



EVALUATING AND COMPARING THE ACADEMIC PERFORMANCE OF COMPUTER SCIENCE GRADUATING STUDENTS BETWEEN 2016 – 2019

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Abstract

This study aimed at evaluating and comparing the academic performance of computer science students in tertiary institutions in Nigeria using Ekiti State University, Oyo Campus as case study. The researcher adopted examination results as the instrument for the data collection. Descriptive research survey design was used for the study with Chi square (X^2) analysis. The data collected were presented in tables and analyzed using grade points, frequencies and bar chart. Findings revealed that Chi square Cal. value (54.74) is greater than the chi tab (21.03). The null hypothesis which states that there is no significant decrease in the academic performance of computer science 400level students between 2016 and 2019 is hereby rejected. Therefore, the alternative hypothesis which states that there is a significant decrease in the academic performance of computer science students in 2016 – 2019 is accepted. The result obtained revealed that students in 2016 academic session performed better than other years in terms of distinction attainment and decrease in low grades. The study showed that, poor and inadequate physical facilities, obsolete teaching style, moral decadence of the students such as cybercrime has greatly contributed to the students' poor academic performance. It is therefore recommended that professional computer lecturers with many years working experiences should be employed to lecture, lecturers should be encouraged and motivated by paying their due promptly, lecturers should be mandated to use internet and information communication technology (ICT) facilities and supervision of lecturers through Internal Quality Assurance (IQA) body to ensure effective discharge of duty.

Keywords: *academic performance, computer science, students, lecturers, ICT and IQA*

Introduction

The academic performance of students is the ultimate aspiration of every set up educational institution. This concerns with how students deal with their studies and how they cope with different tasks given to them by their lecturers at the end of every academic year. Education plays a vital role in the acquisition of knowledge and skills because it helps any society fashion and model individuals to function well in their environment (Tshewang, 2015). Every student is expected to have desire and goal to come out in flying colour at the end of his study. So, goal orientation is one of the concepts that has emerged in education over the last few decades and also is one of the most important concepts regarding learning in any educational setting (Naser and Fatemeh, 2012). Academic achievement in terms of GPA or grades is one tool to measure students' academic performance. Based on the Center for Research and Development Academic Achievement (CRIRES) (2005) report, academic achievement is a construct to measure students' achievement, knowledge and skills. This measurement is holistically based on the students' capability related to public and education skills. In the measurement of such academic achievement, educators use different types of assessment which is a continuous process that brings some valuable information about the learning process (Linn and Gronlund, 1995). One of the major means of assessing students is through examination. An examination is a formal test that you take to show your knowledge or ability in a particular subject, or to obtain a qualification. Hargis (2003) commented that the grading process is supposed to be motivating and provide goals. Grading has the additional benefit of providing records of students' academic achievements (Haladyna, 1999). Meanwhile, the major task of each tertiary institution in the field of computing and information technology is to offer high quality and relevant education in order to produce skillful and competent graduates. Although it is a generally belief that computer science course is one of the most difficult courses in tertiary institutions because it is too abstract and requires higher analytical and problem solving skills. Thus, the students' academic progress needs to be examined to improve the performance of struggling students in computer science course.

Researchers have argued that when learning programming, continuous practice is compulsory to ensure that the knowledge is sustained (Chen, Chang, & Wang, 2008; Hwang, *et al.*, 2008). Moreover, actively and periodically

scheduled learning is important for students to reach high levels of achievement (Hwang & Wang, 2004). Nevertheless, many computer science students cannot grasp the most fundamental concepts of programming and are thus unable to produce even the most basic programs (Eckerdal, 2009). Learning strategy, lack of study, and lack of practice have been identified by researchers as the fundamental attributes of success or failure in a computer programming course (Hawi, 2010; Hwang, Wu, Tseng, & Huang, 2011).

Statement of the Problem

Learning computer science is a complex task since computer science requires new ideas in thinking and creative skills in problem solving. The average of students' academic performance in computer science course for over the years in undergraduate programme of computing and information technology in many universities and polytechnics can be concluded as poor compared to other courses in the field. However, the percentage of students with poor academic performance every semester is controvertible and do not support the mission of many academic programmes. This affects the quality of education the academic programmes are trying to build up. Thus, improving the academic performance of students is part of the continuous effort to uplift the standard of education in the area of computing and information technology and this can only be labored for if the current performance is related to the previous performances.

Objectives of the Study

The objectives of the study are;

1. To identify the behaviours of students in computer science courses
2. To ascertain the academic performance of students on computer science
3. To recommend improvement strategies to the students' performance in computer science courses.

Research Hypotheses

For the successful completion of the study, the following research hypotheses were formulated by the researcher;

H₀: Students are not performing well on Computer Science courses

H₁: Students are performing well on Computer Science courses

Significance of the Study

The study will be very significant to computer science students and policy makers. The study will give a clear insight on the comparison of academic performance of students in computer science in the tertiary institution from 2016-2019. The study will also serve as a reference to other researcher that will embark on related topic.

Scope of the Study

The scope of the study covered comparison of academic performance of students in computer science in tertiary institution from 2016-2019.

Research Methodology

Research design

The researcher used descriptive research survey design in building up this work. The choice of this research design was considered appropriate because of its advantages of identifying attributes of a large population from a group of individuals. The design was suitable for the study as the study sought to comparison of academic performance of students in computer science in the tertiary institution from 2016-2019.

Sources of data collection

The researcher used secondary data which is the result of 400 levels students from 2016-2019 which were collected from computer science department of Ekiti State University, Oyo campus with due permission from the Head, Computer Science Department.

Population of the study

Population of the study is the information on the scores and grades of four hundred level (400L) computer students between 2016 and 2019 in order to compare their academic performance in Ekiti State University, Oyo campus.

Sampling procedure

Sample is the set grading sheets which constituted the result obtained in each of their registered courses as population sampling.

Method of data analysis

The data collected was not an end in itself but it served as a means to an end. The end being the use of the required data to understand the various situations it is with a view to making valuable recommendations and contributions. To this end, the data collected has to be analysed for meaningful interpretation to come out with some results. It is for this reason that the following methods were adopted in the research work for the analysis of the data collected. For a comprehensive analysis of data collected, emphasis was laid on the use of absolute numbers frequencies of responses. The chi square statistical method of data analysis was used to test the hypotheses.

GRADE FREQUENCY FOR 2016

COURSE CODE	A	B	C	D
CSC 411	6	25	30	9
CSC 413	7	20	33	10
CSC 415	6	30	25	9
CSC 417	7	33	20	10
CSC 419	4	25	35	8
CSC 412	8	24	36	2
CSC 414	8	25	30	7
CSC 416	9	28	30	3
CSC 418	7	30	31	2
TOTAL	62	240	270	60

GRADE	TOTAL SCORE	POINT
A	62	5
B	240	4
C	270	3
D	60	2

$$A = 62 \times 5 = 310$$

$$B = 240 \times 4 = 960$$

$$C = 270 \times 3 = 810$$

$$D = 60 \times 2 = 120$$

2,200

The table above shows frequency of students in 2016. A total number of 62 students had A in computer course, 240, 270 and 60 had B, C and D respectively. A total of 2,200 scores were recorded after calculating the grade points.

GRADE FREQUENCY FOR 2017

COURSE CODE	A	B	C	D
CSC 411	2	36	24	8
CSC 413	3	26	37	4
CSC 415	2	20	43	5
CSC 417	2	10	30	20
CSC 419	3	16	20	31
CSC 412	2	25	39	9
CSC 414	4	15	30	21
CSC 416	2	22	30	16
CSC 418	2	13	35	20
TOTAL	22	183	288	134

GRADE	TOTAL SCORE	POINT
A	22	5
B	183	4
C	288	3
D	134	2

$$A = 22 \times 5 = 110$$

$$B = 183 \times 4 = 732$$

$$C = 288 \times 3 = 864$$

$$D = 134 \times 2 = 268$$

$$\underline{\underline{1,974}}$$

The table above shows frequency of students in 2017. However a total number of 22A was recorded in a computer course, 183B, 288C and 134D respectively.

GRADE FREQUENCY FOR 2018

COURSE CODE	A	B	C	D
CSC 411	2	1	35	20
CSC 413	2	2	38	7
CSC 415	1	1	39	15
CSC 417	4	2	28	13
CSC 419	2	3	26	12
CSC 412	1	2	37	11
CSC 414	3	2	33	13
CSC 416	2	2	20	26
CSC 418	2	3	20	27
TOTAL	19	18	276	144

GRADE	TOTAL SCORE	POINT
A	19	5
B	189	4
C	276	3
D	144	2

$$A = 19 \times 5 = 95$$

$$B = 18 \times 4 = 72$$

$$C = 276 \times 3 = 828$$

$$D = 144 \times 2 = 288$$

$$1,283$$

The table above shows frequency of students in 2018. A total number of 19 students had A in computer course, 18, 276 and 144 had B, C and D respectively. A total of 1,283 scores were recorded after calculating the grade points.

GRADE FREQUENCY FOR 2019

COURSE CODE	A	B	C	D
CSC 411	1	34	23	10
CSC 413	3	20	33	14

CSC 415	2	29	39	7
CSC 417	1	25	34	10
CSC 419	1	20	39	10
CSC 412	1	29	32	8
CSC 414	--	39	20	11
CSC 416	2	40	19	7
CSC 418	1	36	28	5
TOTAL	12	272	267	82

GRADE	TOTAL SCORE	POINT
A	12	5
B	272	4
C	267	3
D	82	2

$$A = 12 \times 5 = 60$$

$$B = 272 \times 4 = 1,088$$

$$C = 267 \times 3 = 801$$

$$D = 82 \times 2 = 164$$

$$\underline{\underline{2,113}}$$

The table above shows frequency of students in 2019. A total number of 12 students had A in computer course, 272, 267 and 82 had B, C and D respectively. A total of 2,113 scores were recorded after calculating the grade points.

The performance was a bit good in 2016 but declined in 2017 – 2018 but there was an improvement in 2019.

Furthermore in 2016, 270 students had credit, 288 in 2017, 276 in 2018 and 267 in 2019

Meanwhile the credit level rises from 2017 and declined again in 2018 and 2019 to 276 and 267 students respectively.

In 2016, 60 students had grade D, 134 in 2017, 144 in 2018 and 82 in 2019 that Mean 2016 records the lowest grade, then 2019, 2017 and 2018 respectively.

The session was measured using the grade points

In 2016 the grade point is 2,200 which show the highest of the four sessions.

In 2017 the grade point is 1,974 which indicates the third position

In 2018 the grade point is 1,283 which is in fourth position which has the lowest performance. In 2019 the grade point is 2,113 which is in second position that performed better.

CUMULATIVE GRADE FROM 2016- 2019

YEAR	A	B	C	D
2016	62	240	270	60
2017	22	183	288	134
2018	19	18	276	144
2019	12	272	267	82
TOTAL	115	713	1,101	420

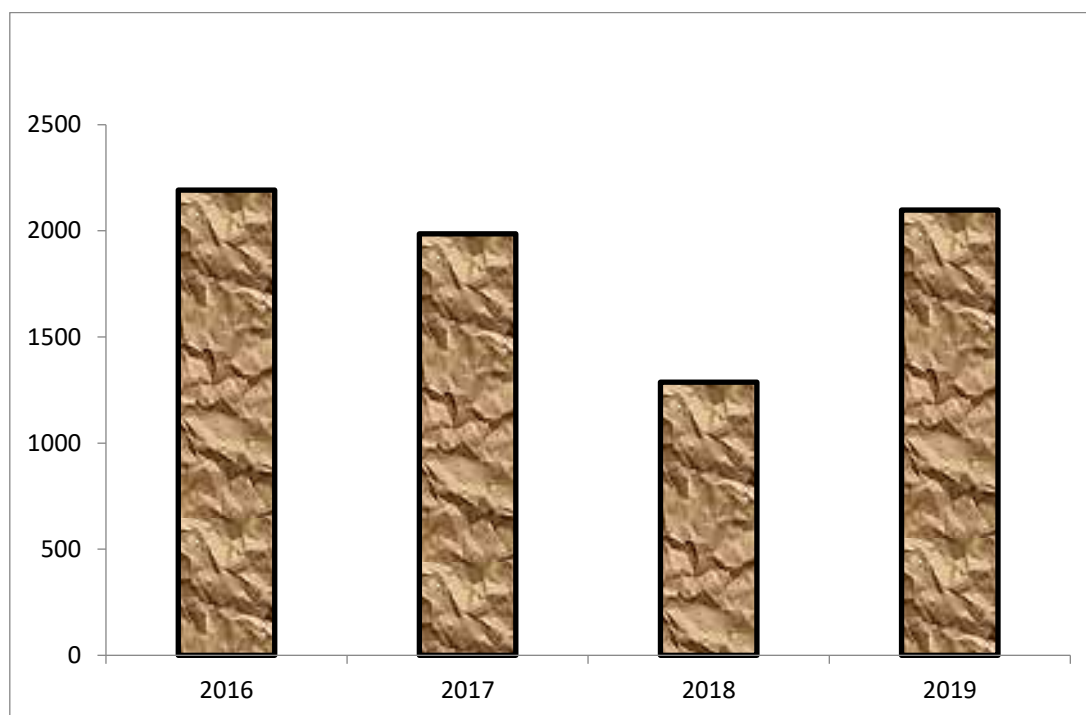
O	E	$(O-E)^2$	$\frac{(O - E)^2}{E}$
115	28.75	1105.56	38.45
713	221.25	280.56	1.27
1,101	274	16	0.058
420	106	2116	19.96

GROUP	DF	χ^2 - Cal	χ^2 - tab	DECISION
STUDENT PERFORMANCE	12	59.74	21.03	REJECT NULL HYPOTHESIS

Since the Chi Cal (54.74) is greater than the chi tab (21.03). The null hypothesis which states that there is no significant decrease in the academic performance of computer science 400level students between 2016 - 2019 is hereby rejected. Therefore the alternative hypothesis is accepted that there is a significant decrease in the academic performance of computer science students 2016 – 2019

Conclusively, the performance of students declined from 2016 – 2018 and a little better in 2019. It was discovered that 2016 has the highest number A grades and the lowest number of D grades

Figure 1: The Bar Chart diagram shows the performance of students at each session.



Summary

The result obtained revealed that students in 2016 academic session performed better than other years in terms of distinction attainment and decrease in low grades. The result obtained also revealed that students in 2017 perform a bit better than other consecutive years. The low level of students performances in 2018 might perhaps be attributed to what we can described as poor staffing in schools and frequent absence of student from school, truancy there was great improvement in the year 2019 due to readjustment and improvements made from the previous year which includes good staffing and better orientation to the students.

Conclusion

The study concludes that, poor and inadequate physical facilities, obsolete teaching, poor school facilities and moral guiding provision contribute to the student poor academic performance. Also, classroom learning environment in schools were poor which has a significant impact on students' academic performance.

Recommendations

Based on the findings of the study the following recommendations were made:

- (i) Professional computer lecturers with many years working experiences should be employed to lecture with standard computer laboratory for regular practicals.
- (ii) Lecturers should be encouraged and motivated to work hard by paying their allowances and other incentive promptly.
- (iii) Total usage of internet and information communication technology (ICT) by both the lecturers and the students in schools.
 - ❖ Recognition of the weak ones among the students and treat them accordingly to overcome their emotional problems.
 - ❖ Adequate supervision through Internal Quality Assurance (IQA) body to ensure that the lecturers discharge their duty effectively.

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