

Influence of Administrator of Institutions on Students' Academic Achievement in General Mathematics between Mission – Government Partnered and Sole Government Administered Secondary Schools: Nigeria Perspective

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Abstract

The purpose of this research is to ascertain the mean achievement score of the students in mathematics who wrote Senior Secondary Certificate Examination (SSCE) in mission – government partnered and sole government-administered secondary schools; to determine the influence of the administrator of the institution. The population of the study is 2,982, which is the total number of students who wrote Senior Secondary Certificate Examination (SSCE) mathematics for the period between 2018 and 2020 for both mission – government-partnered and sole government-administered secondary schools in the study area. The sample size is 298. Three (3) research questions were prepared. Null and alternate hypothesis were developed. The data collected was obtained by the researcher from the exam body - The Post Primary Schools Management Board (PPSMB) Enugu, as well as, the different senior secondary schools involved in this research that are located in Enugu South Local Government Area of Enugu State, Agbani Zone. The data was analyzed using descriptive statistics (mean, for research questions) and T-test for the hypothesis. For Distinction and Credit H_A is accepted and for Pass H_A is rejected. In conclusion, in order to function in a mathematically literate way in the future, students must have a strong foundation in mathematics in their elementary school years. It is highly recommended that Mathematics should be taught by teachers who have a strong knowledge of mathematical content and pedagogy.

Keywords: Agbani Education Zone, Nigeria, Mean Achievement Score, Hypotheses, Administrator, Problem Statement, and Significance of the Study.

1. Introduction

1.1. Student's Background and Previous Mathematics Knowledge

All students deserve to become mathematically literate regardless of gender, socioeconomic background, language, cultural background, learning ability, or previous mathematics experiences. Instruction must address the needs of students from a wide range of backgrounds. As Van de Walle and Folk (2005) assert, "It is no longer reasonable to talk about the 'regular classroom'". It is even

more difficult to talk about the ‘average child’. The type of instruction described is designed to allow teachers to take into account these differences and value who the student is and what the student’s background and previous knowledge are. It should be recognized, however, that certain situations require either a modification of the methods we have outlined or more than what is outlined. All students benefit from good instructional methods, which can be instrumental in helping them overcome real or perceived disadvantages that they may have as a result of:

- living in impoverished circumstances;
- having a different language or different cultural background;
- having special needs.

1.2. Problem Statement

Mathematics still remained one of the most dreaded subjects in schools despite the effort put in by different levels of government and various stakeholders of education. But with the aid of the right instructional material being in place and rightly applied, it will go a long way in making positive impact on the students (Abdulahi, 1982). Mathematics has a Greek origin *mathemata* which was used quite generally in early writings to indicate any subject of instruction or study. As learning advanced, it now became much easier to streamline it to specific areas of study. Pythagorians used it to explain geometry and arithmetic; initially, each of these subjects had been called by its different names, with no designation common to both. The use of the names by the pythagorians might be what gave the idea that mathematics began in classical Greece from 600 – 300 BC (Burton, 2004). But its history can be followed much further back. In ancient Egypt and Babylonia, there already existed a significant body of knowledge that we should see as mathematics around three or four thousand years ago. It should be noted that mathematics is the central point on which science and science related courses can rest on and hence an important tool for scientific and technological development (Okeke, 2011).

Adepoju, and Oluchukwu, (2011) are researchers who carried out research on this title: A study of secondary school students’ academic performance at the Senior School Certificate Examinations and implications for educational planning and policy in Nigeria. This sole author; Peter, (2021), made his point on this paper titled: senior high school students’ usage of time and its impact on their academic achievement in northern Ghana. These authors by name Anshu, and Bilkees, (2016), made their voice to be heard in their research paper titled: Academic performance of senior secondary school students: influence of parental encouragement and school environment. The research gaps from the above different literature reviewed is that none of the researchers wrote on Enugu South Local Government Area, no comparative study that laid emphasis on senior secondary students’ examination scores who are government and mission students.

1.3. Purpose of the Study

The broad purpose of this study is to compare the academic achievement of students in mission – government partnered and sole government administrator secondary school. The purpose of the study was to communicate specifically the study sought to:

- 1) Calculate the mean achievement score of SS III students in mathematics in mission – government partnered secondary school from 2018 – 2020 in Agbani Zone of Enugu State.
- 2) Solve the mean achievement score of SS III students in mathematics in sole government administered secondary school from 2018 – 2020 in Agbani Zone of Enugu State.
- 3) Ascertain the influence of administrator of institution on students' achievement in Senior Secondary Certificate Examination (SSCE) mathematics from 2018 – 2020 in Agbani Zone of Enugu State.

1.4. Research Questions

The following research questions guided study:

- 1) What is the mean achievement score of SS III students in mathematics in mission – government partnered secondary school from 2018 – 2020 in Agbani Zone of Enugu State?
- 2) What is the mean achievement score of SS III students in mathematics in sole government administered secondary school from 2018 – 2020 in Agbani Zone of Enugu State?
- 3) What is the influence of administrator of institution on students' achievement in Senior Secondary Certificate Examination (SSCE) mathematics from 2018 – 2020 in Agbani Zone of Enugu State?

1.5. Research Hypotheses

H₀ There is no significant difference in SSCE mathematics achievement of mission – government partnered and sole government administered secondary schools in Agbani Zone of Enugu State.

H_A There is a significant difference in SSCE mathematics achievement of mission – government partnered and sole government administered secondary schools in Agbani Zone of Enugu State.

1.6. Scope of the Study

This research focuses on comparative study of mathematics results between mission – government partnered and sole government administered secondary schools in Agbani Zone of Enugu State. The period in consideration span from 2018 to 2020. In other words, this study centers on secondary schools, precisely the senior secondary III level.

1.7. Significance of the Research

Practically, this research makes valuable contributions to the practice of education. Because credit in general mathematics is the minimum grade used to secure tertiary institution admission in any department. Therefore, academic achievement in general mathematics is required of all students in the educational system. In practice, it will benefit both male and female students, it will equally benefit both male and female academia. Research institutes, researchers, teachers, government schools, mission schools, private schools and lecturers will equally benefit from this research. All these beneficiaries mentioned will benefit from this research by helping to give them directions when they conduct similar research, it will equally be used theoretically by lecturers, teachers and researchers to teach and lecture students. And for the research institutes, government schools,

mission schools and private schools, it will be manual and guide to build their institutes to a very good standard.

2. Literature Review

Literature review is the section in research where works of different scholars are reviewed. Here, the researcher makes arguments against the opinions of other authors as well as support the points of other writers. On the other hand, the researcher of this work will make his voice to be heard on some points. Mathematics is as old as civilization.

2.1. Differences in Language and Culture of Institution Owners

Language here might not necessarily concern only the spoken languages like: Igbo Language, English Language, French Language, Spanish Language, and German Language. Even though the above languages are important and vital to the different Institutional owners, there is more to it than the normal language we speak with each other. Here, owner of institution has his blueprint, in this blueprint equally lies some success secrets which he shares with his trusted staff. It is this success secret that is referred to as the Language and culture of Institutional owners. Other aspects of language and culture are discussed as follows: Kitta (2004) defined mathematics as the language that helps us to describe ideas and relationships drawn from the environment. Language and Culture Teachers can make effective use of problem-oriented methods with specific modifications to better address the needs of students from different cultures or languages. Mathematics was defined as a culture and as an art. As a culture, mathematics affords man the opportunity to know and access things and objects within the immediate and remote environment. On the other hand, mathematics as an art is simply the beauty of mathematics exhibited in the process where a chaos of isolated fact is transformed into logical order (Harbor-Peters, 2000). Instruction that includes a student's culture in different ways is more likely to engage the student. In one example, students began with narratives of their home experiences in their own language as a basis for mathematics in the classroom (Lo Cicero, De La Cruz, and Fuson, 1999). The teachers and students used student stories and pictures from home to build math problems that are related to the students' everyday lives but served equally to advance their mathematical knowledge. Learning mathematics in a second language (whether as an ESL student or an English-speaking French immersion student) can initially add a layer of difficulty in mathematics. The same techniques used to support literacy skills can be used in the development of mathematics – for example, working where possible in languages, making use of manipulative and diagrams to communicate, working with a fellow student in the same original language. In the case of students who have withdrawal services for language development, having them write mathematics word problems (to share with other students) can serve as a link between the instructional experience during withdrawal and that of the regular classroom. Below suggestions are vital while communicating mathematical ideas:

- allow wait time for students' responses;
- pose problems in familiar contexts;
- connect symbols with words;
- have students share with their partner first, then with the whole class;
- use "English experts" (students with the same native language but a stronger grasp of

English);

- have students “re-tell” another student’s explanation.

The above scenario can be seen in Nigeria that has so many languages. For instance, a student from the east who gained admission into senior secondary school in a core northern state that teaches their students with Hausa Language. It will be observed that in order for that eastern student to understand what is been taught there especially the subject mathematics, he must first learn the Hausa language. If not, then his stay in that school will be futile efforts.

2.2. Theory Used

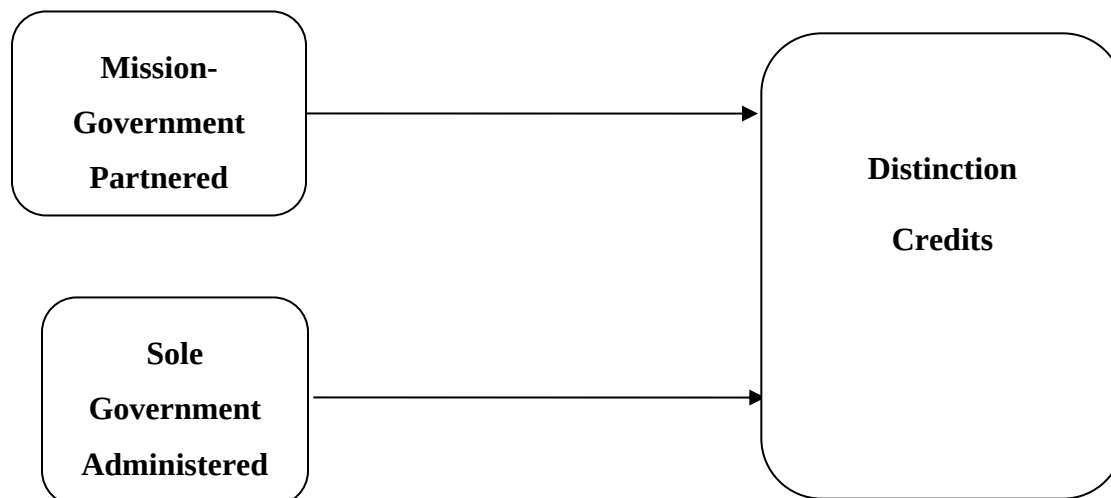
Implicit theory of intelligence is the theory to discuss in this work. In social and developmental psychology, an individual's implicit theory of intelligence refers to his or her fundamental underlying beliefs regarding whether or not intelligence or abilities can change, developed by Carol Dweck and colleagues (Dweck, and Leggett, 1988).

Ellen Leggett developed implicit theories of intelligence in 1985. Her paper "Children's entity and incremental theories of intelligence: Relationships to achievement behavior" was presented at the 1985 meeting of the Eastern Psychological Association in Boston (Leggett, 1985). As a result, Dweck and her collaborators began studying how individuals unknowingly (or implicitly) assess their own intelligence and abilities through interaction and interpretation of their environment. It was assumed that these assessments ultimately influenced the individual's goals, motivations, behaviors, and self-esteem. The researchers began by looking at students who were highly motivated to achieve, and students who were not, though the levels of self-achievement were not clarified. They noticed that the highly motivated students thrived in the face of challenge while the other students quit or withdrew from their work, but critically, a student's raw intelligence did not predict whether a student was highly motivated or not (Diener, and Dweck, 1978). Rather, they discovered that these two groups of students held different beliefs (or implicit theories) about intelligence, categorized as entity or incremental theories, which affected their classroom performance (Dweck, and Leggett, 1988).

2.3. Conceptual Framework

The researcher of this work observed that from previous literatures, some researchers used written sentences to explain their conceptual frameworks (Nwokwu, Rathnasinghe, and Pradeep, 2019), while on the other hand, some researchers used diagram to represent their conceptual frameworks (Nwokwu, Atapattu, and Azeez, 2019; Nwokwu, Dharmadasa, and Rathnasinghe, 2018; Nwokwu, 2018).

2.4. Conceptual Framework



2.5. Conceptual Definitions

1. A mission school or missionary school is a religious school originally developed and run by Christian missionaries. The mission school was commonly used in the colonial era for the purposes of Westernization of local people. These may be day schools or residential schools (as in the Canadian Indian residential school system) (https://en.wikipedia.org/wiki/Mission_school).
2. Government school means a school established under section 5 of the Act, for the purpose of providing courses of instruction in pre-school, primary or secondary education (<https://www.lawinsider.com/dictionary/government-school>).

Research studies are done to discover new information or to answer a question about how we learn, behave and function with the end-goal of benefitting society. Some studies might involve simple tasks like completing a survey, being observed among a group of people or participating in a group discussion (<https://www.rochester.edu/ohsp/subject/participatingInResearch.html>).

3. Research Methodology

3.1. Design of the Research

Descriptive Survey Research is an approach of Descriptive Research that blends quantitative and qualitative data to provide you with relevant and accurate information. A time-efficient research method, Descriptive Survey Design engages the people who are at the center of the research objective (<https://www.voxco.com/blog/descriptive-survey-design/>). Descriptive design studies are mainly concerned with describing events as they are without any manipulation of what is being observed. In addition, any study which seeks merely to find out “what is” and describes it, is descriptive.

3.2. Area of Study

This is comparative study of mathematics results between mission – government partnered and sole government administered secondary schools in Enugu South Local Government Area of Enugu State. The period in consideration span from 2018 to 2020. In other words, this study centers on secondary schools, precisely the senior secondary III level.

3.3. Population of Study

The population of the study is 2,982, which are the total students who wrote Senior Secondary Certificate Examination (SSCE) mathematics for the period between 2018 and 2020 for both mission – government partnered and sole government administered secondary schools in the study area.

3.4. Sample and Sampling Techniques

The sample size is 298. Simple random sampling technique was used to select from mission and government schools when they have been separated into school type i.e. to say they have been purposely sampled.

3.5. Source for Data Collection

The data collected was obtained by the researcher from The Post Primary Schools Management Board (PPSMB) Enugu, as well as, the different senior secondary schools involved in this research that are located in Enugu South Local Government Area of Enugu State.

3.6. Validity and Reliability of Instrument

The instrument is valid and reliable because it was conducted by The Post Primary Schools Management Board (PPSMB) that gave the data.

3.7. Method of Data Collection

Secondary method was used to collect the secondary data from Post Primary Schools Management Board (PPSMB) Enugu.

3.8. Method of Data Analysis

Data collected was analyzed using descriptive statistics (mean, for research questions) and T-test for the hypothesis.

3.9. Presentation and Analysis of Results

The mission-government partnered and sole government administered secondary school are the independent variables. They are categorical (Qualitative) variables. Dependent variables are distinction, credits and pass. They are quantitative (Continuous) variables. Therefore, we applied an independent sample t-test.

4. Result and Discussion

This section presents the analysis of data in tables, showing the distinctions, credits and passes according to the research questions.

4.1. Research Question 1

What is the mean achievement score of the students in mathematics who wrote Senior Secondary Certificate Examination (SSCE) in mission – government partnered secondary schools from 2018 – 2020 in Enugu South Local Government Area of Enugu State?

Table 1. Mission – Government Partnered Secondary Schools

S/N	NAMES	YEARS	DIS 70 - 100	CRE 55 - 69	PAS 40 – 54	TOTAL SCORES	SCHOOL TYPE
1	Union Secondary School Awkunanaw (USS)	2018 – 2020	166	59	-	14,865	Mission – Government Partnered
2	Girls’ Grammar School Awkunanaw (GGS)	2018 – 2020	123	11	5	9,450	Mission – Government Partnered
3	Holy Rosary College Enugu (HRC)	2018 – 2020	279	240	31	34,187	Mission – Government Partnered
4	College of Immaculate Conception (CIC)	2018 – 2020	362	145	29	34,678	Mission – Government Partnered
TOTAL						93,180	

Source: Post Primary Schools Management Board (PPSMB)

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Table 2. Research Question 1 was answered below

Group Statistics					
	School	N	Mean	Std. Deviation	Std. Error Mean
Dis	MGP	10	93.00	63.701	20.144
	SGA	10	37.30	30.152	9.535

Note that DISM, CREM and PASM belongs to Mission – Government Partnered Secondary Schools. While DISS, CRES and PASS belongs to Sole Government Administered Secondary Schools.

Answer to research question 1 is stated below:

The mean achievement scores for DISM, CREM and PASM are respectively 93.00, 45.50 and 10.83

Research Question 2

What is the mean achievement score of the students in mathematics who wrote Senior Secondary Certificate Examination (SSCE) in sole government administered secondary schools from 2018 – 2020 in Enugu South Local Government Area of Enugu State?

Table 3. Sole Government Administered Secondary Schools

S/N	NAMES	YEARS	DIS 70 - 100	CRE 55 - 69	PAS 40 – 54	TOTAL SCORES	SCHOOL TYPE
1	Idaw-River Girls' Secondary School Enugu	2020 – 2018	62	343	74	26,683	Sole Government Administered
2	Uwani Secondary School Enugu	2018 – 2020	148	161	43	21,236	Sole Government Administered
3	Maryland Secondary School Enugu	2018 – 2020	72	169	5	14,570	Sole Government Administered
4	Girls' High School, Uwani	2018 – 2020	91	276	88	25,686	Sole Government Administered
TOTAL						88,175	

Source: Post Primary Schools Management Board (PPSMB)

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Table 4. Research Question 2 was answered below

Group Statistics					
	School	N	Mean	Std. Deviation	Std. Error Mean
CRE	MGP	10	45.50	46.452	14.690
	SGA	11	86.27	54.043	16.295

Group Statistics					
	School	N	Mean	Std. Deviation	Std. Error Mean
Pass	MGP	6	10.83	9.766	3.987
	SGA	11	19.09	20.325	6.128

Answer to research question 2 is stated below:

The mean achievement scores for DISS, CRES and PASS are respectively 37.30, 86.27 and 19.09

Research Question 3

What is the influence of administrator of institution (mission-government partnered or sole government administered secondary school) on students' achievement in Senior Secondary Certificate Examination (SSCE) mathematics?

Answer to research question 3 is stated below:

The influence of administrator of institution for DIS, CRE and PAS are calculated below:\

$$\text{FOR DIS} = \text{DISM} - \text{DISS} = 93.00 - 37.30 = 55.70$$

From Distinction (DIS) level, the above calculation shows that mission – government partnered secondary schools has more influence than the sole government administered secondary schools.

$$\text{FOR CRE} = \text{CRES} - \text{CREM} = 86.27 - 45.50 = 40.77$$

From Credit (CRE) level, the above calculation reveals that the sole government administered secondary schools is more influential than the mission – government partnered secondary schools.

$$\text{FOR PAS} = \text{PASS} - \text{PASM} = 19.09 - 10.83 = 8.26$$

From Pass (PAS) level, the above calculation indicates that sole government administered secondary schools are much more influential than the mission – government partnered secondary schools.

Hypotheses

H₀ - There is no significant difference in SSCE mathematics achievement of mission-government partnered and solely government administered secondary schools in Enugu South Local Government Area of Enugu State.

H_A - There is significant difference in SSCE mathematics achievement of mission-government partnered and solely government administered secondary schools in Enugu South Local Government Area of Enugu State.

Discussion of Findings

Table. 5. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
DIS	Equal variances assumed	7.577	.013	2.499	18	.022	55.700	22.287	8.878	102.522
	Equal variances not assumed			2.499	12.840	.027	55.700	22.287	7.492	103.908

P value of levene's test is significant at 5% as the value is 0.013. This says that the variance of DIS between MGP and SGA is different. The P value of mean test is 0.027. This indicates that, the DIS is having a significant difference between MGP and SGA. In the group statistics, mean value of MGP is 93 and SGA is 37.30. Result shows that higher DIS belongs to MGP. Accordingly, there is significant difference in SSCE mathematics Distinction achievement of mission-

government partnered and solely government administered secondary schools in Enugu South Local Government Area of Enugu State. Accordingly, H_A is accepted.

Table 6. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CRE	Equal variances assumed	.415	.527	-1.845	19	.081	-40.773	22.104	-87.037	5.492
	Equal variances not assumed			-1.859	18.951	.079	-40.773	21.938	-86.698	5.153

P value of levene's test is insignificant at 5% as the value is 0.527. This says that the variance of CRE between MGP and SGA is equal. The P value of mean test is 0.081. This indicates that, the CRE is having a marginal significant difference between MGP and SGA. In the group statistics, mean value of MGP is 45.5 and SGA is 86.27. Result shows that higher CRE belongs to SGA. Accordingly, there is significant difference in SSCE mathematics credit achievement of mission-government partnered and solely government administered secondary schools in Enugu South Local Government Area of Enugu State. Accordingly, H_A is accepted.

Table 7. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper

PAS	Equal variances assumed	2.418	.141	-.928	15	.368	-8.258	8.895	-27.217	10.702
	Equal variances not assumed			-1.129	14.913	.277	-8.258	7.311	-23.848	7.333

P value of levene's test is insignificant at 5% as the value is 0.141. This says that the variance of Pass between MGP and SGA is equal. The P value of mean test is 0.368. This indicates that, the Pass is not having a significant difference between MGP and SGA. Accordingly, there is not a significant difference in SSCE mathematics pass achievement of mission-government partnered and solely government administered secondary schools in Enugu South Local Government Area of Enugu State. Accordingly, H_A is rejected.

5. Conclusion

- There should not be unhealthy comparison between mission – government partnered secondary schools and sole government administered secondary schools.
- Absenteeism should be discouraged in schools.

Future researchers are encouraged to carryout same research with different number of hypotheses.

Conclusively, all students should be able to make connections between concepts and see patterns throughout mathematics, as well as communicate their reasoning and, equally, listen to others reason mathematically, as well as enjoy mathematics and be willing to persevere in doing mathematics.

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