

Students' Academic Achievement In Basic Electronics In Six Technical Colleges In Enugu State

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Abstract: This study examined students' academic achievement in Basic Electronics in six technical colleges in Enugu State. Two research questions and two hypotheses were formulated to guide the study. The population for the study consisted of 729 students of the six technical colleges in Enugu State offering Basic Electronics subjects. There was no sampling because of the small number of students involved in the study. The data generated from the two research questions were analyzed using the mean and standard deviation while the null hypotheses were tested using ANOVA at 0.05 level of significance. The findings revealed that the females performed better than their male counterparts. The findings further revealed that the urban students performed better than their rural counterparts in NABTEB examination in 2014 and 2015. There is a significant difference in the mean scores of male and female students in Basic Electronics in Urban and Rural technical colleges. There is no significant difference in the mean academic achievement of urban and rural students in Basic Electronics in technical colleges in Enugu State. Based on the findings of the study, it was recommended that learning should be improved upon to enhance the academic achievement of students. Students should strive towards effective learning by adopting the best learning in practical and theoretical aspects of Basic Electronics to enhance students' academic achievement in NABTEB examination among others.

I. INTRODUCTION

The education industry is a very peculiar system. Generally, the sub-systems within the industry are charged with the responsibility of facilitating skill acquisition, application and utilization of knowledge through effective teaching and learning (Ovuka, 2008). In the academic situation, it has been observed that differences in academic achievement of youths vary from one person to another. Some perform excellently well in their academic pursuits while others perform below expectations and exhibit abysmal academic performances in spite of careful instructions and encouragement. Opinions vary as to why some youth excel in academics while others appear to be at the lowest level of the academic ladder. Youth enrolments in formal technical colleges require good experience and knowledge that can lead to the production of a well-trained, skilled technical youths. A well-trained youth graduate is expected to effectively use the skills, knowledge and experience to change his environment by applying acquired skills to work situation. This can be seen

from a positive and excellent academic achievement in the classroom and the environment where the youths are trained and subsequently employed as workers.

Learning can be defined therefore, as outcome of academic achievement in technical colleges. Learning is the process by which we acquire and retain attitudes, knowledge, understanding, skills and capabilities that cannot be attributed to inherited behaviour pattern or physical growth (Akin, 2014). It is expected that schools should provide the youth opportunity to acquire skills and knowledge for effective national building and create the needed human resources in our society. It can be mentioned here that one of such school programmes that provide the youths opportunities to acquire skills and knowledge for effective national building and creates a qualified human resource is the technical college programme.

The realization of the objectives of technical college in Basic Electronics programme and to improve students' academic achievement depends largely on a number of factors. These factors include the availability, adequate provision of

trained teachers, provision of Basic Electronics materials equipment and facilities, proper implementation, students' learning styles and usage of relevant textbooks. Aniemeka (2009) defined electronics as the science that deals with the study of the properties and behaviour of electronics under all conditions of applications, ranging from a simple device like a photoelectric relay, light dependent resistor (LDR), to a more complex machine such as an electronic computer. Aniemeka (2009) further pointed out that radio, television, radar, automatic controls in industry and guidance control systems for missiles are but a few of the many possible examples of electronics in action. Indeed, electronics span and permeates all academic disciplines, and is important in medical research, all branches of engineering, radar and the satellite industry. Other electronic devices encompass devices like the vacuum tubes, transistors, integrated circuits and electronic circuits used at homes and technical colleges for teaching and learning.

Considering the numerous importance of electronics, it has been observed that students' academic achievement in electronics in technical colleges had been on the decline in National Business and Technical Education Board examinations. (NABTEB 2011). There is need to investigate the correlation of male and female academic achievement in Basic Electronics. Hence, a study of relational studies of academic achievement of male and female students in Basic Electronics subject in Urban and Rural technical colleges appears desirable.

II. STATEMENT OF THE PROBLEM

The present state of students' academic achievement in Nigeria in technical Colleges today leaves much to be desired. It is apparent that there is astronomical decline in students' academic achievement in Basic Electronics in technical colleges. The finding that students' academic achievement is generally below average may be linked with the students' locus of control and poor school adjustment found in the study of locus of control and school adjustment (Aniemeka, 2009). This study corroborates earlier findings that found positive relationship between internality-externality and academic achievement reported by (Aniemeka, 2009) and relationship between under achievement and poor school adjustment (Akin, 2014).

A number of reasons or factors have been found to contribute to students' poor academic achievement in technical colleges. Odika (2005) had a contrary view to the factors mentioned by Aniemeka (2009). Odika attributed the poor performance of students to gender, learning styles, techniques and environment.

It is expected of the technical colleges to provide trained manpower in applied technology particularly at craft, advanced craft and to provide individuals with knowledge and vocational skills necessary for agricultural, commercial and economic development. The institution is also expected to provide training and impart the necessary skills to individuals who shall be self-reliant economically. It appears that the individual students from the technical colleges are failing in the achievement of the set goals of national policy on

education from their results. As observed in various NABTEB schools reports that Basic Electronics students that sat for the examination performed very poorly. This raises more questions as to whether beside the existence of the environment and locus of control, there are no such factors as issues of male and female and the enrolment of students in Urban and Rural areas which also influence this ugly trend in Basic Electronics. Thus, a relational study of male and female students' academic achievement in Basic Electronics subject in Urban and Rural technical colleges is desirable.

III. PURPOSE OF THE STUDY

The major purpose of this study is to determine students' academic achievement in Basic Electronics in technical colleges in Enugu State.

Specifically, the study investigated the followings:

- ✓ The relationship in academic achievement of male and female students in Basic Electronics
- ✓ The relationship in academic achievement of urban and rural students in Basic Technology.

IV. RESEARCH QUESTIONS

The following research questions guided this study:

- ✓ What is the relationship in academic achievement of male and female students examined in Basic Electronics subject in six technical colleges in Enugu State.
- ✓ What is the relationship in academic achievement in Basic Electronics in Urban and Rural technical colleges in Enugu State?

HYPOTHESES

H_{01} There is no significant difference in the mean academic achievement of male and female technical college students in Basic Electronics in 2014 and 2015-examination years.

H_{02} There is no significant difference in the mean academic achievement of urban and rural technical college students in Basic Electronics in 2014 and 2015-examination years as reflected in table 1.

V. METHOD

This study was a survey work, which was designed to enquire into and provide information about the academic achievement of students examined in Basic Electronics subject in Urban and Rural technical colleges in Enugu State.

AREA OF THE STUDY

The area of study was Enugu State. The state has 17 local government areas with 19 technical colleges.

POPULATION OF THE STUDY

The population for the study consisted of 729 students of six technical colleges that offered Basic Electronics subject in 2014 and 2015-examination years.

SAMPLE AND SAMPLING TECHNIQUES

No sampling was done. All the students in the population were used for the study.

S/N	Institution	2014 Population	2015population	Location
1	Government Technical College Enugu	80	59	Urban
2	Government Technical College, Abor	68	54	Rural
3	Government Technical College Nsukka	67	67	Urban
4	Government Technical College Mgbidi	48	46	Rural
5	Government Technical College-Umu-Itodo Obollor Afor	55	51	Rural
6	Government Technical College Udi	69	65	Urban
Total		387	342	
Grand Total		729		

Table 1

Table I shows the institutions, population of each technical college and their different locations. It was clearly shown in Table I that technical colleges whose serial numbers are 1, 3 and 6 are located in the urban areas. While the rural technical colleges are 2, 4 and 5.

INSTRUMENT FOR DATA COLLECTION

The documented examination results of National Business and Technical Examination Board (NABTEB) in 2014 and 2015 examination years in urban and rural technical colleges were the major instrument used at bringing out answers to the research questions raised and the hypotheses formulated in the study.

VALIDITY OF THE INSTRUMENT

National Business and Technical examination scores of the students were subjected to confirmation by two experts in the area. This was done by visiting the examination body's website.

RELIABILITY OF THE INSTRUMENT

The reliability of the instrument was established using Kuder-Richardson Formula 20. It was used to establish the internal consistency reliability of the instrument. The scores of the previous year 2013 was obtained and computed to establish the internal consistency reliability estimates of Basic Electronics of the instrument at 0.79.

METHOD OF DATA COLLECTION

The researcher personally collected the documented examination printouts in Basic Electronics from the schools studied for 2013, 2014 and 2015.

METHOD OF DATA ANALYSIS

The stated research questions one and two were answered by using mean and standard deviation. The hypotheses were tested by using the ANOVA.

VI. RESULTS

RESEARCH QUESTION I

What is the relationship in academic achievement of male and female students examined in Basic Electronics Subject in the six technical colleges?

Gender	Mean	N	Std. Deviation
Males (2014)	43.8191	304	14.78527
Females (2014)	48.5542	83	11.05337
Males (2015)	49.0429	280	11.85176
Females (2015)	50.9712	62	8.04379
Total	46.9712	729	13.09330

Table 2: Mean and standard Deviation of Male and Female Students Examined in Basic Electronics in NABTEB, 2014 and 2015 May/June in Technical Colleges Students Score (Gender)

Table 2 Above shows data of computed scores of 2014; and the male students had a mean of 43.8191 with standard deviation of 14.78527, while females had a mean of 48.5542 with standard deviation of 11.05337. In 2015, male students had a mean of 49.0429 with standard deviation of 11.85176 while the female had a mean of 50.9516 with standard deviation of 8.04379. In all, Table 2 reflected a mean of 46.9712 with a standard deviation of 13.09330.

RESEARCH QUESTION 2

What is the relationship in academic achievement of students examined in Basic Electronics in urban and rural technical colleges?

Location of student	Mean	N	Std. Deviation
Students in Urban Technical Colleges	47.5135	407	13.7577
Students in Rural Technical Colleges	46.2857	322	12.18851
Total	46.9712	729	13.09330

Table 3: Mean and Standard Deviation of Students' Academic Achievement in Basic Electronics Examination in Urbana and Rural Technical Colleges Student Score (Gender)

In Table 3, students in urban technical colleges had the mean scores of 47.5135 with standard deviation 13.75773, while students in rural technical colleges had the mean scores of 46.2857 with standard deviation 12.18851. In urban and rural locations, the students had a mean of 46.9712 with standard deviation of 13.09330.

HYPOTHESIS I

There is no significant difference in the mean academic achievement of male and female technical college students in Basic Electronics subject in 2014 and 2015 examination years.

Summary of Analysis of Variance of Male and female Students' Scores in Six Technical Colleges in Basic Electronics Subject in 2014 and 2015 NABTEB Examination,

The analysis of variance of students' scores on Basic Electronics subject by gender shows reported significant difference. The calculation reflected $P=0.000$ value while $F\text{-calculate}=10.956$ at 0.05 level of significance.

Therefore, the students' score were associated with their gender.

HYPOTHESIS 2

There is no significant difference in the academic achievement of students examined in Basic Electronics subject in Urban and Rural Technical Colleges.

Summary of Analysis of Variance of Students' scores in six technical colleges in Basic Electronics subject in Urban and Rural settings in 2014 and 2015 NABTEB Examinations.

The analysis of variance of students' scores on Basic Electronics subject by location (Urban and Rural) revealed that there is no significant difference between the Urban and the Rural in terms of locations. This is indicated in the confidence interval for mean of students in urban (lower bound 46.17) (Upper bound 48.85) while students in rural (lower bound 44.9) (upper bound 47.2). In terms of measure of association, students' academic achievement are not strongly associated with their locale.

VII. DISCUSSION

The findings of the research question one revealed that students' performances and academic achievement differ from one technical college to another. Findings revealed that the academic achievement of the students in different schools was because of the methods of teaching, learning styles and habits of students. Generally, there is evidence from the findings that students academic achievement in Basic Electronics is below average in the 2014 and 2015 examinations as reflected in the computation. As concluded in the computation, students had a mean score for 46.97, which is below the benchmark of 50 as average score for NABTEB examinations and other external examinations in Nigeria.

Ordu (2004) supported the findings when he observed that differences in academic performances of students vary from one person to another. Some males performed excellently in their academic pursuits while other females performed below expectation. In another environment, (Urban or Rural) some females performed well in their academic pursuits while other males exhibited discouraging academic performances in spite of careful instruction and encouragement. Opinions vary as to why some students excel academically while others appear to be at the lowest level of the academic ladder. NABTEB (2013) results revealed unsatisfactory performance of the students in electrical/electronics instrumentation and electrical domestic/industrial installation with failure rate of 42.5% and 45.5% respectively.

The findings of research question two on the academic achievement of students in urban and rural technical colleges revealed that failures are recorded in the rural technical colleges than urban locations in the study.

Anakwe (2008) opined that students' academic achievement is generally below average. He supported the findings that revealed the adjustment of students to school environment (Urban and Rural) is an important requirement of life and good performances in technical colleges.

The hypothesis one revealed that there is significant difference between the technical college male and female students academic achievement from the results of 2014 and 2015 tested in the study. It can be inferred that the difference

in academic achievement can be because of student's background and the location of the technical colleges.

The hypothesis two revealed that there is no significant difference between the technical college Urban and Rural students academic achievement from the results of 2014 and 2015 tested in the study. Some of the technical college teachers attested that academic achievement of the students can be associated with their location that lack the enabling environment, facilities, electricity and teachers of the subjects. It is inferred from the findings of study that the difference in academic achievement could be because of lack of these equipment and facilities in Urban and Rural technical colleges in Enugu State.

VIII. CONCLUSION

The paper examined the students' academic achievement in Basic Electronics in Technical Colleges in Enugu State. The paper attempted detailed study of the academic achievement and male females students in the rural and urban technical colleges. It was revealed that the academic achievement of the male and female students in the urban and rural indicated a significant difference in academic achievement in different locations of the technical colleges. The males performed below expectation compared to their female counterparts as revealed from the findings. This study was a survey work, which was designed to enquire into and provide information on the academic achievement in the different technical colleges revealed that there is no significant difference in academic achievement in Urban and Rural technical colleges. The study treated and analyzed 387 students in 2014 and 342 in 2015 examination years. Two research questions and two null hypotheses guided the study. The study revealed the following findings that there is a significant difference between the male and female students academic achievement in urban and rural technical colleges. There is no significant difference in academic achievement of students in urban and rural technical colleges. Based on the findings, it was recommended that the government should improve the students' learning skills to enhance their academic achievement in external examinations among others by providing well equipped electronic workshops.

IX. RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made for sustainable development in Basic Electronics.

- ✓ Government should provide well-equipped electronics workshop for effective learning of Basic Electronics in the Urban and Rural technical colleges to enhance students' performance in NABTEB and other external examinations.
- ✓ Adequate funding of the technical colleges in the urban and rural technical colleges for the requirements of Basic Electronics workshops will improve teaching and learning in the six technical colleges in Enugu State.

- ✓ Instructional materials, textbooks, internet facilitates, should be provided for the students for effective learning of Basic Electronics in the technical colleges to promote acquisition of skills, competencies and improve the performance of students.
- ✓ Students of electronics should improve their learning styles and to refresh their knowledge in electronics subject in the classroom to assist them to understand the subject to enhance the academic achievement of students in external examinations.
- ✓ Extra-moral classes should be organized for electronic subjects for technical college students to assist them perform well in NABTEB examination and technical college teachers should complete the syllabus of the electronics subject to prepare students for the external examinations.

What can improve the situation is the use of the Basic Electronics circuit's for teaching in line with each topic, objectives, content, activities and specific tasks in NABTEB syllabus that are applicable for teaching and learning.

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