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INVESTIGATION INTO SECONDARY SCHOOL STUDENTS ATTITUDE TO SCIENCE IN NORTH CENTRAL, NIGERIA

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ABSTRACT: *This study is an investigation into the attitudes secondary school students towards Science in the North Central Geo-political Zone, Nigeria. In this study, One thousand, six hundred and sixty three (1,663) students consisting of 963 Males and 700 Females, 900 Christians and 763 Moslems were selected from 6 states in the North Central Geopolitical Zone. A stratified random sampling method was adopted in arriving at the sample. The researchers through this method ensured that both urban and rural schools were represented, as well as single sex and co-educational schools to take care of the gender variable. The study was guided by a research question and hypothesis and the findings showed that 84.25% of the students has a positive attitude towards science and that gender has no influence on students' attitude towards science in the north central, geopolitical Zone, Nigeria. The educational implications based on the findings were discussed and a number of recommendations were presented.*

KEYWORDS: attitudes, science, secondary school students.

INTRODUCTION

In all societies' word wide, education has been adopted as the main instrument for nation's economic, social, political, scientific and technological development. One is therefore not surprised that the Federal Republic of Nigeria (2004) Stressed thus: *... education is the most important instrument of change as any fundamental change in the intellectual and outlook of any society has to be proceeded by any educational revolution (p.8).* It is therefore imperative from the quotation above for individuals to acquire the required skills, values and attitudes through education in order to satisfy the demands and expectations of the society they will live in.

The situation is more pertinent when one considers the requirements need to live effectively in our modern age of science and technology (Akano, 2001). This is possible why FRN (2004 p29) stressed the need for scientists in the National policy on Education (NPE) that "Government shall popularize the study of the sciences and the production of adequate number of scientist to inspire and support national development". To ensure the adequate production of scientists, the aim of 60:40 ratio of science to liberal arts students' enrolment has been earmarked in the policy (Ajakaiye, 1987). In corroborating the role of science, Abdullahi (1987) described it as a means through which nations could gain economic independence. Several authors such as Awokoya (1976), Ogunniyi (1984, 1986) and Banu (1985) further stressed the importance of science as atool through which technological and a political breakthrough can be achieved by a nation.

It is however unsavory that despite the important roles education is expected to play, the academic performances in public examinations of the students especially at the secondary school level have been rather very disappointing. The situation is even worse with the science subjects as revealed by studies of Maduabum (1986), Salami (1987), Oyebode (1990), Aremu (1997) and Adeyegbe (1998), that students continue to perform poorly in science subjects in public examinations

Several factors have been identified as responsible for the poor academic performance in science subjects among Nigerian adolescents. These include negative attitude toward science (Okebukola & Jegede, 1986), perception of science subjects as difficult (Akpan, 1986),low self-concept(Busari, 1991), student's belief system (Asonibare, 1984; Wasagu,1999), inadequate qualified science teachers and poor teaching/learning facilities (Lawal,1990).In particular, Okatahi and Adeyanju (1989) stated that students failed examinations not because of defect in fixed qualities like cognitive and affective dimensions , but due to lack appropriate range of entry behaviours (interest, attitude, self-concept and perception).

Unfortunately, a critical perusal of the identified entry behaviours (such as interest, self-concept, attitude and perception) attitudes tend to be a determinant of the others. Hence, the need to lay emphasis on the desired attitude towards the study of science subjects among learners. A summary opinion of the relationship among attitude, self-concept and academic performance can be provided from the views of Thompson III (1987) based on his extensive review of literature and his clinical observations as an educator thus:

A positive attitude will help a person to achieve more and to come closer to achieve his/her potential, whereas a negative attitude will thwart achievement drive and leave many potentials abilities untapped. People's self-image are influenced by their attitudes because they tend to evaluate themselves on what they achieve and how they feel about their achievement. It is easy to see how a negative attitude leads toward little or no achievement and this lack of achievement directs self-image. When people realize how a negative self-image reinforce an already negative attitude, they see a potentially harmful cycle (P.135-136).

In the light of the above, the negative entry behaviour of most Nigerian learners in science learning must be a thing of concern. An attitude is learned predisposition to respond consistently in appositive or negative way to some person, object or situation (Petty, Ostrom & Brook, 1981).
Evident from research studies reviewed, most of the findings on attitude toward science subjects among Nigerian students were based on isolated locale settings hence the justification for an extended study of this current locale to identify the pattern of attitude for possible proffer of solution.

Problem of the study

It is glaring from studies cited and observation that Nigerian youths have been performing poorly in science subjects in public examinations. Previous studies have shown that the poor academic performance in science subjects has its root in a number of actors among which are low self-concept, lack of interest, wrong perception, inadequate qualified science teachers, external locus of control and negative attitude (Aremu, 1997). Unfortunately, attitude tends to be central to most

of the other factors (Thompson III, 1987). An extensive attitude survey across states has not been significantly carried out among Nigerian youths as far as the knowledge of these researchers is concerned. Therefore, the main purpose of the present study is to find out the pattern/type of attitude of North-Central geopolitical zone selected secondary school students toward science subjects.

Significance and Relevance of this Study

This investigation on students' attitude to science is very significant and relevant to science education in Nigeria, since it is expected to provide useful information on the status of students' interest in science and also providing empirical information on students' attitude to science subjects which will enhance any meaningful effort toward improving the teaching and learning of science in our schools.The various tiers of government policy marks and implementers as well as teachers in secondary schools will benefit immensely from the findings of this study since a carefully gathered and analyzed research data is an indispensable tool for decision making and educational planning.

Lastly, educational counselors will gain insight from the findings of this study to know the areas of focus in guidance and counseling sessions which are geared towards improving students' performance in school subject with particular reference to science related subjects.

Research questions

The following research questions were addressed in this study:

1. What is the general attitude of students towards science subjects in North-Central Geopolitical zone of Nigeria?
2. Does students' sex, religious affiliation, age and class level influence their attitude to science subject in the North- Central Geopolitical zone of Nigeria?

Hypotheses

The following null hypothesis which naturally grew out of the research tested at 0.05 alpha level guided the study:

There is no statistically significant difference in the attitude of students towards science subject's base on gender.

REVIEW OF RELATED LITERATURE

The increasing attention on science and technology in Nigeria as a result of the global scientific era has led to intensified efforts to train more people in science career disciplines. The federal republic of Nigeria (2004) in the national policy on education has stressed the need for 60:40 ratio of science to liberal art in our schools. Based on the aforementioned policy, secondary education is expected to equip students to live effectively in our modern age of science and technology. Unfortunately, judging by Aremu (1997) report on academic performance and general behaviour disposition of secondary school students, one would feel that Nigeria adolescents especially at the secondary school level are not being adequately prepared for the society they would live in or function at the end of their formal education. In particular, his illumination with a three years West

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African school certificate examination (WASCE) results of 1989-1991 revealed a disheartening failure rate in science subjects. Hence, the concerted effort of researchers to identify associated factors in an attempt to proffer a way forward.

The Concept of Attitude

According to Droba (2004) based on an extensive review of literature reported a petty general agreement among writers in this field that an attitude is acertain subjective state of preparation to action. It is the foreshadowing of what the individual will likely be doing with respect to the object in question. He opined that only a very small minority would identify an attitude with the behaviour of the person. The latter extremists belong largely to the behaviouristic school of psychology. To social psychologists, an attitude is a disposition to act which is built up the integration of numerous specific responses of a similar type, but which exists as a general neural `set` and when activated by a specific stimulus results in behaviour that is more obviously a function of the disposition than of the stimulus.

A radical group of social psychologists conceived that, an attitude is a mental disposition of the human individual to act for or against a definite object. This `disposition` is composed predominantly of feeling elements. When we express our attitude toward a particular object, we are not reasoning about it, we are not aware of all the factors that go into the type of activity we are performing. We indicate our disposition half unconsciously as though we had known 'why' of it. For this reason, the expression of attitude is an immediate one. Hence, it is based on a series of experiences with respect to the object which have been molded into a totality that is the complex and too intimate to understand.

The Development of Attitude

Psychologists and sociologists have always been concerned with the original nature of man and the development of traits in the individual. Much emphasis by sociologists had been laid on the field of interaction, cultural products and social change and is working on the hypothesis that social life is to a high degree acquired. Suffice to summarize, that there is nothing in attitudes that is not acquired. The origin of certain attitudes may run back to early childhood, but it does not go beyond the first day of the child's life. From then on, attitude are modified and developed into a relatively constant system of dispositions to determine the directions of activities that are follow.

According to Hanse, warner and smith (1980), peer identification and peer influence help the development of new attitudes and behaviour. In our secondary schools especially with school going adolescents, peers or senior students tend to serve as significant others through which attitudes are formed and reinforced. For instance, Deaux, Dane and Wrightsman`s (1993) view tends to support Hanse's ideas when they suggested that models can be used to express particular attitudes/behaviours, which may then be adopted by the individual who witnessed their expression. They further argued that, people probably acquire many of their attitudes through imitation of peers without having any direct experience with the target of the attitude.

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Attitude and Academic achievement

It is evident in literature that attitude and related variables play a significant role in determining learners' achievement. Tseng (1970) and Asonibare (1982) posited that locus of control as a construct is of particular importance and serves as a motivational variable and very significant in teaching-learning settings and also being an attitudinal variable and affecting work attitude and production. Feldman and Prohaska (1979) found a significant correlation between students' differential attitudes, their non-verbal behaviour and academic success according to their expectations about the competence of their teacher.

According to Coleman, Campbell, hobson, Mopartland, Mood, Weinfeild and York (1986), school, family or teacher variables. Also, Lawal (1990) asserted that, the perception of the nature of science by student affects their attitude toward science and consequently their academic achiement in these science related subjects. In their own studies, Bakare (1985) and Gorleh (1990) found a significant relationship between students' attitude and school academic performance. Although, Jackson (1969) did not find such a relationship

Again, Balogun (1985) and Lawal (1990) reported a significance in the perception and attitude of students toward science as a result of their gender and class level. Ato (1986) also confirmed that students' girls expressed difficulty in science more than boys and that younger students differ significantly from older ones in their attitude toward the difficulty or easiness of science. Though this was not true of girls in the mixed sample. It was however true of boys with the younger ones having better attitude.

Asonible (1984) and Aremu (2001) stressed that, Nigerian children especially those from illiterate home and rural environments may find the learning of science relatively difficult because of what they called cultural ambivalence that has been created in the school as result of the apparent conflict between African beliefs or view of the nature and the scientific view. That the 'new' scientific conceptions/views at school may be accepted with a lot of skepticism and this may lead to a negative attitude toward science. This may therefore compound the task of the teacher.

Again, the relevance of attitude to teaching-learning within the educational system has been acknowledged by psychologists for example, a learner's attitude to a subject or self or teach by postulation could affect the learner's self-concept and performance in that subject. In support of this postulation, Abiri (1966) argued that the inculcation of a wholesome attitude is an important aspect in the education of a child. He stressed further that if a society is to be made better by means of the quality of education provided, it becomes imperative that the attitude held by the individuals within that system vis-à-vis the entire society itself ought to be consistent and continually gauged and modified where and when identified.

Summarily, Thompson III (1987)'s opinion provides the relationship among attitude, self-concept and academic achievement base on his extensive review of literature thus:

A positive attitude will help a person to achieve more and to come closer to realizing his/her potential, where as a negative attitude will thwart achievement drive and leave many potential, abilities untapped. People's self-images are influenced by their attitudes because they tend to

evaluate themselves on what they achieve and how they feel about their achievement. It is easy to see how a negative attitudes leads toward little or no achievement, and this lack of achievement direct self-image. When people realize how a negative self-image reinforces an already negative attitude, they see a potentially harmful cycle (p.135-136).

From several studies reported thus far, it is evident that, attitude (positive) is central to effective learning of school subjects and science in particular. More so, most of the studies were narrow in terms of locale. Hence, the need to widen the coverage study area (the whole of North-Central Geo-political zone of Nigeria) for better generalization and strive toward national goal.

METHODOLOGY

This study adopted a survey research on the science attitude of selected secondary school students from the North Central geo-political zone of Nigeria. In this chapter, the research methodology is described succinctly.

Research Population/Sample

The population for this study comprised all the junior secondary students in year three (JSS III) and senior secondary school students in year II (SSII) in the North central geopolitical zone of Nigeria. However, the samples for the study were two thousand one hundred (2100) students based on three hundred and fifty (350) students per state. A stratified random sampling method was adopted in arriving at the sample. The researchers through this method ensured that both urban and rural schools were represented, as well as single sex and co-educational schools to take care of the gender variable. By the aforementioned, a purposive procedure was in-built in the sampling.

Instrumentation

The specific instrument used in this research and methods of administration to the respondents are described below: A student Attitude towards science Questionnaire (SASQ) was developed through literature search and adaptation of existing questionnaire such as Aiyedu (1992) and Aremu (2000) and the questionnaire consists of twenty –four (24) items on which options were rated on four point Likert type scale. That is, Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD).

There were eleven (11) positive and (13) negative statements. Students were expected to respond to the items by choosing one of the four alternatives supplied. Scoring was based on, SA= 4; A=3; SD= 2; D= 2 and SD= 1 for positive statements. However, in the case of items expressing contrary sentiments, scoring was reversed. Provision was also made for students' personal data such as: sex, age, class and religion. Three experts in science education validated the instrument to ensure the items were adequate in terms of face and content validity. Reliability coefficient of 0.67 was obtained for the instrument through a split-half on two hundred respondents in a pilot test using Pearson Product Moment correlation. This coefficient value represent a satisfactory indication of the reliability of the instrument, hence the justification for its use in the study.

The questionnaire was administered personally by the researchers and facilitators in all the six states covering at least three (3) local government areas randomly selected in each state. All

wrongly filled questionnaires were discarded and finally 1663 were found useable for data analysis.

For this study, scores of less or equal to60 was considered a negative attitude, while scores ranging between 61 and 96 was rated as positive attitude. In data analysis, the student t-test at 0.05 level of significance was used on four stated null hypotheses

RESULTS AND DISCUSSION

This investigation attempted to find out the attitude of junior and senior secondary school students in North central geopolitical zone of Nigeria towards science subjects. A total of 1663 selected students were used. Data obtained from the responses of the students are presented descriptively and statistically below.

Research Question 1: What is the general attitude of students towards science subject?

Table I: Summary of students' attitudes to science in terms of frequency and percentage of the respondents.

ATTITUDE	FREQUENCY	SCORE	PERCENTAGE
Positive Attitude	**1,401**	**> 60**	**84.25**
Negative Attitude	**262**	**< 60**	**15.75**
Total	**1,663**		**100**

Results in Table 1 shows that 262 respondents scored less or equal 60 given a percentage value of 15.75 and these students' attitude was counted as being negative towards science subjects. On the other hand, the remaining 1401 (84.25%) students scored between61 and 96 representing those with positive attitude towards science. That is, the results showed that more students had positive attitude towards science in North- Central Geopolitical zone of Nigeria

Table II: Summary Results of t-test comparing mean scores of students' attitude to science.

Variables	Group	No	$\bar{X}$	SD	Df	t-cal	t-tab	Decision
Gender	Male	963	72.31	10.62	1661	0.46	1.65	NS
	Female	700	72.06	11.52				

P< 0.05
NS= Not Significant, P> 0.05
S = Significant

The research hypothesis state that there is no statistically significant difference between the attitude of male and female students to science subjects.

Results in Table II shows that the calculated t-value of 0.46 is less than the table t-value of 1.65 at df of1661 and significant level of 0.05. The null hypothesis was therefore accepted. The

result reveals no attitude inventory by male and female secondary school students of North central geopolitical zone of Nigeria.

From table I, it can be observed that 15.75% of respondents had attitude scores less or equal to 60 while the rest 1401 represent 84.24% had scores. From this values, it can be said that students attitude towards science in the attitude subject is high. On the average, students' score in the attitude questionnaire is 72.21 which is high enough and suggest a positive attitude to science. This finding is inconsistent with those of Okebukola and Jegede (1986), who found students' attitude to science to be negative. With the current emphasis on science to in schools. It will therefore be expected that students' achievement in science will therefore will improve since there is a positive relationship between attitude to science and science achievement. (Okatahi and Adeyangu, 19989, Gorleh, 1990).

From this study, findings have shown no significant difference in the attitude of students based on their sex and class (junior and senior). This is contrary to the findings of Balogun (1985), Ato (1986) and Lawal (1990) who found boys to be better than girls in attitude towards science.

SUMMARY OF FINDINGS

On the basis of data presented in table I and II in chapter IV, the following findings are obtained from the answer to the research question and testing of the four null hypotheses in the study.

1. Selected secondary school students in the North central Geopolitical zone of Nigeria generally have a high positive attitude to science based on data collected from the six states of the geopolitical zone..
2. There is no significant difference in the attitude of students in the North Central Geopolitical Zone resulting from their gender

IMPLICATIONS, RECOMMENDATIONS AND CONCLUSION

On the basis of the major findings of this investigation, the following conclusion were presented.

1. Students' high attitude to science should be sustained by the employment of qualified science teachers who will efficiently shows a good preparation on the part of the students to learn science and effort should be made exploit it for fostering the advancement of science in the North central geopolitical zone and in the nation as a whole. This will go a long way in ensuring the nations' goal of 60:40 sciences to liberal art students. More so, the enhancement of science and technological advancement in the nation

2. Government at all levels should intensify effort at posting of guidance counselors on full-time basis in to schools to assist in the identification of potentials, right placement and realistic decision making of youngsters. This is needed more than before especially in an ever increasing students' population..

In particular, counselors can adopt attitude modification techniques as asserted by Bojuwoye (1995), Aremu (1997) and Droba (2004) to assist senior secondary school students at their choice point. This could enhance decision making and good preparation for adult life especially in an increasing complex and competitive society ahead.

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