaluation of traditional admission standards in predicting Kuwait University students' academic performance. Higher Education, 17(2). Dordrecht, Netherlands: Kluwer Academics.

Mlambo V (2011). An analysis of some factors affecting student academic performance in an introductory biochemistry course at the University of the West Indies. Caribbean Teaching Scholar 1(2):79–92. Retrieved December 4, 2013 from http://journals.sta.uwi.edu/cts/index.asp%3Faction%3DdownloadArticle%26articleId%3D10%26gal...

NCCE (2008). Minimum standard for Nigeria Certificate in Education-Vocational and Technical Education. Abuja: National Commission for Colleges of Education (NCCE), 85-114.

University Admission Center (2006). Universities admission index. Retrieved December 4, 2013 from http://www.uac.edu.au/admin/uai.html

Waller DM, Foy JM (1987). Using British school examinations as a predictor of university performance in Pharmacy course: A correlative study. Higher Education 16(6). Retrieved December 4, 2013 from http://www.jstr.org/stable/3446847

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