

**SECONDARY SCHOOL STUDENTS' PERCEPTION OF CHEMISTRY IN LANGTANG NORTH,
PLATEAU STATE, NIGERIA**

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ABSTRACT

The study investigated secondary school students' perception of Chemistry in Langtang North, Plateau State. Two research questions and one hypothesis guided the study. The study employed a survey consisted of 1,500 students and 18 schools. The sample comprised 600 senior secondary two students drawn from nine senior secondary schools using proportionate and purposive sampling techniques. The instruments used for data collection were the Chemistry Perception Questionnaire (CPQ) and Chemistry Perception Achievement Inventory (CPAI). with reliability coefficients of 0.68 and 0.88 respectively. The instruments were validated by three experts. The data collected were analysed using mean and standard deviation to answer the research question while Pearson Product-Moment Correlation coefficient was used to test the hypotheses at 0.05 level of significance. The findings revealed that most students selected had negative perception of Chemistry as a subject, with male students having better perception of the subject compared to their female counterparts. There was a significant difference between the mean achievement scores of students that showed positive perception of Chemistry with those that showed negative perception of the subject. Those that showed positive perception had a greater mean achievement score. With respect to gender, there was a slight significant difference in the mean achievement scores of male and female students in favour of male students that showed positive perception in Chemistry. Going by the findings, it was concluded that positive perception in Chemistry enhanced students' achievement in Chemistry. It was therefore, recommended among others, that Chemistry teachers should create classroom environments that would make their students to have positive perception in the subject.

Key words: Chemistry Perception Secondary school Students.

INTRODUCTION

Akpoghol and Otor (2020) conceived Chemistry as the branch of science that deals with the properties, composition and structure of elements and compounds in terms of how they can change and the energy that is released or absorbed when they change. Chemistry plays a big part in our everyday life. We start the day with Chemistry. One can find Chemistry in daily life in the foods we eat, the air we breathe, cleaning chemicals, our emotion and literally, every object we can see or touch (Roy 2016).

The relevant role of Chemistry in the economic growth of any nation in contemporary time is quite obvious. In Nigeria, the importance of Chemistry to the development of the nation cannot be underestimated especially as her national income rests mainly on petroleum and petrochemical industries (Nleonu & Ezelibe, 2020). It is in this respect that the National Policy on Education (Federal Republic of Nigeria, FRN, 2014) specified, among others, that the goal of science education shall be to produce scientists for national development. However, science education cannot produce scientists for national development where the perception of students in Chemistry is very poor.

Yunus (2012) states that in this current era, the world is facing environmental challenge where the future communities are losing interest in science subjects such as Chemistry. The also explains that there are many factors that contribute to students' success, one of which is the students' perception of learning. Consequently, the promotion of favourable perception in science, scientists and learning science which has always been a component of science education is

interestingly a matter of concern. However, the concept of perception towards science is somewhat nebulous often poorly articulated and not well understood.

The popular ways of teaching which do not promote higher order cognitive level of gaps between students' wishes and teachers teaching. Difficulty of the Chemistry course, wide coverage of the syllabus in combination with little allocated teaching time, low awareness of career opportunities, lack of teaching aids/laboratory students' background in Chemistry, low engagement toward Chemistry related subjects, a relatively poor knowledge of the main concepts of chemical science are factors that can affect students' perception of Chemistry.

Corresponding investigations reveal that students orientate their choice of course level mostly towards personal abilities and individual interests as well as towards high marks from secondary level and career aspiration. Further studies have tried to approach the problem by investigating students' perception. They show that Chemistry and Physics lessons at school are comparatively unpopular and disliked by a majority of students. When students were asked about their perception of Chemistry, they usually complained of the subject being too difficult, boring and too abstract and irrelevant for their lives. However, students' perception appears not to be easy to read choice barometer. Ziani (2019) observed that success or failure depends to a great extent on the perception of learners involved in learning. On this note, the perception of students must be taken seriously in order to achieve any educational goal. Wrigley (2023) on the other hand, revealed that poor results of science subjects by students may be attributed to gender polarization and perception towards the subject.

Science education aims to produce scientists for national development. However, science education cannot produce scientists for national development where the perception of students in Chemistry as a subject is very negative. The outcry of several science educators and the general public concerning the continuous negative perception of students about Chemistry as a subject cannot be overemphasized. This negative perception of Chemistry may not go well for the nation as Nigeria which looks forward to being among the top twenty scientifically, technologically and economically developed nations of the world by the year 2030.

STATEMENT OF THE PROBLEM

The persistent negative perception of students towards science, especially Chemistry makes it an imperative to embark on the study. Going by research evidences on perception of Chemistry, reasons abound such as teachers shying away from using innovative teaching strategies that involve activities and the teaching of concepts in abstract instead of practical in nature in order to make students to perceive Chemistry with alacrity thereby developing positive perception. Domenici and Chiocca (2024) revealed that, there is a general negative perception of Chemistry and Chemistry related subjects of Italian young people which has been summarized in the so-called 'Chemophobic' behaviour which results in poor students' academic achievement in Chemistry in external examination, such as WAEC and NECO in recent times that imperilled the realization of Nigeria's quest for scientific and technological advancement may not be unconnected to poor perception of the students of the subject. Research studies have shown different ideas on gender as it affects students' perception of Chemistry. Yet, so much is left to be desired, since not much has been recorded in terms of progress in perception of Chemistry. This concern has given birth to this study to investigate secondary school students' perception of Chemistry.

RESEARCH QUESTIONS

The study was guided by the following research questions:

1. What is the students' perception of Chemistry?
2. To what extent does gender affect students' perception of Chemistry?

HYPOTHESES

The following hypothesis was stated and tested at 0.05 level of significance:

1. There is no significant difference between mean scores of male and female students in their perception of Chemistry.
2. There is no significant difference between mean scores of male and female students in their perception of Chemistry

METHOD

The study employed the survey research design. A sample of 600 senior secondary two students was drawn from the student population of 1,500, taken from 18 senior secondary schools, using proportionate and purposive sampling techniques. A researcher-developed instrument, known as Chemistry Perception Questionnaire (CPQ) was used for data collection. The instrument was validated by three experts from the Department of Science and Technology Education, University of Jos. The instrument was pilot tested using Kuder-Richardson (K – R21) formula which yielded a coefficient of 0.88. The data collected were analysed using mean and standard deviation to answer the four research questions, while t-test was used to test the hypothesis at 0.05 level of significance. The perceptions of the students were correlated with their third term Chemistry results.

RESULTS

Research Question One

What is the students' perception of Chemistry?

Table 1: Students' Perception of Chemistry Responses

S/No.	Statement	Mean	Std. Dev.	Decision
1	Chemistry is boring	4.60	0.60	Agreed
2	Chemistry lessons are boring	3.96	1.34	Agreed
3	My background in Chemistry encourages me to read the subject	3.23	1.76	Agreed
4	In calculation, Chemistry is confusing	1.65	0.74	Disagreed
5	Chemistry assignments are boring	4.25	1.62	Agreed
6		4.15	1.30	Agreed
7	Chemistry is a very difficult subject	4.38	0.95	Agreed
8	Chemistry is an interesting subject	4.57	0.90	Agreed
9	I have ever visited a chemical-related factory	4.55	0.89	Agreed
Grand mean score		3.93	1.12	Agreed

Table 1 presents data that were used to answer research question one. Save for item no.4 which has a mean score of 1.65 and standard deviation 0.74, respondents agreed with all the items on the table. This suggests that students have a high perception about the subject Chemistry. The grand mean score of the table stands at 3.93, with standard deviation 0.74, indicating the high perception students have about Chemistry.

Research Question Two

To what extent does gender affect students' perception of Chemistry?

Table 2: Students Perception of Chemistry with Gender

S/N of Question Item	Male Mean Score	Female Mean Score
2	1.67	2.30
5	1.34	2.20
6	1.60	1.60
8	1.32	1.80
10	1.38	1.90
13	1.25	1.81

15	2.01	2.32
16	1.32	1.77
18	1.30	1.99
20	2.00	1.82
24	2.28	2.10
26	1.66	2.10
28	1.77	1.90
29	1.34	2.12
30	1.23	2.00
Average Mean Score	1.89	2.35

Table 2 showed that the average mean score of male students is 1.89 and the average mean score of female students is 2.35 which implies that the female mean score is greater than that of the male mean score, though both mean scores fall short of the criterion mean score of 2.50. Notwithstanding, female students had better perception of Chemistry than their male counterparts.

Hypothesis One

There is no significant difference between the mean achievement scores of students and their perception of Chemistry.

Table 3: Correlation Analysis of Students' Perception of Chemistry and Achievement Scores.

Category	N	Mean	Std.Dev	DF	t-crit	t-cal	Decision
Perception	426	4.2	0.84	250	1.980	1.26	Significant
Achievement	174	3.1	1.0				

In Table 3 are data that were used to test hypothesis one. In the table, t-cal of 1.76 is less than the t-crit. Of 1.980. This result indicates that there is a significant difference between students' perception of Chemistry and their achievement.

Hypothesis Two

There is no significant difference between mean scores of male and female students in their perception of Chemistry.

Table 4: Correlation Analysis of Students' Perception in Chemistry based on Gender

Category	N	Mean	Std.Dev	DF	t-tab	t-cal	Decision
Male	426	4.2	0.84	250	1.980	1.26	Significant
Female	174	3.1	1.0				

The data presented in Table 4 were used to test hypothesis two at 0.05 level of significance. The table shows that t-cal of 1.26 is less than the t-crit of 1.980. This indicates that there is a significant difference in students' perception of Chemistry based on gender.

DISCUSSION

The purpose of the study was to determine students' perception of Chemistry and the implication on their aspiration and attitude towards Chemistry at the senior secondary school level in Langtang North, Plateau state. The findings are discussed based on the research questions and hypotheses. The findings showed that students had a high perception about Chemistry. Female students however, had a better perception of Chemistry than their male counterparts. The study found that there was a significant difference between students' perception of Chemistry and their achievement.

It also found that there was a significant difference in students' perception of Chemistry based on gender.

CONCLUSION AND RECOMMENDATION

Based on the findings, the study concluded that most Chemistry students have negative perception of the subject. However, the finding on gender shows that there was significant difference of perception of Chemistry in the mean scores of male and female students who offer Chemistry in favour of female students. The implication is that the continual poor achievement of students presents a bleak picture of Nigeria's technological development.

Based on the findings, the following recommendations were made:

1. Students of Chemistry, and indeed science students need to have a positive perception about Chemistry as a subject.
2. So as to encourage students to pursue careers in the sciences, Chemistry students need to be provided with special scholarships.
3. Science teachers need to be trained and retrained so as to update their skills and knowledge.

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