

# An Analysis of the University of Jos Remedial Students' Achievement in Physics (2007-2010)

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DOI: 10.29322/IJSRP.8.12.2018.p8496

<http://dx.doi.org/10.29322/IJSRP.8.12.2018.p8496>

## Abstract

*The achievement of students in Physics in Nigeria has been generally poor as compared to other subjects. This study was initiated to analyze the achievement of University of Jos remedial students in Physics and to establish the factors that lead to the poor achievement. A descriptive survey research design was adopted for the study. The target population was all the remedial students and lecturers for 2007/2008, 2008/2009 and 2009/2010 sessions. Simple random sampling technique was used to select 200 respondents; this includes 198 remedial science students offering physics and 2 lecturers for 2009/2010 session. Two instruments were used for data collection: A questionnaire titled "Remedial Physics Students' Achievement Scale" (RPSAS) consisting seven (7) items in a likert scale format, and students results for three consecutive years namely 2007/2008, 2008/2009, and 2009/2010. Split-half technique using Spearman Brown Prophecy formula was used to check the reliability ( $r = 0.80$ ) of the questionnaire and experts from the faculty of education validated the instrument. Two research questions and one hypothesis guided the study. Data collected were analyzed using descriptive statistics of mean and standard deviations to answer the research questions while the research hypothesis was tested using inferential statistic of Analysis of Covariance (ANCOVA). The finding shows that there is low achievement in physics compare to other subjects offered at remedial level and the contributing factors are large class size and teaching method among others. It was recommended that Physics teachers should employ student centred methods/strategies to improve the achievement level in Physics.*

**Keywords;** Factors, Achievement, Physics, and Remedial

## Introduction

To transit from one level of education to the other, students have to undergo selection or achievement tests or examinations to determine their academic suitability for the level they are transiting into (Suwa, 2013). In most of the public schools in Nigeria written test symbolized by question paper, and oral examination remains one of the most significant tool of assessment, but in sciences other measures of assessment like practical examinations are also used.

The achievement of students in any of these examinations determines their placement in the next level of education. In Nigeria, to transit from secondary level of education to the tertiary level, students are required to take public examinations from West African Examination Council (WAEC), National Examination Council (NECO), and/or Joint Admission Matriculation Board (JAMB) to enable them gain entry to tertiary institutions.

<http://dx.doi.org/10.29322/IJSRP.8.12.2018.p8496>

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The entry requirement of most tertiary institutions is at least five (5) credits and above in English, Mathematics and three (3) other subjects depending on the discipline the student wants to enrol for (Danjem, 2018). Students that want to study science courses are required to have at least credit pass in Physics, Chemistry, Biology or any of the science related subjects. Physics plays an important role in all the natural sciences (Weidner & Brown, 2018). Physics is a major requirement for courses such as medicine, engineering or any of the sciences because physics is regarded as the bedrock of sciences.

Physics is the study of matter and energy and their interaction. The study of physics is very important because it generates/creates basic knowledge needed for technological advancement. Physics is an essential part of the educational system and of an advanced society (Samy, 2015). Physics is perceived to be a difficult course because of the abstract nature of some of the concepts (Adeyemo, 2010). As a result of the difficulty of studying physics many students fail the subject. Results from external examinations have shown the extent of poor achievement of students in physics in Nigeria (Asikhia, 2010; WAEC, 2012) see Table 1. It is understandable that many students will simply choose less challenging subjects at school.

**Table 1: Students’ enrolment and achievement in May/June WAEC in physics (2008–2012)**

Year	Total entry	% Credit pass (A1-C6)	% Fail (D7-F9)
2008	105,256	43.60	56.40
2009	158,952	46.40	53.60
2010	149,983	53.40	46.60
2011	253,199	31.06	68.94
2012	253,058	34.46	65.54

Source: Statistics Section; West African Examination Council (WAEC) National Office, Lagos, Nigeria.

Some of the factors responsible for this low achievement are poor background of students in Physics, high students’ ratio compare to the number of lecturer, teaching/learning methods, poor entry ability of students (Emmanuel, 2013; Mekonnen, 2014; WAEC chief examiners’ report on Physics, 2015). Some tertiary institutions introduced remedial programmes to enable students remedy deficiencies in any of the five subject required by those institutions to enable the students gain admission into 100 level to study their course of choice.

Remedial is a programme assigned to assist students in order to achieve expected competencies in core academic skills. Post secondary remedial education is a large and growing segment of higher education in Nigeria. It provide opportunities to rectify disparities generated in secondary education and helps the participants to acquire the minimum skills deemed necessary for functional participation in the higher education.

University of Jos remedial science department was established 1979 in the faculty of natural science with the aim of providing teaching facilities for remedying the deficiencies of secondary school education, with particular reference to science based subjects in preparatory for university admission. Any candidates who wish to study at the University of Jos remedial Science department is required to posses WASC/SSCE/NECO/GCE ‘O’ Level result(s) or its equivalent in the following Subjects: Mathematics or Further Mathematics, English Language, Chemistry, Physics and either Biology or Agric Science or Geography or Technical Drawing or Fine Art to be eligible for admission. The Pre-Degree Science course is strictly for science students who want to study Medicine, Pharmacy, Nursing, Medical Lab Science, Biochemistry, SLT or any single honourdegree course in faculty of natural sciences and other science disciplines.

Students at this level are made to offer five (5) subjects from the selected seven core science subjects, in line with the National Policy on Education (Federal Ministry of Education, 2008). They are allowed to take four core subjects as English Languages, Mathematics, Chemistry and Physics with an option from Biology, Technical Drawing, and Geography depending on the course they intend to study after remedial programme. Physics is one of the core subjects offered in University of Jos remedial science department and a subject of interest in this research work. Despite the remedial given to students on physics, students results still shows low achievement in Physics, this necessitated the need for this study.

### **Statement of the Problem**

In spite of all the advantages derived and the recognition given to physics as one of the core science subjects and as a pivot to technological and economic development, there is however low achievement in students' achievement in Nigeria. The phenomenon of low achievement among Physics students in Nigeria is a matter that has become a source of worry to successive governments and major stakeholders in the education sector in the country.

Over the years, many students that sat for the May/ June and November/December West African Examinations Council (WAEC) and National Examination Council (NECO) recorded mass failure in Physics. From Table 1, the highest percentage passed (A1-C6) in WAEC (May/June) from 2007 to 2010 for Physics was 53.4%; this implies that more than 46% of students failed (D7-F9) each year for five (5) consecutive years.

If the persistent poor achievement of students in physics is not addressed, students will find it difficult to gain admission into tertiary level of education to study science related courses. The persistent decline in students' performance in public examinations is not only frustrating to the students and parents, it also affects the technological advancement of the county.

The problem has to a large extent been attributed to high students' ratio compare to the number of lecturer, teaching/learning methods, and poor entry ability of students. e.t.c. during the 2009/2010 academic section, remedial sciences in University of Jos recorded 1062 students running two sections concurrently. This implies that a teacher lectures about 531 students at a time with the help of public address system. This study hopes to analyze the achievement level of remedial students in physics compared to other subjects, and also determine the factor(s) responsible for achievement in physics.

### **Objective of the Study**

The objective of the study is to analyze the University of Jos remedial students' achievement in physics (2007-2010). Specifically, the study sought to determine:

1. the achievement level of university of Jos remedial students in Physics from 2007-2010,
2. the factors responsible for remedial students' achievement in Physics, and
3. the mean scores obtained by remedial students in physics and compared with their mean scores in other subjects offered at remedial level.

Two research questions was raised to guide the study

1. What is the achievement level of university of Jos remedial students in Physics from 2007-2010? and
2. What are the factors responsible for remedial students' achievement in Physics?

One null hypothesis was formulated to guide the study at 0.05 level of significant

1. There is no significant difference between the University of Jos remedial students' mean achievement in Physics and their mean achievement in other subjects offered at remedial science department

## Method

The study employed descriptive survey research design in analyzing data for the purpose of this research work. The population comprises 1050 students for 2007/2008 section, 819 students for 2008/2009 section, 1062 students for 2009/2010 section and 32 lecturers were used for the purpose of this study. Simple random sampling was used to select 200 respondents; this includes 198 remedial science students offering physics and 2 lecturers.

Two instruments were used for data collection:

1. A questionnaire titled "Remedial Physics Students' Achievement Scale" (RPSAS) consisting seven (7) items placed alongside the response format Strongly Agreed (SA), Agreed (A), Disagreed (D), and Strongly Disagreed (SD). The weightings of the response were SA = 4, A = 3, SD = 2, and SD = 1. The bench mark of 2.5 was chosen as basis for agreement or disagreement for each item. The instrument was validated by expert in science and technology education in University of Jos. Fifty copies were trial tested on students who are not part of the study; data collected were analyzed with spearman prophecy method to determine the reliability of 0.80.
2. Students results for three consecutive years namely 2007/2008, 2008/2009, and 2009/2010.

The mean score, percentages, and standard deviations (S.D) were used to answer the research questions while the research hypotheses was tested using inferential statistic of Analysis of Covariance (ANCOVA) formulated to guide the study.

## Results and Discussion

### Research Question 1

What is the achievement level of university of Jos remedial students in Physics from 2007-2010?

**Table 2: Summary of achievement level of remedial science students' in physics in University of Jos.**

S/No	Session	No. of Students	Mean	Percentage
1.	2007/2008	1050	43.52	43.52
2.	2008/2009	819	46.31	46.31
3.	2009/2010	1062	46.18	46.18
Average mean/percentage			45.34	45.34

Table 2 shows a meanachievement of 43.52 for 2007/2008 session, a mean achievement of 46.31 for 2008/20098 session, and a mean achievement of 46.18 for 2009/2010 session. The achievement level of the University of Jos students for three consecutive

years is found to be 45.34 percent. The mean scores for all the sessions can be rated as 'D' which is below average. The low achievement of students in Physics confirmed with WACE Chief Examiner's Report (2015) and Asikhia (2010). According to Adeyomo (2010), Physics is perceived to be a difficult course because of the abstract nature of some of the concepts. As a result of the difficulty of studying physics many students fail the subject. This low achievement has been traced to many factors which were answered in research question 2.

## Research Question 2

What are the factors responsible for remedial students' achievement in Physics?

**Table 3: Analysis of the factors responsible for remedial students' achievement in Physics.**

S/No	Statements	Means	S.D	Decision
1.	Large classes	3.85	0.49	Agree
2.	Poor background of students in physics	3.46	0.91	Agree
3.	Teaching method	3.69	0.60	Agree
4.	Overload of work for lecturers	2.56	1.05	Agree
5.	Links between class lecture and practical activities	3.30	0.83	Agree
6.	Students participation during lecture	3.08	0.85	Agree
7.	Entering ability of student	3.04	0.96	Agree
Sectional means/std. deviation		3.28	0.81	Agree

Table 3 shows that the respondents agreed with all the listed statements on the factors affecting University of Jos remedial students' achievement in Physics, none was found to be the negative. The overall mean for the items in respect to the respondents from table 3 was 3.28 which indicate that all the factors listed affects students' achievement in Physics.

Large class sizes has the highest mean of 3.85, meaning that it's the most serious factor affecting students' achievement in Physics at remedial level. This is evidence from the fact that under the three sessions under investigation was overpopulated. In 2007/2008 section, there were 1050 students; 2008/2009 session, 819; and 1062 students for 2009/2010 session which is far higher than the speculated student-teacher ratio in the National Policy on Education (2004). The finding agrees with Edomwonyi-Out and Aavaa (2011) who identified class size as a major hindrance for effective teaching and learning. It disagrees with Owoeye and Yara (2011), who found no significant effect of class size on achievement.

Other factors such as poor background of students in physics, teaching method, overload of work for lecturers, links between class lecture and practical activities, students' participation during lecture, and entering ability of students also affect students' achievement in Physics. While other factors cannot be ignored, teaching method greatly affects students' achievement in Physics. Due to large class size, many lecturers use the lecture teaching method which is teachers' centred not minding its suitability. Studies have shown that if teaching-learning strategies are improved, achievement can be enhanced (Elvis, 2014; Raimond, 2012). Research studies also emphasized that teachers should shift the present emphasis on learning facts to the use of effective critical thinking as the primary tool for learning. The objectives of physics include fostering conceptual understanding and development of several important cognitive, psychomotor, attitudinal and affective abilities. Therefore, teaching and learning of

physics is inadequate unless students gain a significant “hands-on-minds-on” experience which can only be achieved with the use of student centred method.

### Hypothesis

There is no significant difference between the University of Jos remedial students’ mean achievement in Physics and their mean achievement in other subjects offered at remedial science department.

**Table 4: Summary of the Analysis of Variance at alpha level of 0.05**

Session/Mean	Phy	Eng	Maths	Chem	Bio	TD	Geo	F <sub>cal</sub>	F <sub>critica</sub>	Decision
2007/2008	43.52	46.67	42.89	45.09	43.78	47.22	44.08	16.82	2.10	Rejected
2008/2009	46.31	54.10	39.56	46.55	53.43	51.21	59.69	96.18	2.10	Rejected
2009/2010	46.18	48.37	44.08	43.52	47.87	43.87	54.03	17.98	2.10	Rejected

Table 4 shows the summary of the Analysis of covariance at alpha level of 0.05 for three sessions, F<sub>cal</sub> was greater than F<sub>tab</sub> for the three sessions. Therefore, the null hypothesis was rejected. Hence, there is significant difference between the University of Jos students’ mean achievement in Physics and their mean achievement in other subjects offered at remedial level.

### Conclusion

Based on the finding, this study concludes that:

1. Remedial science students in University of Jos have low achievement in Physics.
2. Large class size, poor background of students in physics, teaching method, overload of work for lecturers, links between class lecture and practical activities, students participation during lecture, and entering ability of students are the factors that affects students achievement in Physics.
3. The mean score of students varies from one subject to the other.

### Recommendation

Based on the findings, the following recommendations were made:

1. Physics teachers should employ student centred methods/strategies to improve the achievement level in Physics.
2. The factors affecting students’ achievement in Physics should be looked into by relevant authorities and strategize ways to combat them.

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