Full Length Research Paper

Some correlates of students attitude towards chemistry in government technical colleges in Imo State

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It has been noted that students in government technical colleges are not well disposed to the study of chemistry. This is evidenced by the general performance of students in National Technical Certificate (NTC) and National Business Certificate (NBC) results. For instance, it was observed in one of the four government technical colleges in Imo State that, out of a total of 122 students who took chemistry in the 2007 NTC examination, only 4 students had credit (C6) while the rest of 118 students had ordinary pass and failure grades. The attitude of students to this subject can influence its study. There are no conclusive variables known to be responsible for the negative attitude of the students to the study of Chemistry. The researcher wonders whether it may be due to the following variables; students' occupational aspiration; teachers' method of teaching; students' intelligence; influence of family on the students; teachers' qualification. Five research questions and hypotheses were formulated and each focused on the identified variables. The researcher prepared and administered questionnaires to 277 students, out of a total of 2800 students in the four technical colleges in Imo State, to determine their responses. Correlational technique was used to ascertain the extent each of the identified variables is related to the students' attitude to chemistry. T-test statistic was used to find out if there is significant relationship between students attitude to chemistry and each of the identified variables. It was observed that, four of the variables have significant correlation with students' attitude to chemistry while one of them has no significant correlation with students' attitude to chemistry. The researcher therefore recommends among other things that, schools' guidance counsellor should be made to organize regular career guidance to the students.

Key words: occupational aspiration, teaching method, student intelligence and family influence on students.

INTRODUCTION

A technical college is a secondary level of Nigerian educational system which offers only skill-based subjects referred to as trades. Apart from skill-based trades such as woodwork, metal work, mechanical crafts, other trade offering may include, business and commercial subjects. The curriculum of technical colleges prepares candidates for the award of the National Technical Certificate (NTC), National Business Certificate (NBC) and the Advanced Technical/Business Certificate (ANTC/ANBC). All the certificates are approved entry qualifications to

Polytechnics and Universities in Nigeria. The National Business and Technical Education Board (NABTEB) is the agency that examines and awards the certificate. The entry qualification for the NTC/NBC programme is the Junior Secondary School Certificate (NBTE 2001).

There are four technical colleges in Imo State. They are:

1. Government Technical College, Owerri.
2. Ahiara Technical College, Mbaise.
3. Okporo Technical College, Orlu.
4. Technical college Osu, Mbano.

Each of these colleges is made up of eight departments which offer the following trades; (i) Radio and Television

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(RTV); (ii) Refrigeration (REF); (iii) Electrical; (iv) Automobile; (v) Mechanical; (vi) Welding and Fabrication (W/F); (vii)`Carpentry and Joinery (CJ); (viii) Building and Construction (BC).

In each of these departments, general education courses (English, Mathematics, Integrated Physical Science - Physics, Chemistry) are made compulsory for students to learn, register and take during NTC/NBC examination.

This general education component of the curriculum aims at providing the trainee with complete secondary education critical subjects to enhance the understanding of machines, tools and materials of their trades and their application and as a foundation of post-secondary technical education for the above average trainee. Hence, it is hoped that the trainees who successfully complete their trade, training and general education, may be able to compete with their secondary school counterparts for direct entry into the polytechnics or colleges of education (technical) for ND or NCE courses respectively (NBTE, NTC & ANTC Curriculum and Module Specification, 1985).

Statement of the problem

Chemistry, which is an integrated physical science, will not only help in the knowledge/understanding of the above technical courses, but will also help one to specialize in areas such as medicine, biochemistry, pharmacy, dentistry, etc. It has been noted that students in government technical colleges are not well disposed to the study of chemistry. This is evidenced from the general results of the students in NABTEB (NTC/NBC Examination of 2006 to 2009). These years' results were nothing to write home about. The results revealed very poor performance of students in chemistry. The attitude of students to chemistry can influence its study. Hilgard et al. (1979) wrote that, attitude is a like or dislike, a positive or negative evaluation about some aspects of the world. James (1980) defined attitude as a characteristic way of thinking, feeling or behaving towards an object, person or group of persons. This attitude of students to chemistry could be as a result of the following variables; students' occupational aspiration; teachers' method of teaching; students' intelligence; influence of family on the students; and teachers qualification.

Purpose of the study

The purpose of this study is to ascertain the extent of each of the identified variables: occupational aspiration of the students, teachers' method of teaching, students' intelligence, and influence of family on the students and teachers qualification, as related to the students' attitude to chemistry.

To help achieve the aims and purposes of this study,

five research questions and five hypotheses were formulated.

Research questions

1.   What are the coefficient of correlation between students' attitude to chemistry and their occupational aspiration?
2.   What is the level of relationship between students' attitude to chemistry and their perception of their teachers' method of teaching?
3.   What is the coefficient of correlation between students' attitude to chemistry and their intelligence?
4.   What are the correlate of students' attitude towards chemistry and the influence of the family on the students?
5.   What is the extent of relationship between students' attitude towards chemistry and their teacher's qualification?

Hypothesis

1. There is no significant relationship between students' attitude towards chemistry and their occupational aspiration ($p < 0.05$).
2. The level of relationship between students' attitude to chemistry and their perception of their teachers' method of teaching is not significantly different from zero ($p < 0.05$).
3. The coefficient of correlation between students' attitude to chemistry and their intelligence is not significant. ($p < 0.05$).
4. The correlate of students' attitude towards chemistry and the influence of the family on the students are not significantly greater than zero. ($p < 0.05$).
5. The extent of relationship between students attitude towards chemistry and their teacher's qualification is not significant ($p < 0.05$).

METHOD

Design of the study

The design is a correlational study involving the use of correlational technique to ascertain the extent, each of the identified variables is related to the students' attitude to chemistry in government technical colleges in Imo State.

Population of the study

The population comprises of the number of students in year one and year two in each school. At the period of the study, the year three students had taken their external examination and left. In all, they were about 2,800 students and all of them offer chemistry.

Sample and sampling technique

A sample of 280 students was randomly selected from the total

Table 1. The calculated r-value of 0.1552 is greater than the critical r-value of 0.138 by 0.0172. Therefore, there is a significant relationship between technical college students' attitude to chemistry and their level of occupational aspirations.

Variables	Sample Size (n)	df	Calculated r-value	Critical r-value
Occupational aspiration of students and students attitude towards Chemistry	277	276	0.1552	0.138 at p < 0.05

Table 2. The calculated r-value of 0.1846 is greater than the critical r-value of 0.138 by 0.0466. Therefore the null hypothesis is not upheld. There is significant relationship between students' attitude to chemistry and the teachers' method of teaching.

Variables	Sample Size (n)	df	Calculated r-value	Critical r-value
Teachers method of teaching and students attitude towards Chemistry	277	276	0.1846	0.138 at p < 0.05

population of the four schools and this was ten percent (10%) of the total population. Two hundred and seventy seven teachers comprising JS one, two and three teachers, SS one, two and three teachers, guidance counsellors and vice principals (academic) of junior and senior secondary of the four technical colleges.

Instrument for data collection

The instruments used in this study are the questionnaire-like type, designed by the researcher. The questionnaire has four points for each item. These are, strongly Agree (SA), Agree (AG), Disagree (DA) and Strongly Disagree (SD). There are five sections in the questionnaire with 25 item questions. Each section deals on a hypothesis: (1) Occupational aspiration (six items); (2) teachers method of teaching (seven items); (3) students intelligence (four items); (4) influence of the family on the students (four items) and; (5) teachers qualification (four items). Items on section 1, 2, and 4 are responded to by students while items on sections 3 and 5 are responded to by teachers. The scale points, SA, AG, DA and SD are scored 4, 3, 2, and 1 for items statements indicating positive positions respectively. The points are scored in the reverse order for negative statements.

Administration of the instrument

The researcher personally visited each of the four technical colleges, randomly drew the 280 students and administered the items on sections 1, 2, and 4 of the instruments to them. Items on sections 3 and 5 were administered to 277 teachers. The researcher waited on the respondents to fill on the instruments and collected the responses thereafter. After the administration of the instruments, 277 students'/teachers responses were retrieved.

Method of data analysis

The various sections of the responses of the instrument were scored. The students' and teachers' (respondents') scores from the various sections of the instrument were used to obtain the correlation coefficients. The hypotheses concerning the significance or otherwise of the coefficients of correlation were tested using t-test statistic. The calculated values and the tabulated values are compared at relevant degrees of freedom.

RESULTS

Research question 1: What is the coefficient of correlation between students' attitude to chemistry and their occupational aspiration?

Hypothesis 1: There is no significant relationship between students' attitude towards chemistry and their occupational aspiration (p < 0.05) (Table 1).

Research question 2: What is the level of relationship between students' attitude to chemistry and their perception of their teachers' method of teaching?

Hypothesis 2: The level of relationship between students' attitude to chemistry and their perception of their teachers' method of teaching is not significantly different from zero (p < 0.05) (Table 2).

Research question 3: What is the coefficient of correlation between students' attitude to chemistry and their intelligence?

Hypothesis 3: The coefficient of correlation between students' attitude to chemistry and their intelligence is not

Table 3. The calculated r-value of 0.2050 is greater than the critical r-value of 0.138 by 0.0670. Therefore the null hypothesis is rejected. There is significant relationship between students' intelligence and their attitude towards chemistry.

Variables	Sample Size (n)	df	Calculated r-value	Critical r-value
Students intelligence and their attitude towards Chemistry	277	276	0.2050	0.138 at p < 0.05

Table 4. The calculated r-value of 0.4135 is greater than the critical r-value of 0.138 by 0.2755. Therefore, the null hypothesis is rejected. The correlate of students' attitude towards chemistry and the influence of their family on the students are significantly greater than zero.

Variables	Sample Size (n)	df	Calculated r-value	Critical r-value
Students attitude towards Chemistry and their Family Influence on the students	277	276	0.4135	0.138 at p < 0.05

Table 5. The calculated r-value of 0.0098 is less than the critical r-value of 0.138. The null hypothesis is accepted. Therefore, there is no significant relationship between student attitude towards chemistry and their teachers' qualification.

Variables	Sample Size (n)	df	Calculated r-value	Critical r-value
Students attitude towards Chemistry and their teachers' qualification	277	276	0.0098	0.138 at p < 0.05

significant. (p< 0.05) (Table3).

Research question 4: What is the extent of relationship between students' attitude towards chemistry and their teacher's qualification?

Hypothesis 4: The correlate of students' attitude towards chemistry and the influence of the family on the students are not significantly greater than zero (p< 0.05) (Table 4).

Research question 5: What is the extent of relationship between students' attitude towards chemistry and their teacher's qualification?

Hypothesis 5: The extent of relationship between students' attitude towards chemistry and their teacher's qualification is not significant. (p< 0.05) (Table 5).

Summary of findings

There are very low to moderate coefficients of correlation (0.15 to 0.41) between each of the considered variables and students' attitude to chemistry. The coefficients of correlation between students' attitude to chemistry and

each of the variables -occupational aspiration of students, teachers' teaching method, students' intelligence and family influence of the students - are all significant while that of teachers' qualification and students' attitude is not significant.

DISCUSSION

On hypothesis 1, there was significant relationship between students' attitude to chemistry and their level of occupational aspirations. This shows that the desired occupation of students can affect their attitude to chemistry. From students' responses, it was discovered that many students in these four technical colleges aspired to end in opening up roadside workshop as soon as they finished their secondary education. For such students, learning of chemistry, which helps in areas such as medicine, biochemistry, pharmacy, dentistry etc., is not for them and as such, develop negative attitude. This shows that those students that perform above average in chemistry are those that aspire to proceed to higher institution after their secondary education. This was why Davies and Moore (1954) noted that societal rewards of incomes, prestige and power, provides the primary motivation to candidates competing for occupational roles.

On hypothesis 2, there is significant relationship between students' attitude to chemistry and the perception of their teachers' method of teaching chemistry.

When the teacher uses appropriate method, of teaching, the students tend to follow and grasp the knowledge (Agoha, 2005).

On hypothesis 3, there is significant relationship between students' attitude to chemistry and the intelligence of the students. It was inferred from the teachers' responses that majority of the students posted to these technical colleges are those who scored low in the Common Entrance Examination. Due to their low intelligence quotients, majority of them could not pass their junior West Africa Examination Certificate exams (WAEC) before entering the senior classes.

On hypothesis 4, there is significant relationship between students' attitude to chemistry and the family influence on the students. Dubey et al. (1979) wrote that parents' attitude help to condition their children's attitude. Morrish (1972) reported that a child whose parents have positive attitude towards science is bound to have positive attitude to science and those children whose parents have negative attitude towards science will also be influenced by their parents' attitude. The finding of this study revealed that most of the students in these technical colleges were brought up by their parents to learn a particular trade. For those students, there is no doubt, they will develop negative attitude to science. Parents are therefore advised to allow their children develop towards their natural inclination and attitude rather than unduly influencing them.

On hypothesis 5, there is no significant relationship between students' attitude to chemistry and the qualification of their teachers. The teacher may be well qualified to handle a subject but the students, due to their low intelligence quotient (IQ) may not follow and grasp the knowledge. From the finding of the study, it was observed that teachers teaching chemistry in years one and two levels in these four technical colleges, are well qualified, but the students had negative attitude towards the study of chemistry and therefore ,were not well disposed to the subject.

Recommendation

Since students' occupational aspiration, teachers teaching methods, students' intelligence and the family influence on the students have significant influence on the students' attitude towards chemistry, the researcher therefore recommends that:

1. School guidance counsellors should be made to organize regular career guidance to students and this in turn, will make the students know the need or importance of chemistry to their trade, or in furthering their education. The counsellors could help give motivational talks that can improve the attitude of learners towards the study of chemistry as well as counsel them to find out reasons for poor attitude towards the study of chemistry with a view of improving it.

2. Chemistry laboratories should be well-equipped. This will help the chemistry teachers make their teaching real to students.
3. Science education inspector from NABTEB in both state and federal government should pay regular visits to the schools. This will help both the teachers and their students to work harder. Seminars, workshops and conferences should be organized occasionally for both the chemistry teachers and their students and this will help the teachers refresh their knowledge, especially on the modern method of teaching and for students to develop positive attitude to learning chemistry.
4. Strong Parents/Teachers Associations (PTAs) should be formed by each school and in their meetings, parents should be made to allow their children choose the type of trade/course which they can do, rather than unduly influencing them to do a particular trade or course of study.
5. Chemistry teachers should be giving positive reinforcement to students who make efforts in chemistry work. This will make other students put more efforts in learning chemistry (Dara, 2008). The researcher also recommends that more research be done using technical schools in other states of the federation.

Conclusion

The result of the analysis revealed that:

1. There are significant relationship between students' attitude to chemistry and each of the following variables; Occupational aspiration of the students; teachers' method of teaching; family influence on the students; Students' intelligence.
2. There is no statistical relationship between students' attitude to chemistry and the chemistry teachers' qualification. Here, each variable (students attitude, teachers' qualification) operate independent of one another.

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