
TECHNOLOGY AND SCIENCE EDUCATION GRADUATES' RATING OF LEARNING RESOURCES IN MODIBBO ADAMA UNIVERSITY OF TECHNOLOGY, YOLA

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ABSTRACT

This study was necessitated out of the need for programme improvement. Informed feedback on how to improve technology education programmes provided by graduates of STSE would be helpful to the school in its programme improvement efforts. The study was carried out in Northern Nigeria where most of the graduates of the programme are working. The target population of the study comprised of all the graduates of Technology education. However, a purposive sample of 193 respondents made up of 86 prospective supervisors and 107 graduates of technology education programme (Electrical technology, Electronics technology, mechanical technology and construction technology) that graduated from 2008 through 2011 were used for the study. A descriptive survey research design was adopted. Four research questions and four hypotheses guided the study. The instrument used for data collection was a structured questionnaire designed by the researchers called Follow-up study instrument for data collection (FUSIDC) developed on a five-point rating scale. The instrument was validated by four specialists in STSE and five graduates from the department of technology education. It was trial tested on 30 respondents mainly graduates of STSE in 2007 in order to establish the reliability of the instrument. Cronbach alpha was used to compute a reliability index of 0.78. Descriptive statistics mainly, means and standard deviations were used to answer the research questions. The four hypotheses were tested at 0.05 level of significance using analysis of variance. Among the findings made were that teaching and learning facilities including classrooms, toilets and workshops were rated fair. All the hypotheses tested were rejected, meaning significant differences existed in the mean responses of the respondents. Based on these findings, some recommendations were made amongst which is that, in order to position teaching and learning activities in line with the modern trends in technology, MAUTech and STSE in particular is encouraged to improve even those items that were rated in category 'good' and 'very good'. Improvement is an on-going activity which education institutions and organizations should undertake.

Key words: Follow-up, technology education, programme, improvements, School of Technology and Science Education, STSE, MAUTech.

INTRODUCTION

Follow-up study is an activity undertaken to locate and identify problems of a system to which solutions are proffered. In educational settings, follow-up studies are noble obligations higher education

institutions undertake to establish special contacts with continuing and previous students in order to obtain useful information (feedback ideas) for integration into institutional programme reviews. Such feedback records on programme improvements are virtually

unavailable in Nigeria's universities and colleges. Anyanwu (2000) stated that follow-up study or graduate tracer study could be undertaken to examine retrospective contribution of graduates' education to their current jobs, a post studentship study. Juhani and Pertti (2001) suggested that young and adult students' orientation, satisfaction and learning outcomes in an institution of higher education could be examined through appropriate follow-up study.

In Modibbo Adama University of Technology (MAUTECH), Yola, School of Technology and Science Education (STSE) offers learning opportunities at both undergraduate and postgraduate levels to individuals with interest in teaching profession. Technology Education programmes which include construction, electrical, electronics, mechanical automobile and mechanical production are offered in STSE. Education and engineering principles are meticulously blended in these technology education programmes which provide learning opportunities for students to acquire appropriate knowledge and skills to work efficiently in schools and industries. Agbowuro, Oriade and Shuaibu (2015) defined technology education as the study of technology in which students learn about the process and knowledge related to the field of technology. As a field of study, technology education covers the human ability to shape and change the physical world to meet needs, by manipulating materials and tools with techniques. Farther more, Agbowuro et. all (2015) stated that technology education is a means of preparing for occupational fields and for effective participation in the world of work, an aspect of lifelong learning a preparation for responsible citizenship and an instrument for promoting environmentally sound sustainable development.

Nigeria's quality assurance agency (QAA) for higher education institutions is the National Universities Commission (NUC). According to Uvah (2003) NUC was established in 1962 to help in the assessment of the

development of universities in the country, and in 1985, the Commission developed a Minimum Academic Standards (MAS) which it used in the assessment of undergraduate programmes taught in the then existing Nigerian universities. In 1989, the Commission developed and produced its Benchmark for the assessment of the academic standards and the quality of higher education deliverance in the country. The commission used this Benchmark in its 1990/1991, 1996/1997, 1999/2000, 2002, and 2003 accreditation exercises (Uvah, 2003). In 2007, NUC developed and published a revised document the Benchmark Minimum Academic Standards (BMAS) which universities across Nigeria are currently implementing (NUC, 2007). The primary objective of Nigeria's higher education system is the production of a relevant highly skilled workforce capable of impacting positively the overall national development (FRN, 2004). Accordingly, Okon et al. (2007) noted that Nigerian universities lay strong emphasis on skills such as managerial skills, communication skills, skills of ethics and human relations, scientific skills and skills in technology. Modibbo Adama University of Technology and its schools alongside other universities are obligated to produce relevant highly skilled graduates in line with the mandate of the Federal Government. In line with this mandate, technology education graduates from STSE form an appreciable proportion of teaching workforce serving in the public education system of North Eastern States of Nigeria and beyond. In STSE, technology education programmes are reviewed every five (5) years. The need to improve the status of university and college graduates all across Nigeria would require the unreserved participation of all education stakeholders. In line with this novel requirement, Section 1.5.4 Students' Evaluation of Every Course Each Semester in the 2007 BMAS document could not have come at a better time.

In the School of Technology and Science Education (STSE) at Modibbo Adama University of

Technology (MAUTECH) Yola, programmes are reviewed after a five-year period. The prime intent of programme reviews is the creation of improved teaching and learning environments in which the needs of lecturers' and students are sufficiently understood and provided for. Basic needs such as office spaces, classroom and workshop spaces, toilets and good water system, electricity power supply and healthy surroundings had acutely been lacking in STSE. However, the school had managed to graduate virtually all of its respective sets of students over the years. Informed feedback on how to improve technology education programmes provided by some STSE graduates, some of whom are currently supervisors/employees, self-employed or unemployed, would be helpful to the school in its programme improvement efforts. These former students of STSE could, when consulted on a mutual ground of common interest and trust such as 'study programme improvement', provide rewarding efforts out of which school programmes would be improved and graduates as well as their loved ones would get good education. A formally established and sustained follow-up surveys undertaken by STSE on its older and newer graduates would potentially create a lasting and rewarding collaborative alliance from which the school and the graduates would derive satisfying benefits. This is the problem that underscored the need to undertake this follow-up study on STSE graduates.

Objectives of the Study

1. Find out the opinions of graduates regarding undergraduate classroom facilities in STSE
2. Find out the opinions of graduates regarding undergraduate classroom experiences in STSE
3. Find out the opinions of graduates regarding undergraduate laboratory/workshop facilities in STSE

4. Find out the opinions of graduates regarding undergraduate-Laboratory/workshop experiences in STSE
5. Find out the opinions of graduates regarding undergraduate campus facilities in MAUTECH

Research Questions

1. What are the mean opinion ratings of graduates regarding undergraduate classroom facilities in STSE?
2. What are the mean opinion ratings of graduates regarding undergraduate classroom experiences in STSE?
3. What are the mean opinion ratings of graduates regarding undergraduate laboratory/workshop facilities in STSE?
4. What are the mean opinion ratings of graduates regarding undergraduate laboratory/workshop experiences in STSE?

Hypothesis

Three null hypotheses were formulated and tested at 95% confidence interval

- HO₁.** There is no significant difference in the mean ratings of graduates regarding undergraduate classroom facilities in STSE
- HO₂.** There is no significant difference in the mean ratings of graduates regarding undergraduate classroom experiences in STSE
- HO₃.** There is no significant difference in the mean ratings of graduates regarding undergraduate laboratory/workshop facilities in STSE
- HO₄.** There is no significant difference in the mean ratings of graduates regarding undergraduate laboratory/workshop experiences in STSE

METHODOLOGY

The study adopted a descriptive survey research design. The study was conducted in all the

universities in Northern Nigeria that offer technology education programmes (electrical, electronics, mechanical, and building technology). The population for this study was two hundred and one (201) prospective respondents. The constituents of the population were eighty-six (86) assumed prospective supervisors mostly located within the education sector of the area of the study and one hundred and fifteen (115) graduates of the five technology education study programmes. The chain of reasons that guided the conservative estimation of the supervisors were: (1) graduate(s) might not be employed, (2) graduate(s) might be self-employed and (3) several graduates might be employed in the same employment and therefore supervised by one supervisor. Similarly, basic premises upon which the graduates of the classes of 2008 through 2011 were selected included; First, training facilities and environment in the school had not changed significantly within the period, Second, the graduates had either been exempted from or completed the mandatory one year National Youth Service Corp (NYSC) programme and had at least a year or two within which employment would have been sought and secured, and third, graduates' recollections of the actual experiences they had during their respective studentship periods in MAUTECH had not degraded. The sample for this research was one hundred and ninety three (193) prospective respondents. The whole of the eighty six (86) supervisors and one hundred and seven (107) of the technology education graduates were purposively by the exclusion of eight (8) graduates who live outside the area of the study. The composition of the sample ($N_i=193$) was as follows: eighty six supervisors ($n_1=86$), twenty-four ($n_2=24$) graduates of Construction Technology, twenty-two ($n_3=22$) graduates of Electrical Technology, twenty- six ($n_4=26$) graduates of Electronics Technology, eighteen ($n_4=18$) graduates of Mechanical Automobile Technology and seventeen ($n_5=17$) graduates of Mechanical technology. The instrument was a structured questionnaire called Follow-Up Study

Instrument for Data Collection (FUSIDC). Graduates' opinions were sought regarding the university campus facilities and services. A 5 point rating scale (5=excellent, 4=very good, 3=good, 2=fair, and 1=poor) was used to rate the items in all of the seven sections of the instrument. The instrument was subjected to face validation by some academics and a handful of final year students of School of Technology and Science Education, STSE. This instrument for data collection in this follow-up study was administered on two groups of final year students of the five technology education programmes during 2012/2013 and 2014/2015 sessions. The data collected from the final year students were computed at $\alpha = 0.05$ level of significance. The reliability of the instrument was computed using Cronbach Coefficient alpha. Reliability results computed on the data from the final year students were 0.81 and 0.78 respectively.

The research questions were answered using means, standard deviations and grand means. The null hypotheses were tested using analysis of variance (ANOVA) and Scheffe test statistics.

Research Question I: What are the mean opinion ratings of graduates regarding undergraduate classroom facilities in STSE?

RESULTS AND DISCUSSIONS

Table 1: Technology Education Graduates' Mean Opinion Ratings Regarding Undergraduate Classroom Facilities in STSE

S/No	Items on classroom facilities	N2=23		N3=16		N4=18		N5=10		N6=11		Remarks	
		x ₂	s ₂	x ₃	s ₃	x ₄	s ₄	x ₅	s ₅	x ₆			
24	Classroom building structures in the school	3.00	1.00	2.88	0.96	3.11	1.02	2.40	0.84	3.09	0.53	2.94	Good
25	Flush toilets/urinals facilities for students	2.17	0.83	2.31	0.82	2.28	1.13	2.20	1.03	2.64	0.98	2.29	Fair
26	Drinking water fountains within classroom premises	2.00	1.04	2.25	1.13	1.78	0.94	2.20	1.40	2.82	0.98	2.14	Fair
27	Students' classroom furniture sets	2.78	1.00	2.94	0.85	3.00	0.77	2.70	0.67	3.36	0.67	2.94	Good
28	Lecturers' classroom furniture sets	2.43	1.04	2.85	0.96	2.94	1.11	2.40	0.79	2.82	0.98	2.69	Good
29	Adequacy of classroom space per student	2.57	0.79	2.81	1.11	2.83	1.04	2.80	0.63	2.91	0.70	2.76	Good
30	Efficiency of classroom lighting fixtures	2.65	1.03	2.50	1.26	2.67	1.24	2.50	0.71	2.82	0.98	2.63	Good
31	Classroom electric power outlets fixtures	2.52	0.99	2.56	1.15	2.61	1.20	2.20	0.63	2.82	0.98	2.55	Good
32	Classroom ventilation system provisions	3.04	0.93	2.81	1.05	3.22	1.17	2.80	0.79	3.18	0.98	3.02	Good
33	Safety provisions against classroom hazards	2.52	0.99	2.44	1.03	2.28	1.13	2.50	0.71	2.55	0.93	2.45	Fair
34	Grand mean	2.57		2.64		2.67		2.47		2.90		2.64	Good

x₂₋₆ = Means of Graduates' Groups s₂₋₆ = Standard Deviations of Graduates' Groups

x_G = Item Grand Means of Graduates' Groups N = Sample Size

seven (7) items were rated in category 'good' with means 2.55 to 3.02. Each item in the table was rated with a grand mean of 2.64 in category 'good' by these graduates.

Statistics depicted in Table 1 were computed using data collected from graduates regarding classroom facilities in STSE. The statistics given in the eleventh column in the table was the respective item grand mean (x_G). An overview of the column reveals nine (9) items were rated below 3.00. Three (3) items were rated in category 'fair' with means 2.14 to 2.45 while the remaining

Research Question 2: What are the mean opinion ratings of graduates regarding undergraduate classroom experiences in STSE?

Table 2: Technology Education Graduates' Mean Opinion Ratings Regarding Undergraduate Classroom Experiences in STSE

S/No	Items on classroom experiences	N2=23		N3=16		N4=18		N5=10		N6=11		Remarks	
		x ₂	s ₂	x ₃	s ₃	x ₄	s ₄	x ₅	s ₅	x ₆	s ₆		
35	Attendance of at least 75% by school lecturers	3.09	1.10	3.31	0.60	3.50	1.04	3.30	0.82	3.00	0.77	3.24	Good
36	Accessibility of lecturers during normal work days	3.22	0.78	3.25	0.68	3.50	0.79	3.40	0.84	3.00	0.77	3.28	Good
37	Lecturers' attitudes towards starting lect. on time	3.04	0.69	3.19	0.66	2.89	1.13	3.00	0.67	3.36	0.92	3.08	Good
38	Sufficiency of actual weekly classroom contacts	3.13	0.80	3.06	0.44	3.28	0.82	2.70	0.82	3.00	0.77	3.08	Good
39	Lecturers' knowledge of subject areas	3.17	0.78	3.38	0.62	3.56	0.92	3.20	0.92	3.45	0.93	3.35	Good
40	Actual use of instructional materials by lecturers	3.04	0.93	3.13	0.50	2.83	0.92	3.10	0.88	3.64	0.92	3.10	Good
41	Lecturers' skills to improvise instructional materials	3.04	0.83	3.00	0.82	2.89	1.02	3.40	0.70	2.82	0.87	2.99	Good
42	Lecturers' classroom communications skills	3.61	0.88	3.56	0.81	3.61	0.92	3.50	0.53	3.18	0.60	3.53	V/Good
43	Unbiased ability to conduct continuous assessment	3.22	0.83	3.81	0.91	3.50	0.92	3.40	0.70	3.27	0.79	3.44	Good
44	Standards of in class tests for C. A..	3.43	0.65	3.63	0.89	3.56	0.92	3.70	0.82	3.09	0.54	3.49	Good
45	Timely publication of continuous assessment results	2.78	0.91	3.31	0.79	3.17	0.99	2.90	0.88	2.64	0.67	2.97	Good
46	Appropriateness of final examination questions	3.48	0.88	3.44	0.96	3.61	0.85	3.80	0.92	3.18	0.60	3.50	V/Good
47	Ability of lecturers to submit marked scripts on time	3.13	0.74	3.38	1.02	3.61	0.85	3.10	0.99	3.09	0.94	3.28	Good
48	Timely publications of examination results	3.04	0.62	3.25	0.68	3.06	1.00	3.00	0.94	2.45	1.04	3.00	Good
49	The worth of knowledge acquired in core courses	3.26	0.68	3.50	0.63	3.39	0.78	3.30	0.67	3.27	0.79	3.35	Good
50	The worth of knowledge acquired in educ. Courses	3.30	0.62	3.69	0.70	3.61	0.70	3.60	0.97	3.27	0.47	3.49	Good
51	The worth of knowledge acquired in gen study course	3.39	0.65	3.44	0.63	3.39	0.78	3.30	0.95	3.18	0.40	3.36	Good
52	Suitability of MAUTECH for pursuit of educational goal	3.57	1.10	3.75	0.77	3.61	1.24	3.70	0.67	3.45	0.82	3.62	V/Good
53.	Grand mean	3.22		3.39		3.36		3.30		3.08		3.10	Good

x₂₋₆ = Means of Graduates' Groups s₂₋₆ = Standard Deviations Graduates' Groups

x_G = Item Grand Means of Graduates' Groups N = Sample Size

The statistics given in Table 2 were computed using data provided by graduates regarding classroom experiences in STSE. In the eleventh column in the table was given respective item grand mean (x_G). Overview of the column shows two (2) items were rated below 3.00. Fifteen (15) items were rated 2.97

to 3.49 in category 'good' while the remaining three (3) items were rated 3.50 to 3.62 in category 'very good'. Each item in the table was rated with a grand mean of 3.10 in category 'good' by the graduates.

Research Question 3: What are the mean opinion ratings of graduates regarding undergraduate laboratory/workshop facilities in STSE?

Table 3: Technology Education Graduates' Mean Opinion Ratings Regarding Undergraduate Laboratory/workshop Facilities in STSE

S/No	Items on Lab/workshop Facilities	N2=23		N3=17			N4=17		N5=10		N6=11		Remarks
		x2	s2	3	s3	4	s4	x5	s5	x6	s6	x6	
54.	Laboratory/workshop building structures	2.87	0.76	2.82	1.07	2.59	1.12	2.40	0.70	2.82	1.08	2.73	Good
55.	Sufficiency of work stations in laboratory/workshop	2.83	0.83	2.82	0.95	2.47	1.18	2.40	0.70	2.55	0.82	2.65	Good
56.	Provision of appropriate lab./workshop equipment	2.61	0.72	2.47	0.87	2.41	1.18	2.50	0.85	2.55	0.93	2.51	Good
57.	Provision of laboratory/workshop consumables	2.65	0.83	2.35	0.79	2.29	1.10	2.30	0.67	2.64	0.81	2.46	Fair
58.	Students' furniture sets per work station	2.39	0.78	2.47	0.80	2.47	1.07	2.50	0.85	2.55	0.93	2.46	Fair
59.	Furniture sets for instructors' work stations	2.61	0.72	2.59	0.87	2.65	1.11	2.40	0.67	2.55	0.82	2.58	Good
60.	Prov of safety measures in laboratory/w/shop	2.78	1.00	3.00	1.17	2.41	1.07	2.60	0.84	2.92	1.04	2.74	Good
61.	Ventilation system in laboratory/workshop	3.13	0.69	2.88	1.11	2.94	1.14	2.90	1.10	3.09	0.94	3.00	Good
62.	Efficiency of laboratory/workshop lighting system	2.83	0.78	2.88	1.05	2.71	1.16	2.60	0.84	2.73	1.10	2.77	Good
63.	Electric power fixture outlets at work stations	2.78	0.95	2.71	1.16	2.65	1.11	2.80	0.92	2.64	1.12	2.72	Good
64.	Grand mean	2.75		2.70		2.56		2.54		2.70		2.66	Good

x₂₋₆ = Means of Graduates' Groups s₂₋₆ = Standard Deviations Graduates' Groups x₆ = Item Grand Means of Graduates' Groups N = Sample Size

The statistics given in Table 3 were computed using data graduates provided regarding laboratory/workshop facilities in STSE. Eleventh column of Table 5 shows respective item grand mean (x₆). Nine (9) items in this column were rated below 3.00. Two (2) items were rated 2.46 each in category 'fair'

while the remaining eight (8) items were rated 2.51 to 3.00 in category 'good'. These graduates rated each item in the table with a grand mean of 2.66 in category 'good'.

Research Question 4: What are the mean opinion ratings of graduates regarding undergraduate laboratory/workshop experiences in STSE?

Table 4: Technology Education Graduates' Mean Opinion Ratings Regarding Undergraduate Laboratory/workshop Experiences in STSE

S/No	Items on Lab/workshop experiences	N2=22		N3=17		N4=17		N5=9		N6=11		Remarks	
		x2	s2	3	s3	4	s4	5	s5	6	s6		x6
65.	Attendance of at least 75% by school lecturers	3.05	0.95	3.24	0.66	3.18	1.01	2.89	0.78	3.00	0.89	3.10	Good
66.	Sufficiency of actual contacts in lab/workshop	3.00	0.76	3.06	0.83	2.76	0.75	2.89	0.33	2.55	0.82	2.66	Good
67.	Duration of the actual hands-on contact periods	2.82	0.59	2.82	0.64	2.82	1.19	3.00	0.71	2.27	0.79	2.76	Good
68.	Relevancy of hands-on to classroom theories	3.05	0.84	3.00	0.50	3.06	1.03	3.22	0.83	3.18	0.98	3.08	Good
69.	Lecturers' proficiency in design relevant hands-on	3.09	0.53	3.12	0.78	2.76	0.83	3.00	0.50	2.82	0.87	2.97	Good
70.	Lecturers' skills to cond actual hands-on exercises	2.82	0.66	3.00	0.71	3.12	0.99	3.11	0.78	3.09	0.83	3.00	Good
71.	Enthusiasm of lecturers in the conduct of hands-on	3.00	0.82	2.88	0.78	2.82	0.88	2.78	0.44	2.73	1.01	2.87	Good
72.	Timely publications of hands-on results	2.73	0.77	2.88	0.77	2.71	0.92	2.89	0.60	2.55	1.29	2.75	Good
73.	Lecturers' knowledge of lab/workshop hazard	3.27	0.77	3.53	0.62	3.29	1.05	3.33	1.00	2.73	1.01	3.26	Good
74.	The worth of overall lab/workshop experience	3.05	0.84	3.29	0.69	3.06	0.83	3.11	0.78	2.82	0.98	3.08	Good
75.	Grand mean	2.99		3.08		2.96		3.02		2.77		2.95	Good

x₂₋₆ = Means of Graduates' Groups

s₂₋₆ = Standard Deviations of Graduates' Groups

x₆ = Item Grand Means of Graduates' Groups N = Sample Size

Data collected from the graduates regarding laboratory/workshop experiences in STSE were used in the computations of statistics given in Table 4. Respective item grand mean (x₆) was given in the eleventh column in the table. Overview of the statistics in the column reveals five (5) items were rated below

3.00. All ten (10) items in the table were rated 2.66 to 3.10 in category 'good'. Each item in the table was rated with a grand of 2.95 in category 'good' by the graduates.

Hypothesis 1 There is no significant difference among the mean ratings of the five groups of technology

education graduates regarding undergraduate classroom facilities in STSE

Table 5: F-ratio Results of Five Groups of Graduates Regarding Undergraduate Classroom Facilities in STSE

Source	Sum of Squares	df	Mean Square	F _c	F _{cv}
Between	3.29	9	0.37	8.11	6.00
Within	1.02	4	0.26		

The F results in Table 5 were computed using the statistics of five groups of graduates regarding undergraduate classroom facilities in STSE. Hypothesis 1 was not retained because F observed was greater than F critical. This hypothesis was rejected because Scheffe F = 3.798 was obtained when automobile and production

graduates' means ($x_5 = 2.47$ and $x_6 = 2.90$) on classroom facilities were tested.

Hypothesis 2 There is no significant difference among the mean ratings of the five groups of technology education graduates regarding undergraduate classroom experiences in STSE

Table 6: F Results of Five Groups of Graduates Regarding Undergraduate Classroom Experiences in STSE

Source	Sum of Squares	df	Mean Square	F _c	F _{cv}
Between	3.99	17	0.24	11.02	5.84
Within	1.22	4	0.31		

The F results in Table 6 were computed using the statistics of the five groups of graduates regarding undergraduate classroom experiences in STSE. The value of F critical was smaller than that of F observed, an outcome by which hypothesis 2 was rejected. Hypothesis 2 was rejected when electrical and production graduates' means ($x_3 = 3.39$ and $x_6 = 3.08$) on classroom

experiences were tested and resulted in Scheffe F = 0.513.

Hypothesis 3 There is no significant difference among the mean ratings of the five groups of technology education graduates regarding undergraduate laboratory/workshop facilities in STSE

Table 7: F Results of Five Groups of Graduates Regarding Undergraduate Laboratory/workshop Facilities in STSE

Source	Sum of Squares	df	Mean Square	F _c	F _{cv}
Between	1.21	9	0.13	6.03	6.00
Within	0.35	4	0.09		

The F results in Table 7 were computed using the statistics of the five groups of graduates regarding undergraduate laboratory/workshop facilities in STSE. Hypothesis 3 was not retained because the value of

critical F was significantly smaller than observed F. Hypothesis 4 was not retained because when construction and electronic graduates' means ($x_2 = 2.75$

and $x_4=2.56$) on laboratory/workshop facilities were tested, Scheffe $F = 1.009$ was obtained.

Hypothesis 4 There is no significant difference among the mean ratings of the five groups of technology education graduates regarding undergraduate laboratory/workshop facilities in STSE

Table 8: F Results of Five Groups of Graduates Regarding Undergraduate Laboratory/workshop Facilities in STSE

Source	Sum of Squares	df	Mean Square	F_c	F_{cv}
Between	1.21	9	0.13	6.03	6.00
Within	0.35	4	0.09		

The F results in Table 8 were computed using the statistics of the five groups of graduates regarding undergraduate laboratory/workshop facilities in STSE. Hypothesis 4 was not retained because the value of critical F was significantly smaller than observed F. Hypothesis 4 was not retained because when construction and electronic graduates' means ($x_2 = 2.75$ and $x_4=2.56$) on laboratory/workshop facilities were tested, Scheffe $F = 1.009$ was obtained.

- Individual and average rating of the items on laboratory/workshop experiences in Table 4 were in category 'good'.
- Five (5) out of the seven (7) null hypotheses tested in this work failed retention while the remaining two (2) were retained. And the highest Scheffe F is not necessarily the difference between highest mean and lowest mean.

FINDINGS OF THE STUDY

The major findings in this study reflect some of the item grand statistics (x_G) and ANOVA and Scheffee F statistics. These findings include the following:

- Overall, each item in Table 1 was rated in category 'good' by the graduates.
- Lecturers' in-class communication skills (No.42), appropriateness of final examination questions (No.46) and suitability of MAUTECH for pursuit of educational goals (No.52) were rated in category 'very good' by the graduates.
- On the whole, each item in Table 2 was rated in category 'good' by the graduates.
- Provision of consumables (No.57) and students' furniture sets per work station (No.58) in laboratory/workshop were rated in category 'fair' by the graduates.
- On the average, each item in Table 3 was rated in category 'good' by the graduates.

DISCUSSION

The rating category 'fair' is a strong suggestion that item(s) is lacking and should be provided. In the workplaces where STSE graduates are currently engaged, both the supervisors and the graduates (respondents) identified the lack of recreational facilities and staff clinic services for them to utilize. The availability of these items in workplaces could help improve the productivity of both the graduates and the supervisors. Items rated in category 'very good' are considered sufficiently satisfying and may need little or no improvement. The last four items rated in this category were all about some characteristics of STSE graduates which suggest the graduates are doing very well in their official undertakings at work. Overall mean rating on workplace items is in category 'good' which suggests a satisfactory collective opinion of the respondents with what obtain in the workplaces. Items on classroom,

laboratory/workshop and campus were rated by groups of STSE graduates.

Graduates of STSE opined that flush toilets/urinals, drinking water fountains and safety provisions against in-class hazards within classroom premises were seriously lacking, opinions which placed the three items in category 'fair'. The same graduates placed provision of laboratory/workshop consumables and furniture sets per workstation in category 'fair', opinions that suggest unimpressive provision of these items in STSE. Graduates strongly suggest therefore that STSE should up grade and drastically improve the state of these items in the school. Making these things available would improve teaching/hands-on and learning outcomes in STSE. On the whole, however, graduates' collective opinions placed these items on classroom and laboratory/workshop facilities in a lower part of category 'good'. The opinions of the same graduates regarding classroom and hands-on experiences in STSE placed the vast majority of the items in category 'good'. However, the graduates placed lecturers' in-class communication skills, appropriateness of final examination questions and suitability of MAUTECH for pursuit of educational goals in category 'very good'. Going by the collective overall opinions of these graduates regarding in-class and hands-on experiences in STSE, the items on these areas would require a modest level of improve effort. Today, however, STSE should not disregard the rapid changes that take place in technology. Those items which graduates placed in categories 'good' and 'very good' should be updated appropriately as long as needed in order for the staff and students of STSE to keep in step with the modern technological trends.

RECOMMENDATIONS

The following recommendations were made regarding this follow-up study on the graduates of STSE and their supervisors. The recommendations included:

1. MAUTECH and STSE are recommended to drastically improve supply of good water system, provision of toilet/urinal, in-class safety measures, consumables and seats/space for hands-on, dormitory laundry/space per student, and clinic services which were rated in category 'fair'.
2. MAUTECH and STSE are recommended to equally improve those items which were rated in category 'good' in order to enhance effective teaching and learning capacities.
3. In order to position teaching/learning activities in line with the modern trends in technology, MAUTECH and STSE are recommended to encourage the improvement of even those items which were rated in category 'very good'. Improvement is an on-going activity which education institutions and organizations should undertake.

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