

QUALITY OF TEACHERS AND STUDENTS PERFORMANCE: EVIDENCE FROM SCHOOLS IN IBADAN METROPOLIS IN NIGERIA.

OMO AREGBEYEN

Department of Economics, University of Ibadan, Ibadan, Nigeria

E-mail address for correspondence: omoareg@yahoo.com

Abstract: The dramatic effects that teachers have on students' achievement are largely undisputed. Empirically, a number of studies have shown that the quality of teachers is strongly related to students' performance. This study presents evidence on this issue with a sample of 400 students and 200 teachers from 40 purposively selected secondary schools in Ibadan metropolis in Nigeria. These schools were categorized into four as public elite schools; public non-elite schools; private elite schools and private non-elite schools. A composite measure of the quality of the teachers covering qualification, experience, patience, creativity, and communication skills was utilized. The students' performance was measured by their scores in the two compulsory subjects of English Language and Mathematics in the general school leaving certificate examination. The empirical methodology combined descriptive and inferential statistical analysis. The results suggest that the observed variations in the students' performance across the four categories of the schools are significantly explained by the differences in the quality of the teachers.

Keywords: Quality; Teachers; Students; Performance; Schools; Nigeria.

INTRODUCTION

Education is the compilation and product of many and varied resources. Among these, teachers stand out as a key to realizing the high standards that are increasingly emphasized in schools and school systems across countries (Rice, 2003). There is a general agreement about the importance of high-quality teachers among researchers, practitioners, and policy makers. According to Leigh and Mead (2005), teacher quality matters a lot because teachers' knowledge and skills are the most vital in-school factors influencing children's learning. And, for children from disadvantaged backgrounds or troubled home environments, quality teaching is even more important. This explains why the dramatic effects that teachers have on students' achievement are largely undisputed (Dee and Keys, 2004). Empirically, a number of studies have shown that the quality of teachers is strongly related to students' performance (examples include Mrozowski, 2002; Fryer et al, 2002; Rivkin et al., 2005; and Goldhaber and Brewer, 2002 etc.).

However, most of these studies have focused on developed countries particularly the United States of America. No study in this area has been conducted for Nigeria. This fact provides the motivation for this study. The primary objective of this paper therefore is to examine the effects of the quality of teachers on students' performance in Nigeria. In particular, the aim is to contribute to the existing body of knowledge and evidence in the literature.

Our examination shows that there are expectedly differences in the quality of teachers and students performance across the schools sampled and that the differences in the quality of the teachers significantly account for the variations in the students' performance.

The rest of the paper is organized as follows. Section two reviews the literature on the measures of teacher quality as well as documents some previous studies. The research methodology is laid out in section three. Section four is devoted to data analysis, while section five concludes.

LITERATURE REVIEW

Measures of Teacher Quality

Unlike students performance that has a standardized measure- examination score, measures of teachers quality is a highly devise and controversial exercise. This is because, despite general agreement about the importance of high-quality teachers, researchers, practitioners, policy makers, and the public have been unable to reach a consensus about what specific qualities and characteristics make a good teacher. As such several measures of teachers quality abounds. These include qualification and certificate, experience, attributes-patience, creativity and communication skills, and cognitive ability, particularly, verbal ability scores. In the literature, these measures are broadly classified into observed and unobserved characteristics. The observed characteristics/measures are qualification and certificate, and experience. While attributes like patience, creativity, communication skills and cognitive ability are the unobserved characteristics/measures. However, the unobserved measures are difficult to measure and are often not used (Concoran, et. al., 2004). But, the studies by Hanushek et al. (1998) and Rockoff (2004) indicate that the unobserved characteristics or measures of teachers quality are perhaps more important for students performance than most observed characteristics/measures.

In this regards, Rice (2003) documents a number of studies that found that measures of cognitive ability –teachers' verbal ability scores are among the most important measures of students' achievement. One of these studies is by Ehrenberg and Brewer (1995) that reported that a one-half standard deviation increase in the verbal aptitude score of white female teachers would have raised the synthetic gain scores of white elementary students in the 1996 Coleman report data by 4 to 8.5 per cent. Similarly, Ferguson and Ladd (1996) reported that a one standard deviation increase in teachers ACT composite scores (in the state of Alabama) almost resulted in a one-tenth standard deviation increase in students reading scores from 3rd to 4th grade (comparable to about one-half the black-white test score gap in urban areas during the this time period).

These literature suggest that students of teachers who score higher in the distribution of standardized tests takers tend to perform better than students with teachers who ranked lower in the distribution (Corcoran et.al, 2004). They noted further that though what the teacher's relative score measures is less clear, nevertheless these studies well illustrate that these scores do indeed capture something, either specific skills or general intelligence or both that is important in explaining academic achievement of their students.

In consideration of the fact that standardized test scores are a measure of relative quality and not absolute quality, Corcoran et.al. (2004) advised that teacher quality be measured using a multi-dimensional vector of these characteristics that are positively associated with the output of the educational process.

Previous Studies

Mrozowski (2002) reports a linkage between teacher quality and student progress in a study of students and teachers in grades 3-8 under the Cincinnati Public Schools' teacher evaluation system. According to her, the study showed that students of teachers rated "unsatisfactory," the lowest rating for teachers, scored as much as 13 points below what they would be expected to score on science proficiency tests, based on predicted averages. Math test scores for students of those same teachers were 9 points below expected outcomes. And for students of teachers rated "distinguished," the highest rating for teachers, science scores were 3 points above expected averages. Math scores were also 3 points higher than predicted. In summary, teachers who rate highest under Cincinnati Public Schools' teacher evaluation system also show the greatest gains, on average, in their students' achievement on proficiency tests.

The study by Fryer et al (2002) on understanding the black –white test score gap in the first two years of school reported that on the average, black 12th graders score at about the same level as white eighth graders on the National Assessment of Education Progress—a difference roughly equivalent to one standard deviation. Because difference in the quality of the teachers was discovered, they considered how improved teacher quality might affect this large and troubling gap between white and black students in academic achievements.

The research by Rivkin et al. (2005), (using data from Texas), and by Rockoff (2004), using data from New Jersey have found large gaps between the best and worst teachers, and shown that this variation has significant consequences for student achievement. Switching from an average teacher to a teacher at the 90th percentile raises test scores by about one-eighth of a standard deviation on the national distribution. To put this into perspective, the benefit from this switch is twice as large as a 10 percent cut in class size (and some studies suggest that class size cuts have even smaller benefits than this).

Goldhaber and Brewer (2002) observed that students do better in math if taught by a teacher with a bachelor's or master's degree in mathematics. They also found that, although advanced degrees in general were not associated with higher student achievement, an advanced degree that was specific to the subject area that a teacher taught was associated with higher achievement. In contrast, other studies did not indicate that teachers with graduate-level training in a content area performed better than did teachers having an undergraduate degree in their content area (Rivkin, Hanushek, & Kain, 2005; Ferguson & Ladd, 1996).

A comprehensive analysis by Greenwald, Hedges, and Laine (1996) examined data from 60 studies and found a positive relationship between years of teacher experience and student test scores. Similarly, the UTD Texas Schools Project data showed that students of experienced teachers attained significantly higher levels of achievement than did students of new teachers (those with one to three years of experience) (Rivkin, Hanushek, & Kain, 2005). Schools with more inexperienced teachers have higher dropout rates. In a related finding, an analysis of math achievement and dropout rates in a sample of California high schools (Fetler, 2001) found that schools whose dropout rates were in the highest 10 percent had 50 percent more new teachers than did schools in the lowest 10 percent.

Fuller and Alexander's (2004) analysis identified similar students who were taught by Texas math teachers who were also similar except that some were certified and others were not. The study found that the students taught by certified teachers scored better on the state math achievement test. Similarly, Laczko-Kerr and Berliner (2002) examined the math achievement of elementary students and reported that students taught by new, uncertified teachers did significantly worse on achievement tests than did those taught by new, certified teachers. Likewise, Darling-Hammond (1999) found a significant positive association between achievement and teacher certification; she also found a significant negative association between achievement and the presence of a high proportion of new or uncertified teachers in the school. And Fetler (1999) found that teachers with emergency teaching certificates did not perform as well as teachers who were fully certified, even when controlling for the amount of teaching experience.

METHODOLOGY

The Data

The data come from forty (40) purposefully selected secondary schools in Ibadan metropolis¹. The 40 schools were evenly distributed among the four categories of schools namely public elite schools (PES); public non-elite schools (PNES); private elite schools (PRES); and private non-elite schools (PRNES). From each category of the schools we randomly sampled five (5) teachers that teach English language and mathematics, the two compulsory subjects at the secondary school and school leaving certificate examination. This gives a total sample of two hundred (200) teachers. A total of four hundred (400) students were sampled. This comprises of ten (10) students from each of the ten (10) selected schools in the four categories of schools.

The systematic random sampling technique was adopted in the selection of the students. This selection process involves the following procedures: (i) we obtained the total number of students who sat for the school leaving certificate examination in the school in the last exam, i.e. the population size (N); (ii) note the number of students to be sampled i.e. the sample size (n)-10 in our case; (iii) obtained the sampling interval by dividing the population size (N) by the sample size (n); (iv) obtained the sampling frame of the population; (v) used the simple random sampling technique to select the first number of the sample from among the sampling interval observations in the sampling frame i.e. the random start; (vi) for subsequent numbers of the sample, we add sampling interval repeatedly to the random start; (vii) the members of the sample are those whose positions are as determined in step (vi).

The students' performance was measured by the results of the sampled students' results in the common senior secondary terminal certificate examination. These results were available in each of the schools sampled. From the sampled students results we came up with a synthesized measure of performance as shown in the table below.

Table 1: Synthesized Measure of Sampled Students Performance

Performance Classification	Level of Performance	Score Scale
Very Good	Passed both subjects with distinction	5
Good	Passed one of the subjects with distinction and the other at credit level	4
Average	Passed both subjects at credit level	3
Below Average	Passed at one of the subjects at below credit level	2
Poor	Failed one or both subjects	1

In measuring the quality of the teachers, a composite measure was utilized. This includes the teachers' qualification, experience, patience, creativity, and communication skills. The qualifications and experience (measured by the number of years the teachers have on the job) of the teachers were obtained from the file records. Patience, creativity and communication skills of the teachers were judged by observing the teachers while teaching. Patience of the teachers' was adjudged by the coolness and composure of the teachers while teaching. Creativity was assessed by the appropriateness and innovativeness with illustrations in explaining the key concepts and ideas to the students. Communication skills was measured by the used of appropriate language and good grammatical and verbal expressions. The quality score of the teachers was then based on the average score on all of these measures (see appendix for the detailed scoring scale). Table 2 shows the quality of the teachers' classification and the corresponding score scale that we constructed.

¹ Our purposeful selection of the schools followed from the observation of Leigh and Mead (2005) that there are huge teacher quality disparities between poor and affluent schools.

Table 2: Quality of Teachers Classification and the Score Scale

Quality of Teacher Classification	Score Scale
Very High	4.5-5.0
High	3.5-4.4
Fair	2.5-3.4
Low	1.5-2.4
Poor	1.0-1.4

METHOD OF ANALYSIS

The analysis of our data combines the use of both descriptive and inferential statistical analysis. The descriptive statistical analysis is to allow us make precise statements about the data as it is used to characterize the quality of the teachers and the students’ performance across the four categories of the schools as well as establish a link between the quality of the teachers and the students’ performance. The inferential statistical analysis is used to ascertain the significance of the differences in the quality of the teachers and the students’ performance across the four categories of the schools. It is also used to evaluate how much of the variations in the students’ performance is explained by the differences in the quality of the teachers.

For our inferential statistical analysis we explored the one-way analysis of variance (ANOVA) statistics and the simple regression analysis. The ANOVA is used to test for the significance of the differences in the quality of the teachers and the students’ performance across the schools. The regression analysis is used to explain the extent to which the differences in the quality of the teachers account for variations in the students’ performance. Our regression equation is therefore specified as:

$$STP = \beta_0 + \beta_1 QT + \beta_t \dots \dots \dots (1)$$

where:

STP = Student Performance

QT = Quality of the Teachers

β_t = The Error Term

DATA ANALYSIS

Descriptive Analysis

Table 3 presents some descriptive statistics for the five measures of the quality of the teachers sampled. Beginning with their qualifications, the table shows that overall majority (47 %) of the total sampled teachers hold 1st degree, followed by 43 per cent master’s degree holders. The remaining 11 per cent are holders of the National Certificate of Education (NCE). Among the four categories of schools, the private elite schools have the highest number of qualified teachers, followed by public elite schools and then the private non-elite schools. The public non-elite schools come last.

Coming to experience, on the average the public elite schools have the most experienced teachers. Next in rank are the private elite schools. The public and private and non-elite schools come in the third and fourth position, respectively. Generally, teachers with between 5-10 years experience constitute the majority at 41 per cent, while those with just 1-5 years experience trailed behind with 35 per cent. Teachers with longer years of experience, 10 years and above are in the minority, representing just 25 percent.

The larger proportion (54 per cent) of the teachers is moderately patient while teaching. Another 25 per cent have patience while those that exhibit high level of patience while teaching account for the outstanding 22 per cent. Comparatively, teachers in the public elite schools rated highest. Teachers in the private elite schools come next and closely followed by those private non-elite schools. Teachers in the public non-elite schools rated lowest.

Table 3: Descriptive Statistics of the Quality of the Sampled Teachers

1. Qualification	PES F (%)	PNES F (%)	PRES F (%)	PRNES F (%)	TOTAL F (%)
Master's Degree	22 (44)	14 (28)	32 (64)	18 (36)	86 (43)
1 st Degree	28 (46)	20 (40)	18 (36)	27 (54)	93 (47)
NCE	0 (0)	16 (32)	0 (0)	5 (10)	21 (11)
TOTAL	50	50	50	50	200
2. Experience	PES F (%)	PNES F (%)	PRES F (%)	PRNES F (%)	TOTAL F (%)
> 10 years	12 (24)	15 (30)	13 (26)	9 (18)	49 (25)
5-10 years	30 (60)	15 (30)	23 (46)	14 (28)	82 (41)
< 5 years	8 (16)	20 (40)	14 (28)	27 (54)	69 (35)
TOTAL	50	50	50	50	200
3. Patience	PES F (%)	PNES F (%)	PRES F (%)	PRNES F (%)	TOTAL F (%)
High	15 (30)	8 (16)	10 (20)	10 (20)	43 (22)
Moderate	25 (50)	25 (50)	30 (60)	28 (56)	108 (54)
Low	10 (20)	17 (34)	10 (20)	12 (24)	49 (25)
TOTAL	50	50	50	50	200
4. Creativity	PES F (%)	PNES F (%)	PRES F (%)	PRNES F (%)	TOTAL F (%)
High	14 (28)	5 (10)	16 (32)	10 (20)	45 (23)
Moderate	19 (38)	17 (34)	24 (48)	20 (40)	80 (40)
Low	17 (34)	28 (56)	10 (20)	20 (40)	75 (38)
TOTAL	50	50	50	50	200
5. Communication Skills	PES F (%)	PNES F (%)	PRES F (%)	PRNES F (%)	TOTAL F (%)
Very Good	20 (40)	15 (30)	24 (48)	14 (28)	73 (37)
Good	20 (40)	18 (36)	20 (40)	24 (48)	82 (41)
Average	10 (20)	17 (34)	6 (12)	13 (26)	46 (23)
TOTAL	50	50	50	50	200

Source: Field Survey, 2011

In a reversal of pattern, teachers of the private elite schools are most creative and with marked difference from those of the public elite schools that take the second position. Teachers of the private non-elite schools come in the third position while those of the public non-elite schools are the least creative. On the whole, teachers with moderate

creativity are more in number (80) followed by 75 with low creativity. The 45 with high creativity constitute the minority. In a similar pattern, communication skills of the teachers are generally better in the private elite schools. Teachers of the public elite schools come next, then those of the private non-elite schools and lastly those of public non-elite schools. Taking all the teachers irrespective of the schools shows that a total of 73 of them representing 37 per cent are very good in their communication skills. Another 82 amounting to 41 per cent got rated as having good communication skills, while the rest 46 (23 per cent) communicate averagely well.

The summary statistics of the quality of the teachers that have been described is presented in table 4. From the table, 29 (about 15 per cent) of the total 200 sampled teachers got classified as high quality teachers. A group of 84,55 and 32 of them are classified as good, low and poor quality teachers, respectively. In the public elite schools, 15 teachers (30 per cent) make the group of high quality teachers. 32 others and as a matter of fact the majority, representing about 64 per cent passed for good quality teachers. A balancing figure of 3 teachers (6 per cent) is low quality teachers. It is very striking that no teacher of the public elite school got classified as poor teacher. Six teachers of the public non-elite schools is a high quality teacher. Eleven others make the good quality list. Majority twenty-three (23) are low quality teachers with the remaining 10 passing for poor quality teachers.

There are no low and poor quality teachers in the private elite schools. 37 of the 50 teachers are good quality teachers while the remaining 13 got high quality teachers ratings. The private non-elite schools have no teacher making the high quality teacher list. 9 are classified as good quality teachers and 29 others as low quality teachers. The remaining 12 teachers are of poor quality.

By way of ranking, on the average we rank first the private schools first on the quality of the teachers. Public elite schools come second. The third position goes to the public non-elite schools while the private non-elite schools come fourth and last.

Table 4: Summary Statistics of the Quality of the Sampled Teachers across the Four Categories of Schools

Quality Classification/ Category of Schools	PES	PN ES	PR ES	PRN ES	TOT AL
Very High	-	-	-	-	-
High	15	6	13	0	29
Good	32	11	37	9	84
Low	3	23	0	29	55
Poor	0	10	0	12	32
Total	50	50	50	50	200

Source: Field Survey, 2011

Coming to the sampled students performance, table 5 shows that 74 students by our performance scale are very good students. 37 of them representing 50 per cent are students of private elite schools. Public elite schools accounted for about 32 per cent; followed by private non-elite schools with about 16 per cent, which is exactly half of that of the public elite schools. Public non-elite schools had only 1 student, which also represents about 1 per cent. A similar pattern of distribution is observed in the distribution of the 117 (about 29 per cent of the total sample) with good performance score. Private elite schools accounted for the highest percentage of about 38 per cent. Public elite schools accounted for about 32 per cent. Private non-elite schools and public non-elite schools accounted for about 26 per cent and 3 per cent, respectively.

Across the four categories of the schools, students with average performance totaled 93. 30 of them are of the private non-elite schools. Public elite schools followed closely with 29 students. Public non-elite schools and private elite schools had equal numbers of 17 students. Not surprisingly, the highest number of students with fair and poor performance scores was observed in the public non-elite schools. They had about 59 percent and 76 per cent of the total fairly and poorly performed students. Private non-elite schools followed at a distance with a percentage share of 24 and 22 per cent for fair and poor performance, respectively. The public elite schools that came next had 8 fair students and 1 poor student. These figures constitute about 14 and 2 per cent of the total 58 students in both instances. No student of the private elite schools had poor performance while only 2 students made fair performances.

From the forgoing discussions on the performance of the students across the four categories of the sampled schools, the obvious conclusion is that students performed best in the private elite schools. Students of the public elite schools followed. Next are those of the private non-elite schools while students of the public non-elite schools had the least performance.

Table 5: Summary Statistics of the Sampled Students Performance across the Four Categories of Schools

Performance Classifications/ Category of Schools	P E S	PNE S	PRE S	PRNE S	TOTAL
Very Good	24	1	37	12	74
Good	38	4	44	31	117
Average	29	17	17	30	93
Fair	8	34	2	14	58
Poor	1	44	0	13	58
Total	100	100	100	100	400

Source: Field Survey, 2011

The average statistics of the teachers' quality and students' performance are contained in table 6. In the public elite schools, the mean score for the teacher quality is 3.31 with maximum and minimum scores of 3.48 and 3.12, respectively. The average student performance was highest at 4.30 and lowest of 3.30, with a mean score of 3.76. The mean teacher quality score in the public non-elite schools is 2.34. The maximum score being 3.12 and the lowest 1.80. The student performance score ranges between 2.20 and 1.50 with a mean score of 1.84. Among the private elite schools, teachers' quality and students performance scores averaged 3.41 and 4.15, respectively. The maximum teacher quality score is 3.76 and the lowest 3.16, while that of the students performance score is 3.60 lowest and 4.60 highest. Lastly, in the private non-elite schools the school with best quality teachers scores 2.96 while the school with the least quality teachers scored 1.36. Similarly, the school with the best student performance record scored 4.00 while the school the worst student performance record scored 1.70. Teacher quality and student performance scores averaged 2.11 and 3.14, respectively.

From these descriptions, it is obvious that the private elite schools that scored highest in teachers' quality also had the best student performance record. The public elite schools come next. Although, the public non-elite schools scored higher on the average than private elite schools on teachers' quality, however, the private elite schools had better student performance record than the public non-elite schools. On the whole, the picture suggests a positive link between the teacher quality and the students' performance (see figure 1). From the figure, it can be seen that the students' performance closely mirrored the teachers' quality in that higher teacher quality scores are associated with greater student performance (score) and vice versa.

Table 6: Average Statistics of the Sampled Teachers Quality and Students Performance across the Four Categories of Schools

Statistics/Category of Schools	PES	PNES	PRES	PRNES						
	QT	STP	QT	STP	QT	STP	QT	STP	QT	STP
Mean	3.31	3.76	2.34	1.84	3.41	4.15	2.11	3.14		
Median	3.30	3.75	2.14	1.85	3.39	4.20	20.6	3.15		
Maximum	3.48	4.30	3.12	2.20	3.76	4.60	2.96	4.00		
Minimum	3.12	3.30	1.80	1.50	3.16	3.60	1.36	1.70		
Stand.Dev	0.11	0.34	0.52	0.23	0.17	0.30	0.54	0.68		

Source: Calculated by Authors.

Figure 1: Teacher Quality and Students Performance across the Sampled Schools.

In summary, our descriptive analyses have shown that there are differences in the quality of the teachers and students performance across the four categories of the schools sampled. The descriptive analyses also imply that the differences in the quality of the teachers account for the variations in the students' performance. These revelations as a matter of fact raise two pertinent questions. These questions are (i) how strong or significant are the differences in the quality of the teachers and the performance of the students across the four categories of the school? and (ii) does the differences in the quality of the teachers sufficiently explain the variations in the students' performance. The results from our inferential statistical analyses provide the answers to these questions.

Inferential Statistical Analyses

The results for our inferential statistical analyses are presented in tables 6, 7 and 8. Tables 6 and 7 present the results of the one-way analysis of variance of the teachers' quality and students' performance, respectively among the four categories of the schools sampled. The results contained in both tables indicate that there exist significant differences (at 5 % and 1 % level of significance) in the quality of teachers and performance of students among the four categories of the schools sampled. However, the difference in the student performance is stronger or of greater significance.

Table 6: ANOVA Results for the Quality of Teachers.

Source of Variation	Degree of Freedom	Variation; Sum of Squares	Variance; Mean Sum of Squares	F Cal
Between Schools	3	13.15	6.58	43.87
Within Schools	36	5.45	0.15	-
Total	39	18.60	-	-

Table 7: ANOVA Results for the Students Performance

Source of Variation	Degree of Freedom	Variation; Sum of Squares	Variance; Mean Sum of Squares	F Cal
Between Schools	3	30.69	15.35	85.28
Within Schools	36	6.46	0.18	-
Total	39	37.15	-	-

The results of the evaluation of the explanatory power of the quality of the teachers on the students' performance are presented in table 8. From the table, the teacher quality positively and significantly explains the differences in the students' performance records. From the coefficient linking student performance to the quality of the teachers, it is suggestive that a one per cent improvement in the teachers' quality will result in 1.04 per cent i.e. about one per cent improvement also in the students' performance. Expressed in simple terms, it means that any improvement in the teachers' quality will bring about a corresponding increase in the students' performance.

Apart from that the teachers' quality positively and significantly explains the student's performance, the regression results also indicate that the teachers' quality is the most important factor affecting students' performance. This is because the coefficient of determination, otherwise, called the R^2 shows that more than half, about 54 per cent, of the total variation in the students' performance is accounted for by the quality of the teachers. This therefore implies that the teachers' quality sufficiently explains the observed significant variations or differences in the students' performance

Table 8: Regression Results of the Effect of Teacher Quality on Students Performance

Estimation Technique: OLS Dependent Variable: Student Performance		
Variable	Coefficient	t-statistics
Constant	0.32	0.72
Teachers Quality	1.04	6.70*
R^2 0.54; Adjusted R^2 0.53; F-statistics 44.87		

* Significant at 1% level of significance

CONCLUSION

A number of studies have shown that the quality of teachers is strongly related to students' performance. This study presents new evidence on this issue with a sample of 400 students and 200 teachers from 40 purposively selected secondary schools from in Ibadan metropolis in Nigeria. These schools are categorized into four as public elite schools; public non-elite schools; private elite schools; and private non-elite schools. A composite measure of the quality of the teachers covering qualification, experience, patience, creativity and communication skills was utilized. The students' performance was measured by their scores in the in two compulsory subjects of English Language and Mathematics in the general school leaving certificate examination.

The empirical methodology combined descriptive and inferential statistical analyses. The descriptive analysis is used to characterize the quality of the teachers and the students' performance as well as establish a link between the quality of the teachers and the students' performance. The inferential analysis is used to ascertain the significance of the differences in the quality of the teachers and the students' performance. It is also used to evaluate how much of the variations in the students' performance is explained by the differences in the quality of the teachers. The set of inferential statistics explored include the one analysis of variance and regression analysis.

The results from the descriptive analyses show expectedly that there are differences in the quality of the teachers and students performance across the four categories of the schools sampled. The descriptive analyses also imply that the differences in the quality of the teachers account for the variations in the students' performance. The inferential statistical analyses results show the observed differences in the quality of the teachers and the performances of the students across the four categories of the school are strong and/or significant. It also shows that the differences in the quality of the teachers sufficiently explain the variations in the students' performance. The conclusion and policy lesson of this paper therefore, is that the quality of teachers matters for student performance in schools.

REFERENCES

- Corcoran, S.P.; Evans, N. W.; and Schwab, R.M. (2004), "Women, the Labor Market, and the Declining Relative Quality of Teachers", *Journal of Policy Analysis and Management*, Vol.23, no.3, pp.449-470.
- Darling-Hammond, L. (1999). Teacher quality and student achievement: A review of state policy evidence. Seattle: Center for the Study of Teaching and Policy. December.
- Dee, T.S. and Keys, B.J. (2004), "Does Merit Pay Reward Good Teachers? Evidence from a Randomized Experiment", *Journal of Policy Analysis and Management*, Vol. 23, no.3, pp.471-488.
- Ehrenberg, R.G., and Brewer, D.J. (1995), "Did Teachers Verbal Ability and Race Matter in the 1960s? Coleman Revisited", *Economics of Education Review*, 14, 1-21. Evidence from Panel Data," *American Economic Review*, 94(2): 247-252.
- Ferguson, R.F., and Ladd, H.F. (1996), How and Why Money Matters: An Analysis of Alabama Schools, in H.F. Ladd (ed.), *Holding Schools Accountable: Performance-based Reform in Education* (pp.265-298). Washington, DC. Brookings Institution.
- Fetler, M. (1999, March). High school staff characteristics and mathematics test results. *Education Policy Analysis Archive*, 7(9).
- Fetler, M. (2001). Student mathematic achievement test scores, dropout rates and teacher characteristics. *Teacher Education Quarterly*, 28:(1), 151-168.

- Fuller, E.J., & Alexander, C. (2004,). Does teacher certification matter? Teacher certification and middle school mathematics achievement in Texas. Paper presented at the national meeting of the American Education Research Association, April, San Diego.
- Fryer Jr., Roland G., and Steven D. Levitt (2002), "Understanding the Black-White Test Scor Gap in the First Two Years of School," National Bureau of Economic Research, NBER Working Paper 8975.
- Goldhaber, D.D., & Brewer, D.J. (1996). Evaluating the effect of teacher degree level on educational performance. Washington, DC: NCES.
- Goldhaber, D.D., & Brewer, D.J. (2000). Does teacher certification matter? High school teacher certification status and student achievement. *Educational Evaluation and Policy Analysis*, 22, 129-145.
- Greenwald, R., Hedges, L.V., & Laine, R.D. (1996). The effect of school resources on student achievement. *Review of Educational Research*, 66: 3, 361- 396.
- Hanushek, E.A.; Kain, J.F; and Rivkin, S.G. (1998), Teachers, Schools, and Academic Achievement, Working Paper No.6691 (revised). Cambridge, MA: National Bureau of Economic Research.
- Laczko-Kerr, I., & Berliner, D.C. (2002,). The effectiveness of "Teach for America" and other under-certified teachers on student academic achievement: A case of harmful public policy. *Education Policy Analysis Archives*, 10(37).
- Leigh, Andrew and Sara Mead (2005), **Lifting Teacher Performance**, Policy Report, April, Progressive Policy Institute.
- Mrozowski, Jennifer (2002), Study links teacher quality and student progress: Best teachers' students' score higher on tests, *The Cincinnati Enquirer*, Thursday, February 21.
- Rice, J.K. (2003), *Teacher Quality: Understanding the Effectiveness of Teacher Attributes*, Economic Policy Institute Book, August.
- Rivkin, S.G., Hanushek, E.A., & Kain, J.F. (2005). Teachers, schools, and academic achievement. *Econometrica*, 73(2), 417-458.
- Rockoff, Jonah E. (2004), "The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data," *American Economic Review*, 94(2): 247-252, 2004.

Appendix: Teacher Quality Scoring Scale

Qualification	
Masters Degree	5 Marks
1 st Degree	2 marks
National Certificate of Education (NCE)	1 mark
Experience	
> 10 years	5 mark
5-10 years	3mark
< 5years	1 mark
Patience	
High	5 mark
Moderate	3 mark
Low	1 mark
Poor	0 mark
Creativity	
High	5 mark
Moderate	3 mark
Low	1 mark
Poor	0 mark
Communication Skill	
Very Good	5 mark
Good	3 mark
Average	1 mark
Poor	0 mark