

Full Length Research Paper

Career aspirations of students in Engineering and Technical and Vocational education hampered by their performance

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Accepted 13 April, 2016

Students' prospects for career pursuits in engineering and technical and vocational education (TVE) were being hampered by their poor performances in Technical and Engineering Drawing (T.E.D.) as a core engineering subject. This study investigated the career aspirations of students in engineering and technical and vocational education due to their good performance in T.E.D. and their contributions to society. Using the structured questionnaire to collect data from students and teachers of three technical colleges in Adamawa State, the study found that students' career aspirations due to their good performance in T.E.D. include electrical and electronic engineering, mechanical engineering, and technical and vocational education (TVE). Students' likely contributions to society from their career choices in engineering and TVE, due to their good performance in T.E.D. include town planning, engineering contracting, land use development and entrepreneurship development. Testing at a 0.05 level of significance, the study also established that significant differences did not exist between the mean scores of students and teachers on the career aspirations of students and the students' likely contributions to society from their career choices in engineering and TVE. Factors that militated against the performance of the students in T.E.D. towards an effective career choice in engineering and TVE are poor background of students, truancy, and language of instruction of the teacher, among others. However, no significant difference existed between the mean scores of students and teachers on the factors militating against the performance of students in T.E.D. which affect the students' career choices in engineering and TVE. The study has recommended among others, the training and retraining of T.E.D. teachers, equipping of drawing studios and the provision of a stand-by power plant to guarantee stable power supply.

Key words: Performance, technical and engineering drawing, career choice, engineering, technical and vocational education.

INTRODUCTION

Abundant literature shows that the quality of the teaching personnel, the learning atmosphere (situation), mastery of the subjects' matter by the teacher, the teaching process, drawing studios, instructional and educational

items are all important things in students' performances (Ukwugwu, 1997; Abdullahi, 1997). Similarly, the teacher's language of instruction, his ability to stimulate students' interest and to use teaching methods appropriate to the subject matter, are vital factors in students' performance (Eyibe, 1987; Edem, 1982; Okoh, 2001). According to Ayeduso (2001), inadequate workshop facilities, insufficient hand tools and materials,

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Table 1. Summary of NABTEB results in Technical/Engineering Drawing from three technical colleges in Adamawa State for the years 2004, 2005, 2006, 2007 and 2008.

Year	No. that sat for the exam	No. that passed at credit level	No. with pass	No. that failed
2003	906	101 (11.15%)	312 (34.44%)	493 (54.42%)
2004	942	125 (13.27%)	226 (24.00%)	591 (62.74%)
2005	1005	98 (9.75%)	413 (41.10%)	494 (49.15%)
2006	979	158 (16.14%)	238 (24.31%)	583 (59.55%)
2007	1027	212 (20.64%)	372 (36.22%)	443 (41.14%)
Total	4859	694 (14.28%)	1561 (32.13%)	2604 (53.59%)

Source: Exam offices of the 3 technical colleges.

the professional qualification of technical teachers, their methods and their personality contributed to ineffective teaching in technical education. A specific study by Fagbemi (1997), which assessed the adequacy or otherwise of workshops for the teaching of Introductory Technology in Yobe State secondary schools discovered a gross inadequacy of workshop facilities – tools and equipment, as well as personnel. Furthermore, the study by Manabete (2004), which aimed to find out the causative factors of electrical power failure and its impact on electrical and electronic students of tertiary institutions in Adamawa state, discovered that incessant power outages led to poor academic performances. The situation today in most science and engineering based subjects is worrisome in that there has been a dearth of teachers (the quality of the teachers), text books and instructional materials, among others (Nwachukwu, 1995). Nwachukwu's work showed that schools experienced poor quality of teachers because a great majority of them never attended any workshop, seminar or refresher course. The roles of the teacher however, are those of planner of learning – facilitator, instructor and counselor (Lassa, 1995). The teacher must be academically sound and professionally qualified (Abiodun, 1995). Consequently, it is of vital importance for the teacher to be a role model as the way students perceive him/her can affect the quality and quantity of learning (Abiodun, 1995).

Careers in engineering and technical and vocational education are very vital for meaningful national development. A career, according to *The Advanced Learners' Dictionary* refers to a series of jobs that one has in a particular area of work. A career can best be described as a lifetime occupation an individual chooses for a meaningful livelihood. Because of the need for individuals to enter upon and stay in a particular occupation, the importance of career education cannot be over-emphasized. Career education, according to Okoro (2006: 5) is essentially "an educational system in which the function of education is viewed as consisting of preparing persons for careers". Okoro argued that career education must be viewed as a lifetime process which begins from early childhood and extends to adult life. According to Yaduma and Danboyi (2003: 27), "the

introduction of such courses as computer education, introductory technology, agricultural science, metal work, wood work, etc., is intended to give students some opportunities of acquiring skills and interest which may lead them into their specific career choices". That is why Tika and Manabete (2003) explained that career opportunities in technical and vocational education appear to be somewhat unlimited – masons, technicians, technologists, computer operators, systems designers and teachers. Manabete (2003) added that careers in engineering and technical and vocational education have led to the setting up of large engineering consortia for construction, electrical and mechanical engineering practices. The works of Manabete and Zamdayu (2004), Manabete and Kamaunji (2005) and Manabete et al. (2005) have also indicated how students, after graduating from college, have found useful careers in various fields of endeavour.

Technical Drawing forms one of the core engineering subjects (Ogwo and Ogbonabo, 1991; Eze, 1991). This means that for a student to pursue a career in engineering and technical and vocational education for sustainable economic rehabilitation and reliance, he or she needs to pass the subject very well. Unfortunately however, in the last several years, students' performance in Technical Drawing in the National Business and Technical Extermination Board (NABTEB) examinations has been quite alarming. A case in point is the result of Table 1 obtained from the Adamawa State's three technical colleges. From the table, out of a total of 4859 candidates who sat for the NABTEB examination in Technical and Engineering Drawing in five years, only 694 candidates, representing 14.28%, passed at credit level, thereby meeting university and polytechnic admission requirement. For any well meaning government or educational planner and administrator, this development calls for a serious concern, as the trend is capable of retarding students' career prospects in engineering and TVE for sustainable economic rehabilitation. There is therefore, the need to conduct a study on the performance of students in Technical and Engineering Drawing for effective career choice in engineering and technical and vocational education.

The general purpose of the study was to determine the

career choices of students in engineering and technical and vocational education by their performances in technical and engineering drawing. Specifically, the study aims:

- 1) To determine the career aspirations of students in engineering and technical and vocational education (TVE), due to their good performance in Technical and Engineering Drawing (T.E.D.).
- 2) To find out the intended contributions of students to society from their career choices in engineering and TVE due to the students' good performance in T.E.D.
- 3) To find out the factors that militate against the performance of students in T.E.D. which affect their career choices in engineering and TVE.

Research questions

The following research questions were stated to which answers were sought:

1. What are the career aspirations of students in engineering and technical and vocational education (TVE), due to their good performance in Building and Engineering Drawing (T.E.D.)?
2. What are the likely contributions of students to society from their career choices in engineering and TVE, due to the students' good performance in T.E.D.?
3. What are the factors that militate against the performance of students in T.E.D. which affect their career choices in engineering and TVE?

Hypotheses

The following stated hypotheses were tested at a 0.05 level of significance:

H₀₁: There is no significant difference between the mean scores of students and teachers on the students' career aspirations in engineering and TVE, due to their good performance in T.E.D.

H₀₂: There is no significant difference between the mean ratings of students and teachers on the students' likely contributions to society from their career choices in engineering and TVE, due to the students' good performance in T.E.D.

H₀₃: There is no significant difference between the mean scores of students and teachers on the factors that militate against the performance of students in T.E.D., which affect their career choices in engineering and TVE.

METHODOLOGY

As a survey research, the structured questionnaire was used to collect data from students and teachers of the three technical colleges, that is, Government Technical College, Yola, Government Technical College, Mubi and

Government Technical College, Numan. The target population included all candidates (students) that offered the NABTEB subject, Technical and Engineering Drawing (T.E.D.), in the three schools and the teachers that taught them. A sample of 75 candidates, selected at random in each school, was supplied with 75 copies of the structured questionnaire to fill. Similarly, 5 teachers were randomly selected from each school. In all, there were 225 candidates (students) and 15 teachers, giving a total of 240 respondents. Consequently, 240 copies of the questionnaire were randomly administered in the three schools. The design of the questionnaire was based on the research questions. The questionnaire asked questions relating to the career aspirations of students, their intended contributions to society and the factors that militated against their performance in T.E.D. towards an effective career choice in engineering and technical and vocational education (TVE). Out of the 240 copies of the structured questionnaire administered, 195 copies were fully filled and returned, made up of 15 copies for teachers and 180 copies for students. Analyses of the results were based on the number of fully filled and returned copies of questionnaire. Mean and standard deviation answered the research questions and the students't-test tested the null hypotheses. A mean of 3.50, as specified by Sipegel (1972), was chosen as decision rule for agreeing or disagreeing with a test item. Similarly, testing at a 0.05 level of significance, a null hypothesis (H₀) was rejected in favour of the alternative hypothesis, H_A, when the t-calculated exceeded the t-tabulated, otherwise it was accepted.

RESULTS

The results of the study have been presented in tables, based on the research questions and hypotheses, as follows:

Research question 1

What are the career aspirations of students in engineering and technical and vocational education (TVE), due to their good performance in Technical and Engineering Drawing (T.E.D.)?

Table 2 provides data on the career aspirations of students after a good performance in Technical and Engineering Drawing (T.E.D.). With mean scores which ranged from 3.65 – 3.92, respondents agreed in all the thirteen items presented that after a good performance in T.E.D., students can pursue careers in engineering and technical and vocational education such as Electrical and Electronic Engineering, Building Technology and Technical and Vocational Education.

Research question 2

What are the likely contributions of students to society

Table 2. Career aspirations of students in Engineering and TVE due to their performance in Technical and Engineering Drawing (T.E.D.).

S/N	Item	Category of respondents				\bar{X}_G	Decision
		Students		Teachers			
		$N_1 = 180$		$N_2 = 15$			
		\bar{X}_1	SD_1	\bar{X}_2	SD_2		
1.	Elect/Elect. Eng'g	3.57	1.76	3.79	1.68	3.68	Agree
2.	Mechanical Eng'g	3.98	1.57	3.85	1.63	3.92	Agree
3.	Civil Engineering	3.87	1.31	3.92	1.31	3.90	Agree
4.	Agricultural Engineering	3.65	1.38	3.76	1.63	3.71	Agree
5.	Chemical Engineering	3.98	1.52	3.82	1.61	3.90	Agree
6.	Building Technology	3.73	1.31	3.87	1.52	3.80	Agree
7.	Architecture	3.74	1.98	3.92	1.35	3.83	Agree
8.	Regional and Town Planning	3.67	1.87	3.78	1.38	3.73	Agree
9.	Elect/Elect Technology Education	3.54	2.10	3.76	1.67	3.65	Agree
10.	Metal Work Technology Education	3.87	1.63	3.90	1.78	3.89	Agree
11.	Agric. Technology Education	3.64	2.03	3.65	1.53	3.65	Agree
12.	Drafting Technology Education	3.85	1.87	3.73	1.32	3.79	Agree
13.	Building Technology Education	3.92	1.91	3.79	1.76	3.86	Agree

Table 3. Respondents' likely contributions to society from their career choices in Engineering and Technical and Vocational Education arising from good performance in T.E.D.

S/N	Item	Category of respondents				\bar{X}_G	Decision
		Students		Teachers			
		$N_1 = 180$		$N_2 = 15$			
		\bar{X}_1	SD_1	\bar{X}_2	SD_2		
1.	Town planning	3.67	1.77	3.91	1.62	3.79	Agree
2.	Engineering contracting	3.64	1.82	3.76	1.55	3.70	Agree
3.	Entrepreneurship development	3.75	1.73	3.65	2.01	3.70	Agree
4.	Land use development	3.79	2.21	3.72	1.67	3.76	Agree
5.	Modern farming methods	3.89	2.10	3.79	1.57	3.84	Agree
6.	Farm implements development	3.92	1.73	3.83	2.03	3.88	Agree
7.	Building projects supervision	3.74	2.12	3.78	1.77	3.76	Agree
8.	Technical education development	3.57	1.99	3.83	1.95	3.70	Agree
9.	Vocational education development	3.71	1.85	3.93	1.76	3.82	Agree
10.	Electric power supply	3.81	2.57	3.72	2.01	3.77	Agree
11.	Rural/urban water supply	3.74	2.20	3.92	1.60	3.83	Agree
12.	Systems development	3.68	2.03	3.74	1.99	3.71	Agree

from their career choices in engineering and TVE, due to the students' good performance in T.E.D.?

Table 3 show data on respondents' intended contributions to society after effective career choices in engineering and technical and vocational education, arising from a good performance in Technical and Engineering Drawing. With grand mean scores ranging from 3.70 – 3.88, respondents agreed in all the twelve items presented, some of which are town planning, modern farming methods and the development of technical and vocational education.

Research Question 3

What are the factors that militate against the performance of students in T.E.D. which affect their career choices in engineering and TVE?

Tables 4 to 6 present data on the factors that affect students' performance in Technical and Engineering Drawing (T.E.D.). Table 4 shows those factors that are related to the students. Out of the eight items presented in the table, students disagreed in four of them, among which are that T.E.D. is a more difficult subject (with a

Table 4. Student factors that militate against the performance of the students in Technical Engineering Drawing.

S/N	Item	Category of respondents				\bar{X}_G	Decision
		Students		Teachers			
		$N_1 = 180$		$N_2 = 15$			
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂		
1.	B.E.D. a more difficult subject	3.78	1.93	2.65	2.97	3.22	Disagree
2.	Lack of interest by students	2.65	2.30	3.73	1.92	3.19	Disagree
3.	B.E.D. – a compulsory subject	2.35	2.27	2.52	2.41	2.44	Disagree
4.	Offered as a parental wish	2.94	2.31	2.56	2.21	2.75	Disagree
5.	Poor background of students	3.95	1.83	3.90	1.73	3.93	Agree
6.	Non-class attendance	3.78	1.51	3.83	1.31	3.81	Agree
7.	In-school anti-social behaviours	3.94	1.27	3.73	1.52	3.84	Agree
8.	Peer group influence	3.63	2.11	3.69	2.03	3.66	Agree

Table 5. Teacher factors that militate against students' performance in Technical and Engineering Drawing.

S/N	Item	Category of respondents				\bar{X}_G	Decision
		Students		Teachers			
		$N_1 = 180$		$N_2 = 15$			
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂		
1.	Teachers' language in instruction	3.98	1.75	3.54	1.73	3.76	Agree
2.	Teachers' teaching methods	3.65	1.68	2.57	2.31	3.11	Disagree
3.	Teachers' knowledge of T.E.D.	3.89	1.37	2.94	2.42	3.42	Disagree
4.	Inadequate teaching skills	3.78	1.34	2.56	2.32	3.17	Disagree
5.	Insufficient no. of T.E.D. teachers	3.72	1.91	3.86	1.86	3.79	Agree
6.	Unqualified T.E.D. teachers	3.56	2.12	3.51	2.21	3.54	Agree
7.	Lack of commitment by teachers	3.60	2.05	3.34	2.48	3.47	Disagree
8.	Lack of improvisation by teachers	3.54	2.30	2.56	2.41	3.05	Disagree
9.	Insufficient time for instruction	3.96	1.75	3.98	1.52	3.97	Agree
10.	Lack of incentives by teachers	3.78	1.65	3.45	1.98	3.62	Agree

Table 6. Factors related to the school and environment.

S/N	Item	Category of respondents				\bar{X}_G	Decision
		Students		Teachers			
		$N_1 = 180$		$N_2 = 15$			
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂		
1.	Inadequate drawing studios	3.86	1.74	3.93	1.81	3.90	Agree
2.	Inadequate drawing instruments	3.73	1.91	3.83	1.62	3.78	Agree
3.	Outdated drawing instruments	3.67	1.98	3.54	1.78	3.61	Agree
4.	Lack of relevant text books	3.87	1.83	3.69	2.01	3.82	Agree
5.	Overcrowding in the class	3.98	1.56	3.76	1.75	3.87	Agree
6.	Poor feeding for students	3.98	1.83	1.98	2.89	2.98	Disagree
7.	Lack of extra curricula activities	3.57	1.75	2.63	2.33	3.10	Disagree
8.	Lack of electrical power supply	3.91	1.53	3.84	1.46	3.88	Agree
9.	Constant power outages	3.97	1.75	3.90	1.52	3.94	Agree
10.	Non-use of award for excellence	3.65	2.10	3.23	2.13	3.44	Disagree

Table 7. t-Test of difference between the mean scores of students and teachers on the career aspirations of students.

Respondent category	Mean	Standard deviation	N	df	S.E.	t-cal	t-tab	Decision
Students	3.77	1.07	13	24	0.49	0.41	2.06	Accept
Teachers	3.57	1.39	13					

Table 8. t-Test of difference between the mean scores of students and teachers on the likely contributions of students to society.

Respondent category	Mean	Standard deviation	N	df	S.E.	t-cal	t-tab	Decision
Students	3.74	0.14	12	22	0.25	0.20	2.07	Accept
Teachers	3.80	0.32	12					

grand mean of 3.22), lack of interest by students in the subject (with a grand mean of 3.19) and T.E.D. offered to fulfill parents' wish (with a grand mean of 2.44). Respondents however, agreed in four items which affect negatively students' performance in T.E.D. These items, among others, are the poor background of the students, non-class attendance and peer group influence, with grand means of 3.93, 3.81 and 3.66 respectively.

Table 5 show data on teacher factors that affect the performance of students in Technical and Engineering Drawing. Out of the ten items in the table, respondents agreed on five and also disagreed on five of the items. Among the five items the respondents agreed on are: the teacher's language in instruction, insufficient number of teachers and lack of incentives by teachers. Their grand mean scores are 3.76, 3.79 and 3.62 respectively.

Teacher's teaching methods, teacher's knowledge of subject matter, and lack of commitment by teachers, are among the items respondents disagreed on. Their grand means are 3.11, 3.42 and 3.47 respectively.

Table 6 presents data on school and environmental factors that militate against students' performance in Technical and Engineering Drawing. Out of the ten factors presented, respondents disagreed on three factors, but at the same time agreed on seven factors. The three factors that respondents disagreed on are poor feeding of students, lack of extra-curricular activities and non-use of reward for excellence by school authorities. Their grand means are 2.98, 3.10 and 3.44 respectively. Among the factors respondents agreed that militate against students' performance are inadequate drawing studios, overcrowding and lack of electrical power supply. Their mean ratings are 3.90, 3.97 and 3.88 respectively.

Hypothesis 1

There is no significant difference between the mean scores of students and teachers on the students' career aspirations in engineering and TVE, due to their good

performance in T.E.D.

Table 7 shows the result obtained when hypothesis 1 was tested at a 0.05 level of significance. At degree of freedom (df) 24, the calculated value (t-cal) is 0.41. This value is below the tabulated value (t-tab) of 2.06. This shows that there is no significant difference between the mean scores of students and teachers on the career aspirations of students in engineering and TVE due to the students' good performance in Technical and Engineering Drawing (T.E.D.). Therefore, the null hypothesis, H_{01} , is accepted.

Hypothesis 2

There is no significant difference between the mean ratings of students and teachers on the students' likely contributions to society from their career choices in engineering and TVE, due to the students' good performance in T.E.D.

Table 8 presents the result that was obtained when hypothesis 2 was tested at a 0.05 level of significance. At df 22, t-cal is 0.20, which is below t-tab of 2.07. This result shows that there is no significant difference between the mean ratings of students and teachers on the likely contributions of the students to society, from their career choices in engineering and TVE, due to the students' good performance in T.E.D. Therefore, the null hypothesis, H_{02} , is accepted.

Hypothesis 3

There is no significant difference between the mean scores of students and teachers on the factors that militate against the performance of students in T.E.D., which affect the students' career choices in engineering and TVE.

Table 9 presents the result obtained when hypothesis 3 was tested at a 0.05 level of significance. The result shows that at df 54 (but taken at 100 since 54 is not in

Table 9. t-Test of difference between the mean scores of students and teachers on the factors that militate against the performance of students in T.E.D.

Respondent category	Mean	Standard deviation	N	df	S.E.	t-cal	t-tab	Decision
Students	3.65	1.15	28	54	0.49	1.10	1.98	Accept
Teachers	3.33	1.05	28					

the t-test table), t-cal is 1.10. This figure is below the tabulated value (t-tab) of 1.98. The result shows that there is no significant difference between the mean scores of students and teachers on the factors that militate against the performance of students in T.E.D., which affect the students' career choice in engineering and TVE. Therefore, the null hypothesis, H_0 , is accepted.

Results of the study revealed the following findings:

- a) Students' career aspirations due to their good performance in technical and engineering drawing (T.E.D.) include electrical and electronic engineering, mechanical engineering, agricultural engineering, building technology and technical and vocational education (TVE)
- b) Students' likely contributions to society from their career choices in engineering and TVE, due to their good performance in T.E.D. are town planning, engineering contracting, land use development and entrepreneurship development and practice. Others are modern farming methods, farm implements development, building projects supervision and TVE development. Yet others are electric power supply, rural/urban water supply and systems development.
- c) Student factors that militate against the performance of the students in T.E.D. towards an effective career choice in engineering and TVE are poor background of students, truancy, engagement in anti-social behaviours and peer group influence. Factors such as interest, the compulsory nature of T.E.D. and parental wish do not militate against the performance of students in T.E.D.
- d) Teacher's language of instruction, inadequate number of teachers and limited time for teaching T.E.D. are some of the teacher factors that militate against the performance of students in T.E.D. Others are unqualified T.E.D. teachers and lack of incentives by the teachers to students who perform well in T.E.D. However, teacher's teaching methods, knowledge of T.E.D., commitment and improvisation are not factors that militate against students' performance in T.E.D.
- e) School and environmental related factors that militate against students' performance in T.E.D. towards an effective career choice in engineering and TVE are inadequate drawing studios, inadequate drawing instruments, class overcrowding and lack of electrical power supply. However, poor feeding of students, lack of extra-curricular activities and non-use of reward for excellence are factors that do not militate against students' performance in T.E.D.

f) Testing at a 0.05 level of significance, no significant difference existed between the mean scores of students and teachers on the career aspirations of students, due to the students' good performance in T.E.D.

g) At a 0.05 level of significance, there was no significant difference between the ratings of students and teachers on the students' likely contributions to society from their career choices in engineering and TVE.

h) No significant difference existed between the mean scores of students and teachers on the factors militating against the performance of students in T.E.D. which affect the students' career choices in engineering and TVE.

DISCUSSION

After a good performance in Technical and Engineering Drawing, as the findings of the study show, students are able to pursue various careers in engineering and technical and vocational education, such as Electrical and Electronic Engineering, Civil and Water Engineering and Town Planning. This finding is supported by the works of Yaduma and Danboyi (2003), Manabete and Zamdayu (2004), Manabete and Kamaunji (2005) and Manabete et al. (2005) in which students acquired skills to fit into various technical and vocational career/entrepreneurial choices. Such enterprises are capable of dealing with unemployment and the menace of armed robbery, drug addiction, prostitution and other social vices (Akanbi and Ugbe, 1997; Tika and Manabete, 2003). Truancy, poor background of students and engagement in anti-social behaviours have been found to be serious factors that militate against the performance of students in Technical and Engineering Drawing. That explains why many students, after leaving school, are not able to engage in any productive ventures. Because many of the youths are unemployed (Apagu, 2003), they engage in many social vices such as prostitution and drug abuse (Akanbi and Ugbe, 1997).

The study found that the teacher's language of instruction, the insufficient number of teachers, unqualified teachers, and insufficient time for instruction and lack of the use of incentives by teachers are all factors that militate against the performance of students in Technical and Engineering Drawing. This finding agrees partly with the works of Edem (1982), Eyibe (1987), Anni (1991), Nwachukwu (1995), Ukwugwu (1997) and Jen (2002), and disagrees partly with the works of the same authors in which teachers' teaching

method, knowledge of subject matter, commitment to duty and skills at improvisation, are not factors that militate against the performance of students. Lack of essential drawing instruments and drawing studios and class over-crowding have been found to be factors that militate against the performance of students in Technical and Engineering Drawing towards an effective career choice in engineering and technical and vocational education. Lack of relevant textbooks, lack of power supply and constant power outages have been found to be potential factors that affect the performance of students. This finding is supported by the works of Nwachukwu (1995) who argued that schools in Nigeria are plagued by the dearth of relevant text books and teachers. Fagbemi's (1997) work which found inadequate workshops and other facilities for teaching Introductory Technology in Yobe State secondary schools agrees with the finding of this study. Similarly, as Ayeduso (2001) argued, inadequate workshop facilities and insufficient hand tools and materials affect students' performance in various subjects to a large extent. Manabete's (2004) work which found incessant power outages as a factor that affected the performance of Electrical and Electronic students in tertiary institutions in Adamawa State has also supported the finding of this study. This study has serious implications for education in Nigeria, particularly engineering and technology education. First, Technical and Engineering Drawing being a core engineering subject, must be viewed, understood and appreciated by students, educationists and government. A successful performance in the subject by students opens the way for the students to explore a wide variety of careers in engineering and technical and vocational education (TVE). Similarly, a successful career in engineering and TVE should warrant the candidates making useful contribution to society in areas like water supply, modern methods of farming and the design of engineering systems. However, students' effective career choices in engineering and technology, arising from their good performance in Technical and Engineering Drawing are impossible without the necessary enabling environment. In other words, drawing studios and other drawing facilities need to be provided in schools and colleges in Nigeria. Teachers need to be trained and retrained to update their knowledge. Electrical power needs to be provided to enable students undertake functional studies. This entails that government and all stakeholders in education must have their hands on deck, to contribute meaningfully towards students' performance in Technical and Engineering Drawing in order for them to make meaningful career choices in engineering and TVE. This way, the students, after graduation from school or college, will be able to engage in useful and rewarding ventures so as to make useful contribution to society.

Conclusion

Career is a lifelong occupation an individual enters into

and progresses in it through his or her adult life for meaningful living. A wide variety of opportunities exists for meaningful career choices in engineering and technical and vocational education (TVE). If these opportunities are explored and harnessed, no citizen of Nigeria will be idle. Social vices like prostitution and drug addition will be greatly curtailed. Technical and Engineering Drawing is one of the core engineering subjects. Students' performance in the subject is expected to lead to effective career choices in engineering and TVE. An examination of the performance of students in the NABTEB examinations for five years running, that is, 2004, 2005, 2006, 2007 and 2008, showed that many of the students could not pass the subject at credit level. Several factors have been identified to be responsible for this development. Some of these factors are inadequacy of drawing facilities, teacher factors and the background of the students. The study has recommended that in order to deal with the problems, government and all stakeholders in education must have their hands on deck and contribute to making the learning condition conducive for students. This way, the students' good performance in Technical and Engineering Drawing would lead to an effective career choice in engineering and technical and vocational education. As a result, the students will be able to make meaningful contributions to the society.

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