Some Factors Affecting the Performance of Secondary School Students in Chemistry, A Kolokuma/Opokuma Study.

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Abstract
The study reveals the extent at which factors like attitude/interest, previous preparation, study style, parental involvement and teacher expectancy influence students' performance in chemistry in Kolokuma/Opokuma local government area of Bayelsa State. The study adopted the correlation research design as it seeks to establish relationship between two or more variables. The scope of the study comprises of all senior secondary school III (SSS III) students from ten randomly selected schools to make a total sample of six hundred students. The instrument for data collection was the Students Chemistry Learning Inventory (SCLI) designed by the researcher and chemistry performance test. The reliability of SCLI was established with a test-retest method to obtain a coefficient (r) = 0.82 with Pearson product moment correlation. The data obtained from SCLI and tests were analyzed by Pearson product moment correlation and the results were found statistically significant (Z crit = 1.96) at df = 598 and p ≤ 0.05.
Keywords: Chemistry, Kolokuma/Opokuma, Student, Relationship, Performance

1.0   Introduction

Chemistry is the study of the nature and properties of all forms of matter as well as substance that make up our environment and the various changes which these substances undergo in different conditions. According to Ikeobi, 1986, all form of human endeavors and absolutely nothing goes on in science without the application of chemistry. The importance and role of science education (especially chemistry) cannot be over emphasized.

Chemistry has long been a traditional part of academic curriculum in schools and it is usually studied alongside other related subjects such as biology, physics and mathematics. It is a core subject in the study of many biological science courses such as Medicine, Biochemistry, Microbiology, Pharmacy, Engineering among others. Thus a sound knowledge of chemistry is of great importance to many pupils and the community at large (Baja, 1976).

This study intends to determine some factors responsible for the failure or success of students in chemistry subject at senior secondary school level in Kolokuma/Opokuma local government area of Bayelsa State.

2.0   Research method

The various techniques used in carrying out this study are described below;

2.1   Research design

This study adopted the correlation survey design, as it seeks to establish what relationship exists between two or more variable to predict one from the other (Nwankwo, 1999). Thus the present study is correlation one because it could establish relationship between attitude, study style, parental involvement and teacher expectancy to actual examination scores (results) to predict their performance.

2.2   Area of study

The study was conducted in Kolokuma/Opokuma local government area of Bayelsa State, Nigeria. The local government area was chosen for easy accessibility.

2.3   Population

The target population was all senior secondary school (SSS III) students in all government owned schools in the area. There were a total of 16,600 students in 2006/2007 session when this study was conducted. The choice of SSS III students was based on the fact that they can understand greatly the items/ terms of the instrument.

2.4   Sample and sampling technique

A total of 600 SSS III students constituted the sample of the study. A multi stage stratified random sampling technique was adopted in selecting 10 out of 11 mixed (Unisex) governments owned senior secondary schools in the local government area. 60 SSS III students from each of the selected schools were picked for the study.

2.5   Instrument for data collection

The instrument for data collection in this study is the students chemistry learning inventory (SCLI), which is made up of two sections: A and B with close ended question and raw test scores.

2.6   Validation of the instrument

A copy of SCLI was sent to two educationists in chemistry for face validation in requested to vet items of the instrument in terms of clarity of words, simplicity of vocabularies and relevance of items to the study. Corrections were effected and the final copy of the instrument sent to supervisors for comment and approval.

2.7   Reliability of the instrument

The establishment of reliability coefficient of SCLI was done with the test retest method. The researcher administered copies of the instrument to 40 students in 3 schools which were not used in the study to avoid contamination. After two weeks, these students were re-administered with the instrument, the data generated from these two administrations of the were then co-related with Pearson product moment co-relation coefficient (r), a coefficient of 0.82 was obtained as this was found significant at 0.05 alpha level, hence SCLI was a reliable instrument.

2.8   Method of data collection

The researcher visited the ten schools used in this study and administered copies of the SCLI to the students. Filled copies were retrieved on the spot to avoid instrument mortality. The two tests were administered to the students' on an interval of two weeks and the mean performance of the students was taken, and the data generated were collected for statistical analysis.

2.9   Method of data analysis

The collected data in this study were analyzed using Pearson product moment correlation and Z-statistics. As the Pearson product moment correlation coefficient (r) was used to answer the research questions and the Z-test was used to test the hypothesis.

3.0   Discussion/conclusion

From the findings, it is observed that factors affecting students performance in chemistry is a peer into the determinants of failure or success of senior secondary school students. The sample of the study consisting of 600 students randomly selected from 10 out of 11 senior secondary school in the study area gave the following variables and the respective correlation coefficient; that a positive relationship exists between students' attitude/interest (r = 0.78), previous preparation (r = 0.88), study style (r = 0.79), parental involvement (r = 0.84), teachers' expectancy (r = 0.80) and students' performance in chemistry subjects in Kolokuma/Opokuma local government area of Bayelsa State. On test statistically, the results for individual parameters were found to be significant at $(p<0.05)$ alpha level of probability.

In conclusion, the findings of this study cannot be conclusive without further analysis some other variables that could influence performance of students in chemistry. Variables such as content difficulty, physical conditions, school organization, outside interest, laboratories, etc. could also provide further information on students' performance in chemistry. However, all variables considered in this work show a positive correlation with slight difference in the correlation coefficient. This is in agreement with the work of Kandel, 1999 and Nokak, 1988, who also found out that attitude, is positively related to performance.

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4.0   Presentation and analysis of data

The data and result of each research question and its corresponding hypothesis are respectively presented on the same table.

4.1   Research question 1

What is the relationship between students' attitude/ interest and performance in chemistry?

Hypothesis 1

There is no significant relationship between students' attitude/ interest and performance in chemistry.

Table 4.1   Relationship between attitude/interest and performance in chemistry.

Variables	N	ΣX^2	ΣY^2	ΣXY	r	Z Cal.	Z Crit.	Result
Attitude/interest Vs Performance	600	29614600	43213237	28003670	0.781	19.11	1.96	Sig.

The table (4.1) above shows a correlation coefficient (r-value = 0.781) which implies that there is a high positive relationship between attitude/interest and students' performance in chemistry.

Furthermore, the calculated Z (19.11) is greater than the critical Z (1.96) at *df* of 598 and 0.05 level of significance for a two tailed test, hence the null hypothesis is rejected. The result therefore is that there is a significant relationship between students' attitude/interest and performance in chemistry.

4.2   Research question 2

What is the relationship between students' prior knowledge and performance in chemistry?

Hypothesis 2

There is no significant relationship between prior knowledge and performance in chemistry.

Table 4.2   Relationship between previous knowledge and performance in chemistry.

Variables	N	ΣX^2	ΣY^2	ΣXY	r	Z Cal.	Z Crit.	Result
Previous knowledge Vs Performance	600	31127000	30560525	4326500	0.885	21.65	1.96	Sig.

Table 4.2 above shows a correlation coefficient (r-value = 0.885) which indicates a high positive relationship between previous knowledge and students' performance in chemistry.

Since the calculated Z (21.65) is greater than the critical Z (1.96) at *df* of 598 and 0.05 alpha level, the result is that there is a significant relationship between students' previous knowledge and performance in chemistry, hence the null hypothesis is rejected.

4.3   Research question 3

What is the relationship between students' study style and performance in chemistry?

Hypothesis 3

There is no significant relationship between study style and performance in chemistry.

Table 4.3   Relationship between study style and performance in chemistry.

Variables	N	ΣX^2	ΣY^2	ΣXY	r	Z Cal.	Z Crit.	Result
Study style Vs Performance	600	30917400	43213237	28003670	0.796	19.47	1.96	Sig.

Table 4.3 shows a correlation coefficient (r-value = 0.796). This shows that there is a high positive relationship between students' study style and performance in chemistry. Furthermore, Z calculated (19.47) is greater than Z critical (1.96) at *df* of 598 and 0.05 alpha level. The result revealed that there is a significant relationship between student study style and performance in chemistry. Therefore the null hypothesis is rejected.

4.4   Research question 4

What is the relationship between parental involvement and students' performance in chemistry?

Hypothesis 4

There is no significant relationship between parental involvement and performance in chemistry.

Table 4.4 Relationship between parental involvement and performance in chemistry.

Variables	N	ΣX^2	ΣY^2	ΣXY	r	Z Cal.	Z Crit.	Result
Parental involvement Vs Performance	600	25095525	43213237	27847760	0.84	20.55	1.96	Sig.

Table 4.4 shows a correlation coefficient (r-value = 0.84). The value indicates that there is a high positive relationship between parental involvement and performance in chemistry, hence Z calculated (20.55) is greater than Z critical (1.960) at *df* of 598 and 0.05 alpha level. The result reveals that there is a significant relationship between parental involvement in students' academics and their performance in chemistry.

## 4.5	Research question 5

What is the relationship between teachers' expectancy and students' performance in chemistry?

Hypothesis 5

There is no significant relationship between teachers' expectancy and students' performance in chemistry.

**Table 4.5	Relationship between teachers' expectancy and performance in chemistry.**

Variables	N	ΣX^2	ΣY^2	ΣXY	r	Z Cal.	Z Crit.	Result
Teachers' expectancy Vs Performance	600	31400150	43213237	29609620	0.80	19.58	1.96	Sig.

Table 4.5 above illustrates a correlation coefficient (r-value = 0.80). Indicating therefore that there is a high positive relationship between teachers' expectancy and performance in chemistry. Also, Z calculated (19.58) is greater than Z critical (1.96) at *df* of 598 and 0.05 alpha level. The result shows that there is a significant relationship between teachers' expectancy and students' performance in chemistry.

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