

LOCUS OF CONTROL, STUDY HABITS AND GENDER AS PREDICTORS OF SENIOR SECONDARY SCHOOL STUDENTS ATTITUDE TO PHYSICS IN IBADAN METROPOLIS

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Abstract

The study investigated the relationship between Locus of Control, Study Habits, Gender, and Attitude of senior secondary schools physics students in Ibadan metropolis. The study focused on the extent to which Locus of Control, Study Habit and Gender predicted senior secondary schools students Attitude to physics in Ibadan metropolis. The study adopted the descriptive survey research design of the correlational type. The population for the study comprised all senior secondary school 3 (SS3) Physics students in Ibadan Metropolis. Seven hundred and fifty (750) senior secondary 3 (SS3) Physics students were randomly selected from 30 schools in the five local government areas of Ibadan Metropolis. Three instruments were used for data collection. The instruments are Locus of Control Scale (LOCS) with a reliability coefficient of (0.86), Study Habit Questionnaire (SHQ) with a reliability coefficient of (0.89) and Physics Attitude Test Questionnaire (PATQ) with a reliability coefficient of (0.70). Four (4) research questions were raised and answered, using descriptive statistics of mean, inferential statistics of Pearson Product Moment Correlation and Multiple Regression Analysis. Findings of the study showed that the students have an internal Locus of Control. There is a significant composite relationship between the independent variables (Locus of Control, study habits and Gender) and Attitude of students to Physics, with $R=.521^a$, which is equivalent to 52.1%. This indicates a good level of prediction. $R^2 = 0.271$, which is equivalent to 27.1%, indicating the level of shared variance between the dependent variable and the independent variables. Locus of control has the highest contribution with unstandardized coefficient of 0.356 and standardized coefficient of 0.334, while gender has the least contribution with standardized coefficient of .016 and unstandardized coefficient of 0.002. There is a significant relationship between students' locus of control and students' attitude to physics [$r=.434, n=750, p<0.01$]. There is no relationship between Gender and Attitude of students to physics [$r=-.041, n=750, p<0.01$]. The study concluded that locus of control; study habits and gender are predictors of students' attitude to physics. The study recommends that necessary instructional methods that will enhance students' locus of control and study habits be adopted; and gender related issues should be de-emphasis in senior secondary school physics teaching and learning.

Keywords: Locus of control, Study Habits, Gender and Attitude

Introduction

Physics is one of the science subjects that deals with energy, matter and their interactions. It is sometimes referred to as the science of measurement and its knowledge has contributed greatly to the production of instruments and devices of tremendous benefits to the human race. Several scientific professions such as engineering, manufacturing, mining and construction require the study of Physics. Physics has been of immense benefit to the development of the society. As laudable as these objectives are, achieving them have seem difficult over time.

According to NERDC (2008), the objectives of senior secondary school physics curriculum in Nigeria is: To provide basic literacy in physics for functional living in the society, Acquire basic concepts and principles of physics as a preparation for future studies, Acquire essential scientific skills and attitudes as a preparation for technological application of physics; and Stimulate and enhance creativity. Despite the huge benefits of physics to the society, Nigeria has not been able to fully benefit from physics. This can be attributed to lack of manpower development in physics.

Fayonyomi (2007) stated that when considering growth in technology, the development of human capital is paramount. Lack of sufficiently trained human resources is a major problem of industrial development in Nigeria. This problem can be attributed to the poor state of physics education in Nigeria.

The attitude of students to physics is another problem facing the teaching and learning of physics. Attitudes are acquired through learning and can be changed through persuasion using variety of techniques. According to Adesina and Akinbobola (2005), attitudes, once established, help to shape the experiences the individual has with object, subject or person. Adesina and Akinbobola (2005), although attitude changes gradually, people constantly form new attitudes and modify old ones when they are exposed to new information and new experiences. Jeje and Olagoke (2006) in their study observed that more males have good attitude for science and mathematics and larger percentage of females in the school opted for other subjects apart from mathematics and science. According to Visser (2007) attitude affects internal motivation which in turn affects the academic achievement and students' participation in school. Physics has always been perceived as a tough subject compared to its other two pure science counterparts; Biology and Chemistry. Physics is not only difficult to be grasped but students also consider finding the solutions to solve any problems related to Physics as complicated (Seth, Fatin & Marlina, 2007). Olusola and Rotimi (2012) supported this claim that Physics is perceived as a difficult subject by students from secondary school to university and for adults in graduate education. Such a belief has long way to affect the disposition toward physics and its practical.

Some factors have been identified as reasons for poor attitude of students to Physics. These factors among others include students' Locus of control and gender. Studies have indicated the relationship between locus of control, gender and attitude. Adepoju (2010), in his study to evaluate the influence of locus of control, age and gender on students' attitude to English teaching and learning in Ibadan found out that there is a significant relation between locus of control and students' attitude to learning. A study by Pell and Jarvis (2001), found that male students recorded a much higher positive attitude compared to female students. In contrast to the study by Pell and Jarvis, findings in the study by Pell and Manganye (2007) showed that there is no difference between attitude and gender among African students.

Locus of control is viewed as an important aspect of psychology developed by Julian Rotter. It refers to the strength of an individual's belief in the amount of control that they have over life-affecting situations and experiences. Individuals have varied opinions about who and what controls their life. Some attributes the outcome of their endeavours to gods, luck or another person, while some will attribute the outcome of their endeavours to their own effort.

Individuals can be classified as possessing either an internal or an external locus of control. Individuals who possess an internal locus of control typically assume that they possess a degree of control over circumstances and events that happen to them. However, individuals who possess an external locus of control believe that they have no control of what happens to them, which leads them to place responsibility and blame on external variables such as luck and gods. Awofala, Awofala, Fatade and Nneji, (2012) stated that internal locus of control is an essential factor for students to have a thorough understanding of science and mathematics. Lan and Shaffer (2009)

concluded that individuals with high internal control were more successful in their careers than those who scored high in external control. Adepoju (2010), in his study to evaluate the influence of locus of control, age and gender on students' attitude to English teaching and learning in Ibadan found that there is a significant relation between locus of control and students' attitude to learning. A pupil who records poor performance in Physics may ascribe his performance to the abstract nature of the subject, inadequate resource availability, poor teaching method adopted by the teacher. A student may say that it is of no need to study for a class test since he will still fail the test because the teacher does not like him. Such pupil will not work harder or learn from previous experiences. These beliefs will show his locus of control. Ifamuyiwa (2006) indicates that locus of control is a critical psychological attribute affecting learners perceptions and attitudes. Fakeye (2011) in his study on locus of control as a correlate of achievement in English as a second language in Ibadan, opined that a learner who has an internal locus of control orientation believes that his or her attitude is guided by his or her personal decisions and efforts while a learner with an external locus of control orientation believes that his or her attitude is guided by fate, luck or external circumstances. Research studies reveal that students who have moderate to strong internal locus of control perform better. According to Fakeye (2011), the position of the locus of control is significant because all things being equal, people will either see themselves as masters of their destiny or victims of circumstances. Tucker, Hamayan, and Genesse, (2006) are of the opinion that people with an external locus of control tend to be more stressed and prone to clinical depression. Furthermore, external locus of control makes people vulnerable to manipulation and open to abuse since externals would depend largely on the reinforcement by significant others for everything they do. Conversely, internals are more at peace with themselves and they take responsibility for their mistakes and successes. It is believed that pupils develop internal locus of control as they grow. Academic procrastination has been linked to adverse behaviours and traits, such as poor study habits, missed deadlines, poor semester grades, and low self-esteem, to name a few (Solomon, 1984; Lee, 2005) in Ahmad (2014). Because internals perceive a contingent relationship between their behaviour and its consequences, they tend to procrastinate less than externals. However, research on the relationship between academic procrastination and locus of control has shown mixed results. Some researchers found no relationship between the two variables (Ferrari, 1992; Baker and Ware, 1992), while others such as Choi (1998); Janssen and Carton (1999 and Carden *et al.* (2004) cited in Ahmad (2014) found that internals procrastinate less than externals.

The term study habit can be referred to as the students' way of study whether systematic, efficient or inefficient. Study habits typically denotes the degree to which the students' engages in regular acts of studying that are characterized by appropriate studying routines occurring in an environment that is conducive to studying (Credé & Kuncel, 2008). Effective study habit refers to a situation in which a learner studies regularly to achieve maximum success in his schoolwork. Study habit, therefore, refers to learning which leads to the achievement of a learner's goal, through a prescribed pattern of steady attitude (Ogbodo, 2010). Fielden (2004) states that good study habits help the student in critical reflection in skills outcomes such as selecting, analyzing, critiquing, and synthesizing. Nneji (2002) states that study habits are learning tendencies that enable students work privately. According to Mendezabal (2013), efficient study habits are associated with a favorable attitude toward learning

in general. An important aspect of a student's attitude toward education is the value he sees in what he has to learn.

Gender refers to the socially determined ideas and practices of what it is to be female or male (Hazel & Sally, 2000). It emerges in human life as a source of determining individual as well as social identity. Gender according to Yang (2010) refers to the social attributes and opportunities associated with being male and female and the relationships between women and men; girls and boys, as well as the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and are learned through socialization processes. Gender systems are established in different socio-cultural contexts which determine what is expected, allowed and valued in a woman/man and girl/boy in these specific contexts. According to Oludipe (2008), what has remained the main focus of great concern in the field of science education are the biases and misconceptions about women and science. According to Erinoshio (2005), Science is viewed as a male enterprise. Studies have been carried out on the relationship between gender and students' attitude to physics with mixed results. Afuwape and Oludipe (2008) found out that there are significant differences in the cognitive, affective and psychomotor skills of students in respect of gender. Aweriale (2006) in his own opinion said, gender has no influence on performance in physics when the male and female are taught under the same conditions. Adepoju (2010), in his study evaluated the influence of locus of control, age and gender on students' attitude to English teaching and learning in Ibadan, found out that there is no significant relation between gender and students' attitude to learning. Arsaythamby, Rahimah and Rozalina (2015) in their findings showed that there are five attitudinal variables towards Physics based on gender namely; interest towards Physics, students' attitude towards career related to Physics, students' attitude towards Physics teachers, students' attitude towards difficulty in Physics and students' attitude towards usage of Physics equipments. There is difference in students' attitude towards Physics in terms of gender. Male students are more interested in Physics than female students are.

The importance position students occupy in teaching and learning exercise cannot be overemphasized. Students are central to education enterprise and attention must be given to their course. While many research studies have been carried out to ascertain ways of improving Physics teaching and learning, it must be noted that student-related variable such as Locus of Control, Study Habits, Gender and Attitude must be given utmost attention. Attitude is a vital ingredient of learning. According to Akinbobola (2009), when students are successful in a subject, they view the subject matter with a very positive attitude because their self-esteem is enhanced. This creates a positive cycle of good performance building higher self-esteem, which in turn leads to more interest in the subject, and higher performance. This has necessitated the need to examine the influence of Locus of Control, Study Habits and Gender on students' Attitude to Physics.

Statement of the Problem

The attitude of secondary school students to physics have attracted increased attention from parents, government and the public in recent times. The poor attitude of students to Physics poses great challenge to national development. Research studies have been carried out to ascertain the cause of students' poor attitude to physics. Most of these

studies focused on the mathematical nature of physics, the abstract nature of physics, and inadequate availability of instructional materials. While these studies have been beneficial to physics teaching and learning, the place of research studies focusing on the influence of student-related variables to physics teaching and learning is necessary. Students are very vital to education enterprise, and attention must be given to them. There is need for renewed interest on student-related factors influencing students' attitude to physics, especially in Ibadan metropolis, hence this study investigated the relationship between students' locus of control, study habits, gender and attitude to physics.

Research Questions

To address the problem, the study seeks to answer the research questions below

What is the locus of control found among the students?

To what extent is the model (locus of control, study habits and gender) able to predict students' attitude to Physics?

What is the relative contribution of the independent variables (locus of control, study habits and gender) to students' attitude to Physics?

Design and Sample

The study adopted descriptive survey research design of the correlational type. The descriptive survey design was adopted to enable the students identify and respond to items according to the level of description it provides to them regarding the variables involved in the study. The correlational design has been chosen to ascertain the level of relationships that exist between the independent variable and the dependent variable, and to express the strength and direction of the relationship. As applicable to correlation, the researcher does not have control over the independent variable, and the design cannot establish causality but it can provide a good rationale for examining the predictive relationship of one variable over the other. The aim is to examine the relationship between the independent variables (Locus of Control, Study Habits and Gender) and the dependent variable (Attitude).

Instrumentation

Three research instrument were used for the study, Locus of Control Scale (LOCS), Study Habits (SHQ) and Physics Attitude Test Questionnaire;

Locus of Control Scale (LOCS): Locus of Control Scale (LOCS) was adapted from Pettijohn (1992) Locus of Control Scale and reorganized to match the level of understanding of the sample population. The instrument was used to find students' locus of control for learning of physics. The students responded by expressing their level of agreement or disagreement on a 4-point Likert-scale questions ranging from Strongly Disagree (SD), Disagree (D), Agree (A) and Strongly Agree (SA).

Study Habit Questionnaire (SHQ) was adapted from Virginia Gordon's University Survey: A guidebook and Readings for New Students. The instrument contained a total of 60 items covering five variables which was used to assess the study habit of senior secondary school students. The students responded by expressing their level of

agreement or disagreement on a 4-point Likert-scale questions ranging from Strongly Disagree (SD), Disagree (D), Agree (A) and Strongly Agree (SA).

Physics Attitude Test Questionnaire (PATQ): The physics attitude test was adapted from a group of 20 multi-choice Test of Science-Related Attitudes (TOSRA) developed by Fraser (1978). The PATQ contained 12 items, carefully designed to elicit proper response from the respondents. The students responded to the questions/items by expressing their level of agreement or disagreement on a 4-point Likert-scale questions ranging from Strongly Disagree (SD), Disagree (D), Agree (A) and Strongly Agree (SA).

Validation of Instruments

To ascertain the validity of the instrument, copies of LOCS was given to experts in the field of science education and education psychology to establish both face and content validity. The experts passed their comments and made necessary corrections. The instrument was taken for pilot study and contained 48 questions, which was trimmed down to 12 questions after pilot study. The reliability of the instrument was determined using Cronbach's alpha. The reliability of the instrument was determined to be 0.86, which is greater than .70. This indicates that the instrument has good internal consistency.

Copies of SHQ were given to experts in the field of science education and education psychology to establish both face and content validity. The experts passed their comments and made necessary corrections. The instrument was taken for pilot study and contained 48 questions, which was trimmed down to 12 questions after pilot study. The reliability of the instrument was determined using Cronbach's alpha. The reliability of the instrument was determined to be 0.89, which is greater than .70. This indicates that the instrument has good internal consistency.

Equally, copies of PATQ were given to experts in the field of science education and education psychology to establish both face and content validity. The experts passed their comments and made necessary corrections. The instrument was taken for pilot study and contained 48 questions, which was trimmed down to 12 questions after pilot study. The reliability of the instrument was determined using Cronbach's alpha. The reliability of the instrument was determined to be 0.70. This indicate internal consistency and level of closeness between the items of the instrument.

Data Analysis

Data collected from the sampled population was analysed using descriptive and inferential statistics. The scores obtained by students on each of the variables were summed up, thus making the data a continuous one; hence, Pearson Product-Moment Correlation and Multiple Regression Analysis were used to analyze the collected data. These data packages enabled the researcher to predict the level of relationship existing between the variables in the study. The composite relationship between Locus of Control, Gender and, Attitude was investigated using multiple regression analysis. Preliminary investigations were carried out to ensure that there is no violation of Multicollinearity, Tolerance, Variance Inflation Factor (VIF), normality and outliers.

Result

Result of the findings of this study is presented here

The table below presents the result obtained from distribution of the locus of control found among the students.

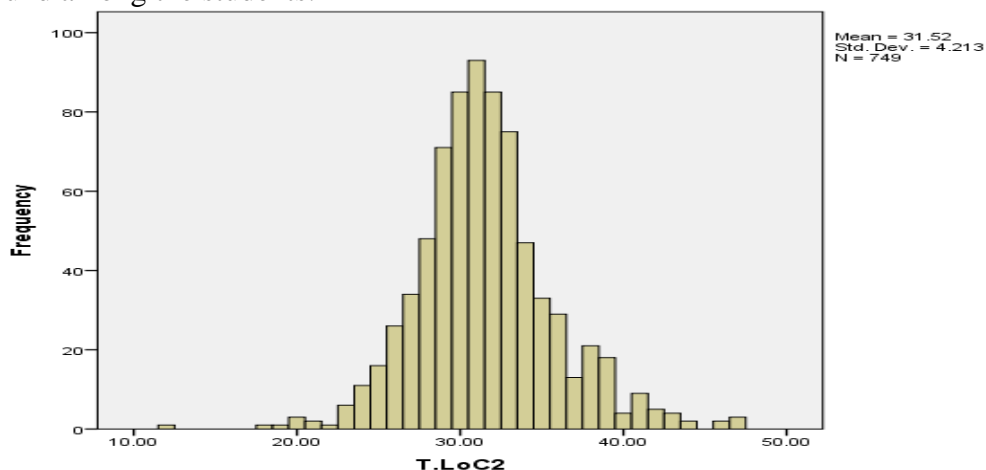


Fig 1: Showing the distribution of Locus of Control scores

Fig 1 above shows the mean score of students on Locus of Control. The minimum score is 17, while the maximum score is 48. With a mean score of 31.52, it can be seen that the students have average-internal Locus of control.

The result obtained from the analysis of the extent to which the model (locus of control, study habits and gender) was able to predict students’ attitude to Physics is presented below.

Table 1: Summary of Multiple Regression Analysis on composite contributions of Independent Variables (locus of control, study habits and gender) on students’ Attitude

Model	Sum of Square	Df	Mean Square	F	Sig
Regression	4082.891	3	1360.964	92.230	.000 ^b
Residual	10963.794	743	14.756		
Total	15046.685	746			

R = .521
R² = .271
Adjusted R² = .268
Std. Error of the estimate = 3.84137

Result obtained from multiple regression analysis of the composite contribution of the independent variables to the dependent variable as shown in Table 1 revealed the extent to which the model (Locus of control, Gender and Study Habit) was able to predict the dependent variable (Attitude), with R=.521, which is equivalent to 52.1%. This indicates a good level of prediction. R² = 0.271, which is equivalent to 27.1%, indicate the level of shared variance between the dependent variable and the independent variable. This explains that 27.1% of the attitude of students to physics

can be explained by the independent variables while the remaining 72.9% will be explained by factors not included in the study

Findings from the relative contribution of the independent variables (locus of control, study habits and gender) to students' attitude to Physics is given below

Table 2: Summary of the Multiple Regression Analysis showing Relative contribution of Independent Variables (locus of control, study habits and gender) on Students' Attitude to Physics

Model	Unstandardized coefficients		Standardized coefficients	Rank	T	Sig
	Beta (B)	Std. Error	Beta (B)			
(Constant)	10.601	1.410			7.517	.000
Locus of Control	.356	.035	.334	1 st	10.119	.000
Study Habits	.204	.022	.307	2 nd	9.303	.000
Gender	.016	.281	.002	3 rd	.056	.955

Table 2 above presents us with the statistics of how the independent variables (locus of control, study habits and gender) were able to predict the dependent variable, when other variables are held constant. The most significant independent variable is Locus of Control, with unstandardized coefficient (B) of 0.356 and standardized coefficient (B) of 0.334. This mean that for one unit increase in locus of control, there will be an increase in students' attitude by 0.356 units. For the standardized coefficient, a unit deviation in locus of control will yield 0.334 deviations in students' attitude. Students' study habits has an unstandardized coefficient of .204 and standardized coefficient of .307. The least significant contributor is Gender, with unstandardized coefficient (B) of 0.016 and standardized coefficient (B) of 0.002. This shows the prediction strength of the independent variables. Locus of control and study habits predicted students' attitude to physics.

In addition, there is a significant relationship between students' locus of control and attitude to physics [$r = .434^{**}$, $n = 750$, $p < 0.01$].

Discussion

The findings of research question one corroborates the findings of Oludipe (2013) which revealed that 63% of the respondents are internal with respect to their locus of control. This clearly shows that majority of them believe that they can take control of their lives and that their actions and behavior are instrumental to achieving desired outcome and avoiding undesirable outcomes. An internally-oriented student will put in conscious effort at learning science since she knows her efforts determine her outcome. Internals are more likely to work for achievements in science, delay gratification and plan for long-term goals. They are also likely to indicate a greater preference for challenge and problem-solving. They are motivated internally and exhibit such behaviours as persistence, hard work, doggedness, inquisitiveness and intelligence.

In addition, the study found significant relationship between study habits and students' attitude to physics [$r=.477^{**}$ $n=750$, $p<0.01$]. This corroborates Mendezabal (2013) who opined that efficient study habits are associated with a favorable attitude toward learning in general. An important aspect of a student's attitude toward education is the value he sees in what he has to learn. The study found no significant relation between gender and students' attitude to physics [$r= -.041$, $n=750$, $p<0.01$]. This finding is supported by the study carried out by Pell and Manganye (2007) which showed that there is no difference between attitude and gender among African students. In contrast, Jeje and Olagoke (2006) in their study observed that more males have good attitude for science and mathematics and larger percentage of females in the school opted for other subjects apart from mathematics and science.

Conclusion

The following conclusions have been made based on the findings from the study. The students that constituted the population for this study reported strong self-belief, i.e. internal locus of control. This indicates that they have faith in their abilities. The independent variables (locus of control, study habits and gender) predicted the attitude of students to physics. Locus of control made the highest contribution to students' attitude, followed by students' study habits. Gender had no contribution to students' attitude to physics. Locus of control and study habits were found to have a significant relationship with attitude of students to teaching and learning of Physics.

There is no significant relationship between gender and students' attitude to physics. In addition, no significant difference was found between male and female attitude to physics. These shows that the female students, unlike in previous years, are now more involve in physics classes. The number of female students that were sampled in this study attests to the fact that there has been an improvement in the involvement of females in physics.

Recommendations

There should be adoption of the necessary instructional methods that will enhance students' locus of control. Such instructional method should be the type that will avail students opportunity to take on exercises/ assignments and individual task.

Efforts should be made by physics teachers to improve the study habits of students.

Curriculum designers should consider methods and techniques of improving students' study habits when designing senior secondary school physics curriculum.

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