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Causal Relationship between Teachers' Job Performance and Students' Academic Achievement in Secondary Schools in Nigeria

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Abstract

The study investigated teachers' job performance and students' academic achievement in secondary schools for the existence of bi-causal relationship in Nigeria. The ex-post facto research design was adopted in the study. The population of the study covered all the Economic teachers and senior school students in class two (SSS II) of selected public Secondary Schools in Ekpoma, Edo State, Nigeria. Two instruments were used for the collection of data namely: Academic Achievement Inventory (AAI) and Teachers' Job Performance Questionnaire (TEJOPAQ). They were used to collect data on students' academic achievement and teachers' job performances on termly basis (in the first, second and third term of the 2015/2016 school years). With a Cronbach alpha reliability of (α) 0.79, data was analysed using the step-wise multiple linear regression analysis. Findings showed that teachers' job performance in the three terms jointly predicted students' academic achievement and vice versa (F*=53.638, 50.530, p<0.05); indicating the existence of bi-causal relationship between the variables. It was

recommended that teachers need to be aware of how seriously they need to take their instructional duties because their job performance in each term has cumulative effect on students' academic achievement in the promotional term.

Key Words: Bi-causality, Teachers' Job Performance, Students' Academic Performance, Lag effect

Introduction

The importance of teachers in any educational institution of teaching-learning cannot be overemphasized. This is because of the central role they play as implementers of the curriculum at the classroom level. This explains that what teachers do or do not do could directly or indirectly affect the attainment of instructional objectives in the classroom. Consequently, scholars have often attributed students' learning outcome to certain teacher attributes such as their educational qualification, years of experience, classroom behaviour and even their job performance among others (Adu, Tadu & Eze, 2012; Bolarinwa, 2013; Fehintola, 2014). Unfortunately, the aforementioned studies among others, have only uni-directionally investigated the relationship between teachers' qualities and students' academic achievement; whereby teacher qualities are only considered to affect, predict or influence students' academic achievement (and not the other way round).

When a worker gets feedback from a completed task, it is likely they would be satisfied if they compare their work input (effort, time, mental and material resources) with the output (the product or work outcome) and find out that the latter (output) yielded positive result. This may also be the case with teachers who are likely to compare the time - expended studying for a lesson, planning and writing lesson plans, teaching and evaluating students and so on with the learning outcome of their students to determine how worthwhile their teaching effort was. On the other hand, whenever a students' performance is poor, a good teacher is likely to feel discouraged and unfilled because the outcome of his students is below his expectations.

Studies on the influence of teacher factors – their qualification, experience, classroom management, and job performance among others on students' academic performance or achievement has attracted attention among several scholars. Fehintola (2014) examined the relationship among teachers' academic qualification, professional qualification, content knowledge, instructional quality, evaluation procedures, work value, classroom attendance' and job performance on academic performance of secondary school students in Saki-West local government area of Oyo State. The study adopted a descriptive research design of correlational type. The secondary school teachers in Saki Township were selected using multi-state sampling techniques and 718 teachers were selected at random for the study out of 2,456 teachers working in this local government. The Teachers' Characteristics Scale (r = 0.80) was used as a measure of teachers' characteristics. Correlation and Multiple regressions were used as tools of analysis. The result showed that the eight variables- teachers' academic qualification, professional qualification, content knowledge, instructional quality, evaluation procedures, work value, classroom attendance' and job performance) when combined, accounted for 54.6% of the total variance in students' academic performance.

Bolarinwa (2013) investigated the relationship that exists between teachers' characteristics and students' academic performance in Financial Accounting in Senior

Secondary Schools in Ondo State. A total of 200 students were selected through purposive sampling technique to participate in the study. Two validated instruments titled: Teachers Qualification and Experience Questionnaire (TQEQ) and Financial Accounting Achievement Test (FAAT) were used for data collection. TQEQ was used to collect information from then teachers who participated in the study. The questionnaire was designed to get some personal information on the respondents' sex, age, qualification and years of services. The TQEQ was administered to 20 teachers as a pilot test and the cronbach coefficient alpha of 0.84 was obtained. Findings from the Pearson Product Moment Correlation (PPMC) statistics revealed that a positive relationship exists between teachers' characteristics (educational quality and years of experience) and performance level of the students in Financial Accounting.

Agharuwhe (2014) examined effects of teachers' career satisfaction on students' academic performance in public secondary schools in Delta State, Nigeria. The study was a descriptive survey that employed an *ex-post-facto* design. The study was targeted at all teachers and students in government owned secondary schools in Delta State of Nigeria. A sample of three hundred and fifty (350) teachers in public secondary schools of the State were used for the study, at the time of this study, by stratified random sampling technique. The teachers were drawn from forty-two (42) public secondary schools in the State as at 2006/2007 school year. The questionnaires tagged Teacher Effectiveness Questionnaire (TEQ) was designed for school administrators and students to evaluate the teaching effectiveness of the sampled teachers in each school. The instruments were face validated, then construct validated by factor analysis using Statistical Package for Social Sciences (SPSS) version 12.0. Cronbach's coefficient alpha values of 0.98 and 0.79 were obtained for the Teacher Effectiveness Questionnaires. The rating scale, tagged Student Academic Performance Rating Scale (SAPRS) was designed to enable the researcher evaluate the academic performance of students taught by the teachers from 2002/2003 to 2004/2005 school years. Three hypotheses were tested at the 0.05 level of significance using correlation, t-test, and single-factor analysis of variance. The result of the analysis showed that satisfied teachers had higher job performance rating and produced better performing students.

Kosgei (2013) in her study established the relationship between teachers' characteristics and students' academic achievement in Biology in Ghana. The study focused on the following independent variables: teacher qualification and teacher experience and their effect on student academic achievement. The study applied a casual comparative research design. The study was conducted in Nandi South District. The target population comprised of Biology teachers of all the 26 public secondary schools. A questionnaire was used for data collection. Data was analyzed using descriptive and inferential statistical techniques. The study among other findings showed that there was no significant relationship between teacher qualification and student academic achievement in Biology (p>0.05).

Kimani, Kara and Njagi (2013) investigated selected teachers' characteristics and classroom instructional practices and students' academic achievement in selected secondary schools in Nyandarua Country, Kenya. One hundred and fifty-three teachers selected randomly from eighteen schools in three districts in the country participated in the study. The schools were categorized as above average, average and below average based on their aggregate performance in Kenya Certificate of Secondary

Education (KCSE) in the last three years. In each category, two schools per district were selected. Data were collected using a questionnaire developed by the researchers. Linear regression and one-way ANOVA were used to test the relationship between the selected variables and performance in KCSE at $p<0.05$. The study found that teachers' professional qualifications and job performance in classroom instructional practices, were not significantly related to students' academic achievement.

Adu, Tadu and Eze (2012) examined the influence of teachers' self-efficacy on students' academic performance in selected secondary school subjects in Southwestern Nigeria. The study adopted the descriptive survey design of *ex-post facto* type. The study population comprised of teachers, and students of secondary schools in Southwestern Nigeria. A multi-stage random sampling technique was used to select a sample of 61 schools, 1,612 teachers and 5,100 students for the study. Teachers' Self-Efficacy Questionnaire for Teachers ($r = 0.94$), and Students' Achievement Test (English Language, $r = 0.74$; Government, $r = 0.66$; Biology, $r = 0.69$) were used to collect data for the study. One hypothesis was tested at 0.05 level of significance. Data were analyzed using descriptive and inferential analyses. The result showed that there was positive relationship between teachers' self-efficacy and students' academic performance ($r = 0.38$; $p< 0.05$).

From the foregoing, it is evident that scholars in recent times have often investigated a one-way causal relationship between teacher characteristics and students' academic performance. Therefore, teachers' characteristics have often been considered as the independent variable or predictor of student academic performance. A knowledge gap exists on the influence of students' academic performance on their teachers' job performance in secondary schools in Ekpoma, Edo State. To determine whether any bi-causal relationship exist between teachers' job performance and students' academic achievement in secondary schools in Ekpoma, Edo State, the following research questions were raised:

1) What is the cumulative effect of teachers' job performance in the first, second and promotional term on students' academic performance in secondary schools in Edo State, Nigeria?
2) What is the cumulative effect of students' academic performance in the first, second and promotional term on their teachers' job performance in secondary schools in Edo State, Nigeria?

Hypotheses

The hypotheses formulated for the study are shown below:

1) Teachers' job performance in the first, second and promotional term has no significant cumulative effect on students' academic performance in secondary schools in Edo State, Nigeria
2) Academic performance of students in the first, second and promotional term has no significant cumulative effect on teachers' job performance in secondary schools in Edo State, Nigeria

Research Method

The ex-post facto design was adopted in this study. The population of the study covered all the Economic teachers and Senior School Students in class two (SSS II) in public

Secondary Schools in Ekpoma metropolis, Edo State, Nigeria. Two instruments were used for the collection of data namely: Academic Achievement Inventory (AAI) and Teachers' Job Performance Questionnaire (TEJOPAQ). AAI was a self-developed inventory used to collect data on students' overall percentage grade point in Economics in their first, second and promotional term. Data collected as conventionally reported in the school's broad sheet include: 70-100% (Excellent/ Distinction), 60-69% (Very Good), 50-59 (Good/Credit/Average), 40-49% (Pass), and below 40% (Fail). However, the overall score or grade of each student was operationally rated as shown below: 60-100% (Pass) – 4; 50-59% (Average) -3; 40-49% (Poor) – 2; 39% and below (Failed) – 1.

The other instrument (TEJOPAQ) was designed for principals and Head of Social Science Subjects (HOSS) in secondary schools. The instrument was used to collect data on their appraisal or evaluation of the job performance of Economics teacher(s) in their school in the just completed term. The fifteen (15) items in TEJOPAQ was adapted from the Annual Performance Evaluation Report (APER) form. APER focuses on the ten (10) basic job functions of every teacher, namely: 1) planning lessons, 2) teaching lessons, 3) evaluation of lessons, 4) classroom management, 5) handling of student discipline and attendant problems, 6) interest in teaching pupils, 7) knowledge of subject matter, 8) professional preparation and scholarship, 9) professional characteristics and 10) effort toward improvement when needed. All the aforementioned job functions in APER were rated: Satisfactory - (S), Requires Improvement – (R), unsatisfactory specific comments and documentation – (U) and Not Observed or Not Applicable – (N). However, only the first five (5) aspects (planning lessons, teaching lessons, evaluation of lessons, classroom management and handling of student discipline and attendant problems) was integrated into the adapted version (TEJOPAQ) to measure teachers' job performance. Three (3) items each were raised under the five items to make a total of fifteen (15) items covered. The fifteen (15) items raised under each of the aforementioned teacher job functions were rated on a four-point scale of: Strongly Agree - 4, Agree - 3, Disagree - 2 and Strongly Disagree - 1.

The validity of the instrument was ensured by giving the instrument to experts in measurement and evaluation in the department of curriculum and instruction (Ambrose Alli University, Ekpoma). Reliability of the instrument was carried out using twenty (20) teachers and cronbach alpha statistics yielded a reliability value of 0.79. This ensured stability and avoided the collection of spurious data, data on teachers' job performance and students' academic performance was collected at the end of each term (first, second and third term) by the researcher in the 2015/2016 school year. Data were collected at the end of each term after the permission principals and Head of Social Science Subjects (HOSS) was solicited in the sampled schools. The step-wise multiple regression was used to analyse the data for bi-causality relationship. The choice of the step-wise multiple regression type was informed by the need to avoid multi-collinearity of variables and show the relative effect of teachers' current and previous job performance on students' current academic performance and vice versa. The models specified to show the functional relationship between the dependent and independent variables are shown below:

Model I

$SAP_3 = f (TJP_3, TJP_2, TJP_1)$

$SAP_3 = \beta_0 + \beta_1 TJP_3 + \beta_2 TJP_2 + \beta_3 TJP_1 + e_1$……………………………………….. (i)

Apriori expectation: $\beta_0 > 0$ and $\beta_1, \beta_2, \beta_3 > 0$. β_0 shows that if all the independent variables (teachers' job performances in each term) is zero, students' academic performance will still be positive while $\beta_1, \beta_2, \beta_3 > 0$ shows that increase in teachers' job performance in the promotional, second and first terms will have positive cumulative effect on students' academic performance.

Model II

$TJP_3 = f (SAP_3, SAP_2, SAP_1)$

$TJP_3 = \alpha_0 + \alpha_1 SAP_3 + \alpha_2 SAP_2 + \alpha_3 SAP_1 + e_1$…………………………….…… (ii)

Apriori expectation: $a_0 < 0$ and $\alpha_1, \alpha_2, \alpha_3 > 0$. a_0 shows that if all the independent variables (students' performances in each term is zero), teachers job performance will be negative (reduce) while $\alpha_1, \alpha_2, \alpha_3 > 0$ shows that increase in students' academic performance in the promotional, second and first terms will have positive cumulative effect on teachers' job performance.

Where:

$SAP_3 =$ Students' academic performance in the promotional term (third term)

$SAP_2 =$ Students' academic performance in the second term

$SAP_1 =$ Students' academic performance in the first term

$TJP_3 =$ Teachers' Job performance in the promotional term (third term)

$TJP_2 =$ Teachers' Job performance in the second term

$TJP_1 =$ Teachers' Job performance in the first term

β_0 and $\alpha_0 =$ Constants in Model I and II respectively

β_1, β_2 and β_3 are slopes of the regression coefficient in Model I.

α_1, α_2 and α_3 are slopes of the regression coefficient in Model II.

$e_1 =$ error terms

Results

Results from the test of hypotheses are presented below:

Hypothesis 1: Teachers' job performance in the first, second and promotional term has no significant cumulative effect on students' academic performance in secondary schools in Edo State, Nigeria

Table 1: Summary result of the Step-wise Multiple Regression analysis showing the relative effect of Predictors on students' academic performance

Model		Coefficients[a]			t-val.	Sig.	F-val.	Sig.	R-square (R^2)	Adjusted R-square (R^{-2})
		Unstandardized Coefficients		Standardized Coefficients						
		β	Std. Error	Beta						
1	(Constant)	-.043	.243		-.177	.860				
	TJP3	1.009	.098	.726	10.301**	.000	106.101**	.000	.528	.523
2	(Constant)	-.223	.229		-.973	.333				
	TJP3	.620	.130	.446	4.760**	.000	70.774**	.000	.601	.592
	TJP2	.508	.122	.390	4.156**	.000				
3	(Constant)	-.122	.223		-.547	.586				
	TJP3	.368	.153	.265	2.409*	.018				
	TJP2	.394	.124	.302	3.168**	.002	53.638**	.000	.634	.622
	TJP1	.344	.119	.310	2.886**	.005				
a. Dependent Variable: SAP3										D.W =2.01

** t-value is significant at 0.01 alpha level (p<0.01)

* t-value is significant at 0.05 alpha level (p<0.05)

Note: SAP_3 = Students' academic performance in the promotional term (third term)

TJP_3 = Teachers' Job performance in the promotional term (third term)

TJP_2 = Teachers' Job performance in the second term

TJP_1 = Teachers' Job performance in the first term

Table 1 showed that the regression coefficients (β) for teachers' job performance in their promotional term (TJP_3), second term (TJP_2) and first term (TJP_1) are all statistically significant (β = 1.009, .620, .508, .394, 344, p<0.01; and β =.368, p<0.05). This show that teachers' job performance in the first, second and promotional significantly predict their students' academic achievement. Furthermore, the model of the regression estimate showed that the constants in each of the step models (model 1, 2 and 3) are negative (-.043, -.223 and -122). This implies that if teachers' job performance is zero (or a teacher is completely absent from his/her duties), students' academic performance will be poor.

The F-values in models 1, 2 and 3 (F = 106.101, 70.774 and 53.638) further showed that teachers' job performance in each term cumulatively contributed significantly to students' academic performance. Therefore, the null hypothesis which states that teachers' job performance in the first, second and promotional term had no significant cumulative effect on students' academic performance in secondary schools in Edo State was rejected while the alternate was accepted. The R^2 and R^{-2} are the coefficient of determination and adjusted coefficient of determination respectively. The R^2 and R^{-2} values in model 3 showed that .634% or .622 of teachers' job performance in the three terms jointly contributed about 63.4% or 62.2% of the changes to students' academic performance in the academic session. The D.W (Durbin Watson) statistic is 2.01. Following the rule of thumb of $1.8 \geq D.W \leq 2.2$, the value of 2.01 which is approximately equal 2 showed that there is no presence of serial autocorrelation among the explanatory variables.

Hypothesis 2: Academic achievement of students in the first, second and promotional term has no significant cumulative effect on teachers' job performance in secondary schools in Edo State, Nigeria

Table 2: Summary result of Step-wise Multiple Regression analysis showing the relative effect of Predictors on teachers' job performance

Model		Coefficients[a]			t-val.	Sig.	F-val.	Sig.	R-square (R^2)	Adjusted R-square (R^{-2})
		Unstandardized Coefficients		Standardized Coefficients						
		B	Std. Error	Beta						
1	(Constant)	1.154	.129		8.946	.000				
	SAP3	.523	.051	.726	10.301**	.000	106.101**	.000	.528	.523
2	(Constant)	.792	.154		5.128**	.000				
	SAP3	.407	.057	.565	7.174**	.000	67.529**	.000	.590	.581
	SAP2	.254	.067	.297	3.769**	.000				
3	(Constant)	.705	.153		4.615**	.000				
	SAP3	.382	.056	.531	6.879**	.000				
	SAP2	.167	.073	.195	2.301*	.024	50.530**	.000	.620	.608
	SAP1	.165	.061	.213	2.716*	.008				
a. Dependent Variable: TJP3										D.W =1.92

** t-value is significant at 0.01 alpha level (p<0.01)

* t-value is significant at 0.05 alpha level (p<0.05)

Note: TJP_3 = Teachers' Job performance in the promotional term (third term)

SAP_3 = Students' academic performance in the promotional term (third term)

SAP_2 = Students' academic performance in the second term

SAP1 = Students' academic performance in the first term

Table 2 showed that the regression coefficients (β) for students' academic performance in their promotional term (TJP_3), second term (TJP_2), and first term (TJP_1) are all statistically significant (β = .523, .407, .254, .382, p<0.01; β = .167, .165, p<0.05). This showed that students' academic achievement in their first, second and promotional terms significantly predicted their teachers' job performance. Furthermore, the model of the regression estimate showed that the constants in each of the step models (model 1, 2 and 3) are positive (1.154, .792 and .705). This implies that if students' academic score is zero (i.e students performed poorly with a score close to zero in their examination); teachers would still perform their duties as their job performance would be positive.

The F-values of 106.101, 67.529 and 50.530 in models 1, 2 and 3 showed that teachers' job performance in each term cumulatively contributed significantly to students' academic achievement. Therefore, the null hypothesis which states that academic performance of students in the first, second and promotional term had no significant cumulative effect on teachers' job performance in secondary schools in Edo State was rejected while the alternate was accepted. The R^2 and R^{-2} are the coefficient of determination and adjusted coefficient of determination respectively. The R-values in model three showed that .620% or .608% of students' performance in the three terms put together contributed about 62.0% or 60.8% of the changes in teachers' job performance in secondary schools in the academic session. The D.W (Durbin Watson) statistic is 1.92. This statistic measures the presence or absence of the serial autocorrelation among the independent variables. Following the rule of thumb of $1.8 \geq D.W \leq 2.2$, the value of 1.92 which is approximately equal to 2 showed that there is no presence of serial autocorrelation among the explanatory variables.

Discussion

Results showed that teachers' job performance affected students' academic achievement in secondary schools in Ekpoma, Edo State, Nigeria and vice versa. This clearly showed that there was the existence of bi-causality relationship between teachers' job performance and students' academic achievement in each term of an academic session in secondary schools in the area. The outcome of this study may be as a result of the fact that many teachers consider the current academic achievement of their students as a feedback for evaluating their previous job performance and instructional delivery. Therefore, the academic achievement of students in the previous term may engender teachers' motivation and enthusiasm for improved instructional delivery in subsequent terms.

Result in this study were consistent with that of Fehintola (2014) that teachers' job performance and other teacher attributes (teachers' academic qualification, professional qualification, content knowledge, instructional quality, evaluation procedures, work value, and classroom attendance) accounted for 54.6% of the total variance in students' academic achievement. Result agrees with that of Bolarinwa (2013) that a positive relationship exists between teachers' characteristics (educational quality and years of experience) and performance level of the students in Financial Accounting in Ondo State. Result support that of Agharuwhe (2014) that satisfied teachers had higher job performance rating and produced better performing students.

Result is in consonance with that of Adu, Tadu and Eze (2012) that there was positive relationship between teachers' class self-efficacy and students' academic achievement. Result of this study disagree with that of Kimani, Kara and Njagi (2013) that teachers' job performance in classroom instructional practices was not significantly related to students' academic achievement. Result also disagrees with that of Kosgei (2013) who found no significant relationship between teachers' quality and student academic achievement in Biology.

Conclusion

A bi-causal relationship existed between teachers' job performance and students' academic achievement; indicating that teachers' performance on their various instructional duties affected students' learning outcome while on the reverse, how well or badly students' performed, also influenced the teachers' job performance. Based on the findings, it was concluded that teachers' previous and current level of job performance would affect students' current academic achievement while students' previous and current academic achievement would also affect teachers' current job performance. This clearly indicated the existence of a "lagged effect" on the performances of both teachers and beneficiaries.

Recommendations

Based on the findings, the following recommendations were made:

1) Teachers have to be conscious of how they perform their instructional duties in not only the promotional term but also in first and second term because their cumulative effort in the two terms has contributory role to play in promoting students' performance in the promotional term.

2) Principals and school authorities should be mindful of how they change subject teachers in their school from term to term to avoid the possible trade-off between teachers' incessant change and students' lowering performance.

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