



Correlation Of Students' Attitude And Gender Differences On Understanding Of Concept In Physics Practical

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Abstract

The study investigated students' attitude and gender differences as correlate to understanding of concept in Physics practical in Senior Secondary School Two (SSS II) students in Nigeria. 240 SSS II students were randomly selected from six secondary schools in six Local Government Area in Osun State, Nigeria. The research design used was Ex-post-Facto. The instruments for the study were Questionnaire on Student Attitude to Physics Practical (QSAPP) and Physics Concept Test (PCT). Using Crombach alpha method, the instruments were found reliable at 0.82 and 0.72 respectively. The Pearson Product Moment Correlation Coefficient was used to analyze the data. Findings showed that students' attitude is significantly related to the understanding of concept in Physics practical, but their gender had no significant relationship. In conclusion, positive attitude is very important towards understanding of concept in Physics practical. It was therefore recommended that teachers and the school administrators should boost the morale of students by teaching Physics practical concept through less stressful methods and modifying all influencing factors in the classroom

Keywords: Attitude, Gender Differences, Understanding, Concept, Physics

INTRODUCTION

The modern world is changing in technology, economic, social and political trend from the simple traditional society of ancient times. The change is due to the contribution of technology advancement as a result of scientists' involvement in practical works. The attitude of scientists to increase our understanding of the world around us solve some of the problems nature bestowed on us and the sequence of meaningful conclusions arrived at form the bedrock of different scientific discoveries . The consequence of this attitude in interacting with environment has aided many discoveries and progress in technology. The interactions between other sciences and Physics are profound and dynamic. Physics has immense contribution to technological needs of the changing society (Juceviciene and Karenauskaite, 2004; Zhaoyao, 2002), generation of electricity, mobile phone communication, optical and satellite communication, portable electronics, radio and radar perception, and X-ray crystallography (Campbell, 2006) and in the application of medicine and in the communication technology.

If science is to be learned effectively, it must be experienced and close to the students through practical activities and the world around us supplies an inexhaustible supply of materials which can be used as the subject matter for practical teaching .If students are to discover the

reality of what science is, they should be equipped with experimental procedures. Omolaran and Mutiu (2003) revealed that the basic truth is that the laboratory is where the students can become involved with his or her environment in such a way that theories and principles are encountered and discussed in the content that has bearing to physical meaning. This is in line with Millar, 2004 that practical work may be considered as engaging the learner in observing or manipulating real or virtual objects and materials. That is, Physics practical is an exciting and intellectual stimulating activity.

However, the reality on ground demands steering up students' attitude towards physics practical in secondary schools as Mustapha (2009) and Danmole (2011) are of the opinion that the development of any nation begins from classroom. Hence, Physics practical is a sharpen tool for actualization technological advancement. Physics curriculum contents emphasized understanding of concepts, experimentation and right attitude, NERDC (2008). Right attitude is crucial to the understanding of concepts in Physics practical. With dynamism of science, an encouraging attitude is necessary in practical activities, attitude regulates the behaviour of the students in their availability, readiness for the subject and their interactive manner during the practical class. According to House of Lords (2006) many students consider Physics as difficult, abstract and theoretical. Olusola and Rotimi (2012) supported this claim that Physics is perceived as a difficult subject for students from secondary school to university and also for adults in graduate education. Such a belief has long way to affect the disposition toward the physics and its practical.

Gender differences in Physics has troubled science educators for decades (Clancy, 1962), this difference has persisted to the present (Ivie & Ray, 2005). There are divergent opinions as regard to the resultant achievement of male and female. These differences are due to disparities in understanding of concept. The international student science assessment survey report different gender patterns. Euridice Network (2010), Matin (2004; 2008); QECD (2004) in International Mathematics and Science Study (TIMSS) often find gender gaps in favour of boys. Whereas the Programme for International Student Assessment (PISA) reports generally show no significant gender differences.

PURPOSE OF THE STUDY

The purpose of the study is to find out the relationship that exist between students attitude and gender differences with understanding of concept in physics practical.

Research Hypotheses:

1. There is no significant relationship between students' attitude and understanding of concept to Physics practical.
2. There is no significant relationship between gender difference and understanding of concept to Physics practical

Significance of the Study

It is hoped that the result of the findings will give information to teachers on the need to assist the students on reviving their attitude to concept of physics practical, besides the school administrators will deem it fit to create atmosphere that will promote positive attitude towards physics practical.

It is also envisaged that the results of the findings if utilized will foster secondary students' achievement in practical Physics as teachers will be sensitized and be adequately prepared to

teach with relevant instructional materials having fore knowledge of gender differences and attitude of students.

METHODOLOGY

Research Design

An Ex-post facto research design was used for the study. The independent variables are the attitude and gender differences and dependent variable is understanding of concept in physics practical.

Population and Sample

The population of this study comprised of senior secondary two students from three districts of Osun State of Nigeria. Six schools from six local governments were randomly selected that were exposed to the following practical: Simple Pendulum Experiments, Determination of Hooke's Law, Determination of Ohm's Law, Measurement of Resistance and Simple Moment. Determination of Density and Relative Density .A sample of 240 students was randomly selected.

Instrumentation

Two instruments used for the study are: Questionnaire on Student Attitude to Physics Practical (QSAPP) and Physics Concept Test (PCT)

Questionnaire on Students' Attitude to Physics Practical

This instrument was constructed with the assistance of two experts to measure the attitude of students to Physics practical activities. Section A of the questionnaire consists of personal information such as name, age, gender while section B consists of 25 attitudinal items on Physics practical placed beside a four point scale of Strongly Agree (S.A), Agree (A), Disagree (D) and Strongly Disagree (SD). The Questionnaire on Student Attitude to Physics Practical (QSAPP) was found reliable at 0.82 using Crobach alpha method.

Physics Concept Test (PCT)

The Physics Concept Test (PCT) was constructed by two test experts from WAEC and the researcher .The items of this test were based on experiments done. The item in PCT consists of symbols, understanding of principles and laws that govern the experiments and concepts of language and mathematical language. This was used to establish the level of understanding the concept of Physics practical and found reliable at 0.72 using Crobach alpha method.

DATA COLLECTION

The Questionnaire on Student Attitude to Physics Practical (QSAPP) and Physics Concept Test (PCT) were administered to 240 senior secondary two (SSS 2) physics students.

DATA ANALYSIS

The data collected was analyzed using Pearson's Product Moment Correlation Coefficient .The results are presented in line with the research hypotheses.

FINDINGS

Hypothesis 1

There is no significant relationship between students' attitude and understanding of concept to physics practical.

Table 1: Pearson Correlation between Students Attitude and Understanding of Concept of Physics Practical .

Variable	N	Mean	S.D	Df	R	Level of Significance
Students' Attitude	240	67.1125	15.79046	238	0.948	P< 0.05
Understanding of Concept		34.6417	12.78682			

From Table 1 ,the correlation co-efficient between students' attitude and understanding of concept of physics practical is 0.948 which is significant at 0.05.Thus ,the null hypothesis is therefore rejected .That is students' attitude is significantly related to understanding of concept in physics practical. The positive r-value in the result implies that the higher the students' attitude, the higher the understanding of concept of physics practical. In the other way the lower the students' attitude to physics practical, the lower the understanding of concept to physics practical.

Hypothesis 2

There is no significant relationship between gender difference and understanding of concept to physics practical

Table 2: Pearson Correlation between Gender and Understanding of Concept to Physics Practical.

Variable	N	Mean	S.D	Df	R	Level of Significance
Gender	240	1.5333	0.49993	238	-0.092	P>0.05
Understanding of Concept		34.6417	12.78682			

From Table 2, the correlation co-efficient between gender and understanding of concept of physics practical is -0.092 which is not significant at 0.05.Thus, the null hypothesis is not rejected.

DISCUSSION

The first hypothesis showed that there is a significant positive relationship between students' attitude and understanding of physics concept which will enhance their performance in physics practical. This is line with the view of Mamlok-Naaman, Ben-Zvi, Hofstein, Menis, and Erduran (2005) that 'if students are not interested in science, they tend not to make an effort to learn and understand the meaning of concepts that are being taught to them". This could mean that students mind set in science has correlation to learning and understanding the concepts being taught. The study revealed from the second hypothesis that there is no gender difference to understanding of practical physics concept.

CONCLUSION

The findings of this study have shown that attitudes have significant relationship on students' learning of physics practical concept. It has also spotlighted that gender difference has no significant relationship on students' learning of physics practical concept.

RECOMMENDATIONS

Attitude of the students to understanding of physics practical concept has a great consequence towards their performance ,hence, teachers and the school administrator can enhance the attitude through the following ways: boosting the morale of students by

teaching physics concept guiding a particular practical topic before the practical session instead of fire approach method, modifying all influencing factors such good class room interaction and less stress classroom relationship to encourage the students . Teachers should be prompted by the ministry of Education to acquired higher qualifications, besides, teachers should given opportunity to attend workshop in order to facilitate their resourcefulness and efficiency in appropriate language, methodology in teaching concept of physics topics in practical.

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