

*Full Length Research Paper*

# **An ordinary level as predictors of students' academic performance in chemistry in Nigerian universities**

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**This paper examined an ordinary level as predictors of students' academic performance in chemistry in South-west Nigeria universities. It also revealed the relationship between the academic performance of students in each level of the university examinations and their corresponding secondary school certificates examination. The sample of the study is made up of 312 chemistry students randomly selected from three universities within South-west Nigeria based on the (proprietorship satisfactory) federal, state and private universities. Ex-post facto design was adopted. The grades of all the chemistry students sampled were selected from the directorate of admission and statistics while the cumulative grade points were selected from chemistry department of the sampled universities. The results revealed that the ordinary level chemistry results related poorly with their respective universities results. The results also showed that there is little or no influence of the mode of entry on the academic performance at all levels and the two examining bodies were equivalent. Based on this finding, it was recommended that both West Africa Examination Council (WAEC) and National Examination Council (NECO) should be used as mode of entry into chemistry department.**

**Key words:** Nigerian universities, ordinary level, predictors, students' achievement.

## **INTRODUCTION**

Formal education has been widely recognized as a dynamic instrument of change socially, politically, economically, scientifically and technologically. Until late sixties, formal secondary education was the general terminal point in Nigerian education system and secondary school was therefore the major source of man power. Today, despite an increase in the number of Universities, secondary education remains the terminal point for many who are unable to secure admission to pursue a degree course in any of pure sciences especially chemistry due to poor performance at ordinary level. Academic performances as a terminology, remains the main determinant of an individual student success in formal education measured directly through reports

examination ratings, and it is also predicable.

The importance of chemistry cannot be over stressed, as it is the base of all environment professions, all science students must learn and pass it at the secondary school level before they can advance to university (Kolawole and Ilugbusi, 2007). Before any science student could be admitted to study chemistry in any Nigerian university, he/she must satisfy a minimum entry grade.

In a study carried out by Ojerinde (1975), he found that there was a positive and significant relationship between candidates' performance in SSCE and the university performances of the same set of students, and that the SSCE has fair predictive power on university performance. Kolawole and Ilugbusi (2007) also found in their study that there was a significant linear and positive relationship between the basic entry grades and academic performance of university under graduates.

The West African Examination Council (WAEC)

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was established in 1952 to replace University of Cambridge Local Examination syndicate, the City and Guilds London Institute, the London Chamber of Commerce and Royal Society of Arts. The certificate awarded has gained national and international recognition since its establishment. However, WAEC has been intensely criticized by scholars and parents for its deficiency. Some of the problems identified include examination malpractices, indiscriminate seizure of candidates' results, monopoly, delay in the release of examination results, mass cancellation of results, leakages and corrupt staff, among others (Kolawole, 2001; Alonge, 2002; Ayodele, 2004).

To solve these problems, committees were set up in University of London, Institute of Education and they recommended that other examining bodies should be set up to reduce the lapses of the embattled WAEC. Based on this recommendation, the National Board for Educational Measurement (NBEM) was transformed to National Examinations Council (NECO) to conduct national examinations simultaneously with WAEC so as to break the monopoly of WAEC thus, enabling Nigerians to monitor and maintain their own educational standard, to reduce the work load of WAEC which many believed had been over stretched beyond capability.

### **Purpose of the study**

The purpose of this study was to examine the relative contributions of predictor variable (SSCE) on the criterion variable (Cumulative Grade Point Average) of chemistry students at all levels in selected universities in South Western, Nigeria.

### **Research questions**

The following research questions were generated for the purpose of this study:

1. Is there any relationship between academic performance of chemistry students in each level of university examination and their senior secondary school certificate examination?
2. Is there any multiple relationships between chemistry students academic performance at all levels in the university and their ordinary level result.
3. Is there any difference between chemistry students SSCE result and their university academic performance at all levels?

### **Hypotheses**

The following null hypothesis were generated and tested at  $P = 0.05$  level of significance.

1. There is no significant relationship between academic

performances of chemistry students in each level of university examination and their SSCE.

2. There are no multiple relationships between chemistry students academic performance at all levels in the university and their ordinary level results.

3. There is no significant difference between chemistry students SSCE result and their university academic performance at all levels.

## **MATERIALS AND METHODS**

### **Research design**

The design used for this study was an ex-post facto design. This is because all the research variables had already existed before the commencement of the study and hence, the research neither controlled nor manipulated the research variables. He just collected the data and used them as they occurred naturally.

### **Population of the study**

The study sample consisted of 312 chemistry students. Stratified and purposive sampling techniques were used to select three universities in South-west, Nigerian, based on proprietorship (federal, state and private owned).

### **Research instrument**

The instruments for this study were obtained from two sets. The first set will consist of the records which contained all the WAEC/NECO grades of chemistry students admitted during the 2004/2005, 2005/2006 and 2006/2007 academic session. The second set consisted of the records which contained all the Cumulative Grade Point Average (CGPA) of the sampled students in chemistry at the degree level in Nigerian universities.

### **Data collection**

The grades of all chemistry students sampled were collected directly from the directorate of admissions and statistics of the universities, while the Cumulative Grade Point Average (CGPA) of the chemistry students sampled were obtained from the selected universities after getting all the necessary permission.

### **Data analysis**

All the data collected were analyzed by t-test, regression analysis as well as the analysis of variance (ANOVA). Hypotheses 1 and 2 were tested using regression analysis and hypothesis 3 was tested using t-test statistical analysis.

## **RESULTS AND DISCUSSION**

The data collected were analyzed for SSCE with their CGPA at all levels in selected Nigerian universities (Tables 1 and 2).

**Table 1.** The SSCE stanine scores and their weights.

WAEC/NECO Grade	A <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	C <sub>4</sub>	C <sub>5</sub>	C <sub>6</sub>	D <sub>7</sub>	E <sub>8</sub>	F <sub>9</sub>
Weights	9	8	7	6	5	4	3	2	1

**Table 2.** The university CGPA level and their grades.

CGPA	4.50 - 5.00	3.50 - 4.49	2.40 - 3.49	1.50 - 2.39	1.00 - 1.49	0.00 - 0.99
Grade	A	B	C	D	E	F

**Table 3.** Analysis of variance between predictor (SSCE) and criterion variables, CGPA as criterion for chemistry students.

Source of variation	N	Part I r <sub>c</sub>	Part II r <sub>c</sub>	Part III r <sub>c</sub>	Part IV r <sub>c</sub>
SSCE	312	0.012	0.012	0.022	0.034

**Table 4.** Analysis of variance between SSCE and CGPA of chemistry student.

Source of variation	Constant	SSCE (R)	R <sup>2</sup>	Beta	F <sub>c</sub>	F <sub>t</sub>	Result
Part I	2.486	0.012	0.000	-0.012	0.043	-	-
Part II	2.374	0.012	0.000	-0.012	0.043	2.21	Not sig
Part III	2.596	0.022	0.000	0.022	0.148	-	-
Part IV	2.142	0.034	0.001	-0.034	0.363	-	-

P ≤ 0.05 level of significant.

### Hypothesis 1

There is no significant relationship between academic performance of chemistry students in each of the university examination and their SSCE.

Table 3 shows that there were very poor relationship between SSCE chemistry result and academic performance of chemistry students at all levels in selected Nigerian universities. Hence, the null hypothesis is rejected.

### Hypothesis 2

There are no multiple relationships between chemistry students academic performance at all levels in the university and their ordinary level result.

Table 4 shows that there were very poor relationship between SSCE scores and academic performance of chemistry students at all levels in the university. The overall CGPA revealed that SSCE scores could only explain just 0.1% variation for all the levels in chemistry as shown by the values of R<sup>2</sup>. Considering the contribution of SSCE scores to each of the CGPA, Beta values showed that SSCE scores had very poor predictive strength for Part III CGPA in chemistry. While part I, II and IV had very poor but negative predictive strength by the SSCE scores. Since all F<sub>c</sub> was less than

F<sub>t</sub> at 0.05 level of significance, the null hypothesis is not rejected. This means that there are no multiple relationships between SSCE scores and academic performance of chemistry students at all levels in Nigerian universities.

### Hypothesis 3

There is no significant difference between academic performance of chemistry students and their mode of entry in Nigerian universities.

Table 5 shows that mean scores and standard deviations showed that there was a slight difference between all levels of academic performance and SSCE scores, t-calculated is less than t-table at 0.05 level of significance. Therefore, the null hypothesis is not rejected. This implies that there is little influence of the mode of entry on university academic performance at all levels. This means that NECO and WAEC are equivalent.

### Conclusion

The finding of this study revealed that there was very poor relationship between SSCE chemistry scores and the academic performance of undergraduate chemistry

**Table 5.** T-test showing mode of entry and academic performance of university undergraduates in chemistry.

Level	Group	N	Mean	S.D	t <sub>c</sub>	t <sub>T</sub>
Part I	WAEC	178	2.50	1.09	1.349	1.960
	NECO	134	2.58	1.07		
Part II	WAEC	178	2.40	1.11	1.321	1.960
	NECO	134	2.46	1.10		
Part III	WAEC	178	2.45	1.11	0.672	1.960
	NECO	134	2.56	1.13		
Part IV	WAEC	178	2.36	0.99	0.717	1.960
	NECO	134	2.29	1.02		

S.D is standard deviation.

students at all levels in the university. Furthermore, result showed that there is slight significant difference between SSCE scores and their academic performance at all level in the university. The study is in line with previous similar studies by Kolawole and Ilugbusi (2007) and Ayodele (2004), respectively who found that there was significant contribution from entry grades to the first year and final year academic performance of students in tertiary institutions. Furthermore, Table 5 showed that mean scores and standard deviations revealed that both WAEC and NECO are valid, reliable and equivalent.

## RECOMMENDATIONS

Based on the finding of this study the following recommendations were made:

1. WAEC and NECO results should remain the mode of entry of students into chemistry department.
2. As far as undergraduate programme is concerned in Nigerian universities, there should be emphasis on the teaching and studying of first session courses as first session CGPA could be used to predict subsequent academic performance of chemistry students.

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