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The Relationship between Study Habits, Test Anxiety and Science Achievement

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Abstract
The study was designed to determine the relationship if any among the variables of study habits, facilitating anxiety and debilitating anxiety on achievement in secondary school science.
The sample consisted of 124 fifth year male and female students offering science subjects in a co-educational secondary school in Lagos State, Nigeria. Using modified versions of Bakare (1977) Study Habits Inventory (SHI); The Alpert – Haper (1960) Achievement Anxiety Test and the science scores of the students, the major finding were:

a. The students exhibited fairly adequate study habit patterns,
b. Significant positive correlations between study habits and science achievement.
c. Significant negative correlations between debilitating anxiety, and science achievement.
d. The relationship among study habits, facilitating anxiety and debilitating anxiety was not significant.

Based on these findings conclusions were drawn and implications for practice suggested.
Keywords: study habits, science achievement, test anxiety.

1. Introduction

1.1 *Background*

The perennial under-achievement in science of students in many secondary schools particularly in the rural areas is a serious problem facing science education in Nigeria. Widespread support for this statement exists (Adeleke, 1983; Agina-Obu, 1984; Comber and Kerves, 1973; Tornunkerhijo, 1982; Agina, 2001; Adeyemo, 2003). For a number of years now, this problem has been the topic for public debates, television interviews, teachers' conferences and journalistic writings. Many research studies carried out in Nigeria have looked into the several variables such as teaching methods (Balogun, 1982; Ndukwe, 1983; Ogunniyi, 1981; Udeani, 1993), evaluation techniques (Arowolo, 1983;Balogun 1981: Baiyelo,2006), interests (Abdullahi,1983; Obioma and Ohuche, 1985), resources for science teaching (Adejumo and Ehidero, 1980, Fajola, 1983), difficulty of subject matter content (Adeniyi, 1983; Okeke and Robinson, 1980) sex (Balogun 1979), attitude (Adeleye, 1981; Akpan, 1983; Babatunde, 1982; Soyibo, 1982), as they affect students achievement in science. Studies on the relationship of science achievemenet to such psychological variables as anxiety (Bakare, 1977) and study habits (Bakare, 1977, Denga 1982; Jegede, 1987; Jegede et.al. 1990) do exist, but this researcher is not aware of any studies in Nigeria that have looked at the inter-relationships among anxiety, study habits and science achievement. The present study addressed this issue.

1.2 *Study Variables*

One major factor which is related to academic performance is anxiety. Anxiety is often reflected in a generalized concern with fears of not succeeding and often specifically tied to test taking situations. Freud (1936) described anxiety as "a specific state of unpleasure accompanied by motor discharge along definite pathways." Test anxiety, which refers to anxiety elicited by academic or intellectual evaluative situations, has been determined as causing students debilitating anxiety and difficulties in studying or performing adequately on their examinations. Pioneering work on test anxiety was conducted by Mandler and Sarason (1952). These authors concluded that test situations induced in test anxious subjects, "Feelings of inadequacy, helplessness, heightened somatic reactions, anticipations of punishment or loss of status and esteem and implicit attempts at leaving the situations".

Measures of test anxiety have been found to be related to performance in several situations (Sinha 1966; Wittmaier 1972). The most consistent finding noted is that high anxiety is associated with relatively low performance at both the school and university levels. This conclusion is based on the significant negative correlations that were obtained in a number of different studies and a variety of measures of academics aptitude and achievement. Also debilitating

anxiety has been found to be negatively related to performance while on the other hand facilitating anxiety has been found to improve performance (Alpert and Haper 1960; Wittmaier 1972). In general experimental investigations suggest that anxiety can detrimentally affect cognitive processes such as problem solving, incidental learning, ability to communicate, and performance on standard intelligence tests. Academic performance and test taking situations represent areas in which anxiety detrimentally affects behaviour.

The other variable in the study is Study Habits. Study Habits are made of various activities which students are required to master through practice in order to study effectively (Bakare 1977) Psychologists have long realized that many students perform poorly in their academic work not because they do not possess the mental ability to do well but because they do not know or do not use the most effective methods of studying. Researchers – (Akinboye 1980; Anyaegbunam 1979; Denga 1982; Landy 1980) have given various guidelines on how to develop adequate study habits. Some studies have demonstrated the importance of effective study habits – Entwistle and Berman 1973; Mbadiwe 1973; and Roberts 1982). Their most important finding has been high positive correlation between study habits and academic achievement. Some other studies have shown relationships between study habits and such diverse variables as self concept, personality, digit span and anxiety Wittmaier (1972) studied the relationship between test anxiety and study habits. He found that students with high facilitating anxiety (AAT) test scores have effective study habits while those with high debilitating anxiety (AAT -) test scores have less effective study habits and are more likely to delay academic tasks.

The studies on the relationship of study habits and anxiety with achievement though few were done in foreign countries and it was this reason that gave impetus to the present study.

The study sought answers to the following questions:

a. What study habit patterns are exhibited by secondary school science students?
b. Is there a significant correlation between study habits and achievement in secondary school science?
c. Is there a significant correlation among secondary school science achievement, facilitating anxiety and debilitating anxiety?
d. Is there a significant correlation among study habits, facilitating anxiety and debilitating anxiety of secondary school science students?

2. Method

2.1 Subjects:- Subjects were 124 fifth year science students in one co-educational secondary school in Akoka, Lagos State of Nigeria. The subjects were studying for the General Certificate of Education (GCE) Ordinary level, in May-June 2011. All the students offering the science subjects of Biology, Chemistry and Physics were selected. Altogether 72 females and 52 males constituted the sample.

2.2 Instruments: The instruments used to measure the variables in the study are as follows:

2.2.1 The Study Habits Inventory (SHI). The SHI developed by Bakare (1977) is a self report inventory which enables the individual student to describe the situations, habits and conditions which affect his use of study time and his subsequent performance on tests and examinations. The inventory consists of 45 – items in form of direct questions to which the student is required to provide answers on a five point scale of how frequently he behaves in that way. The questions on the SHI are grouped into the following 8 sections:

Sections: A: Home work and assignments.
B: Time allocation
C: Reading and Note-taking
D: Study Period Procedures
E: Concentration
F: Writing work
G: Examinations
H: Teacher Consultations

The norms for scoring the inventory are:-

- Scores from 173 – 193 and above represent adequate study habits,
- Scores from 142 – 172 represent average study habits,
- And scores from 0 – 141 represent weak study habits.

The SHI slightly modified for use in this study has reliability coefficient of 0.80($p<0.5$)

2.2.2. The Achievement Anxiety Test (AAT) The Alpert – Haper (1960) Achievement Anxiety Test was used to measure the amount of facilitating anxiety as well as debilitating anxiety. The AAT identifies individuals whose academic performance is facilitated by the stress of the test situations as well as those whose performance is impaired. The AAT consists of two independent scales: a facilitating scale (AAT) of nine items based on a prototype of the item – "Anxiety helps me to do better during examinations and tests" and a debilitating scale (AAT) of 10 items based on a prototype of the item – "Anxiety interferes with my performance during examination and tests". The two scales are administered in the questionnaire with the items randomly mixed. The subjects answer each item on a five point scale indicating the degree to which the item applies to them. The scale was modified slightly for better comprehension by the subjects. In this modified form, the test-retest reliability over a four week period is .75 ($p <. 05$) for the facilitating scale and .76 ($p <. 05$) for the debilitating scale.

c. Science Achievement: Science Achievement was measure by calculating the average score of the student on the science subjects of Biology, Chemistry and Physics, during the December 2010 mock examination in the school used for the study.

3. Data Collection and Analysis.

Each of the participating students was required to fill the Achievement Anxiety Test (AAT) and the Study Habit Inventory (SHI). The score for science achievement was collected from the various subject teachers. Data were analyzed through the use of a scientific calculator. Means, standard deviations and correlation coefficients were thereby obtained.

4. Results and Discussion

Table 1 present the means, standard deviation scores and t-value of the students on the SHI by sex. It shows that males have higher mean scores on five sections: - Home work and assignments, Time allocation, Reading and Note-taking, Concentration and Writing work; while the females have higher means scores on three sections – Study Period Procedures, Examinations and teachers consultation. However, only the means of Homework and assignment was significant ($p \leq 05$).

With respect to the study habit patterns exhibited by the student, Bakare (1977) norms for the SHI was applied. In the sample studies 24 students (19%) scored from 173-193 and above. 59 students (48%) scored from 142-172 an d 41 students (33%) scored from 0 – 141.

The above results though not at variance with the studies of Bakare (1977) and Amah (1985) show that slightly more than half of the students exhibited adequate study habits.

Also regarding the observed relationship between study habits and the other variables, Tables 2 and 3 present the necessary information. Study habits have a significant positive correlation with science achievement for both males and females. Earlier studies of Bakare (1977) Cowell and Entwisle (1971), Entwistle and Berman (1978) have found similar results. Therefore there is a need for the improvement of the study habits of students so that they can study effectively and achieve better.

However, students will not automatically learn effective study skills on their own. Since good students and poor students alike require help in improving their study practices, it is important that teachers, schools counsellors, and psychologists develop effective programmes for the improvement of study skills. Materials for building improvement programmes in these areas could be obtained from a number of How to study books which are available in the market.

This study did not discover any significant relationship among study habits: facilitating anxiety and debilitating anxiety. This is inconsistent with earlier finding (Bakare 1977; Gussenrath, 1967; Wittmaier 1972). They found that study habits correlated positively with facilitating anxiety and negatively with debilitating anxiety.

In Tables 2 and 3, the relationship between science achievement on the hand and either facilitating or debilitating anxiety on the other hand is presented. Science achievement has a significant negative relationship with debilitating anxiety for both male and female students. The relationship is expected since debilitating anxiety has been found to correlate negatively with performance on tasks. (Alpert and Haper 1960; Withmaier 1972). The relationship between science achievement and facilitating anxiety was found not to be significant.

5. Conclusion

A programme of adequate study habits will definitely reduce the amount of debilitating anxiety a student possesses and this will subsequently improve his performance. It must be remembered that merely talking to students will not necessarily improve their study skills. It is important to engage them in conscious systematic training to improve their study practices.

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Table 1

Means and Standard Deviation Sores of the Students on the SHI by Sex

Section of SHI	Maximum Scores per section	Males N-52 X SD	Females N- 72 X SD	t-value p < 05.
Home work and assignments.	30	23.38 4.44	21.83 4.23	1.93*
Time allocation	30	21.07 4.16	19.97 3.46	1.56
Reading and Note-taking	45	31.28 5.67	29.52 6.62	1.43
Study Period Procedures	40	26.78 5.03	27.12 5.32	- 0.36
Concentration	15	9.32 2.84	8.75 3.33	1.03
Writing work	20	14.63 3.29	14.56 3.04	0.12
Examinations	35	22.57 7.07	22.79 6.74	- 0.17
Teacher Consultations	10	5.97 2.80	5.97 2.58	- 0.10

(* Significant at 0.05 level

Table 2

Paired Relationships among Study Habits, Anxiety and Science Achievement for male Students.

	Science Achievement	Study Habits	Facilitating Anxiety	Debilitating Anxiety
Science Achievement	1	+0.45*	+0.05	- 0.31*
Study Habits		1	+0.11	- 0.02
Facilitating Anxiety			1	- 0.07
Debilitating Anxiety				1

(* Significant at 0.05 level)

Table 3

Paired Relationships among Study Habits, Anxiety and Science Achievement for Female Students

	Science Achievement	Study Habits	Facilitating Anxiety	Debilitating Anxiety
Science Achievement	1	+0.39*	+0.01	- 0.39*
Study Habits		1	+0.05	- 0.19
Facilitating Anxiety			1	- 0.04
Debilitating Anxiety				1

(* Significant at 0.05 level.)