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A Comparative Study of Student's Performance in S.S.C.E Mathematics and Pre-National Diploma (PRE-ND) Programmes Mathematics: A Case Study of Nasarawa State Polytechnic Lafia

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Abstract
Pre-National Diploma (Pre-ND) programmes serves as a preparatory stage for students to gain admission, into National Diploma programmes in all Polytechnics in Nigeria. But one may wonder why some student pass Senior School Certificate of Education (S.S.C.E) Mathematics at credit level but still fails Pre-ND mathematics. This work used correlation coefficient to compare performances of students between their S.S.C.E entry grades with their Pre-ND grades in mathematics. The result shows that S.S.C.E, W.A.E.C (West Africa Examination Council) grades in mathematics is better predictor of student's performance at Pre-ND examination in mathematics than S.S.C.E, N.E.C.O (National Examination Council) grades in mathematics.
Keywords: Better predictor, Comparative study, Mathematics, Pre-National Diploma, Student's performance, S.S.C.E. NECO, S.S.C.E. WAEC.

1.0 Introduction

Early attempts to develop a methodological foundation of mathematics attempted to vindicate it as a discipline free of error that did justice to its arrogant and secular epithets as the most perfect of all sciences, Lakatos (1986), the mother of all sciences, Mura (1995). The queen of all sciences, Mc Ginnis, Raidy, Shaman, McDttie, Hurtles, King & Watanebic,(1996), a science in its own right, Mura (1995), as cited in Akinsola,[1] .

Mathematics is therefore a subject that supports all the science. No nation can hope to advance higher in science and technology without the proper foundation in secondary school mathematics.

It is an inconvertible fact from historical evidence that many advancement in science and technology have their roots in mathematic A.K. (1981). Therefore, the importance of mathematics to humanity cannot be over-emphasized.

The study of mathematics in Pre-ND programme is particularly of great importance because polytechnic education is science and technology oriented. The minimum requirement for securing admission into Pre-ND programmes in Nigeria Polytechnics is four passes in SSCE, in relevant subject areas including Mathematics and English Language as recorded in [2].

In addition a student after the Pre-ND Programme is expected to obtain an average score of 50% in mathematics to be qualify for ND 1. Even though the student who are admitted into this programme had passes in their SSCE mathematics; their performance in Pre-ND Mathematics however, does not seem to tally with the student' SSCE scores. This is a matter of serious concern especially, when viewed that the curriculum content of Pre-ND Mathematic is same as that of senior secondary school mathematics.

Furthermore, the poor performances of student in SSCE examination generally and specifically mathematics should be a matter of concern to any Government or individual who is interested in students' progress. Many years back Lassa in 1914, saw the sorry state of senior secondary mathematic in Nigeria. He suggested ways that can help in improving student's performance in mathematics. To buttress this point, Crow in 1958, asserted that an attempt to measure learning progress is not of recent origin. Ever since, there have been schools, tried to determine the performance of students through oral recitation, written test or actual performance on certain skills to the extend in which teaching and learning have resulted in success. Too often, the results of the measurement have failed to yield an adequate appraisal of the learning that supposedly had taken place. As cited by Shammah, [3] in his paper.

In light of the above, the present researcher shares in the concern of authors mentioned. Unfortunately there seem to be no studies that have been conducted on the said problem which will reveal the base of this problem. There is therefore the need to carry out this comparative study with a view to isolating the cause of this apparent contradiction between performance in the SSCE and final year Pre-ND examination in Mathematics.

1.1 Statement of the Problem

Mathematics as we all know, it is vital to everyday life. There is nothing an individual would do in a day that would not have the application of some mathematical knowledge. Despite such applications that are vital to our daily lives, one finds that students dread the subject. Even the society talk of how difficult and abstract the subject is.

Over the years, Mathematics result in the senior secondary school at SSCE has been very disheartening. Many students nearly cluster in the Pass (P) grades while majority obtain outright Fail (F) grades. For instance, Attah (1993), reported that out of the 2.17 million candidates who sat for SSCE over a period of four years, only 444,850 students representing about 20.5% passed at Credit level in the mathematics examination as cited by Shammah,[3] . In the same vein Salehdeen, et.al, [4] Compare "the relationship between Admission grades and performance of students in the first professional Examination in a new medical School" and also another study conducted independently by Oyebola et.al,[5] and Bamgboye et.al [6] Showed clearly that there was no correlation between students' Admission grades in (JAME) Joint Admission and Matriculation Examination with their performance in the University of Ibadan Medical School. Both Studies showed that the SSCE scores are a better predictor of performance at pre-Clinical and 100 level examinations respectively than the JAME scores.

Pre-ND study serves as a preparatory stage for student to get into ND1. But unfortunately there has been an outcry of discontentment and disenchantment by mathematics teachers and wards over the performance of Pre-ND students, these students may pass mathematics in SSCE at credit level but still fails in Pre-ND Mathematics. This apparent contradiction between performance in SSCE and Pre-ND final results has prompted the present researcher to compare the result of the students in SSCE and have undergone Pre-ND course in Mathematics, with a view to identifying the immediate and remote causes for this contradiction.

1.2 Purpose of the Study

The purposes of this study are:

1. To compare the performance of students in SSCE to that of Pre-ND in Mathematics.
2. Find out whether there is any correlation in the performance of student between SSCE result in mathematics and Pre-ND grades in Mathematics.
3. Determine if there is any correlation in SSCE mathematics result and that of Pre-ND Mathematics.

1.3 Significance of this Study.

The findings of this work would help mathematics teachers especially in secondary schools to sit up so that they can produce students with valid result which can be defended anywhere they go.

In the same vein, this research would guide the Polytechnic Management in the admission process into Pre-ND as to whether or not; validity of results should be screen.

The finding of this work will help curricular planners in the formulation of sound educational policies and programmes in running Pre-ND Mathematics in Nigeria Polytechnics.

Hypothesis

Ho: There is no correlation between the performance of student in SSCE mathematics and their performances in Pre-ND Mathematics.

1.4 Delimitation

The study is delimited to the past four academic sessions. To that extent, only the result of the past academic years between 2001/2002 to 2004/2005 for both SSCE and Pre-ND will be considered.

2.0 METHODOLOGY

This study is meant to compare the performance of students in SSCE Mathematics with their performance in Pre-ND Mathematics. To facilitate this, a case study method has to be employed to collect relevant Data necessary for the investigation. The following steps were adopted; Design of the study, population of the study, sample and sampling techniques, Description of the instrument, Validity of the instrument, Reliability of the instrument, Method of data collection and Method of data analysis.

2.1 Design of the Study

The design of the study is a comparative analysis. The study presented in this report is intended to compare the performance of students in SSCE Mathematics with their performance in Pre-ND Mathematics. Mathematics (SSCE) entry grades will be compared with the Pre-ND Mathematics grade.

The researcher therefore intends to collect Data from the academic registry of Nasarawa State Polytechnic Lafia the data will include the students department, course of study academic year, Pre-ND result in Mathematics only and the student entry grade in mathematics.

2.2 Area of Study

The area of these study cover only Nasarawa State Polytechnic Lafia, Nasarawa State Nigeria. At the College of General Studies and Pre-ND, Department of Pre-ND Programme.

2.3 Population of the Study

The researchers here are concern with student's final grades in Pre-ND mathematics and their respective entry grades in S.S.C.E Mathematics at Nasarawa State Polytechnic, Lafia.

Four programmes will be considered, during the range of four academic sessions, thus 2001/2002 to 2004/2005 sessions.

2.4 Sample and Sampling Technique

The research work was carried out at Nasarawa State Polytechnic and more precisely the Pre-ND programmes of the institution is the ground which our samples was drawn.

This work used stratified random sampling to select the samples. Four programmes was used as sample for the study, two from sciences and two from non-sciences of the institution was considered for this research work. In each programme the sample size were ten students.

The programmes are:

(i) Pre-ND Urban and Regional Planning 2003/2004 academic sessions.
(ii) Pre-ND Electrical Engineering 2002/2003 academic sessions.
(iii) Pre-ND Local Government 2004/2005 academic sessions
(iv) Pre-ND Public Administration 2001/2002 academic session.

2.5 Description of Instrument

The instrument used, is the academic record of students from the academic office of the institution, which include the student's grades obtained after their Pre-ND in Mathematics and that of SSCE entry grades in mathematics. The records taken consider four academic sessions; each academic session different programme is to be considered.

2.6 Validity of the Instrument

The Data collection was done from the academic records office is the individual students SSCE entry grades in mathematics. Senior secondary school examination is a standard examination, the data collected are valid. The Pre-ND grades also obtained are those that qualify these students into National Diploma Programme of their choice. Therefore all the data obtained are relevant and valid. All the instrument collected, measures students performances in mathematics.

2.7 Reliability of the Instrument

This work employs the split-half technique in order to establish the reliability of the instrument used. Each programme was measure differently. Each of which was measure, Pre-ND grades against SSCE (WAEC) grades and Pre-ND grades against SSCE (NECO) grades.

2.8 Method of Data Collection

With the permission of the academic office and the department of Pre-ND of the institution, the records of students use in this work was obtained. The Data used in this research was collected by the researcher himself. The students grades in SSCE (WAEC), (NECO) and Pre-ND Mathematics were the date collected.

2.9 Method of Data Analysis

In order to analyze the data collected, the statistical analysis employed was correlation. Correlation simply means "mutual relation". If pairs of measurements on two variable are given, a correlation describes the degree of simultaneous variation of the two variable to be more specific "spearmen's rank correlation coefficient" R, will be used to predict our result. R, is defined by the formula.

$$R = \left(1 - \frac{6\sum d^2}{N(N^2 - 1)}\right)$$

Where d = difference between each pair of row

N = Number of object to be ranked

Correction coefficient is a number which lies between -1 and +1 (inclusive) that is -1< R <+1. If R = +1 signifying perfect positive correlation but if R = -1 signifying perfect negative correlation.

3.0 PRESENTATION AND ANALYSIS OF DATA

In order to collect all the relevant data required for this study, the researcher extracted from the academic registry office of the institution records of students, which include their final Pre-ND Mathematics result and their SSCE entry grades in mathematics only.

In each case the first thirty candidates were considered from the extracted records. Systematic random sampling was used for selecting ten candidates, for the analysis out of the thirty.

Details such as names, state of origin and sex of applicants which were in the actual records used have been omitted in all the tables so as to protect the rights of the candidates to privacy. For the analysis of Data obtained the researchers choose Rank correlation coefficient because; it is quick and easy techniques and so is sometimes used as an approximating to product moment correlation. This is particularly appropriate if the values of numeric bivariate data are difficult to obtain physically or involve great expense and yet can be ranked in size order.

It is also used to measure correlations between non-numeric variables (Data). Especially if one or both of the variables involved in non-numeric, the product moment correlation coefficient cannot be calculated. However as long as the non-numeric values can be ranked in some natural way rank correlation and be used.

Therefore in one case Pre-ND mathematics result is in percentage while the SSCE mathematics is a grades) non-numeric values) the grading system of Pre-ND varies with that of SSCE. However for the purpose of this study, we are going to adopt the SSCE grading system for both.

Table 1: Simple Information on Grading System of the Research Samples

Percentage % From - To	**Grading System**	**Grade**
75 – 100	A1	1
70 – 74	B2	2
65 – 69	B3	3
60 -64	C4	4
55 – 59	C5	5
50 – 54	C6	6
45 – 49	D7	7
40 – 44	E8	8
0 – 39	F9	9

Source: WAEC Office, Jos

3.1 Table and Interpretations

In our analysis four groups namely Group A, B, C and D are considered and each group have Table I and II. In each case Table I compare Pre-ND grades Mathematics with S.S.C.E NECO grades, while Table II compares Pre-ND grades with S.S.C.E., WAEC grades of the candidates, whose registration number appeared in each case.

GROUP A: Pre-ND Administration 2001/2002 Academic Session

TABLE I: Compare Pre-ND grade with S.S.C.E NECO grade.

Reg. No	**Pre-ND**		**NECO**			
	Grade	**Rank**	**Grade**	**Rank**	**D**	**d^2**
7089	C6	3 ½	C6	2	1 ½	2 ¼
5485	E8	8 ½	D7	4	4 ½	20 ½
5720	E8	8 ½	D7	4	4 ½	20 ½
6024	C6	3 ½	E8	6 ½	-3	9 ½
6195	E8	8 ½	F9	9	- ½	¼
6306	C6	3 ½	D7	4	- ½	¼
6874	D7	6	F9	9	-3	9
7090	C4	1	E8	6 ½	-5 ½	30 ¼
9086	E8	8 ½	B3	1	7 ½	56 ¼
10353	C6	3 ½	F9	9	-5 ½	30 ¼

N = 10 $\Sigma d^2=178$

$$R = \left(1 - \frac{6\sum d^2}{N(N^2-1)}\right) \qquad R = 1 - \frac{6(178)}{10(99)}$$

$$R = 1 - \frac{1068}{990}$$

R = 1 - 1.07877875 = -0.0788

R ≈ - 0.08 Var (R) = $R^2 = (-0.08)^2 = 0.64\%$

Table II: Compare Pre-ND grade with S.S.C.E WAEC

Reg. No	Pre-ND		WAEC			
	Grade	Rank	Grade	Rank	D	d^2
10730	C6	2 ½	F9	8	-5 ½	30 ¼
10700	F9	9 ½	C6	2	7 ½	56 ¼
5732	F9	9 ½	F9	8	1 ½	2 ¼
6662	E8	7	F9	8	-1	1
6158	D7	4 ½	F9	8	-3 ½	12 ¼
5576	A1	1	B3	1	0	0
5696	C6	2 ½	F9	8	-5 ½	30 ¼
6197	E8	7	E8	4	3	9
6874	D7	41/2	E8	4	½	¼
9086	E8	7	E8	4	3	9

N = 10 $\Sigma d^2=150.5$

$$R = \left(1 - \frac{6\sum d^2}{N(N^2-1)}\right) \qquad R = 1 - \frac{6(150.5)}{10(99)}$$

$$R = 1 - \frac{930}{990}$$

R = 1 - 0.91212 = 0.087878

R ≈ 0.089 ≈ 0.09

Var (R) = $R^2 = (0.09)^2 = 0.81\%$

3.2 Analysis of Data in Group A

Group A of this study took its records from Pre-ND Public Administration 2001/2002 academic session. Table 1 compares the performance of the candidates whose registration number appears. The comparison was done so as to find out whether there is correlation between their performances in Pre-ND mathematics with that of S.S.C.E N.E.C.O. The result from table 1 shows that the calculated value of R is -0.08 which means that there is little or negligible negative correlation exist between Pre-ND and S.S.C.E N.E.C.O grades. This represents about 0.64% variance of SSCE NECO is predictable from Pre- ND Mathematics grades the other. Table II the comparison here was done so as to find out whether there is correlations between their performances in Pre-ND mathematics with that of S.S.C.E WAEC. The result from table II shows that the calculated value of R is + 0.09 which means that there is little or negligible positive correlations exist between the pre-ND and S.S.C.E WAEC grades. This represent about 0.81% variance of SSCE WAEC is predictable from Pre-ND Mathematics grades.

GROUP B: Pre-ND Electrical Engineering 2002/2003 Academic Session

TABLE I: Compares Pre-ND grade with S.S.C.E NECO grade

Reg. No	Pre-ND		NECO			
	Grade	Rank	Grade	Rank	D	d^2
12681	C6	2	D7	7 ½	-5 ½	30 ¼
10941	F9	7 ½	C6	½	4	16
12824	D7	3 ½	D7	7 ½	-4	16
8542	F9	7 ½	C6	3 ½	4	16
11366	F9	7 ½	B3	1	6 ½	42 ¼
11920	F9	7 ½	D7	7 ½	0	0
8212	F9	7 ½	C6	3 ½	4	16
11994	F9	7 ½	C6	3 ½	4	16
11734	A1	1	E8	10	-9	81
12815	D7	3 ½	D7	7 ½	-4	16

N = 10 Σd^2=249

$$R = \left(1 - \frac{6\sum d^2}{N(N^2-1)}\right) \qquad R = 1 - \frac{6(249.5)}{10(99)}$$

$$R = 1 - \frac{1497}{990}$$

R = 1 - 1.5121212 = -0.5121212

R ≈ - 0.51

Var (R) = R^2 = $(-0.51)^2$ = 0.26 = 26%

TABLE II: Compares Pre-ND grades with S.S.C.E WAEC grade

Reg. No	Pre-ND		WAEC			
	Grade	Rank	Grade	Rank	D	d^2
12681	C6	5	D7	6	-1	1
12703	A1	2 ½	C6	4	-2 ½	6 ¼
11740	C6	5	C6	4	1	1
11242	E8	8	E8	8	0	0
8255	D7	7	E8	8	-1	1
12145	C6	5	E8	8	-3	9
8790	F9	9 ½	C4	1 ½	8	64
11734	A1	1 ½	C6	4	-2 ½	6 ¼
8755	F9	9 ½	C4	1 ½	8	64
8399	B2	3	F9	10	-7	49

N = 10 Σd^2=2015

$$R = \left(1 - \frac{6\sum d^2}{N(N^2-1)}\right) \qquad R = 1 - \frac{6(201.5)}{10(99)}$$

$$R = 1 - \frac{1209}{990}$$

R = 1 - 1. 221212 = -0.221212

R ≈ - 0.22

Var (R) = R^2 = $(-0.22)^2$ = 0.0484 = 4.8%

3.3 Analysis of Data in Group B

Group B of this study pick its records from pre-ND Electrical Engineering 2002/2003 academic session. Table I & II compare the performance of the candidates whose registration number appears. Table I, the comparison here was done so as to find out whether there is correlation between their performances in Pre-ND Mathematics with that of S.S.C.E NECO. The results from Table I showed that the calculated value of R is -0.51 which means there is a substantial or moderate or negative relationship (or correlation) exists between the two variables. This represents 26% variance of Pre-ND grades is predictable from the S.S.C.E NECO grades.

Table II the comparison here is done between Pre-ND and SSCE WAEC. The result of table II shows that the calculated value of R is -0.22, which means there is little or low negative relationship (or correlation) exist, between the two. This represents 4.8% variance of Pre-ND grades is predictable from the SSCE WAEC grade.

GROUP C: Pre-ND Urban and Regional Planning 2003/2004 Academic Session

TABLE I: Compares Pre-ND grades with S.S.C.E NECO grades

Reg. No	Pre-ND		NECO			
	Grade	Rank	Grade	Rank	D	d^2
001	C6	3	E8	9	-6	36
006	D7	5 ½	B2	1	4 ½	20 ¼
009	C6	3	E8	9	-6	36
012	D7	5 ½	C6	4	1 ½	2 ¼
015	C5	1	D7	6 ½	-5 ½	30 ¼
020	F9	9	C6	4	5	25
023	C6	3	E8	9	-6	36
029	F9	9	C5	2	7	49
032	F9	9	D7	6 ½	2 ½	6 ¼
035	E8	7	C6	4	3	9

N = 10 Σd^2=250

$$R = \left(1 - \frac{6\sum d^2}{N(N^2-1)}\right) \qquad R = 1 - \frac{6(205)}{10(99)}$$

$$R = 1 - \frac{1500}{990}$$

R = 1 - 1. 5151515 = -0.5152

R ≈ - 0.52 Var (R) = R^2 = $(-0.52)^2$ = 0.2704 = 27%

TABLE II: Compares Pre-ND grades with S.S.C.E WAEC grades

Reg. No	Pre-ND		WAEC			
	Grade	Rank	Grade	Rank	D	d^2
002	D7	4	C6	5	-1	1
005	E8	6	D7	7 ½	1 ½	2 ¼
009	C6	3 ½	C4	1 ½	2	4
022	F9	9	D7	7 ½	1 ½	2 ¼
024	C6	3 ½	F9	10	-6 ½	42 ¼
032	F9	9	D7	7 ½	1 ½	2 ¼
037	F9	9	D7	7 ½	1 ½	2 ¼
003	E8	6	C5	3 ½	2 ½	6 ¼
004	E8	6	C4	1 ½	4 ½	20 ¼
027	C4	1	C5	3 ½	-2 ½	6 ¼

N = 10 Σd^2=89

$$R = \left(1 - \frac{6\sum d^2}{N(N^2-1)}\right) \qquad R = 1 - \frac{6(89)}{10(99)}$$

$$R = 1 - \frac{534}{990}$$

R = 1 - 0.5151515 = 0.53939

R ≈ 0.46061 ≈ 0.46

Var (R) = R^2 = $(0.46)^2$ = 0.2116 = 21.2%

3.4 Analysis of Data in Group C

Group C of this work's records was selected from Pre-ND Urban and Regional Planning 2003/2004 Academic Session. Table I & II compares the performance of the candidates whose registration number appears. Table I the result here shows that the calculated value R is -0.52 which means there is a moderate or marked negative relationship (or correlation) exists between the two. This represent 27% variance of Pre-ND grades is predictable from the S.S.C.E NECO grades. Table II this result shows that the calculated value of R is 0.46, which means there is a moderate or substantial positive relationship (or correlation) exists between the two variables. This represents 21.2% variance of Pre-ND grades is predictable from the S.S.C.E WAEC grades.

GROUP D: Pre-ND Local Government Administration 2004/2005 Academic Session

TABLE I: Compares Pre-ND grades with S.S.C.E NECO grades

Reg. No	Pre-ND		NECO			
	Grade	Rank	Grade	Rank	D	d^2
043	C4	1	D7	8	-7	49
048	C6	4	C6	4	0	0
055	F9	8 ½	C5	1	7 ½	56 ¼
062	C6	4	C6	4	0	0
079	F9	8 ½	C6	4	4 ½	20 1.4
083	C6	4	C6	4	0	0
095	F9	8 ½	D7	8	½	¼
096	C6	4	E8	10	-6	36
050	F9	8 ½	C6	4	4 ½	20 ¼
053	C6	4	D7	8	-4	16

N = 10 Σd^2=198

$$R = \left(1 - \frac{6\sum d^2}{N(N^2-1)}\right) \qquad R = 1 - \frac{6(198)}{10(99)}$$

$$R = 1 - \frac{1188}{990}$$

R = 1 - 1.2 = -0.2

R ≈ - 0.20

Var (R) = R^2 = $(-0.2)^2$ = 0.04 = 4%

TABLE II: Compares Pre-ND grades with S.S.C.E WAEC grades.

Reg. No	Pre-ND		WAEC			
	Grade	Rank	Grade	Rank	D	d^2
045	F9	9	E8	7	2	4
051	D7	7	D7	4	3	9
056	C6	4	F9	9 ½	-5 ½	30 ¼
060	C6	4	D7	4	0	0
063	F9	9	C6	1 ½	7 ½	56 ¼
066	C6	4	E8	7	-3	9
072	F9	9	F9	9 ½	- ½	¼
076	C6	4	E8	7	-3	9
080	C6	4	C6	1 ½	2 ½	6 ¼
112	B3	1	D7	4	-3	9

N = 10 $\Sigma d^2=133$

$$R=\left(1-\frac{6\sum d^2}{N(N^2-1)}\right) \qquad R=1-\frac{6(133)}{10(99)}$$

$$R=1-\frac{798}{990}$$

R = 1 - 0.80606061= 0.1939
R ≈ 0.194
R = 0.19
Var (R) = R^2 = $(0.194)^2$ = 3.7%

3.5 Analysis of Data in Group D

Group D of this research work, select records from Pre-ND Local Government Administration 2004/2005 Academic Session (table I & II) compares the performance of the candidates whose registration number appears. Table I the result, here shows that the calculated value R is -0.2 which means there is little or negligible negative relationship (or correlation) exist between the two variables. This represents 4% variance of Pre-ND grades is predictable from the S.S.C.E NECO grades Table II. This result shows that the calculated value of R is 0.19 which means there is little or negligible positive relationship (or correlation) exists between the two variables. This represents 3.7% variance of Pre-ND grade is predictable from the S.S.C.E WAEC grades.

3.6 Findings

From the observations made:

(i) All the correlation between Pre-ND mathematics and S.S.C.E NECO Mathematics result shows negative correlation exist between the two Examinations, which means that while one increase the other decrease.

(ii) Three out of the four group, A, C and D the correlation between Pre-ND mathematics and S.S.C.E WAEC Mathematics Results shows that positive correlations exist between the performance in the two examination, only group B which correlation between Pre-ND mathematics and S.S.C.E WAEC math's result shows negative correlation exist between the performance of the two examination, which means increase in one brings about the increase in the other.

(iii) For group B. The correlation between Pre-ND mathematics and S.S.C.E WAEC mathematics result shows negatives correlation exist between the performances of the two examinations.

3.7 Discussions of the Findings

The findings shows that negative correlation exist between the performances of students in Pre-ND Mathematics and S.S.C.E NECO mathematics. This means that the correlation between performances of the two examinations is inversely proportional to each other (i.e one increases while the other decreases).
This proof clearly why students found with very good grade in S.S.C.E Mathematics and yet failed Pre-ND mathematics because the grades they got may not really be their true performances.

Example from Group B Table I of 2002/2003 academic session, out of the ten sampled candidates six failed (F9) Pre-ND mathematics two got D7 in Pre-ND mathematics, one had C6 in Pre-ND mathematics but their performance in S.S.C.E NECO seems not to be in agreement with their result in Pre-ND mathematics. The results of the six candidates that failed Pre-ND Mathematics, in S.S.C.E NECO is as follows C6, C6, B3, D7, C6, C6. Four out of the six candidates had C6 in SSCE NECO mathematics while one candidate had B3 and the other D7. Then the two candidates that got D7 in Pre-ND mathematics had D7 also in SSCE. While the one that got C6 in Pre-ND had D7 in SSCE Mathematics and the one with A1 in Pre-ND Mathematics had E8 in SSCE Mathematics. These two results do not quite agree with each other.

It is observed through the findings of this work that positive correlation exist between the performance of student in Pre-ND Mathematics and SSCE WAEC Mathematics. This means that the correlation between performances of student in the two examinations is directly proportional to one and the other (i.e increase in one, bring about increase in the other, while decrease in one also brings about decrease to the other).
Example from Group D Table II of 2004/2005 academic session, out of the ten sampled students three failed (F9), one got D7, five got C6 and one got B3 in Pre-ND mathematics. While the three candidate that got F9 in Pre-ND Mathematics got E8, C6 and F9 in SSCE WAEC, the one that had D7 in Pre-ND mathematics also got D7 in SSCE WAEC, the five that had C6 in Pre-ND mathematics got F9, D7, E8, E8 and C6 in SSCE WAEC and finally the one with B3 in Pre-ND Mathematics had D7 in SSCE WAEC. From this two results we can said

that the grades this candidate obtain in WAEC are clearly justified by their performance, when we observe their Pre- ND Mathematics grades.

These study shows that SSCE WAEC is the better predictor of student's performance in Pre-ND Examination, in mathematics than SSCE NECO result. Because of the following reasons:

1. For all Tables I of the groups under observation have negative correlation between Pre- ND mathematics and SSCE NECO result. This suggested that negative correlation exist between the two examinations.
2. For all Tables II of the groups under observation, except group B, have positive correlation between SSCE WAEC and Pre-ND mathematics result. This suggested that positive correlation exist between the two examinations.

Correlation lying within ± 0.4 signify an imperfect correlation, while correlation that reads ± 0.5 means that there is substantial or moderate relationship exist between the performances of students in the two examinations.

0'level grades are the determining factor for admission into institution of higher learning. [5] in his paper titled "the importance of 0'level grades in medical school admission; the university of Ado Ekiti experience". He discoursed about the important of 0'level grades compare to the JAME scores as it affect performance of student in institution of higher learning. He conclude that, the students that were admitted base on their grades in Physics, Chemistry, Biology and Mathematics were performing than those admitted base on JAME scores, so he said that the use of 0'level grades is very important and effective in selecting academically sound students and shall be used in admission into medical school. However this research agrees with his finding, mostly base on SSCE WAEC Results. Although in institution of higher learning a good number of students that have good grades in 0'level mathematics, only a few perform well thereafter in mathematics. Due to the decline in the performance of students in recent times, in the institution of higher learning in Nigeria, has reached an alarming stage as reported by several Authors (Olaleye and Salami (1997) Barbara and Sylia 2002) as recorded by [4]. This prompted [4], to carry out a research by "comparing admission grades with the performance of students in the institution of higher learning, Concluded that S.S.C.E is a better predictor of student's performance at preclinical science examination than JAME scores.

However in the finding of this work we have two examination bodies which are SSCE WAEC and SSCE NECO, SSCE WAEC Mathematics grade is now seen as a better predictor of the student's true performance in Pre-ND Mathematics than SSCE NECO. Because the correlation between the performances of students in SSCE NECO Mathematics grade with Pre-ND mathematics grades is inversely proportional to each other, which means that while one increase the other decreases and vice-versa, which means that SSCE NECO does not reflect the true performance of students in Pre-ND Mathematics. This is contrary to the conclusion made by the [4], but SSCE WAEC mathematics grades as compared to the Pre-ND mathematics grade is directly proportional to each other which means that SSCE WAEC reflect the true performance of students in Pre-ND Mathematics. This has approved the conclusion made by [4]. This research work therefore, concluded that SSCE, WAEC grades in Mathematics is a better predictor of student's performance in pre-ND Mathematics.

4.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

4.1 Restatement of the Problem

Mathematics is vital to everyday life, as we all know it. Yet over the years, mathematics result has been very disheartens in SSCE Examination. This has affected student's performance in mathematics, in institution of higher learning. A student may even pass mathematics in SSCE at credit level but still fails mathematics in Pre-ND; this was the challenges that prompt the researcher to find out whether there is a correlation between SSCE entry grades with Pre-ND grades in mathematics.

4.2 Summary of the Procedures Used

This study was designed to compare the performance of students in SSCE entry grades with their Pre-ND grades in mathematics. This review of literature was done on the following topics; performance of students in SSCE mathematics; performance of students in mathematics compared with their performance in other courses; comparing admission grades with the performances of students; importance of 0'level grades as it affects performance;

A survey method was used to collect relevant data necessary for the investigation. The collection of data was done at the academic registry of Nasarawa State Polytechnic Lafia, only a college of General studies was considered and in each case four programmes were taken for our data analysis.

The area of study covers only Nasarawa State Polytechnic Lafia in the College of General Studies and Pre-ND, Department of Pre-ND Programmes.

The sampling techniques we used are random sampling to select the samples.

The instrument used in this work is the academic records of student from the academic office of the institution, which include the students grades obtained after their Pre-ND in Mathematics and their SSCE entry grades in Mathematics since Pre-ND examination is the exams that qualify the students to read National Diploma Programme of their choice. It is relevant and SSCE Exams is a standard examination therefore both examination are relevant and valid.

A split half technique was used in order to establish the reliability of the instrument used. The data used in this research was collected by the researchers themselves. It was collected from the academic office and the department of Pre-ND of the Institution. The method employed for the analysis of data collected. The statistical analysis used correlation.

Correlation simply means "mutual relation" to be more specific "spearman's rank correlation coefficient" R was used to predict our result R is defined by the formula

$$R = \left(1 - \frac{6\sum d^2}{N(N^2 - 1)}\right)$$

Where d = difference between each pair of row.
N = number of object to be ranked.

Principal Finding

The study in the findings of this work has shown that there is a little or no correlation exist between the performance of students in Pre-ND Mathematics grade with their Senior School Certificate Examination SSCE entry grades in mathematics.

Although, three tables out of the eight that were used for our analysis shows that a substantial or moderate correlation exist between the performances of students in the two examinations. While five out of the eight tables shows an imperfect or (insignificant/little/negligible) correlation exist between the performances of students in the two examinations. Therefore with the above findings the correlation between the performances of students in the two examinations is negligible or little.

5.0 Conclusions

From the findings based on the data analyzed, the researcher made the following conclusion.

The use of 0'level grades in mathematics is very important and effective in selecting academically sound students in mathematics and should be used in admissions into Pre-National Diploma. SSCE WAEC grade in mathematics is a better predictor of students' performance at Pre-National Diploma Examination in Mathematics than SSCE NECO grades in Mathematics.

5.1 Implication of the Study

This work shows that there is an imperfect correlation between the performances of students in SSCE mathematics with their performances in Pre-ND mathematics.

It also shows that SSCE NECO is not reflecting the true performance of student in mathematics but SSCE WAEC show better reflection of the true performance of student in mathematics.

5.2 Limitation of the Study

The difficulties encountered during this work range from the academic registry to the Pre-ND department, the workers were not cordial. The student's records were not easily found. The files of students that are withdrawn after Pre-ND programmes were not found completely. The results used to analyses this work is limited to those students that was given National Diploma.

5.3 Recommendations

Dareng [8] carry out a research on "Practical ways that can help improve the performance of students in Mathematics" quote the following reports: WAEC Chief Examiner's report (1993), noted that many student produced confused proofs because they could not pick the essential steps in Geometric formal proof. The shows that teachers might not have explained or emphasized to the student the importance of stating the given, required to prove, construction and the reason for relationship that lead to the final proof. Lassa (1984), Support this idea

by saying that "Teachers must have a through mastery of the mathematics they need to teach and that they should learn mere mathematics than the materials which they are expected to teach, this gives them self-confidence. WAEC Chief Examiner's report (1997), noted teachers as appearing to ignore some topics in their teachings under no circumstance should a mathematics teacher teach some topics and refuse to teach others. When a teacher feels he is not very vast in any particular content, instead of avoiding teaching that content to his students, he should make some effort to read wide or if there is a colleague a round let them discuss that topic and put their head together to teach the correct content. However some specific problems in content are noted in WAEC Chief Examiners report (1996). They observed the under listed as weaknesses demonstrated by the candidates. These were candidates'

- Inability to answer questions on construction and bearing.
- Inability to draw perfect histogram
- Inability to draw suitable diagrams for problems on Geometry and trigonometry
- Inability to handle problems on sets which inequality signs were used, to describe sets.
- Poor application of Pythagoras theorem
- Poor knowledge of the intersecting chords of a circle

Therefore to improve and achieved a better result, in Mathematics among Secondary Schools and Pre-ND students. Dogo [7] stresses on the need for the use of instructional material in teaching and learning of Mathematics in Secondary Schools. This can improve the performance of students.
However the researchers' recommendation based on the findings and conclusions of the study should be noted;

(1) Mathematics teachers in secondary schools should work hard so that they can produce student with valid result which they can defend anywhere they go.
(2) Mathematics teachers in secondary schools should do their best to be vast in any given content and cover the correct content. They should not be selective.
(3) Mathematics teachers in secondary school should avoid the possibility of involving in examination malpractice of any form with the mind of assist the students.
(4) During admission process into pre-ND validity of results should be screened wither through aptitude test or oral interview.
(5) Mathematics teachers in Pre-ND should not compromise the standard of their examination question or favor students during results compilation so that candidates can be screened out to National Diploma.
(6) Parents should avoid aiding or abating examination malpractice of any form, instead should give all the support needed for their children in studying well during or before examination.

We therefore give the following Suggestion for Further Research

1. Further research should consider and include the performance of those candidates that were withdrawn at the end of their Pre-ND.
2. The researchers suggest that other research be done, where first group of candidates should be sample out only those who pass Pre-ND Mathematics up rightly without considering their SSCE entry grades in Mathematics and later check their SSCE grades, then compare them. Second group should be sampled out base on those who up rightly pass their SSCE Mathematics entry grades, without considering their Pre-ND mathematics grades and later check their Pre-ND Mathematics grades and compare them. While third and fourth groups should be sampled based on, those who fail SSCE entry grades and those who fail Pre-ND Mathematics grades, respectively.

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