

Comparative Analysis Of Students' Achievement In Senior School Certificate Examination (SSCE) In Physics Between 2007 And 2012

¹Jegede Samuel. A ., ²Awodun Adebisi .O ., ³Olusola Olasimbo. O

¹ Department of Curriculum Studies, Ekiti State University, Ado-Ekiti, Nigeria

^{2,3} Department of Physics, College of Education, Ikere-Ekiti, Ekiti State, Nigeria.

Corresponding Author: Awodun, Adebisi O,

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Abstract

This study investigated the trends in students' achievement in Senior Secondary School Certificate Examination (SSCE) in Physics in Ekiti State of Nigeria between 2007 and 2012 years. The study adopted a survey research design of ex-post facto type, the design centered on looking back at the performances of the students in Physics. The sample comprised of all Physics students in 141 public secondary schools in Ekiti State that registered and sat for SSCE Physics between 2007 and 2012 years. The investigation of the study reveals that there is neither significant fall nor significant students' academic achievement in Physics in West African School Certificate Examination results over the year of study (that is, it shows fluctuation in the performance over the period of study). Two research questions were answered in the study. Data were analysed using frequency counts and percentages. It is recommended among others that the Teaching Service Commission (TESCOM) of the state should endeavour to provide opportunities for refresher courses for Physics teachers for them to be better informed about how to improve the academic performance of their students in the subject for technological advancement of the nation. And the Ministry of Education ditto the School Principals should ensure adequate and effective supervision of the teaching of Physics in Secondary Schools in the Ekiti State. Government should also provide modern science laboratory equipments to schools and information communication technology centre to all the schools.

Key words: *Physics, senior school certificate examination and students' achievement.*

Introduction

The role of science in this modern era of technology is wide and profound. In line with this reasoning, Olagunju et al as cited by [14] emphasized the importance of scientific knowledge in boosting national prestige, military might, national income and international rating of the country. According to them, science gives birth to the production of micro computers and their innovative applications which earned the developed countries such as the United States of America and Japan unparalleled national wealth, military potential and enviable national prestige. The development of any nation, which depends on science and technology, hinges on the nation's science education. Science education is a distinct form of creative human activity which involves distinct ways of seeing, exploring and understanding reality. Science has become such an indispensable tool that no nation, developed or developing, wishing to progress in the socio-economic sphere will afford to relegate the learning of science in schools to the background. Technological growth of a nation leads to its social and economic development. In the world today science and technology have become a dominant culture factor. America, Russia, Japan and China are typical examples of nations which are now referred to as developed, as a result of their development in the area of Science and Technology. The contemporary word is

driven by science and technology and the two are interrelated. [13] affirmed that science is the theory upon which the technology is built, without Science; there cannot be intuition for technology. Also, to confirm the assertion, [12] claims that while science probes into the question "Why?" technology probes into the "How?" aspect. Physics is among the three major pillars of science (i.e. Physics, Chemistry and Biology). Physics deals with the study of laws that determine the structure of the universe with reference to the matter and energy in the universe [11]. In the words of [17] "Physics is the most utilized basic science subject in most technology and technology-related profession". This merely indicates that the enormous role Physics plays in the technological growth of any nation must not be undermined. It is germane to say that the technological growth of a nation leads to its social and economic development. The importance of Physics for the development of a nation is, therefore, glaring. Physics is the most basic of the sciences and its concepts and techniques underpin the understanding of other disciplines: A thorough understanding of mechanics is necessary to chemists and material scientists since the structure of every atom in the universe is determined by mechanics. Physics is also a cross-cutting discipline that has applications in many sectors of economic development, including health, agriculture, water energy and information technology [12]. There is no doubt that a good part of the scientific knowledge is derived from the principles of Physics. Indeed, the knowledge of Physics has led to so many inventions such as the production, application and utilization of integrated circuits, production and use of machines and other contrivances. It also accounts for the discovery and production of hydroelectric power, gas turbine and thermonuclear power plant, telephones, refrigerators, heaters and cookers. The invention of modern technologies such as Information and Communication Technology (ICT) which has made the world a global village is also part of the benefits of Physics and many other benefits. The principles of radiation used in modern medicine for diagnosis and treatment, the production and use of so many appliances such as electronic gadgets and computers, surgical and astronomical instruments are all traceable to the study of Physics [14]. The effective learning of the subject in schools is therefore desirable. In Nigeria, in spite of the enormous role that Physics plays in national development and the efforts of government and other stake holders in improving science education, Physics results in most certified examination bodies like the West African Examination Council (WAEC) and National Examination Council (NECO) have not been satisfactory. These have been attributed to many factors which include utilization of inappropriate teaching methods in schools, poor quality school science teachers and school location [12]. The broad aims and expectations of any teaching and learning programme is productivity and positive-evaluated end-product (achievement). But in recent times, there have been complaints from almost all quarters of the Nigerian society that the standard of education has subsided. Students' achievement in the Senior School Certificate Examination (SSCE) conducted by WAEC and NECO has continued to deteriorate from year to year, particularly

in the area of sciences (specifically, Physics). In particular, reports on WAEC results of Senior Secondary School Certificate Examination in Ekiti State over the years often revealed low performance of students in Physics (see Tables 1 and 2). Parents and government are in total agreement that their huge investment on education is not yielding the desired dividend. That is, despite their huge investment on education, students' performances still remain poor. Teachers, also complain of students' low performance at both internal and external examinations [6]. Some problems were identified by researchers as reasons behind this ugly trend. Studies of [18]; [15]; [3]; [4]; [7]; [16] and [6]; [10]; [5]; [1] and [2] revealed that poor academic performance and low enrolment in science generally, and Physics, in particular in Nigeria are caused by : ineffective teaching methodology, negative students attitude/interest towards physics, school location and gender inequalities among other problems. It is against this backdrop that this study needs to compare students' achievement in senior school certificate examination (SSCE) in Physics between 2007 and 2012 academic sessions.

Research Questions

The following research questions were formulated and tested at $P < 0.05$:

1. Will there be any significant difference in academic achievement of students in Physics in Senior Secondary School Certificate Examination between 2007 and 2012 years?
2. Will there be any significant difference in the quality of grades of students in Physics in Senior Secondary School Certificate Examination between 2007 and 2012 years?

Methodology

The design was a descriptive survey of the ex-post facto research type. It involves the collection of data from records. The target population for the study was Physics candidates in all the 141 public secondary schools in Ekiti State of Nigeria, from 2007 to 2012 academic sessions. The sample of the study consisted of all Physics candidates in all the public Secondary Schools that registered and sat for SSCE in Physics between 2007 and 2012 academic sessions. The schools are controlled by the state ministry of Education and operated as prescribed by the National Policy on Education. The Schools also operate the same syllabus as prescribed by West African Examination Council.

The summary of Physics results of all candidates that registered and sat for SSCE between 2008 and 2012 academic sessions were obtained from Ekiti State Ministry of Education, Science and Technology Department, Ado-Ekiti, Ekiti State, Nigeria. The grades 'A1' to 'F9' of the West African Examination Council were used in this study for the analysis. The data for distinction and credit (that is, 'A1'-'C6') were put together and treated as the high quality grades, The grade 'D7' to 'E8' were put together and treated as low quality grades while F9 was treated as failure. Two research questions were answered in the study. Data were analysed using frequency count and percentages.

Results and Discussion

Research Question 1

Will there be any significant difference in academic achievement of students in Physics in Senior Secondary School Certificate Examination between 2007 and 2012?

Table 1

Summary table showing the Analysis of Enrolment, Number and Percentage Passes and Failure of Students in Physics in Senior Secondary Certificate Examination in Ekiti State of Nigeria between 2007 and 2012.

| YEAR | No of candidates registered | GRADE [A1- C6] | GRADE [D7- E8] | GRADE [F9] |
|------|-----------------------------|------------------|------------------|-----------------|
| 2007 | 4435 | 2524 (56.9%) | 1243 (28.0%) | 668 (15.1%) |
| 2008 | 3385 | 1274 (37.6%) | 797 (23.5%) | 1314 (38.9%) |
| 2009 | 4289 | 2296 (53.5%) | 1036 (28.7%) | 957 (17.8%) |
| 2010 | 5459 | 2569 (49.8%) | 1825 (31.6%) | 1065 (18.6%) |
| 2011 | 6859 | 4020 (58.6%) | 1124 (16.4%) | 1715 (25.0%) |
| 2012 | 5081 | 2514 (49.5%) | 1379 (27.1%) | 1188 (23.4%) |

Source: [8].

A cursory look at the Table 1 shows the persistent low academic performance of students in Physics over the year of study in Senior Secondary Schools in Ekiti State. Since credit pass (A1-C6) grade is adjudged a better grade (that is, above average) and usually requested for in the admission process as requirement for a related course of study in tertiary institution, not very many of the candidates were able to score the grade. The analysis of the number of the candidates that scored A1-C6 was as follows: In the year 2007, it was 2524 (56.9%); year 2008 was 1274 (37.6%); also year 2009 was 2296 (53.5%); year 2010 was 2569 (49.8%); also year 2011 was 4020 (58.6%); and finally, 2012 was 2514 (49.5%). It is observed that there was fluctuation in the performance of the students in Physics over the period involved in this study.

Resultantly, there is no significant difference in academic achievement of students in Physics in Senior Secondary School Certificate Examination between 2007 and 2012. At an average, the performances call for urgent attention for better academic performance.

Research Question 2

Will there be any significant difference in the quality of grades of students in Physics in Senior Secondary School Certificate Examination between 2007 and 2012 years?

Table 2

Summary table showing the candidates with high quality grades (A1 – C6), low quality grades (D7 - E8) and those with F9 (failure) grade in Physics between 2007 and 2012.

| YEAR | No of candidates that registered | High Quality Grades [A1- C6] | Low Quality Grades [D7- E8] | Failure [F9] |
|------|----------------------------------|--------------------------------|-------------------------------|-----------------|
| 2007 | 4435 | 2524 (56.9%) | 1243 (28.0%) | 668 (15.1%) |
| 2008 | 3385 | 1274 (37.6%) | 797 (23.5%) | 1314 (38.9%) |
| 2009 | 4289 | 2296 (53.5%) | 1036 (28.7%) | 957 (17.8%) |
| 2010 | 5459 | 2569 (49.8%) | 1825 (31.6%) | 1065 (18.6%) |
| 2011 | 6859 | 4020 (58.6%) | 1124 (16.4%) | 1715 (25.0%) |
| 2012 | 5081 | 2514 (49.5%) | 1379 (27.1%) | 1188 (23.4%) |

Source: [8].

From the analysis in the table 2, it shows there is neither significant increase in the quality of performance nor significant decrease in the performance of Physics students in Ekiti State over the years of study. The only noticeable event is that there is fluctuation over the years in the quality of the grades.

For instance, in year 2007 out of 4435 candidates that sat for SSCE in Physics, 2524 (56.9%) had high quality grades, 1243 (28.0%) had low quality grade and while 668 (15.1%) candidates had failure (F9) grade. Also, in year 2008, out of 3385 candidates that sat for SSCE in Physics, 1274 (37.6%) had high quality grades, 797 (23.5%) had low quality grade and while 1314 (38.9%) candidates had failure (F9) grade. Likewise, in year 2009, out of 4289 candidates that sat for SSCE in Physics, 2296 (53.5%) had high quality grades, 1036 (28.7%) had low quality grade and 957 (17.8%) candidates had failure (F9) grade. In the year 2010, out of 5459 candidates that sat for SSCE in Physics, 2569 (49.8%) had high quality grades, 1825 (31.6%) had low quality grade while 1065 (18.6%) candidates had failure (F9) grade, also year 2011, out of 6859 candidates that sat for SSCE in Physics, 4020 (58.6%) had high quality grades, 1124 (16.4%) had low quality grade and 1715 (25.0%) had failure (F9) grade; and finally, in 2012, out of 5081 candidates that sat for SSCE in Physics, 2514 (49.5%) had high quality grades, 1379 (27.1%) had low quality grade while 1188 (23.4%) candidates had failure (F9) grade. Far below average level (37.6%) was recorded in high quality grade in the year 2008.

Conclusion

The results of the study indicated that there was no substantial rising in the performance of students in the West Africa Schools Certificate Examination with respect to Physics as a subject and that it cannot be categorically stated that there is a fall in the performances of students in West African Certificate Examination in Physics as a subject within the period under study. What emerged however from this study was that in quantitative term, there was fluctuation in academic performance of students

in Physics in Ekiti State of Nigeria over the years of study.

Suggestions and Recommendations

Since the investigation of this research work revealed that there was no fall in students' performance in Physics in West Africa Senior School Certificate Examination over the year 2007 to 2012 in public secondary school in Ekiti state, it is therefore necessary that the Teaching Service Commission (TESCOM) of the State should endeavour to provide opportunities for refresher course for teachers so as to better the academic performance of students in Physics and improved their level of attainment. The Ministry of Education ditto the School Principals should ensure adequate and effective supervision of the teaching of this subject. Government should assist the secondary schools in providing modern laboratories equipments and information communication technology centre in schools.

A similar investigation should be carried out in other subjects offered in School Certificate Examination to compare the trend in academic achievement of Secondary School Students. This is necessary so that controversy over the continuous fall and deterioration in the standard of formal education in the state and in the country at large would be checked.

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