

ATTITUDE OF SENIOR SECONDARY SCHOOL STUDENTS IN GWAGWALADA TOWN TOWARDS CHEMISTRY: IMPLICATION FOR TEACHING IN THE 21ST CENTURY

I. A. Ojelade

Abstract

The study was designed to investigate the attitude of Senior Secondary School students in Gwagwalada town towards Chemistry. 300 students were the subjects for the study in which 100 students represent each level of classes that SS I, SS II and SS III. The only instrument for the study was a fifteen item questions and oral interview. Frequency counts and percentage were used to analyze the data whose results revealed that majority of the students had positive attitude towards Chemistry as reflected in their responses to positive statements. Also, it was revealed that those within the age range of 16-20 years exhibited positive attitude towards Chemistry than other respondents in different age categories. It was equally found out that males' respondents had more positive disposition toward, Chemistry than the female respondents. Based on these results it is recommended that the best Chemistry student award should be given on regular basis to encourage students to have positive attitude towards Chemistry.

Introduction

Science and Technology is one of the basic requirements for any technological development in any country, Nigeria is no exception to this claim. Series of attempts and innovations have been made to recognize science and technology at various levels of Nigerian education system by government, educational institutions, scientific agencies, professional association, etc. These efforts are intended to bring about improvement on the teaching and learning with a view to enhancing more positive attitude and better performance in science and technology based subjects, especially Chemistry.

Chemistry is one of the three main branches of pure science, the other two being Biology and Physics. Chemistry deals with the composition properties and uses of matter, it probes into the principles governing the changes that matter undergoes (Ababio, 2007).

Chemistry is a human endeavour that relies on basic human qualities like creativity, insights, reasoning and skills. It depends on habits of mind; skepticism, tolerance of ambiguity, openness to new ideas, intellectual honesty, curiosity, and communication. Students begin the studying of Chemistry with curiosity however, when unconvinced, they become skeptical.

Chemistry is popular called a "volatile" subject by students and teachers alike probably due to rigorous and painstaking process involved, as well as, the nature of substances/elements it deals with, which could sometimes be explosive. This impression students have about Chemistry may have contributed to their changing attitude towards the subject, which could in turn cause declining enrolment in the discipline. Researches focused on gender studies have indicated that, attitudes toward science education differ between males and females. A declining interest in Chemistry and under representation of females in the Chemical science was found (Jacobs, 2000).

The declining situation therefore calls for a closer look with a view to determining the real nature of students attitude towards the Chemistry especially those of them within the Federal Capital Territory where much studies of this nature might not have been explored. It is against this background the study is designed to investigate the attitude of senior secondary school students' in Gwagwalada town towards Chemistry.

Research Questions

- i. What are the attitudes of the total Senior Secondary Students in Gwagwalada town towards Chemistry?
- ii. What are the Senior Secondary Students attitudes across gender in different classes?

- iii. What are the Senior Secondary students' attitudes across age in different classes?

Method

The research design adopted for the study is a survey method of research which examined variables as they exist. The study population covered the Senior Secondary School students in Gwagwalada Area Council. However, the sample constituted this category of students from three randomly selected schools in Gwagwalada town making total number of 300 students as sample. This representative sample was drawn from the three schools using stratified random sampling techniques using age, gender and class as sampling criteria.

The instrument used consisted of a questionnaire which contains 15 items that sought to identify the disposition of the students towards Chemistry. Each item contains a statement with options listed as: Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The instruments was validated by the experts and during the process of validation, language level and class level of the students were considered. Therefore, the reliability index of the questionnaire was determined as 0.82 using a test-retest method.

Frequency counts and percentages were used in analyzing the data.

Research Question 1:

What are the attitude of the total Senior Secondary Students in Gwagwalada Town towards Chemistry

Table I : Percentage Analysis of Total Students' Attitude Towards Chemistry

S/ No	Statements	Grand Total No. of Respondents	Agree	%	Disagree	%	Total %
1	Chemistry is fun	300	161	54	139	46	100
2	Chemistry makes me feel confused	300	127	42	173	58	100
3	Chemistry is important to every day life	300	273	91	27	9	100
4	Most Chemistry topics are difficult	300	164	55	136	45	100
5	I shall like to read a course related to Chemistry in future	300	274	82	53	18	100
6	I like Chemistry practical	300	277	92	23	8	100
7	There are too many topics to cover in 0-level Chemistry Syllabus	300	227	76	73	24	100
8	I want to become a Chemist in future	300	139	46	161	54	100
9	Chemistry practical is dangerous	300	186	62	114	38	100
10	I enjoy reading Chemistry textbooks	300	252	84	48	16	100
11	Chemistry help in developing practical skills	300	271	90	29	10	100
12	I shall not read any Chemistry course after 0-level	300	64	21	236	79	100
13	I don't gain anything from learning Chemistry	300	24	8	276	92	100
14	Chemistry is too mathematical for me	300	79	26	221	74	100
15	Chemistry is a very important subject	300	283	94	17	6	100

Source: Field work.

Research Question 2:

What are the Senior Secondary Students attitudes across gender in different classes?

The Answer to the above question is summarized in tables IIA, IIB and IIC

Table II A : Gender-Based Percentage Analysis of the Respondents Attitude in SS I

S/ No	Statements	Grand total no. of Respondents	Total No. of male	No. of Male Agree	No. of Male Disagree	Total No Of Female	No. of Female Agree	No. of Female Disagree
1	Chemistry is fun	100	64	33(52)	31(48)	36	28(78)	8(22)
2	Chemistry makes me feel confused	100	64	19(30)	45(70)	36	20(56)	16(44)
3	Chemistry is important to every day life	100	64	59(92)	5(8)	36	33(92)	3(8)
4	Most Chemistry topics are difficult	100	64	31(48)	33(52)	36	19(53)	17(47)
5	I shall like to read a course related to Chemistry in future	100	64	55(86)	9(14)	36	34(94)	2(6)
6	I like Chemistry practical	100	64	63(98)	1(2)	36	33(92)	3(8)
7	There are too many topics to cover in 0-level Chemistry Syllabus	100	64	44(69)	20(31)	36	23(64)	13(36)
8	I want to become a Chemist in future	100	64	31(48)	33(52)	36	15(42)	21(58)
9	Chemistry practical is dangerous	100	64	36(56)	28(44)	36	22(61)	14(39)
10	I enjoy reading Chemistry textbooks	100	64	59(92)	5(8)	36	28(78)	8(22)
11	Chemistry help in developing practical skills	100	64	59(92)	5(8)	36	33(92)	3(8)
12	I shall not read any Chemistry course after 0-level	100	64	10(16)	54(84)	36	7(19)	29(81)
13	I don't gain anything from learning Chemistry	100	64	1(2)	63(98)	36	5(14)	31(86)
14	Chemistry is too mathematical for me	100	64	13(20)	51(80)	36	16(44)	20(56)
15	Chemistry is a very important subject	100	64	61(95)	3(5)	36	35(97)	1(3)

Source: Field work.

Note: Percentages in bracket

Table II B : Gender-Based Percentage Analysis of the Respondents Attitude in SS II

S/ No.	STATEMENTS	Grand total No. of Respondents	Total No. of male	No of Male Agree	No of Male Disagree	Total No of Female	No of Female Agree	No of Female Disagree
1	Chemistry is fun	100	59	26(44)	31(48)	41	21(51)	20(49)
2	Chemistry makes me feel confused	100	59	16(27)	33(56)	41	20(49)	21(51)
3	Chemistry is important to every day life	100	59	56(95)	43(73)	41	38(93)	3(7)
4	Most Chemistry topics are difficult	100	59	20(34)	3(5)	41	15(37)	26(63)
5	I shall like to read a course related to Chemistry in future	100	59	47(80)	39(66)	41	41(100)	-(0)
6	I like Chemistry practical	100	59	54(92)	12(20)	41	32(78)	9(22)
7	There are too many topics to cover in 0-level Chemistry Syllabus	100	59	46(78)	13(22)	41	30(73)	11(27)
8	I want to become a Chemist in future	100	59	37(63)	22(37)	41	16(39)	25(61)
9	Chemistry practical is dangerous	100	59	35(59)	24(41)	41	21(51)	20(49)
10	I enjoy reading Chemistry textbooks	100	59	55(93)	4(7)	41	36(88)	5(12)
11	Chemistry help in developing practical skills	100	59	56(95)	3(5)	41	38(93)	3(7)
12	I shall not read any Chemistry course after 0-level	100	59	13(22)	46(78)	41	1(2)	40(98)
13	I don't gain anything from learning Chemistry	100	59	4(7)	55(93)	41	3(7)	38(93)
14	Chemistry is too mathematical for me	100	59	13(22)	46(78)	41	9(22)	32(78)
15	Chemistry is a very important subject	100	59	59(100)	-(0)	41	40(98)	1(2)

Source: Field work.

Percentage in bracket

Table II C : Gender-Based Percentage Analysis of the Respondents Attitude in SS III

S/ No	Statements	Grand Total No. of respondents	Total no. of male	No of Male Agree	No of Male Disagree	Total No Of Female	No of Female Agree	No of Female Disagree
1	Chemistry is fun	100	75	44(59)	31(41)	25	9(36)	16(64)
2	Chemistry makes me feel confused	100	75	40(53)	35(47)	25	12(48)	13(52)
3	Chemistry is important to every day life	100	75	65(87)	10(13)	25	22(88)	3(12)
4	Most Chemistry topics are difficult	100	75	59(79)	16(21)	25	20(80)	5(20)
5	I shall like to read a course related to Chemistry in future	100	75	56(75)	19(25)	25	14(56)	11(44)
6	I like Chemistry practical	100	75	70(93)	5(7)	25	25(100)	-(0)
7	There are too many topics to cover in 0-level Chemistry Syllabus	100	75	59(79)	16(21)	25	25(100)	-(0)
8	I want to become a Chemist in future	100	75	29(39)	46(61)	25	11(44)	14(56)
9	Chemistry practical is dangerous	100	75	57(76)	18(24)	25	15(60)	10(40)

Attitude of Senior Secondary School Students in Gwagwalada Town Towards Chemistry: Implication for Teaching in the 21st Century

10	I enjoy reading Chemistry textbooks	100	75	59(79)	16(21)	25	15(60)	10(40)
11	Chemistry help in developing practical skills	100	75	65(87)	10(13)	25	20(80)	5(20)
12	I shall not read any Chemistry course after 0-level	100	75	24(32)	51(68)	25	9(36)	16(64)
13	I don't gain anything from learning Chemistry	100	75	10(13)	65(87)	25	1(4)	24(96)
14	Chemistry is too mathematical for me	100	75	25(33)	50(67)	25	3(12)	22(88)
15	Chemistry is a very important subject	100	75	65(87)	10(13)	25	23(92)	2(8)

Source: Field work.

Percentage in bracket

Research Question III:

What are the Senior Secondary Students' attitudes across age in different classes? The Answer to the above question is summarized in tables IIIA, IIIB and IIIC

Table III A : Age-By-Age Percentage Analysis of the Respondents Attitude in SS I

S/ No	Statements	Grand total no. of respondents	AGE GROUPS								
			10 – 15 YEARS			16 – 20 YEARS			21 Years And Above		
			Total	A	D	Total	A	D	Total	A	D
1	Chemistry is fun	100	64	45 (70)	19 (30)	34	14 (41)	20 (59)	2	2 (100)	-(0)
2	Chemistry makes me feel confused	100	64	31 (48)	33 (52)	34	8 (24)	26 (76)	2	(0)	2 (100)
3	Chemistry is important to every day life	100	64	60 (94)	4 (6)	34	30 (88)	4 (12)	2	2 (100)	-(0)
4	Most Chemistry topics are difficult	100	64	31 (48)	33 (52)	34	18 (53)	16 (47)	2	2 (100)	(0)
5	I shall like to read a course related to Chemistry in future	100	64	56 (87)	8 (13)	34	31 (91)	3 (9)	2	2 (100)	-(0)
6	I like Chemistry practical	100	64	61 (95)	3 (5)	34	33 (97)	1 (3)	2	2 (100)	-(0)
7	There are too many topics to cover in 0-level Chemistry Syllabus	100	64	40 (63)	24 (37)	34	25 (74)	9 (26)	2	2 (100)	-(0)
8	I want to become a Chemist in future	100	64	28 (44)	36 (56)	34	16 (47)	18 (53)	2	2 (100)	-(0)
9	Chemistry practical is dangerous	100	64	36 (56)	28 (44)	34	20 (59)	14 (41)	2	2 (100)	-(0)
10	I enjoy reading Chemistry textbooks	100	64	53 (83)	11 (17)	34	32 (94)	2 (6)	2	2 (100)	-(0)
11	Chemistry help in developing practical skills	100	64	59 (92)	5 (8)	34	31 (91)	3 (9)	2	2 (100)	-(0)
12	I shall not read any Chemistry course after 0-level	100	64	13 (20)	51 (80)	34	4 (12)	30 (88)	2	(0)	2 (100)
13	I don't gain anything from learning Chemistry	100	64	3 (5)	61 (95)	34	3 (9)	31 (91)	2	(0)	2 (100)
14	Chemistry is too mathematical for me	100	64	23 (36)	41 (64)	34	6 (18)	28 (82)	2	(0)	2 (100)
15	Chemistry is a very important subject	100	64	61 (95)	3 (5)	34	33 (97)	1 (3)	2	2 (100)	-(0)

Source: Field work.

A – Agree D – Disagree and Percentages in bracket

Attitude in SS II

S/ No	Statements	Grand total no. of respon- dents	Age Groups								
			10 – 15 Years			16 – 20 Years			21 Years And Above		
			Total	A	D	Total	A	D	Total	A	D
1	Chemistry is fun	100	21	9 (43)	12 (57)	79	38 (48)	41 (52)	-	-	-
2	Chemistry makes me feel confused	100	21	10 (48)	11 (52)	79	26 (33)	53 (67)	-	-	-
3	Chemistry is important to every day life	100	21	17 (81)	4 (19)	79	77 (97)	2 (3)	-	-	-
4	Most Chemistry topics are difficult	100	21	9 (43)	12 (57)	79	26 (33)	53 (67)	-	-	-
5	I shall like to read a course related to Chemistry in future	100	21	18 (86)	3 (14)	79	70 (89)	9 (11)	-	-	-
6	I like Chemistry practical	100	21	17 (81)	4 (19)	79	69 (87)	10 (13)	-	-	-
7	There are too many topics to cover in 0-level Chemistry Syllabus	100	21	15 (71)	6 (29)	79	61 (77)	18 (23)	-	-	-
8	I want to become a Chemist in future	100	21	7 (33)	14 (67)	79	46 (58)	33 (42)	-	-	-
9	Chemistry practical is dangerous	100	21	13 (62)	8 (38)	79	43 (54)	36 (46)	-	-	-
10	I enjoy reading Chemistry textbooks	100	21	20 (95)	1 (5)	79	71 (90)	8 (10)	-	-	-
11	Chemistry help in developing practical skills	100	21	20 (95)	1 (5)	79	74 (94)	5 (6)	-	-	-
12	I shall not read any Chemistry course after 0-level	100	21	5 (24)	16 (76)	79	9 (11)	70 (89)	-	-	-
13	I don't gain anything from learning Chemistry	100	21	-(0)	21 (100)	79	7 (9)	72 (91)	-	-	-
14	Chemistry is too mathematical for me	100	21	5 (24)	16 (76)	79	17 (22)	62 (78)	-	-	-
15	Chemistry is a very important subject	100	21	21 (100)	-(0)	79	78 (99)	1 (1)	-	-	-

Source: Field work.

A – Agree D – Disagree and Percentages in bracket

Table III C: Age-By-Age Percentage Analysis of the Respondents Attitude in SS III

S/ No	Statements	Grand total no. of respon- dents	Age Groups								
			10 – 15 Years			16 – 20 Years			21 Years And Above		
			Total	A	D	Total	A	D	Total	A	D
1	Chemistry is fun	100	22	12 (55)	10 (45)	61	29 (48)	32 (52)	17	12 (71)	5 (29)
2	Chemistry makes me feel confused	100	22	20 (91)	2 (9)	61	27 (44)	34 (56)	17	5 (29)	1 (71)
3	Chemistry is important to every day life	100	22	17 (77)	5 (23)	61	55 (90)	6 (10)	17	15 (88)	2 (12)
4	Most Chemistry topics are difficult	100	22	20 (91)	2 (9)	61	50 (82)	11 (18)	17	9 (53)	8 (47)
5	I shall like to read a course related to Chemistry in future	100	22	10 (45)	12 (55)	61	47 (77)	14 (23)	17	14 (82)	3 (18)
6	I like Chemistry practical	100	22	22 (100)	-(0)	61	58 (95)	3 (5)	17	15 (88)	2 (12)
7	There are too many topics to cover in 0-level Chemistry Syllabus	100	22	20 (91)	2 (9)	61	50 (82)	11 (18)	17	14 (82)	3 (18)
8	I want to become a Chemist in future	100	22	2 (9)	20 (91)	61	29 (48)	32 (52)	17	9 (53)	8 (47)
9	Chemistry practical is dangerous	100	22	16 (73)	6 (27)	61	45 (74)	16 (26)	17	11 (65)	6 (35)

Attitude of Senior Secondary School Students in Gwagwalada Town Towards Chemistry: Implication for Teaching in the 21st Century

10	I enjoy reading Chemistry textbooks	100	22	17 (77)	5 (23)	61	44 (72)	17 (28)	17	13 (76)	4 (24)
11	Chemistry help in developing practical skills	100	22	17 (77)	5 (23)	61	51 (84)	10 (16)	17	17 (100)	-(0)
12	I shall not read any Chemistry course after 0-level	100	22	12 (55)	10 (45)	61	19 (31)	42 (69)	17	2 (12)	15 (88)
13	I don't gain anything from learning Chemistry	100	22	-(0)	22 (100)	61	6 (10)	55 (90)	17	5 (29)	12 (71)
14	Chemistry is too mathematical for me	100	22	6 (27)	16 (73)	61	14 (23)	47 (77)	17	8 (47)	9 (53)
15	Chemistry is a very important subject	100	22	22 (100)	-(0)	61	51 (84)	10 (16)	17	15 (88)	2 (12)

Source: Field work.

A – Agree D – Disagree and Percentages in bracket

Discussion

The findings in the study showed that majority of the senior secondary school students in Gwagwalada town exhibited positive attitude towards Chemistry. In other words, it means that majority of the students who have chosen the subject might have taken it up willingly. The same results have been recorded for both male and female students, different classes and age groups. This is a commendable development in science education area.

The reason might be connected with the current emphasis in science and technology in our society especially as spelt out in the National Policy on Education (FRC, 2004). Also the 60:40 admission ratio in favour of science students might have generated a lot of interest and subsequent students' positive attitude as found in this study. Besides, governments' interest in science subjects as reflected in their zeal to establish special science schools might have paid off in this regard. This could have triggered off a lot of interest and students' positive attitude towards Chemistry and science generally.

From the response to the questionnaire one can deduce that majority of the students had positive attitude towards Chemistry as reflected in their responses to positive statement. This could be linked to the encouragement, advice, financial and moral support they received from their parents or guardian.

Likewise, it was revealed that male students has more favourable attitude towards Chemistry than their female counterpart. This was confirmed by Simpson and Oliver (1990) that males demonstrate positive attitude towards science than their female. So the male students should try as much as possible to carry their female students along with them.

It was also observed that those respondents within the age range of 16 – 20 years had positive attitude towards Chemistry than other respondents in different age category. This could be attributed to the way they were taught by their Chemistry teachers or the way they embraced Chemistry themselves and for any student to imbibe Chemistry process, he/she needs to be guided and properly directed (Wetzel, 2008). Furthermore it was also found out that Chemistry curriculum is too overloaded with contents, much of which are of little relevance for general education for which secondary education is meant.

Therefore, there is a need to re-examine the Science/Chemistry curricula especially that of secondary schools to include strategies which will stimulate the minds and attitude of the students positively towards Chemistry.

Conclusion and Recommendations

Generally, senior secondary school students in Gwagwalada town exhibited positive attitude towards Chemistry this is likely because they took the subject willingly. The same results have been recorded for both male and female students, different classes and age groups. Male students have more favourable attitude towards Chemistry than their female counterpart. Despite this the overload nature of Chemistry curriculum with contents which are of little relevance for general education for which secondary education is meant affects students performance. Prior to these research findings

there is a need to re-examine the Science/Chemistry curricula in secondary schools stressing the need towards addressing views of students towards positively enhancement of Chemistry

From the findings and subsequent discussion the following recommendations are made.

That the authority concerned should set up a committee that will constantly review the Chemistry curriculum, taking note of the changing nature of the society, country and subject itself. Also, the committee should try to narrow down the scope of Chemistry more especially at the secondary school level to facilitate positive students' attitudes to Chemistry.

In addition, government should try as much as possible to encourage students by introducing the best Chemistry student award in form of scholarship as it is being done in post secondary schools.

Furthermore, in terms of recruitment of teachers, qualified and well experiences teachers need to be employed and willing to work towards improving students' attitude to Chemistry.

Finally, regular seminars, symposium and workshops should be organized for the students on the relevance of Chemistry to their daily live.

References:

Ababio, O.Y. (2007), *New School Chemistry for Senior Secondary Schools*. Africa First publisher limited. revised edition, Onitsha.

Federal Republic of Nigeria (2004). *National policy on education, Lagos: NERDC press*.

Jacobs, M. (2000) cited in Banya, S.K. (2004). *Study of factor affecting attitude of young female students towards chemistry at high school Level*. Dissertkation.com.

Simpson, R.D. & Oliver, J.S. (1990). A summary of master influences on attitude toward and achievement in science among adolescent students. *Science Education*, 74(1), 1-18.

Wetzel, R.D. (2008). *Problem solving and science process skills*. www.suite101.com.