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EVALUATION OF SCIENCE STUDENTS' ACADEMIC PERFORMANCE IN COLLEGE OF EDUCATION IKERE- EKITI, EKITI STATE, NIGERIA

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Abstract

This study examined the evaluation of Science Students' Academic Performance in College of Education Ikere-Ekiti, Ekiti State, Nigeria. The study is a combination of survey and ex-post factor design. The population of this study consists of all science students in College of Education, Ikere Ekiti. Majorly, Physics students, Biology Chemistry and Mathematics students were selected as population for the study. Both male and female students were also selected for the study. The sample for the study was made up of 200. Science students from four cardinal science subject related courses, simple random sampling technique was used to select 50 students from each science related subject. The research instrument for the study was self-designed questionnaire. The instrument was subjected to validity and reliability mechanism. The reliability coefficient of the instrument revealed 0.73 which implies that the instrument was consider reliable and used for the study. Also, the score and cumulative grade point of present 200 level students in science related courses were used as second instrument. The copies of the questionnaire were given to the selected students to fill. *Their responses were collected and presented for* data analysis with appropriate statistical analysis. All hypotheses were tested at 0.05 level of significance. The findings of the study revealed that there was significant relationship between students' performance in physics and other science subjects (Biology, Chemistry, Computer Science and mathematics, students' attitude towards science is very poor and it has effect on their performance, study habit of students contribute significantly to academic performance of students in science and also male students perform significantly better than female students in science. Based on the findings, conclusions and appropriate recommendations were made.

Keywords:

Evaluation, science students, academic performance, college of education.

Introduction

The world is fast becoming scientific in thinking and behaviour that without good knowledge of science, it might be difficult for people to adequately function in it. The role of science in the development of modern societies cannot be overemphasized. Students in Secondary Schools and tertiary institution are expected to acquire scientific skills. The purpose of exposing students to science instruction from primary school level is not necessarily to turn them into scientist really but, to provide favorable scientific attitude of finding out and to enable them raise questions about things that intrigue them.

But in recent times, observations on students academic performance in sciences Biology, Chemistry, Physics) generally over the years in College of Education revealed that a very few number of students perform better in science courses examination compared with other subject regrettably observed that academic excellence had since departed from tertiary institution (Sam, 2011). The "monster" of failure has taken over, unleashing its fury on students year after year. The situation of poor performance has become so bad that students graduating from tertiary institution found it difficult to be self-reliance or perform creditably in any organization (Olorundare, 2010).

The issue of poor academic performance of students in science has been of much concern to all stake holders. The problem is so much that it has led to the widely acclaimed fallen standard in education in Nigeria at large. Due to the observed deterioration in the academic performance, one would wonder if such poor performances may not be a reflection of the institutional and structural qualities in the schools.

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The importance of attitudinal outcomes in science teaching and learning process has long been acknowledged. Attitude is a very strong variable in learning. Jegede (2003) notes that it determines the success or failure of students in learning. Attitude as suggested by him correlates with students achievements in any subject such as physics, chemistry, biology, mathematics etc.

Researchers such as Akorede (2000), Adodo (2005) and others discovered that poor academic performance in science are caused by poor reading habit, negative students attitude/interest towards science, gender inequalities, inadequate laboratory facilities, inadequate staff motivation, inadequate instructional materials and so on. This study therefore evaluates students' academic performance in science in College of Education, Ikere-Ekiti..

Despite stringent measures and strategies employed by the Nigerian government to ensure that education standards and brilliant performance are maintained at the tertiary level, observation shows that students whom after passing through all these vigorous teaching, learning and examinations, still performs far below expectation in sciences. The cause of these poor performances could be attributed to student's factors, teacher's factors, schools/institutional factors.

Concern about this worrisome situation and the urgent need for Nigerian education system to relate appropriately with the global trend in science, this study intends to:
- Present an analysis of academic performance in science particularly in Physics, Chemistry, Biology and Mathematics.
- Compare the performances of students in physics to other science subjects in college of Education.
- Evaluate difference in the performance of male and female students in science.

Research Hypotheses
The following hypotheses were formulated and tested at 0.05 level of significant:
1) There is no significant relationship between students' performance in physics and other science subjects (Biology, Chemistry and Mathematics) in College of Education
2) The attitude of student does not contribute to academic performance of students in science courses in College of Education.
3) The study habit of student does not contribute to academic performance of students in science courses in College of Education.
4) There is no significant relationship between the performance of male and female students in science.

Review of related Literature

Conceptual and Theoretical Consideration in Science Teaching and Learning
Globally, science teaching – learning gains prominence on daily basis simply because of the consistent emphasis on science and technology due to its application in industrial development. Such situation cannot be said to be restricted to developed nations since most developing countries including Nigeria also lay emphasis in the learning of science.

Recent development reforms in the educational system in Nigeria have also focused on effectiveness of science teaching and learning. Over the last two decades there are reflections across nations that teaching and learning of science is problematic (Harlen, 2009).

Unfortunately however, effort made so far to improve the teaching and learning of science across the globe has not yielded the much needed results and therefore deserves further attention. Students fear science so much that anyone who enrolls in it is looked upon with awe, because the course is believed to be difficult and not easy to pass in examination (Olasehinde, 2008).

Students are being encouraged to take up science related subject. Obioma (2007) noted that scientific method parade literally every field of human endeavor and play a fundamental role in economic development of any country including Nigeria. There is need for good performance of students in the sciences at all levels of schooling.

Gender and Academic Performance of Science Students
Gender difference in attitude and achievement relating to science has been extensively investigated by researchers. Badekale (2007) in his studies that conclusive empirical evidence as to the superiority of male over female in science is still lacking. However, studies have found that girls hold lower confidence in their ability

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than boys. It was noted that teachers seem to pay more attention to students who are sure of themselves than those who are less sure.

Iroegbu (2007) also found no significant main effects of gender on students' achievement in energy concepts in physics, but reported interaction effects of treatment and gender as well as gender and numerical ability on students' achievement in energy concepts in physics. The result of the studies of Iroegbu (2007) and Ige (1998) revealed one interesting fact that gender seem not to be as important in students' achievement as their innate ability.

Ofoegbu (2004) attributed the low performance of girls in science to lack of role models to women in science, technology, mathematics and sex stereotypes. Ofoegbu (2004) also cited the low employment of female science teachers. The teaching profession for science subjects is still dominated by males, therefore the attitudes of female students towards the subjects is poor.

Abe (2005) identified sex-bias in the schooling process, including the instructional materials for the subjects. He noted a definite bias in the illustration and written textbooks on all criteria. According to Abe (2005), reference to females were few and even the sex of the person was immaterial, reference to female in scientific activities were virtually nonexistent and there were a few reference to role models for girls.

Green (2001) revealed that more women than men pursue a post secondary degree in the U.S however fewer female pursue an undergraduate degree in science and therefore do not enter into science, technology, engineering and mathematics (STM) related careers at the same rate as males. Females have demonstrated that they are equally capable as their male counterparts of learning and mastering science concepts and knowledge (Jegede, 2013).

Females hold in relation to science and its application to solve real-world problems: courses that females are advised to enroll in science during high school.

The issue of gender differences need further examination since a number of studies especially in Nigeria have reported that girls are underrepresented in the fields of science and technology at secondary and tertiary institution level (Alele, 1999). Gender difference was first investigated by sociologist of education. The focus was largely on female under performance at every level of the educational system. Therefore, there is need to promote the teaching and learning of the sciences in schools especially among female students.

Ajayalemi and Busan (2000) identified the following factors as contributing to under-performance of female in science and technology education in Africa at large;

- Lack of functional guidance and counseling services
- Relationship of sex to occupational prestige
- Influence of schooling
- Family background
- Interest
- Training opportunities
- Lack of adequate orientation programme
- Societal discrimination against females in education
- Occupational choice and adaptation of science and technology.

Fakorede (2009) in his own contribution posited that poor performance of girls in science subject is due to:

- Inadequate opportunity for girls to study science
- Inadequate achievement of girls in science
- Inadequate interest of girls in science
- Unfavorable attitude of girls to science learning and
- Inadequate knowledge of girls on the true nature of science.

The greater disadvantage and underrepresentation of females over male in scientific and technologically related specialties career and even in leadership positions in Nigeria is a fact that certain factors impinging on gender equality and preference may be responsible for seeming non-participation of females. However this does not create any impression of poorer performance. Girls and boys are equally brilliant or equally dull.

Self Efficacy as Correlate of Student's Academic Performance in Science

People's beliefs about their abilities in particular domains are thought to be important in motivating them to do what they can do to achieve (Haw, 2004). The three aspects that have received the most attention are self efficacy-defined as confidence in one's abilities to successfully perform a particular task, outcome

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expectancy define as beliefs that a particular behavior will result in particular outcomes and causal attribution defined as one's judgment about what causes success or failure to perform task.

Bandura (1997) introduced the concept of self efficacy as a key component in social cognitive theory in the late 1970's and it has been found to be an important predictor of student achievement in science (Zimmerman, 2000). Academically therefore, self-efficacy refers to one's perceived capability to perform given academic tasks at the desired level. Self efficacy

is related only to performance expectation and does not depend on the value placed on the task (Hawthorne, 2004).

Students have confirmed strong relationship between self-efficacy. For example Zimmerman (2000) review of the major finding into self-efficacy beliefs concludes that they are positively related to motivation. Researchers have found that students who are self-efficacious are more likely to undertake difficult and challenging tasks than students who are not self-efficacious. They are also more likely to exert more effort and to persist longer in the face of difficulties. It has been found that perceived self efficacy influences students' method of learning as well as their motivational processes. Students who are self-efficacious appear to use more self regulating strategies which lead to higher achievement in science (Hawthorne, 2004).

Several researchers have also demonstrated that self-efficacy, perception are also good predictors of reasonable generalized performance such as obtained grades in science subjects (Bandura, 1997). In a most recent work by Adedeji, Adeyinka & Olufemi (2009) on locus of control interest in schooling, self-efficacy and academic achievement, the researcher reported that self-efficacy made contribution on students' academic performance in science.

Methodology

This study is a combination of survey and ex-post factor design. The survey allows for proper description of students variables (attitude and study habit) as it effects students' academic performance in science while the ex-post factor cause and effect after the event had taken place without involving manipulation of variables

The population of this study consists of all science students in College of Education, Ikere Ekiti. Majorly, Physics students, Biology Chemistry and Mathematics students were selected as population for the study. Both male and female students were also selected for the study.

The sample for the study is made up of 200. Science students from four cardinal science subject related courses, simple random sampling technique was used to select 50 students from each science related subject.

The research instrument for the study was self-designed questionnaire which comprises of two sections. The first section consisted of students' bio-data and the second section comprises of several questions/items evaluating students' performance in sciences. Also the score and cumulative grade point of present 200level students in science related courses were used as second instrument.

The face and content validity of the instrument were established by the experts in measurement and evaluation. Their critical comments helped in effecting the necessary modification in the instrument. These make the instrument to be valid for usage.

The reliability of the instrument was established by conducting reliability test using split half method and the result revealed 0.73 which implies that the instrument was consider reliable and used for the study.

The data (examination scores/grades) that serves as the academic performance of the selected students were collected from their respective head of department. The copies of the questionnaire were also given to the selected students to fill. Their responses were collected and presented for data analysis.

The data collected were analyzed using Chie-Square, t-test and Pearson Product Moment correlation statistical analysis. All hypotheses were tested at 0.05 level of significance.

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Results and Discussion
H01: There is no significant relationship between students' performance in physics and other science subject (Biology, Chemistry, Computer Science and Mathematics) in College of Education.
Table 1: Correlation Matrix for performance of science students.

Subject	1	2	3	4	5
Physics (1)	1				
Biology (2)	0.48	1			
Chemistry (3)	0.42	0.61	1		
Computer Science (4)	0.65	0.28	0.69	1	
Mathematics (5)	0.78	0.55	0.85	0.90	1

The result of analysis in table 1 shows a very high relationship between scores of students in computer science and mathematics (0.90) chemistry and mathematics (0.85) and physics and mathematics (0.78). There is high relationship between Biology and Chemistry (0.61), chemistry and computer science (0.69), physics and computer science (0.65) and Biology and Mathematics the relationship that existed between Physics and Biology (0.48), Physics and Chemistry (0.42) was moderate. The result showed low relationship between Biology and Computer Science (0.28). These results led to the rejection of hypothesis 1. This implies that there was significant relationship between students' performance in physics and other science subjects (Biology, Chemistry, Computer Science and mathematics.

H02: The attitude of students does not contribute to academic performance of students in science.
Table 2: Percentage and X^2-statistics for Attitude and performance in science

S/N	ITEMS	SA	A	D	SD	df	X^2-CAL	X^2-lab
1	Students hate science because it is very broad	25%	48.7%	10.3%	16%			
2	Students entertain fear whenever science teacher enter class	62%	30%	8%	__			
3	Science questions are too difficult to answer during examination	55%	28%	15%	2%			
4	The attitude of science students is not encouraging	35%	58%	7%	__	3	25.60	10.30
5	Students' poor interest affect their performance negatively in science	80%	20%	___	___			
6	Fear of practical and laboratory experience make students to hate science	20%	40%	30%	02%			
7	Science is always boring to me	40%	25%	15%	20%			
8	Cramming of science names and terminologies are difficult for me.	48%	49%	03%	___			

$P< 0.5$ (Result is Significant).

The result presented in table 2 for shows that 73.3% of the respondents agreed that students hate science because it is very broad. Most students entertain fear whenever they see their science teacher. 83% of the respondents agreed that science questions are too difficult to answer during examination. The attitude of science is not encouraging and their poor interest was agreed by 100% of the respondents, affect students performance negatively in science. The responses from the respondents showed that students' attitude towards science is very poor and it has effect on their performance.

Furthermore, the table shows that the chi-square (X^2) calculated (25.60) was greater than chi-square (X^2) table (10.30) at 0.05 level of significance. This makes hypothesis 2 to be rejected. Hence the attitude of students contribute significantly to the academic performance of students in science.

H03: The study habit of students does not contribute to academic performance of students in science.

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Table 5: Percentage and X^2-statistics for student Habit and Performance in science.

S/N	ITEMS	SA	A	D	SD	df	X^2-CAL	X^2-lab
1	Students only study science when examination time table is out	50%	35%	10%	05%			
2	Constant reading and studying of science course contribute to students performance in science	80%	20%	__	__			
3	Students prefer to facebook, '2go' and chart on social media than studying	65%	16.5%	10.5%	8%			
4	Clubbing and night party are disturbance to studying habit	43%	46%	06%	05%	3	14.32	9.28
5	Students' only read when they one given assignment.	35%	40%	15%	10%			
6	Students fails science courses because of lack of proper devotion for studying	650%	32%	03%	__			
7	Most students don't study because they rely on examination malpractice.	58%	35%	07%	__			

P< 0.5 (Result is Significant).

From table 3, 85% of the respondents agreed that students only study science when examination time table is out. 81.5% agreed that most students prefer 'facebook', '2go' and chart on social media than studying. Clubbing and night party are disturbance to students' study habit. 75% agreed that students only read when they are given assignment. Most of these students rely on examination malpractices. 97% of the respondents agreed that most students fail science courses because of lack of proper devotion for studying. 100% of the respondents agreed that constant reading and studying of science course contribute to students' performance in science.

It was further revealed from the table that Chi-square (X^2) calculated (14.32) was greater than Chi-square (X^2) table (9.28) at 0.05 level of significance. This led to the rejection of hypothesis 3 which implies that study habit of students contribute significantly to academic performance of students in science.

H04: There is no significant difference between the performance of male and female students in science.

Table 4: t-test statistics showing difference between male and female performance in science.

Variables	N	X	SD	df	t-cal	t-tab
Male	120	48.31	10.78	198	6.30	1.96
Female	80	30.32	5.11			

P<0.5 (Result is Significant)

The result of analysis in table 4 shows the mean and standard deviation of 48.31 and 10.78 respectively for male performance. It also reveals the mean and standard deviation of 30.32 and 5-11 respectively for female performance in science the t-calculated (6.30) was found greater than t-table (1.96) at 0.05 level of significance. This makes hypothesis 3 to be rejected hence, there was significant difference between the performance of male and female students in science. The mean value of male students' performance was also found greater than the mean value of female. This implies that male students perform significantly better than female students in science.

Discussion

The findings of this study revealed that students' performance in science among college of education students was very poor. This poor performance was attributed to student's mind-set about science.

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The study revealed a significant contribution of correlate of students' performance science. Attitude in the study of Obioma (2007) determine altitude. The finding corroborated with the finding of Zimmerman (2000) that attitude is an important predictor of students' achievement in science.

The finding of the study also revealed significant relationship between students' performance in physics and other science subjects. This finding shows that one science subject has effect on another. Performance in mathematics and physics tends to has effect on other science courses such as Biology, Chemistry, Integrated Science and Computer.

The study finally revealed differences in the performance of male and female students in science. Male students tend to perform significantly higher than female students in science. This finding corroborated with the study and finding of Badekale (2007), Iroegbu (2007), Ofoegbu (2004) and Alele (1999) that male students show superiority over female in science hence performing significantly better than the girls.

Conclusion

Based on the findings, the following conclusions were made:
- Science students performance in College of Education is very poor and this is not encouraging
- Attitude and study habit of students has significant contribution to students performance in science courses
- Male students develop interest in science than their female counterparts. This has serious effect on the performance of students in science.

Recommendations

Based on the findings, the following recommendations were made:
1) Students of College of Education should be encouraged towards the learning of science in order to improve their performance in the subject.
2) Science courses should be introduced in such a way that students would not see it as difficult area of study.
3) Students should be counsel on the different prospects of choosing science courses as a field of study. This will enable them to perform effectively in science subjects.
4) Strategies for improving student's performance in science should be used to foster learning of science courses.

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