Secondary School Students’ Attitude towards Science and Technical Education in Yauri Metropolis, Kebbi State, Nigeria

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Abstract

The study investigated secondary school students’ attitude towards science and technical education in Yauri metropolis, Kebbi State, Nigeria. 130 students constituted the population of this study. A sample of 97 Students 59 male and 38 female were selected using random sampling technique. Two research questions and two null hypotheses were generated to guide the conduct of the study. An instrument titled “students attitude to science and technical education questionnaire” (SASTEQ) was used for data collection; the instrument was validated by three experts in the field of chemistry and science education and a reliability coefficient of 0.72 was obtained. Research questions raised were answered using means, frequency count and percentage while the hypotheses were tested using Chi-square. Findings from the study shows that there was significant difference between the attitude of students in school type towards science and technical education. Based on the findings of this study, the researchers recommended that teachers should employed teaching strategies that enhances students attitude towards science and also deployed use of alternative teaching styles that gives students opportunity to participate in the lesson and by making Science and technical education relevant to their everyday lives.

Keywords: Attitude, Education, school type, Science and Technical

Introduction

The world in which man live today is steeped in science and technology and governed by ever increasing discoveries, inventions and innovations, it is a world characterized by tremendous scientific and technological explorations, it is a world of internet and emails, supersonic jets, the robotics and biotechnologies, it is distant from the world of yesterday characterized by doing witchcraft, taboos and subjugation of men and natural phenomena. There is urgent need, thus for Nigeria to become scientifically and technologically literate to be part of the emerging global village of the 21st century, (UNICEP, 1996). Education is generally seen as a means to develop children’s latent physical skills which fully prepare them to be responsible and patriotic citizens. Education performs a major role in equipping the individual with the skill and knowledge, which will help to transform any society. (NRC, 2012). It is pertinent to say that education is the greatest investment that any nation can provide for the quick development of its natural and human resources. Attitudes, like academic achievement, has a great effect on enhancing secondary school students’
In general, attitudes, goals and interest have been identified as important for students understanding, learning and their academic success. (Adesoji, 2008; Obumamu & Adaramola, 2011). Nowadays, science and technology education has received special attention by educators and researchers because of rapid progress in this area which influences everyday lives. So, the importance of investigating attitude becomes more relevant, especially when study reveal alarmingly low interest of children of all age groups toward science (Hussaini et al, 2015). Several studies have revealed that, Students’ attitudes toward science reduce as students’ age increases, however, observation shows boys have more positive attitudes toward science than girls (Banu, 1986 in Sofiani, Maulida & Fadhilla, 2017; Ilyasu et al, 2015). In the present study, the researchers investigated attitudes of secondary school students towards science and technical education in Yauri Metropolis.

Sekar & Mani (2013) conducted survey on first year higher secondary school and found a significant gender difference, in the favour of girls, with respect to scientific attitude. A similar finding was reported by Amit (2017), in a descriptive survey on 208 students of secondary school in Delhi, the result showed there was gender difference in favour of girls in terms of scientific attitude. Srivastava (2014) reported the achievement in science as predictor of scientific attitude in intent and action. Secondary school boys and girls students served as sample for the study. It was inferred that with respect to boys, achievement wise knowledge, comprehension and application domains do not influence scientific attitude but in case of girls, scientific attitude in terms intent and action can be predicted by comprehension and knowledge respectively. Srivastava (2015) studied the influence of scientific interest, scientific attitude and intelligence on achievement in science at secondary school level and it was revealed that achievement in science has positive correlation with scientific attitude, intelligence and scientific interest.

In a study conducted by Sofiani et al (2017), on 77 sample secondary school students, shows that attitude between gender remain the same. A similar finding was reported by Sakaryau, Taiwo & Ajabbe (2016), on secondary school students’ attitude towards science in Ogun state, Nigeria. Furthermore, Abdulaziz (2018), conducted a study on 150 male and female secondary school students, the finding showed there was no significant difference in attitude towards science between males and female.

According to Osborne et al (2003), studies have incorporated a range of components in their measures of attitudes to science including: science teachers’ perception; anxiety toward science; the value of science; self-esteem at science; motivation towards science; enjoyment of science; peers and friends attitudes towards science; attitudes of parents towards science; the nature of the classroom environment; achievement in science; and fear of failure on course.

In a survey carried out by George, (2006), one of the key factors in learning science is development of student’s positive attitudes toward science and science-related careers.

**Statement of the Problem**

This study is concerned with the negative attitude of students in pursuing science and technical education as a career and also with research indicating widespread scientific
ignorance in the general populace and an increasing recognition of the importance of science and technology. According to a report of House of Commons (2002), students’ interest in school science is declining with an accompanied declining number of students taking science, which consequently causes shortage of science literacy in different science-based professions. The falling numbers of students choosing to pursue the study of science has become a matter of considerable societal concern. The study is concerned by the negative attitude of students in pursuing science and technical education as a career and also with research indicating widespread scientific ignorance in the general populace and an increasing recognition of the importance of science and technology. According to a report of House of Commons (2002), students’ interest in school science is declining with an accompanied declining number of students taking science, which consequently causes shortage of science literacy in different science-based professions. The falling numbers of students choosing to pursue the study of science has become a matter of considerable societal concern. Many factors were reported to have significant effect on students’ attitudes towards science and technical education (Ilyasu et al, 2015). For example, parental involvement, personality constraint, teacher’s attitude, gender and school type. The main thrust of this study therefore, is to determine the attitudes of Secondary School Students towards science and technical education in Yauri Metropolis, Kebbi State- Nigeria.

Objectives of the Study
The objectives of this study were to:
1. determine the attitudes of secondary school students towards science and technical education in Yauri metropolis based on school type
2. determine the attitudes of secondary school students towards science and technical education in Yauri metropolis base on their gender

Research Questions
The following research questions were raised to guide the Study:
1. What are the attitudes of secondary school students towards science and technical education in Yauri Metropolis based on school type?
2. What are the attitudes of secondary school students towards science and technical education in Yauri Metropolis base on their gender?

Null Hypotheses
The following null hypotheses were tested at 0.05 level of significance
\( H_{01} \): School type does not significantly influence the attitudes of secondary school students towards science and technical education in Yauri metropolis
\( H_{02} \): Gender does not significantly influence the attitudes of secondary school students towards science and technical education in Yauri metropolis.

Significance of the Study
It is hoped that the results of this study would benefit science students, teachers, curriculum planners, policy makers in education, as well as other researchers undertaking research in similar field in various ways. It is hoped that the findings from the study will:
1. Provide science teachers with relevant information on attitude of students in order assist teachers in choosing appropriate measures that will improve positive attitude to science students toward science and technical education.
2. Avail curriculum developers and education planners the opportunity to plan the process and evaluation of science students’ attitude to science and technical education. This will also help in suggesting the way forward in the inculcation of interesting programmes and events like science exhibition that will arouse students’ interest in science.

Scope of the Study
The study covered all students in boarding and day secondary schools in Yauri Metropolis, Kebbi State-Nigeria. But due to time and financial constraints the study was limited to all Students in selected boarding and day secondary schools in Yauri metropolis, Kebbi State, and the study is delimited (restricted) to secondary school student’s attitude towards science and technical education.

Methodology
Descriptive survey research design was used in this study, the study was designed to describe student’s attitude towards science and technical education in Yauri. Data for this study were generated through surveys of students, and the study is a quantitative approach which involves the use of questionnaire as a measuring instrument. The descriptive design uses questionnaire to collect information about students’ beliefs, feelings, behaviours and lifestyles.

The population of the study was one hundred and thirty (130) male and female secondary school students distributed across five secondary schools in Yauri Metropolis (Kebbi State Ministry of Education, KSMOE, 2018). A Sample of 97 science students were randomly selected to participate in the study. The sample comprised of 58 Boarding (42 male and 16 female) and 39 day (17 male and 20 female) science students.

An instrument titled “Students Attitude to Science and Technical Education Questionnaire” (SASTEQ) was used for this study. The instrument is made up of two parts. Part A consists of students personal data, Part B contains twenty (20) items structured based on a four point Likert Scale of Agree (A), Strongly agree (SA), Disagree (DA) and Strongly disagree (SD). The scale is designed to investigate attitude of secondary school students’ towards science and technical education.

The instrument was submitted to three experts in the field of science education. Based on their comments and suggestions the questionnaires were fine tuned to the purpose of the study. The reliability of the instrument was calculated after pilot testing the research instrument, the student’s questionnaire were pilot tested with students to determine the level of understanding of questions rose by the researcher, based on the responses in the returned questionnaire, appropriate corrections were made. The reliability index of 0.72 was obtained using Cronbach’s Alpha which shows that the instrument has relatively high internal consistency.

Data collected were analyzed using means, frequency count and percentage; mean score of all the student was determined. The mean score of all the science students was 55.5. Any student who scored below the mean score was considered to have negative attitude while student who scored 55.5 and above are considered to have positive perception towards science and technical education.

Results
Research Question 1: What are the attitudes of secondary school students towards science and technical education in Yauri Metropolis based on school type?

Table 1: Frequency and Percentage of the School Students’ Attitude towards Science and Technical Education in Yauri Metropolis base on School type

<table>
<thead>
<tr>
<th>School</th>
<th>Positive Attitude</th>
<th>Negative Attitude</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boarding</td>
<td>35(59.4%)</td>
<td>23(60.5%)</td>
<td>58</td>
</tr>
<tr>
<td>Day</td>
<td>24(40.6%)</td>
<td>15(39.5%)</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>59(60.8%)</td>
<td>38(39.2%)</td>
<td>97</td>
</tr>
</tbody>
</table>

Table 1 reveals that there were 39 science students in day secondary schools, out of which 24 (40.6%) students have positive attitudes and 15(39.5%) students have negative attitude. The Table also reveals that, out of the 58 science students in the boarding schools, 35(59.4%) students have positive attitudes while 23(60.6%) students have negative attitude toward science and technical education.

Research Question 2: What are the attitudes of secondary school students towards science and technical education in Yauri Metropolis base on their gender?

Table 2: Frequency and Percentage of the Attitude of Students towards Science and Technical Education in Yauri Metropolis base on their Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Positive Attitude</th>
<th>Negative Attitude</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>39(72%)</td>
<td>20(46.5%)</td>
<td>59</td>
</tr>
<tr>
<td>Female</td>
<td>15(28%)</td>
<td>23(53.5%)</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>54(55.7%)</td>
<td>43(44.3%)</td>
<td>97</td>
</tr>
</tbody>
</table>

There were a total of 59 male students. Out of these 39 (72%) students have positive attitudes while 20(46.5%) students have negative attitudes. There were a total of 38 female students. Out of these 15 (28%) have positive attitudes while 23(53.5%) have negative attitudes.

Null Hypothesis 1: School type does not significantly influence the attitudes of secondary school students towards science and technical education in Yauri Metropolis. A Chi Square analysis of the boarding and day students responses were carried out in testing this hypothesis. The students’ response were classified in two categories, positive and negative attitude as follows:
Table 3: The χ² Contingency Table of the Observed and Expected Frequencies for Boarding and Day Secondary School Students

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Day School Students</th>
<th>Boarding School Students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Attitude</td>
<td>24 (28.9)</td>
<td>48 (43.1)</td>
<td>72</td>
</tr>
<tr>
<td>Negative Attitude</td>
<td>15 (10.1)</td>
<td>10 (14.9)</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>58</td>
<td>97</td>
</tr>
</tbody>
</table>

\[ \chi^2 = \sum \left( \frac{O-E}{E} \right)^2 \]
\[ \chi^2 = 0.83 + 0.56 + 2.38 + 1.61, \quad \chi^2 = 5.38 \]

Number of degree of freedom = (No of Columns – 1) (No of Rows – 1)

Referring to the table of X values, critical value for 1 degree of freedom and level of significance of 0.05 is 3.841. The calculated value 5.38 is greater than X value 3.84. Therefore, the hypothesis that state there is no significant difference between the attitudes of day and boarding school students’ towards science and technical education was rejected.

Null Hypothesis 2: Gender does not significantly influence the attitudes of secondary school students towards science and technical education in Yauri Metropolis.

A Chi Square analysis of the male and female students responses were carried out in testing this hypothesis. The students’ response were classified in two categories, positive and negative attitude as follows:

Table 4: The χ² Contingency Table for the Observed and Expected Frequencies for Male and Female Students

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>39 (32.8)</td>
<td>15 (21.2)</td>
<td>54</td>
</tr>
<tr>
<td>Negative</td>
<td>20 (26.2)</td>
<td>23 (16.8)</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>38</td>
<td>97</td>
</tr>
</tbody>
</table>

\[ \chi^2 = \sum \frac{(O-E)^2}{E} \]
\[ \chi^2 = 0.17 + 1.81 + 1.47 + 2.29, \quad \chi^2 = 6.74 \]
Number of degree of freedom = (No of Columns – 1) (No of Rows – 1)
= (2-1) (2-1) = 1

Referring to the table of X values, critical value for 1 degree of freedom and level of significance of 0.05 is 3.841. The calculated value 6.74 is less than X value 3.841. Therefore, the hypothesis that there will be no significant difference between the attitude of male and female school students is hereby rejected.

Discussion of Findings
Findings of this study showed that secondary school students in Yauri Metropolis, Nigeria in general show positive attitudes towards science. Ninety three percent of Students in boarding schools have positive attitudes towards science and technical education while fifty percent of Students in day Schools have positive attitudes towards science and technical education. The findings in this work show that there was significant difference between the attitude of day and boarding school students towards science and technical education at 0.05 level of significance. This finding are similar to the results of the studies of Sakariyau, et al. (2016); and Yunus and Ali (2013), which indicates that secondary school students showed positive attitudes towards science.

The finding also revealed that there was significant difference between the attitude of male and female students towards science. Which is in agreement with the finding of Sekar and Mani (2016); Amit (2017) and Gbanga and Effiong (2015) who in their separate studies found that there is differences in the attitude of secondary school students based on gender towards science. However, the finding of this study is not in agreement with findings of Abdulaziz (2018); Sakaryau, (2016) and Sofiani et al (2017) who’s their findings showed that there was no significant difference between girls and boys in attitude towards science.

Conclusion
School type has no effect on student’s attitudes towards science and technical education as a school subject. Although, student in boarding school have more positive attitudes than students in day schools. Gender has no effect on student’s attitude towards science. However, there was statistically significant difference on attitude of students based on gender, that is to say male students slightly show more positive attitude then female.

Recommendations
Based on the findings, the following recommendations were made:

1. Stakeholders should look at a way of encouraging students’ attitude toward science and technical education regardless of the school types by providing equipment and creating learning environment to both day and boarding schools.
2. Government and the school management should create the learning environment that helps motivate students not only to come to classes but also want to learn and enjoy learning science and technical education, more Public enlightenment campaigns to motivate parents and the entire community to support their children in studying science and technical education.
References


