



DIFFERENCES IN GRADUATION AND PERSISTENCE RATES AS A FUNCTION OF ENTRY REQUIREMENTS INTO DEGREE PROGRAMMES AT DEPARTMENT OF SCIENCE EDUCATION, FEDERAL UNIVERSITY OF KASHERE

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Abstract

This study examined the differences in graduation and persistence rates as a function of entry requirement into degree programmes at Department of Science Education, Federal University of Kashere, Gombe State. The study adopted a causal comparative design. The population of the study comprised all the one hundred and eleven (111) science education students from 2016 to 2018 academic session at Department of Science Education, Gombe State. All the 111 students in the department were purposively selected for the study because of the management size of the population and they were easily accessible. A structured questionnaire titled: Students' Enrolment in Science Disciplines Questionnaire (SESDQ) was used for the collection of data from the participating students' files. Data collected were analyzed with the used of descriptive statistics and Multivariate Analysis of Variance (MANOVA). The findings revealed that students with Direct Entry (DE) qualification had higher graduation rate than their counterparts UTME(SSEC/NECO) entry qualification. Conversely, Students with UTME entry qualifications had higher persistence rates than their colleagues with direct entry qualifications. The department should organize extramural coaching for UTME students and tutorials should be organized in the department, among other strategies that could help students to graduate and persistent in their university degree programmes at the stipulated time.

Keywords: Entry Requirements, Graduation Rates, Persistence Rates, Science Education.

Introduction

Nigerian youths and the adult population attach much attention on university education (Federal Government of Nigeria (FGN), 2020). Most people in Nigeria who have the potential for university education show desperation in their efforts to gain admissions into the highly limited available spaces. Seven thousand five hundred and seventy-nine (7579) candidates applied for admission into various degree programmes in Federal University of Kashere only 2185 were offered admission in 2019/2020 academic session (Federal University Kashere, 2020). This obsessions and preference for university education as against other forms of higher education such as colleges of education, polytechnics and others which also offer degree programmes has placed enormous pressure on the placement and management of universities in Nigeria. Federal University of Kashere, Gombe State was established alongside with other federal universities in Nigeria in 2011 by former

president Goodluck Jonatan. Increasing access to university education has long been the goal of Federal University of Kashere since its establishment. The convenient location of Federal University of Kashere has allowed many more students to enroll and attend the university than would otherwise possible (National University Commission, Federal Government of Nigeria (FGN), 2018). Minister of Education Federal Republic of Nigeria remarked that enrolment in the Nigerian universities is on the increase yearly as a result of graving for white collar job (FGN, 2020). Admission refers to the acceptance of a candidate, on meeting some basic criteria, to study a programme at any level of an educational institution. Modes of admission, otherwise known as entry modes refer to the various means through which a candidate may be admitted into a first-degree programme. In Nigeria, there are various modes of admissions into bachelor degree programmes. These



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include admissions through the Unified Tertiary Matriculation Examination (UTME), Direct Entry, and the various Non-Degree programmes which have been referred to as preliminary studies programmes

Before the advent of the UTME, Nigerian universities had autonomy to admit students. Each school conducted its local entrance examinations. The evil effects of such independent entrance examinations included tests with varying difficulty, formats, durations, and items specifications. Also, this autonomy gave rise to some privileged students gaining multiple admissions at the expense of the less financially privileged ones who could not afford to travel to various schools in different parts of the country to write examinations (Kpolovie, & Ekwebelem, 2013). The admission process seemed to be wasteful to an extent because candidates who had the financial means purchased many forms from different universities; and the university officials were expected to travel to different parts of the country to conduct examinations, hence the introduction of Joint and Matriculation Board (JAMB) in 1977 responsible for conducting University Tertiary Matriculation Examination (UTME).

JAMB have been saddled with the responsibility for admitting candidates to first degree in all Nigerian Universities and degree awarding institution in Nigeria. Candidates seeking admission to the Federal University of Kashere therefore, sent their application to JAMB for admission. A candidate is expected to write tests in three UTME subjects relevant to his course of study with a compulsory Use of English Language making a total of four subjects. The multiple-choice form type of examination is composed of a stem, a key, and distractors. The key and the distractors are collectively known as the options.

Admission requirement into Nigerian university, candidate requires to possess a minimum of five O-level subjects at credit passes in relevant areas. For a student to graduate, he or she is required to have passed with a minimum CGPA of 2.5 or an average of 40%. Just like other universities programmes, the Continuous Assessment (CA) constitute

40% or 30% as the case may be of the scores while examination is 60% or 70% respectively. On completion of the Nigerian Certificate in Education (NCE) and diploma in education from other government recognized institutions, candidate with a good result may be granted Direct (DE) entry through JAMB to 200 level of degree programme in the relevant discipline. A minimum requirement of JAMB is also however maintained as in the case of Diploma and NCE certificates. One may ask what is the graduation and persistence rates of the admitted candidates to Federal University of Kashere, Gombe State in spite of the entry requirement and candidates writing standardized examinations?

Texas Higher Education Coordinating Board (THECB) (2015) refers to graduation as the percentage of a given college-entering cohort of degree seeking students who graduate or successfully pass out in a specific period of time, normally three and four years respectively in educational institutions. Persistence is the rate at which students persist in higher education, often as measured by the percentage of students who continue in higher education from one year to the succeeding year (THECB, 2015). Astin (2013) believed that students' graduation and persistence in a course depends on two major factors thus: what they were before they gained admission into the college and the college environment. He identified several variables that described students' characteristics before gaining admission into college thus: age, gender, religion, ethnicity, high school grade and admission test score. Others are variables of the college environment to include college characteristics, students peer group characteristics, faculty characteristics and major fields of study.

Federal University of Kashere strictly adhere to the JAMB guidelines of admitting candidates to various programmes in the university. However, it has been observed that most candidates come in with good qualifications, meet both JAMB and the university cut off points, good number of admitted students are being withdrawn, majority having a lot of carry overs over to add to their yearly academic loads and some having experience of spill over and

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spending extra years to graduate (Federal University of Kashere, 2020). Some withdrawn students even refuse to go back home to their parents and remain in Kashere collecting money from their parents pretending to still be students. This has been a great concern to the university management and scholars in the university. This study therefore, focused on the differences in graduation and persistence rates of students at Department of Science Education Federal University of Kashere, Gombe State from the year 2016 through to 2018 academic years.

A study carried out by Fike and Fike (2008) on the variables determining the retention of first-year students in community college in Texas discovered that students with developmental education to make up as entry requirement to community college persisted and stayed in the college than others students without developmental education.

Kimberly and John (2014) carried out a study on the differences in graduation and persistence rates at Texas Community colleges as a function of developmental education for enrolment, observed that graduation and persistence rates at Texas Community Colleges in the 2009 through the 2013 academic years as a function of developmental education were low. The percentage of students who graduated and persisted after developmental education was statistically significantly lower than the percentage of students who were not required to take developmental education courses. Similarly, Clark, Slate, Moore and Bames (2013) in a study on Black, White and Hispanic students who were to take developmental education (an entry qualification) and who were not required to take developmental education observed that those with developmental education as entry qualification had lower rate of graduation than those who did not take developmental education as entry requirement for admission.

Nathaniel (2014) in a study on predictive validity of entry qualifications on student's final year grade among physics students in Gombe State University observed that, there was significant relationship between students' entry qualifications and their overall academic

grade at the University. In a related study, Okedara (2015) investigated the effect of students' entry qualifications on persistence rate in mathematics programme in Osun and Oyo State Colleges of Education noticed that students with Unified Tertiary Matriculation Examination (UTME) persisted and continued in their programmes than those with remedial entry qualifications.

Kimberly and John (2014) in the similar study of differences in graduation and persistence rates at Texas Community colleges as a function of developmental education enrolment observed that graduation and persistence rates at Texas Community Colleges in the 2009 through the 2013 academic years as a function of developmental education were low. The percentage of students who persisted were higher in favour of those who took developmental education. Zepke (2015) carried a study on students' engagement in higher schools and discovered higher persistence rate of students with those who were engaged in developmental education entry qualifications than those who were not engaged. Naylor (2017) observed in a related study of variance of persistence rates of higher education students with different entry qualifications among first year students in community college found out that those with pre-degree programmes had higher persistence rates than those with direct entry qualifications.

Statement of the Problem

The admission requirement and guidelines into Federal University of Kashere, Gombe are clearly stated in the students' handbook which is in conformity with the JAMB guidelines. Students have been admitted to various programmes in the university based on the JAMB guidelines. Despite using Joint Admission and Matriculation Board (JAMB) (2016) standard and guidelines in the entry qualification for admission into Federal University of Kashere and Department of Science Education in particular, it has been observed that most candidates come in with good qualifications yet, good number of admitted students are being withdrawn, majority having a lot of carry overs over to add



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to their yearly academic loads and some having experience of spill over (spending extra years to graduate). This study, therefore, examined graduation and persistence rates of students at Department of Science Education, Federal University of Kashere, Gombe State as a function of entry qualification enrollment.

Purpose of the Study

The purpose of this study is to investigate the differences in graduation and persistence rates of students at Department of Science Education Federal University of Kashere, Gombe State from the year 2016 through to 2018 academic years. Specifically: to investigate the effect of entry qualification enrolment on graduation rates of students at Department of Science Education, Federal University of Kashere and to find out the effect of entry qualification enrolment on persistence rates at Department of Science Education, Federal University of Kashere.

Research Questions

In order to achieve the purpose above, these questions were raised

1. What is the effect of entry qualification enrollment on graduation rate of students at Department of Science Education Federal University of Kashere?
2. What is the effect of entry qualification enrollment on persistence rates of students at Department of Science Education Federal University of Kashere?

Research Hypothesis

H₀₁: There is no significant effect of entry qualifications of enrollment of students on the combined dependent variables of graduation and persistence rates at Department of Science Education, Federal University of Kashere.

Methodology

The study employed a causal comparative design (Johnson & Christensen, 2012). Archival data were used to determine the extent to which differences were present in graduation and persistence rates as a function of Unified Tertiary Matriculation Examination (UTME)

and Direct Entry (DE) status or enrollment at Department of Science Education in the 2016 through 2018 academic years. The use of archival data in which the independent variables and the dependent variables had already occurred necessitated the use of a causal comparative research design (Johnson & Christensen, 2012).

The population of this study comprises of one hundred and eleven (111) science education students at Department of Science Education from 2016 through 2018 academic years. All the one hundred and eleven (111) students from Science Education Department, participants were selected in the study through purposive sampling techniques because their number was moderate to handle and easily accessible.

One research instrument was developed by the researchers and used for data collection titled Students' Enrolment in Science Disciplines Questionnaire (SESDQ). The instrument collected students' enrolment, graduation and persistence rates in science and mathematics programmes in the Department of Science Education, Faculty of Education from the year 2016-2018 academic sessions.

The instrument was given to experts in Test and Measurement and Science Education Departments at Federal University of Kashere, Gombe State to ensure that the instrument collected the required information. The reliability of SESDQ was ascertained through the use of Cronbach alpha coefficient and was computed to be 0.81 and which was considered high enough for the instrument to be used for the study. Data were obtained from students' files from both the head of department and departmental examination office with the permission of the head of department, Science Education Department, Federal University of Kashere.

Before carrying out inferential statistics to determine whether there was statistically significant difference between graduation and persistence rates at Department of Science Education, Federal University of Kashere, Gombe State from 2016 through 2018 academic year as a function of entry qualification, checks were conducted to determine the extent to which the data were

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distributed normally. For the coefficients of standardized kurtosis (the kurtosis divided by its standard error), the four coefficients were within the range of normality, ± 3 (Onwuegbuzie & Daniel, 2002; Brace and Kemp, 2006). Besides, the assumption for the Box's Test of Equality of Covariance was achieved. In addition, Levene's Test of Equality of Error Variances indicated that the assumptions were achieved for the graduation and persistence rates. Hence, Multivariate Analysis of Variance (MANOVA) analysis

was appropriate to analyzed the data in this study (Field, 2009). Data of graduation and persistence rates of students admitted through UTME and direct entry were analyzed using descriptive statistics and Multivariate Analysis of Variance (MANOVA)

Results

Research Question 1: What is the effect of entry qualification enrollment on graduation rate of students?

Table 1: Descriptive Statistics of Graduation Rates as a Function of Entry Qualification Enrolment in the Department of Science Education

Dep. Variable	Entry qualification	Mean	SD	95% confidence interval	
				Lower Bound	Upper Bound
Graduation rate	UTME group	3.442	.095	3.154	3.530
	DE group	3.569	.084	3.402	3.736

Table 1 Shows that, students with entry qualification of DE had higher estimated mean score of 3.569 in graduation rate than their UTME counterpart with 3.342 adjusted mean. This implies that the rate at which those candidates with direct entry qualification had higher rate of graduation than their colleagues with either UTME entry qualification. This might be as a result of the direct entry

candidates have been exposed to higher education before gaining admission to the university.

Research Question 2: What is the effect of entry qualification enrollment on persistence rates of students at Department of Science Education, Federal University of Kashere?

Table 2: Descriptive Statistics of Persistence Rates as a Function of Entry Qualification Enrolment in the Department of Science Education

Dep. Variable	Entry qualification	Mean	SD	95% confidence interval	
				Lower Bound	Upper Bound
Persistence Rate	UTME group	4.388	.071	4.248	4.528
	DE group	3.177	.063	3.053	3.302

Table 2 reveals that students with entry qualification of UTME had higher estimated mean score of 4.388 of persistence rates than their DE counterparts with adjusted mean of 3.177. This might due to the fact that candidates with UTME entry qualifications had maximum six years of studentship in the university which allow them ample time to clear and pass all their carry over courses before graduation.

Research Hypothesis 1: There is no significant effect of entry qualifications of enrollment of students on the combined dependent variables of graduation and persistence rates at Department of Science Education, Federal University of Kashere.



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Table 3: Summary of Multivariate Test on Combined Graduation and Persistence Rate of Students as a Function of Entry Qualifications.

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squares
Intercept	Pillai's Trace	.996	12630.341	2.000	108.000	.000	.996
	Wilk's Lambda	.004	12630.341		108.000	.000	.996
	Hotelling's Trace	233.895	12630.341	2.000	108.000	.000	.996
	Roy's Largest Root	233.895	12630.341	2.000	108.000	.000	.996
Group	Pillai's Trace	.683	116.04	2.000	108.000	.000	.996
	Wilk's Lambda	.317	116.04	2.000	108.000	.000	.996
	Hotelling's Trace	2.150	116.04	2.000	108.000	.000	.996
	Roy's Largest Root	2.150	116.04	2.000	108.000	.000	.996

a. Design: Intercept + Group b. Exact statistics

Key: Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roys' Largest Root

These are four different statistics that MANOVA will provide you to choose from, all which indicate whether there are statistically significant differences among the levels of the independent variable on the linear combination of the dependent variables. SPSS will report a value for all of these, along with the F tests for each.

Table 3 reveals that there is significant effect of entry qualification enrollment on the combined dependent variable of graduation and persistence rates, $F(2,108) = 116.1, P < .005$; Wilks' Lambda = .317; partial $\eta^2 = .68$. In order to determine the contribution of each individual dependable variable on dependable variables Bonferroni Analysis was conducted at adjusted alpha of .025 as indicated in Table 4.



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Table 4: Summary of Bonferroni Analysis of Subjects Effect Test

	Dep. Variable	Type III Sum of Square	Df	Mean Square	F	Sig.	Partial Squared	Eta
Corrected Model	graduation	1.415	1	1.415	1.209	.076	.029	
	persistence	40.094	1	40.094	163.795	.000	.0600	
Intercept	graduation	1307.087	1	1307.087	2963.644	.000	.965	
	persistence	1566.400	1	1566.400	6399.211	.000	.983	
Group	graduation	1,415	1	1.415	3.209	.076	.029	
	persistence	40.094	1	40.094	163.795	.000	.060	
Error	graduation	48.073	109	.441				
	persistence	26.681	109	.245				
Total	graduation	1384.988	111					
	persistence	1596.000	111					
Corrected Total	graduation	49.489	110					
	persistence	66.775	110					

a. R Square = .029 (Adjusted R Square = .020)

b. R Square = .600 (Adjusted R Square = .597)

Table 4 shows that analysis of each individual dependent variable, using a Bonferroni adjusted alpha level of .025, showed that there was no contribution of the number of graduation rate installed, $F(1, 109) = .076$ partial $\eta^2 = .029$. The two groups differed in terms of the number of times they contribute on their own, $F(1, 109) = 3.21$, $P = .076$, partial $\eta^2 = .029$, and in terms of persistence rate $F(1, 109) = 163.8$, $P < .0005$, partial $\eta^2 = .60$.

Discussion

The findings showed that the students with entry qualification of DE had higher adjusted mean score of 3.57 in graduation rate than their UTME counterpart with 3.34 adjusted mean. That is to say a significant difference was observed between graduation and persistence rates for students who were admitted through DE and UTME entry requirement. This might be as a result of the students with DE entry qualification have been exposed to higher education before gaining admission to the university. The findings of the study corroborate the finding of Clark, Slate, Moore and Bames (2013) in a study on Black, White and Hispanic students who were to take developmental education (an entry qualification) and who were not required to take developmental education.

Besides, the study revealed that candidates with UTME entry qualification had higher adjusted mean of 4.38 of persistence rates than their DE counterparts with adjusted mean of 3.17. Hence, a significant difference was observed between persistence rates for students who were admitted through UTME and DE entry requirements. This might due to the fact that candidates with UTME entry qualifications had maximum six years of studentship in the university which allow them ample time to clear and pass all their carry over courses before graduation. Kimberly and John (2014) observed similar results between graduation and persistence rates for students whose entry qualifications were developmental education and those that were not with developmental education. The finding of this study also concurs with the studies of Zepke (2015) and Naylor (2017) that students admitted through developmental education had higher persistence rates than their colleagues without developmental education.

Conclusion

Based on the findings of this study, it is therefore concluded that the students with DE entry qualification enrollment successfully completed their programmes and graduated at specified period than those with UTME entry

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qualification enrollment, while students with UTME qualification enrollment persisted or continue on their programmes than those with DE qualification enrollment.

Recommendations

Based on the findings of this study, the following recommendations were made.

- The Department of Science Education should organize extra-mural coaching and tutorials for UTME students in order to strengthen them in their weak courses.
- The Department of Science Education should regularly organize orientations and counselling programmes for the students to be aware of minimum requirements for them to graduate at the stipulated period.
- The department and the faculty should set up both departmental and faculty libraries.
- Also, the department should see as a matter of urgent the need to equip science laboratories for various programmes in the department.

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