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Relationship among School Type, Self-Esteem, Career Aspiration and Academic Achievement in Mathematics of Public Senior Secondary School Students in Adamawa State, Nigeria

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ABSTRACT

This study examined the relationship among school type, self-esteem, career aspiration and academic achievement in Mathematics of public senior secondary schools students in Adamawa state, Nigeria. The study was guided by seven research questions and eight null hypotheses. The study was based on a survey research design. The population of study was 31,984 SS II students across 301 secondary schools in Adamawa state. The study sampled 641 SS II students comprising of 364 students from mixed-schools and 277 students from single schools. The instruments for data collection include validated "Students' Self-Esteem Scale" (SSS), "Students' Career Aspiration Questionnaire" (SCAQ), and "WAEC Adapted Students' Mathematics Assessment Test" (WAECASMAT), with the reliability coefficient values 0.78, 0.85 and 0.80 respectively. Data were analyzed using percentage, mean and standard deviation to answer research questions while the null hypotheses were tested using Simple Linear and Multiple Linear Regression analysis. The findings show that there is no significant relationship between school type and students' academic achievement in Mathematics in senior public secondary schools ($R^2 = 0.001$, $F(1, 639) = 0.651$, $p = 0.420 > 0.05$). There is a significant relationship between students' self-esteem and academic achievement of senior public secondary school students in Mathematics ($R^2 = 0.229$, $F(1, 639) = 183.023$, $p = 0.000 < 0.05$). There is significant relationship between career aspiration and students' academic achievement in mathematics ($R^2 = 0.299$, $F(1, 617) = 262.631$, $p = 0.000 < 0.05$). There is no significant relationship among school-type, gender and students' academic achievement in mathematics ($R^2 = 0.006$, $F(2, 638) = 1.970$, $p = 0.140 > 0.05$). There is significant relationship among students' self-esteem, gender and academic achievement of students in mathematics ($R^2 = 0.143$, $F(2, 638) = 51.572$, $p = 0.000 < 0.05$). There is significant relationship among career aspiration, gender and academic achievement of students in mathematics ($R^2 = 0.216$, $F(2, 638) = 85.101$, $p = 0.000 < 0.05$). There is significant relationship among school-type, self-esteem, career aspiration and academic achievement of secondary school students in mathematics ($R^2 = 0.312$, $F(3, 637) = 92.891$, $p = 0.000 < 0.05$). There is significant relationship among gender, school-type, self-esteem, career aspiration and academic achievement of students in mathematics ($R^2 = 0.271$, $F(4, 636) = 57.101$, $p = 0.000 < 0.05$). The implication of these results is that self-esteem, gender and career aspiration of learners could jointly play a significant role in their academic achievement in Mathematics. As these variables increase in mean, students' academic achievement in Mathematics increases correspondingly. Therefore, the study recommended among others for engagement of school counselors, parental involvement, teachers participation and principals involvement in encouraging self-esteem and guiding secondary school students when considering their career aspiration and academic achievement in Mathematics.

Keywords: School Type, Self-Esteem, Career Aspiration and Academic Achievement

Introduction

Education is a process and a kind of activity in relation to human development. It is a continuous attempt to develop all capacities of learners to control their environment and to fulfill their needs. Adegbesan (2012) stated that people and nations are what they are, because of the nature and types of education they are exposed to. This means that education makes it possible for a country to have a steady supply of highly creative citizens who can help the nation to keep improving the living conditions of general citizenry and solving the existing problems from time to time. To ensure that education plays its role in national development, the National Policy on Education (Federal Republic of Nigeria, FRN, 2013) states that education has to be geared towards self-realization, better human relationship, national consciousness, national unity, as well as social, cultural, economic, political, scientific and technological progress. For education to contribute to attainment of the national development, Fafunwa (2007) remarked that the quality of instruction at all levels of education should be oriented towards inculcation of certain values that will unite the nation.

In Nigeria, secondary education aims at preparing an individual for useful living within the society and higher education. Specifically, it aims at the following; providing all primary school leavers with the opportunity for education at higher level irrespective of sex, social status, religious and ethnic background; offering diversified curriculum to cater for differences in talents, opportunities, and future careers; providing trained manpower in applied science, technology and commerce at sub-professional grades (FRN, 2013).

School-type in this context is defined as the composition of students in terms of sex in a particular school. The school-type can be analyzed into two which are: single sex schools and mixed sex schools (Co-educational) (Reasoner, 2010). There is much commentary on the educational outcome related

to school-type; that is single sex schools and coeducational (mixed) schools (Ajayi, 2013; Ajayi, 2015). According to Booth and Nolan (2015) girls' environment plays an important role in explaining why girls choose not to compete. Girls from single-sex schools behave more competitively than do girls in coeducational schools. According to Ajayi (2015) critics of single-sex education argue that girls-only schools are unnatural social settings which isolate girls from boys.

Self-esteem is a feeling of satisfaction that someone has in himself or herself and his/her own abilities. Moreover, it encompasses beliefs about oneself that are used to describe a person's overall sense of self-worth or personal value that is often seen as a personality trait (Sadaat, Ghasemzadeh & Soleimani, 2012; Adewale, 2014). The purpose of self-esteem is the feeling and imagination that people nurtured in their mind over time about their self, interest and aspirations. In simple words, self-esteem is self-assessment; this perception and evaluation can be positive or negative and pleasant or unpleasant. Children with high self-esteem, usually feel good about themselves and better able to resolve their conflicts with other children and are resistant to deal with problems, troubles and failures. Appraisal of the effects of self-esteem is complicated by several factors, because many people with high self-esteem exaggerate their successes and good traits, emphasize objective measures of outcomes.

Career aspiration represents a learner's orientation towards particular occupational goals and as Hoover (2015) reported, it can be influenced by academic achievement. Career aspiration is especially important because they allow students to evaluate the degree to which various choices help or hinder their chances of attaining desired goals. Career aspiration is an important precursor for successful career development across the life span and is closely related to students' adjustment and well-being (Huiling & Peng, 2012). According to Karendra (2013), aspirations refer to an individual's expressed career related goals or intentions and also include motivational components which are not present in mere interests. The career aspirations of students have been viewed as significant determinants of both short term educational and long term career choices. They have also been regarded as important career motivational variables which are predictive of latter career attainment levels, irrespective of gender of students and places of education (Karendra, 2013).

Similarly, grouping of career aspiration as done by Chemeli (2013) and Gregor and O'Brien (2013) are too copious and can mislead data gathering or make harmonization of data for analysis difficult. Therefore, the current study will adopt the color collar job grouping as proposed by Lucas and Buzzanell (2014) and McQuerrey (2018); their collar job grouping simplified the career aspiration type. More so, using these three distinct collar job grouping is likely to suit the psychological level of secondary schools students regarding thinking about future career. Therefore, this study will measure career aspiration using aspiration for white collar job, aspiration for blue collar or pink collar.

Academic achievement is generally a pedagogical terminology used while determining learner's success in formal education and which is measured through reports, examinations, researches and ratings with numerous factors (Yusuf & Adigun, 2010). Essentially, the national policy on education (2013) has identified secondary school achievement according to school subjects which are classified as either core or elective subjects. Academic achievement also refers to how well a student is accomplishing his or her tasks and studies (Linderman, 2012). The trend of poor achievement of senior public secondary school students in Adamawa state has been confirmed by the West African Examination Council (WAEC) (WAEC, 2017).

In Adamawa state, Udonsa (2015) reported a great salient issue regarding the poor performance of students in Mathematics in WAEC examinations. It was indicated that in the last five years (2013 – 2017), out of 165,827 candidates who sat for Mathematics examinations, only 30,823 which accounted for 19% of candidates passed at credit or higher grade, while 49,381 students who accounted for 30% of candidates have pass grade, while the remaining whopping 85,623 students who accounted for 52% of candidates failed. This shows that the students' performance in Mathematics in Adamawa state is generally below average.

The arguments about interaction effects among self-esteem, career aspiration, school - type and academic achievement seemed endless and inconclusive, with varying degrees of findings and conclusions. The situation could be more dared in the North-East region of Nigeria, where child's gender affected virtually types of education, social and economic orientation given by the parents. Therefore, this study is an effort to determine the type of relationship possibly exists among the school-type, self-esteem, career aspirations on academic achievement in senior public secondary schools, in Adamawa State. It expected of this study to reveal the actual effect and difference in the performance of students in senior public secondary schools in Adamawa state based on the type of school attended by the students, genders of students and the kind of job aspired by the students, as well as self-esteem for each of the students.

Statement of the Problem

In every educational system, the issue of students' academic achievement is very crucial in the sense that the quality of school, teacher and every other input determines the output which is students' academic achievement. Secondary schools in Adamawa State are expected to function in compliance with the expectations of the national education objectives. Mathematics is one the compulsory subjects offered by all students in secondary schools of Adamawa State. Its importance to the students for securing admission into institutions of higher learning in Nigeria cannot be overemphasized. However, WAEC records show that the state is lagging behind in terms of overall achievement in Mathematics (WAEC, 2017). Many factors may have contributed to students' underachievement in Mathematics in secondary schools of Adamawa State earlier reported by Udonsa (2015). Nonetheless, this study focuses on school type, self-esteem and career aspiration as probable instigators of students' underachievement in Mathematics.

The north-eastern part of Nigeria, where Adamawa State is located has peculiar cases. Educational participation is low and the level of literacy in Mathematics among secondary school students is also on the decline. What this means is that, since a credit in Mathematics is required as basic for securing admission into higher institutions of learning, most secondary school graduates in the state may not present this basic requirement for admission. Therefore, they may be left out of the admission process year in year out. This would further compound the problems already experienced in this region,

as it would be disastrous not to educate and engage these youthful minds. In light of this, the study investigates the relationship among self-esteem, career aspirations and school-type on students' academic achievement in Mathematics in senior public secondary schools in Adamawa State, Nigeria.

Purpose of the Study

The purpose of this study is to determine the relationship among self-esteem, career aspiration and school-types on academic achievement in Mathematics of senior secondary school students in Adamawa State. Specifically, the study seeks to determine the:

1. Relationship between school-type and academic achievement of senior public secondary school students in Adamawa state.

2. Relationship between self-esteem and academic achievement in Mathematics of senior public secondary school students in Adamawa state.

3. Relationship between career aspirations and academic achievement in Mathematics of senior public secondary school students in Adamawa state.

4. Relationship among school-type, gender and academic achievement in Mathematics of senior public secondary school students in Adamawa state

Research Questions

The following research questions were raised to guide the study:-

1. What is the mean score of senior public secondary school students in Mathematics based on school-type?

2. What is the mean score of senior public secondary school students in Mathematics based on level of self-esteem?

3. What is the mean score of senior public secondary school students in Mathematics based on career aspirations?

4. What is the mean score of senior public secondary school students in Mathematics based on gender?

Hypotheses

The following null hypotheses are formulated and tested in this study, at 0.05 level of significance to guide the study.

$H0_1$: There is no significant relationship between school-type and academic achievement in Mathematics of senior public secondary school students in Adamawa state.

$H0_2$: There is no significant relationship between self-esteem and academic achievement in Mathematics of senior public secondary school students in Adamawa state.

$H0_3$: There is no significant relationship between career aspiration and academic achievement in Mathematics of senior public secondary school students in Adamawa state.

$H0_4$: There is no significant relationship among school-type, gender and academic achievement in Mathematics of senior public secondary schools students in Adamawa state.

Theoretical Framework

This study is hinged on the Self-Concept Theory propounded by Rogers in 1959 (as cited in Onaa, 2015).The Theory stated that both the unconditional and conditional positive esteem are fundamental in the development of the self. The critical factors in one's environment that enhanced one make self-actualization possible including being accepted, treated with empathy and being treated genuinely. One has an opportunity for full actualization when grow in situations of unconditional positive regard. When raised in an environment of conditional positive regard, one feels worthy only if they match conditions, that have been laid down for by others.

Rogers examined the conditioned, controlling world that kept an individual from having positive self-concept and reaching their full potential as human beings. Acceptance is difficult because as we grew up, the significant other (people central in our lives) conditioned us to move away from these positive feelings. Our parents, siblings, teachers and peers all placed constraints and contingencies on our behaviors. For instance such statements came to us "Don't do that," "Don't be different," "But we just want to be proud of you," and "How can you be stupid?"

The society has been conditioned to attach better performance and quality to national schools and mediocrity with sub-country schools. Those who fail to get good WAEC marks for whatever reason may be perceived as inferior. This may negatively influence a student from having positive self-concept and reaching their full (e.g. in academic performance) potential as human beings in relation to Rogers "conditions of worth" theory. Those raised in an environment of conditional positive regard will feel worthy only if they match conditions of worth lay down by others. This influences our self-esteem.

Conditional Positive Regard is Rogers' terms for the concept that love and praise often are not given unless an individual conforms to parental or social standards. The result is lower self-esteem.

In relation to self-concept, Covington (1984) points out that in our society people tend to view success with human worth, which generates the notion that people are only as valuable as their achievement. He wondered how this could be if such a perception is enhanced in the school set up. If this becomes the case, students can easily irrationally mix and confuse ones value with ability. In addition, adequate guidance and counselling for students 'cognitive restructuring may be lacking. Secondary school students may feel proud of themselves; value themselves more than those in State schools, just because the schools they attend exhibit better academic achievement. The school experiences seemingly form a significant determinant towards the sense of self of the student. This influences ones values, self-concept and eventually ones self-esteem (Covington, 1984). The current study therefore endeavored to establish if there are students' self-esteem differences in relation to school-type.

Rogers believed that problems originate when many people despise themselves and perceive themselves devoid of worth and value for acceptance and love. He therefore emphasized on unconditional acceptance of clients. Students may unfairly harbor irrational thoughts in conformity to stereotypes and biases related to their school-type (single and mixed schools) which may eventually influence their self-esteem and career aspirations on academic achievement. For instance, students who attend single senior secondary schools may have an attitude and self-image of failure and being academically poor. It may be worth noting that their poor WAEC marks could have been due to environmental factors or problems. This leads to low self-esteem and affects self-efficacy, eventually leading to poor WAEC grades. At times, career aspirations may be conditioned in relation to students' performance. Those in mixed schools may be expected to aspire high-level careers, or varies careers aspiration due to mix in gender, which may influence their self-efficacy and eventual WAEC results while those in single schools are likely to a similar career aspiration, since they might be taken inspiration from similar perspective due to gender similarity.

Implications of Self-Concept Theory to this Study

The self-concept theory established that individual achievements are mostly being shape by how one think of him or her being accepted within the society and what one aim to achieve within the society in term of career. Thus, as a student in the secondary education that is transiting from adolescences to adulthood, there is a need to feel being accepted in the society as well as aiming at better career opportunity in future that can further guarantee the better position within the society. As such, the failure of attaining either self-esteem desired by the students or the kind of career aspired by the students can both impaired the achievement of students academically. Likewise, when both conditions fall in a line for the students, such that he/she perceived being accepted and sees possibility to achieve the aspired career the academic achievement for such student likely to be enhanced. In short, the self-esteem and career aspired by the students can both interact with other variables such as nature of school attended (school factors) and gender assigned roles by the society to influence the academic achievement of the students.

Concept of School-type

Generally, school-type can be differentiate by gender of student (single-sex or mixed) and by ownership –private owned or public schools. Evidences, from various studies have shown that school-type determine the school management styles, school climate, school environment and overall quality of schools. The single-sex education is the practice of conducting education with male and female students attending separate classes, perhaps in separate buildings or schools.

Mixed-sex education is known as, co-education or coeducation is a system of education where males and females are educated together. In Nigeria, the majority of governments owned schools are mixed schools. Analysts have argued that mixed schools are necessary for the interaction between children of both sexes (Utpal, 2014). While co-education may have certain benefit. However the main disadvantage of the co-educational schools is that our secondary schools cannot cater for both boys and girls (Keith & Ralf, 2011). This is because at secondary school level, the interests of boys tend to be different from those of girls. Most girls are more at home in a domestic science laboratory than its physics laboratory, they are interested in different library books and magazine, they prefer volley ball or handball (Bleidorn *et al.,* 2016).

Concept of Students' Self-Esteem

Self-esteem reflects an individual's overall subjective emotional evaluation of his or her own worth. It is the decision made by an individual as an attitude towards the self. Self-esteem encompasses beliefs about oneself, (for example, "I am competent", "I am worthy"), as well as emotional states, such as triumph, despair, pride, and shame (Orth & Robbins, 2014).

According to Baumeister, Smart and Boden (2016) self-esteem is the confidence one has in his/her ability to cope with the basic challenges of life and confidence in ones right for happiness and success. High self-esteem is associated with positive feelings and low self-esteem with negative feelings. Reasoner (2010) stated that self-esteem possesses behavioural, cognitive and affective elements. In the cognition dimension one thinks consciously about oneself (explicit self-esteem)-looking at the difference existing between the person one wishes to be (ideal-self) and realistic appraisal of how one sees oneself (perceived self). The feeling or emotion that one has when considering such a difference is regarded as affective dimension. Behaviours that may include resilience, being decisive, assertiveness, and respect for others denote the behavioural aspects (Baumeister et al., 2016; Reasoner, 2010). Hewitt (2009) states that what a person experiences in life is a critical source for development of self-esteem. Life experiences that one has (positive or negative),

brings about attitudes towards the self, which can be good developing positive emotions of self-value, or unfavorable, developing negative emotions of self-value.

Methodology

In the study a descriptive survey design was adopted. According to Eze (2005) the descriptive survey design uses reliable techniques to collect data from a well-defined population or systematically selected segments of the population for the purpose of determining the attributes of the entire population. The design is best suited for the present study because it dealt with large population sizes. The population of this study includes all the 31,984 Senior Secondary School (SS II) students across the 301 public senior secondary schools located in the five education zones in Adamawa State. The sample size for this study is 641 SS II students comprises of 364 students from mixed-school and 277 students from single schools, across five education zone in Adamawa state. In order to arrive at the sample size, the study adopts multistage sampling procedure. The instruments for this study were structured questionnaire tagged "Students' Self-Esteem Scale" (SSS), Students' Career Aspiration Questionnaire" (SCAQ) and WAEC Adapted Student Mathematics Assessment Test (WAECASMAT). The research question of this study was answered using descriptive statistics such as frequency count and percentages, mean and standard deviation. The null hypotheses were tested using simple linear regression.

Morgan (2007) argued that the correlational survey research design involves collecting data gradually in order to determine whether a relationship exists between two or more quantifiable variables. Bless and Higson-Smith (as cited in Akpo, 2012) added that the purpose of correlational survey research is often to detect the existence of a relationship between or among variables, which suggests a possible base for causality. In this study, the correlational survey research design was used to establish the relationships that exist between school-type, self-esteem and career aspiration on academic achievement of senior public secondary school students in Adamawa state. Therefore, correlational survey design was found to be the best strategy to investigate the objectives of this study.

Data Analysis

Research Question One: What is the mean score of senior public secondary school students in Mathematics based on school-type?

Table 1: Mean Achievement Scores for those Students from Mixed and Single School in Adamawa State

School-type	n	$\overline{X}$	S.D	Mean Difference
Mixed	364	47.90	16.86	-1.12
Single	277	49.03	17.53	

Table 1 revealed the mean and standard deviation of achievement scores in Mathematics by students from both mixed and single schools in Adamawa state. In the category of those students from mixed schools, the table revealed that mean achievement score for the total of 364 students was 47.90 with standard deviation of 16.86. Also, the result showed that for total of 277 students from single schools, the mean score recorded was 49.03 with standard deviation of 17.53. The table shows further that there is a mean score difference of 1.13 in favor of those students from single schools.

Research Question Two: What is the mean score of senior public secondary school students in Mathematics based on level of self-esteem?

Table 2: Mean Achievement Scores in Mathematics by Senior Secondary School Students in Adamawa State Based on Level of Self-esteem

Level of Self-esteem	n	$\overline{X}$	S.D	Mean Difference
Low	390	41.89	14.31	-16.83
High	251	58.72	16.20	

Table 2 revealed the mean and standard deviation of achievement scores in Mathematics by public secondary school students in Adamawa state based on level of self-esteem. The results showed that for the category of students with low self-esteem the mean achievement score was 41.89 with standard deviation of 14.31. Also, in the category of students with high self-esteem, the mean achievement score was 58.72 with standard deviation of 16.20. Also, the table shows the mean score difference of 16.83 in favor of those students with high self-esteem.

Research Question Three: What is the mean score of senior public secondary school students in Mathematics based on career aspirations?

Table 3: Mean Achievement Scores in Mathematics by Senior Secondary School Students in Adamawa State Based on Career Aspiration

Career Aspiration	n	$\overline{X}$	S.D
White Collar Job	330	55.55	16.02
Blue Collar Job	171	44.28	15.50
Pink Collar Job	140	36.29	12.78

The results on Table 3 revealed the mean and standard deviation of achievement scores in Mathematics by public secondary school students in Adamawa state based on level of career aspiration. In the category of those students (n=320) that aspired the white collar job, the mean achievement score was 55.55 with standard deviation of 16.02, while in the total 166 students that aspired the blue collar jobs, the mean achievement score was 44.278 with standard deviation of 15.50. Also, for the total 133 students that aspired to the pink collar jobs the mean achievement score were 36.29 with standard deviation of 12.78. This result showed that those students with white collar jobs recorded highest mean score; follow by those category of students who aspired to blue collar jobs and lastly those who aspired to pink collar jobs.

Research Question Four: What is the mean score of senior public secondary school students in Mathematics based on gender?

Table 4: Mean Achievement Scores in Mathematics for Senior Secondary School Students in Adamawa State Based on Gender

Gender	n	$\overline{X}$	S.D	Mean Difference
Male	282	49.79	16.68	2.49
Female	359	47.30	17.45	

Results on Table 4 revealed the mean achievement scores in Mathematics for senior secondary school students in Adamawa state in respect to their gender. The results showed that in the category of male students (n=282) the mean achievement score was 49.793 with standard deviation of 16.68. Also, for a total of 359 female students, the mean achievement score was 47.30 with standard deviation of 17.45. A mean score difference of 2.49 was revealed by the table in favour of male students. This shows that the achievement of male students in Mathematics is slightly higher than female students.

H0₁: There is no significant relationship between school-type and academic achievement in Mathematics of senior public secondary school students in Adamawa state.

In order to test this hypothesis, the mean score of students on school type and academic achievement in Mathematics were correlated using simple linear regression method. The results are presented in Tables 8a, 8b and 8c respectively.

Table 5a: Model Summary for Regressors (School Type and Academic Achievement in Mathematics)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.032[a]	0.001	0.001	17.154	1.839

a. Predictors: (Constant), School Type

b. Dependent Variable: Academic Achievement

Table 5a presents the result on model summary for regressors (school type and academic achievement in Mathematics). The result reveals R-value of 0.031, which indicates that independent variable has no good level of prediction on the dependent variable (academic achievement). Also, R-square value of 0.001 reported on the table indicated that the independent variable (school type) can only explain about 0.1% of the variability in dependent variable. The similar insignificant value was revealed for adjusted-R-value which is 0.001. Thus, the model summary established that the independent variables cannot sufficiently explain variation in the dependent variable, thus the model is not fit.

Table 5b: Analysis of Variance (ANOVA) for Model Fitness for Regressors (School Type and Academic Achievement in Mathematics)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	191.646	1	191.646	.651	.420[b]
Residual	181561.524	639	294.265		
Total	181753.170	640			

a. Dependent Variable: Academic Achievement

b. Predictors: (Constant), School Type

The result of Analysis of Variance (F-Ratio) for the overall regression model fitness revealed F (1, 639) =0.651, P-value 0.420 > 0.05. Thus, the obtained p-value (0.420) greater than hypothetical p-value (0.05), this implies that the model is not a good fit for the data.

Table 5c: Results of Linear Regression Analysis on Relationship between School-type and Students' Academic Achievement in Mathematics in Senior Public Secondary Schools in Adamawa State

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	46.780	2.110		22.172	.000
School Type	1.123	1.392	.032	0.807	.420

a. Dependent Variable: Academic Achievement

The result of regression analysis on the relationship between school type and students' academic achievement in Mathematics is presented in Table 8c. The result showed standardized coefficient beta (0.032), t-value of 0.807, p-value of 0.420. Thus, p-value of 0.42 is greater than hypothetical p-value 0.05, which implies no significant relationship between the dependent variable (student academic achievement) and independent (variable school type). Therefore, the null hypothesis is not rejected.

H0$_2$: There is no significant relationship between self-esteem and academic achievement in Mathematics of senior public secondary school students in Adamawa state.

This hypothesis was tested by comparing the mean score of students on self-esteem with their mean academic achievement score in mathematics using simple linear regression method. The results are displayed in Tables 9a to 9c respectively.

Table 6a: Model Summary for Regressors (Students' Self-esteem and Academic Achievement in Mathematics)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.478[a]	.229	.228	15.073	1.213

a. Predictors: (Constant), Self-esteem

b. Dependent Variable: Academic Achievement

Table 6a presents the result on model summary for regressors (students' self-esteem and academic achievement in Mathematics). The result reveals R-value of 0.478, which indicates that independent variable has moderate level of perdition on the dependent variable (academic achievement). Also, R-square value of 0.229 reported on the table indicated that the independent variable (self-esteem) can only explain about 22.9% of the variability in dependent variable. The table revealed adjusted-R-value which is 0.228 buttressed the moderate contribution of self-esteem to student academic achievement. Thus, the model summary established that the independent variables can offer some level of explanation toward variability in the dependent variable, thus the model is consider fit.

Table 6b: Analysis of Variance (ANOVA) for Model Fitness for Regressors (School Type and Academic Achievement in Mathematics)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	41580.038	1	41580.038	183.023	0.000[b]
Residual	140173.132	639	227.185		
Total	181753.170	640			

a. Dependent Variable: Academic Achievement

b. Predictors: (Constant), Self-esteem

Table 6b present the result of Analysis of Variance (F-Ratio) for the overall regression model fitness. The result revealed $F(1, 639) = 183.023$, P-value 0.000<0.05. Thus, the obtained p-value (0.000) is less than hypothetical p-value (0.05); this implies that model is fit.

Table 6c: Results of Linear Regression Analysis on Relationship between Students' Self-esteem and Academic Achievement in Mathematics in Senior Public Secondary Schools in Adamawa State

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	25.055	1.828		13.705	.000
Self-esteem	16.834	1.244	0.478	13.529	.000

a. Dependent Variable: Academic Achievement

Table 6c presents the results of regression analysis on the relationship between self-esteem and students' academic achievement in Mathematics. The result showed standardized coefficient beta (0.478), t-value of 13.529, p-value of 0.000. Thus, since calculated p-value 0.000 is less than hypothetical p-

value 0.05, this implies significant relationship between dependent variable (student academic achievement) and independent variable (self-esteem). Therefore, the null hypothesis, which stated that there is no significant relationship between students' self-esteem and academic achievement of senior public secondary school students in Mathematics in Adamawa state, is rejected.

H0₃: There is no significant relationship between career aspiration and academic achievement in Mathematics of senior public secondary school students in Adamawa state.

In order to test this null hypothesis, the data on career and academic achievement in Mathematics of the students were compared using simple linear regression statistic. The Tables 10a -10c displays the results.

Table 7a: Model Summary for Regressors (Career Aspiration and Academic Achievement in Mathematics)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.546[a]	0.299	0.297	14.37443	1.118

a. Predictors: (Constant), Career Aspiration

b. Dependent Variable: Academic Achievement

Table 7a presents the result on model summary for regressors (career aspiration and academic achievement in Mathematics). The result reveals R-value of 0.546, which indicates that independent variable has moderate level of perdition on the dependent variable (academic achievement). Also, R-square value of 0.299 reported on the table indicated that the independent variable (career aspiration) can explain about 29.9% of the variability in dependent variable (academic achievement). Also, the table revealed adjusted-R-value of 0.297, which buttressed the moderate contribution of career aspiration to student academic achievement. Thus, the model summary established that the independent variables can offer some level of explanation toward variability in the dependent variable, thus the model is consider fit.

Table 7b: Analysis of Variance (ANOVA) for Model Fitness for Regressors (Career Aspiration and Academic Achievement in Mathematics)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	54265.959	1	54265.959	262.631	.000[b]
Residual	127487.210	639	206.624		
Total	181753.170	640			

a. Dependent Variable: Academic Achievement

b. Predictors: (Constant), Career Aspiration

Table 7b present the result of Analysis of Variance (F-Ratio) for the overall regression model fitness. The result revealed $F_{(1, 639)} =262.631$, P-value 0.000<0.05. Thus, the obtained p-value (0.000) is less than hypothetical p-value (0.05), this implies that model is fit.

Table 7c: Results of Linear Regression Analysis on Relationship between Career Aspiration and Students' Academic Achievement in Mathematics in Senior Public Secondary Schools in Adamawa State

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	22.101	1.722		12.835	.000
Career Aspiration	12.753	.787	.546	16.206	.000

a. Dependent Variable: Academic Achievement

Table 7c presents the results of regression analysis on the relationship between career aspiration and students' academic achievement in Mathematics. The result showed standardized coefficient beta (0.546), t-value of 16.206, p-value of 0.000. Since calculated p-value 0.000 less than hypothetical p-value 0.05, this implies significant relationship between dependent variable (student academic achievement) and independent variable (career aspiration). Therefore, the null hypothesis, which stated that there is no relationship between career aspiration and students' academic achievement in Mathematics in senior public secondary schools in Adamawa state, is rejected.

H0₄: There is no significant relationship among school-type, gender and academic achievement in Mathematics of senior public secondary schools students in Adamawa state.

This hypothesis was tested by comparing the means on school type, gender and academic achievement using multiple regression statistic. The results are presented in Tables 11a-11c.

Table 8a: Model Summary for Regressors (School-type, Gender and Academic Achievement in Mathematics)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.080[a]	0.006	.003	17.123	1.986

a. Predictors: (Constant), School-type, Gender

b. Dependent Variable: Academic Achievement

Table 8a presents the result on model summary for regressors (school type and academic achievement in Mathematics). The result reveals R-value of 0.080, which indicates that independent variables have no good level of perdition on the dependent variable (academic achievement). Also, R-square value of 0.006 reported on the table indicated that the independent variables (school type and gender) can jointly explain about 0.6% of the variability in dependent variable. The similar insignificant value was revealed for adjusted-R-value which is 0.003. Thus, the model summary established that the independent variables cannot sufficiently explain variation in the dependent variable (academic achievement), thus the model is not fit.

Table 8b: Analysis of Variance (ANOVA) for Model Fitness for Regressors (School-type, Gender and Academic Achievement in Mathematics)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1155.220	2	577.610	1.970	.140[b]
Residual	180597.950	638	293.178		
Total	181753.170	640			

a. Dependent Variable: Academic Achievement

b. Predictors: (Constant), School-type, Gender

Table 8b present the result of Analysis of Variance (F-Ratio) for the overall regression model fitness. The result revealed $F(2, 638) = 1.970$, P-value $0.140 > 0.05$. Thus, the obtained p-value (0.140) is greater than hypothetical p-value (0.05); this implies that model is not good fit for data.

Table 8c: Results of Linear Regression Analysis on Relationship among School-type, Gender and Students' Academic Achievement in Mathematics in Senior Public Secondary Schools in Adamawa State

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	50.654	3.000		16.884	.000
Gender	2.515	1.387	.073	1.813	.170
School type	1.162	1.389	.034	.836	.403

a. Dependent Variable: Academic Achievement

Table 8c presents the results of regression analysis on the relationship among school-type, gender and students' academic achievement in Mathematics. The result showed standardized coefficient beta (0.073), t-value of 1.813, p-value of 0.170 for gender. Also, for school type, the result showed standardized coefficient beta (0.034), t-value of 0.836, p-value of 0.403. Thus, both calculated p-value (gender=0.170 and school-type =0.403) indicated that both independent variables (gender and school type) do not related with dependent variable (student academic achievement). Therefore, the null hypothesis, which stated that there is no significant relationship among school-type, gender and students' academic achievement in Mathematics in senior public secondary schools in Adamawa state is not rejected.

Findings of the Study

The study generated the following findings:

i. Students in single schools had higher mean achievement score (49.03) compared to those from mixed school with mean score of 47.90. There is no significant relationship between school type and students' academic achievement in Mathematics in senior public secondary schools in Adamawa state ($R^2 = 0.001$, $F(1, 639) = 0.651$, $p = 0.420 > 0.05$).

ii. Students with high self-esteem had higher mean achievement score (58.72) compared to those students with low self-esteem 41.891. There is a significant relationship between students' self-esteem and academic achievement of senior public secondary school students in Mathematics in Adamawa state ($R^2 = 0.229$, $F(1, 639) = 183.023$, $p = 0.000 < 0.05$).

iii. Students with white collar jobs secured highest mean achievement score (55.55) followed by those students who aspired to blue collar jobs (44.28) and those aspired to pink collar jobs (36.29). There is significant relationship between career aspiration and students' academic achievement in Mathematics in senior public secondary schools in Adamawa state (R^2=0.299, F(1, 617) =262.631, p = 0.000 < 0.05).

iv. There is no significant relationship among school-type, gender and students' academic achievement in Mathematics in senior public secondary schools in Adamawa state (R^2 = 0.006, F(2, 638) =1.970, p = 0.140 > 0.05).

Discussions of the Findings

The findings from this study showed that there was no significant relationship between school type and students' academic achievement in Mathematics in senior public secondary schools in Adamawa state. More so, the study showed further that the mean achievement scores for both students from mixed and single school were below average score with slight mean difference of 1.123. This result showed that school-type may not be a good predictor of students' academic achievement. This finding may not be unconnected with fact that Mathematics is a core subject being taught from primary to tertiary institution in Nigeria system of education. Also, the non-significant difference in the mean achievement score among students from mixed and single schools could be attributed to the fact that both school-types operate the same school curriculum. This agrees with the earlier findings made by Agu (2010); Knigge and Hannover (2011); Carlson, Brooklyn and Adsworth (2013); Leka (2015); *Baumeister et al. (2016)*. The researchers all found that school-type has no significant impact on the performance of students in Mathematics. However, studies by Munanu (2016), Obura (2012) and Ajayi (2013) indicated school-type as a factor that significantly contributed towards students' performance in subjects like Chemistry, Physics and Mathematics. The difference between their finding and current study was due to their definition of school-type which was based on school ownership and school governorship which pointed at both government, NGO and private ownership, while the current study used single and mixed public secondary schools as designation for school-type across the study area.

Above all, the current study showed that neither single nor mixed school (school-type) related with student academic achievement in Mathematics. This concurred with the conclusion drawn by Maliha (2015) that single sex education is the practice aiming at conducting education with male and female students attending separate classes, perhaps in separate buildings or schools, but not necessarily meant for teaching something different from mixed school. Also, similar conclusion was arrived at by Shaffer and Kipp (2014) and *Fam and Yaacob (2016)* they argued that students from both mixed and single school could perfectly sit and attend similar classes at higher education level (tertiary) after the secondary education due to similarity in teaching method, curriculum, teachers' quality and school academic calendar. Though, studies by Habibollah (2012) and *Abruzzi et al.* (2016) pointed at possible special provision of facilities in some single schools which has much to do with conveniences of students in the schools, it does not necessarily mean difference in school curriculum compared to mixed schools. Likewise, earlier study by Wood (2012) has concluded that no big difference exists between single and mixed schools in term of academic achievement at least in both Mathematics and English language, even when other variables such as school ownership, population of schools and school climate were considered. In the recent, the study by *Fam and Yaacob (2016)* argued that to effectively determine the effect of schools type on students' academic achievement there must be a robust conceptual modeling weighted single and mixed school performance after taking into account students attributes and the other attributes to be considered should include ethnicity, family income and English language proficiency as well as the skill and experience of the teaching staff.

Conclusion

To effectively determine the factors accounted for academic achievement of students in senior secondary schools various variables have to be examined inclusively. This has been the rationale behind the current study that aimed at examined the relationship among school-type, gender, self-esteem, career aspiration and academic achievement in Mathematics. The current study has shown that both school-type and students gender have less contribution toward academic achievement especially, in Mathematics. It has also been reaffirmed in this study that trend of career aspiration is no longer gender biased, both male and female students aspired for white collar job as other blue or pink collar job in as much the benefits and opportunities attached to the job is satisfactory.

Recommendations

Based on the findings and conclusion of this study the following are the recommendations:

1. Employment and engagement of competent and qualified teachers: The school management should ensure that competent Mathematics teachers are engage to enhance the academic achievement of students in Mathematics.

2. School-types are not a significant factor in promoting students' academic performance, therefore, the federal and state government through education ministries should ensure that adequate facilities are provided to all school irrespective of type to further promote better performance across the five education zone in Adamawa state.

3. The self-esteem among students are generally low, therefore, there should be more efforts from school through teachers, form master and school counselor to keep in touch with students and positively influence their self-esteem irrespective of their school-types and gender to influence better academic performance.

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