

## **Factors Influencing Student Achievement Scores: Public vs. Private Schools**

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### **Abstract**

*There are evidences of relationship between the performances of primary school student's achievement scores with socioeconomic status of the household. Literature mostly point out the effect of school quality on students' achievement. Based on the existing literature, this study has explored the effect of school choice, quality and socioeconomic status of the household on student achievement score in case of Pakistan. Findings indicate that choice of schooling and teacher's characteristics play an important role in student performance.*

**Keywords:** Factors; student achievement scores; public & private schools

**JEL classification:** I23, I29

### **I. Introduction**

The effect of socioeconomic factors on school performance is substantial. Social gaps in achievement and outcomes are large. There exist strong relationship between student performance in primary schools and socioeconomic status. There have been numerous studies that examine the effects of school quality on student educational achievement. However, despite the large number of studies published over the years, there is little or no consensus in the literature regarding the impact of various elements of school quality on student educational achievement especially in case of Pakistan. Measuring the student achievement score is challenging and depended on socio-economic background as well as school quality.

Thus examining the nature of the relationship between socioeconomic status and student achievement has always remained in discussion. There have been many theories explaining this relationship. Students from a low-socioeconomic status are at disadvantage in school because they lack an academic home background, which influences their academic success at school.

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As far as literature in Pakistan is concerned study conducted by Academy of Educational Planning and Management (AEPAM) in 1999, Measuring Learning Achievement at primary level in Pakistan is the first most comprehensive study. The study was based on a sample consisting of grade five pupils for public schools. Standardized tests were used for science, Mathematics and national language - Urdu. Study conducted by AEPAM is very useful in developing an insight into some of the crucial factors affecting learning in the government schools of Pakistan. It had examined students' scores and how various factors affect it. But still research is always there to find out what are the factors that affect the achievement of the students.

This study also focuses on investigating the factors affecting achievement of 5<sup>th</sup> grade students taking into account public and private school differences. More specifically this study will aim to found out the factors, which are responsible for student achievement scores along with identifying those factors, which help a student to improve his/her grades. Quality of education at the primary level in Pakistan is dependent upon many factors including the teacher's qualifications (both formal and professional), availability of teaching learning materials, facilities in the school and the socio-economic background of the students. This study aims to identify the some of these major factors associated with the students' achievement at primary level. Empirical assessment is based on the survey data held in Pakistan by World Bank to collect information regarding factors affecting student achievement in 1997 the same data is used for this study.

The rest of paper is organized as follows: section II provides review of relevant literature, section III discusses objectives of the study, section IV generates detail methodology for the estimation purpose, section V gives detail of the data source, estimation of the factors influencing student achievement score in both types of school public/private and a logistic regression for the choice of school by parents' are discussed in section VI and finally conclusions is given in section VII.

## **II. Review of Literature**

The aim of the review is to have a better understanding regarding the socio-economic and school factors that impact on student achievement score. Literature shows that socio-economic status can have a significant effect upon student achievement. Literature often hypothesized that student achievement depends on different socio-economic background and learning abilities. For example Sheldon (2003) provides evidence that a student who comes from a

higher socio-economic status will achieve better test score than a student from a lower socio-economic background. Likewise, students' attending a school that has a higher concentration of students' from higher socio-economic background will also achieves higher scores than students' attending schools with high concentrations of students coming from low socio-economic background. This may be because students who attend schools that predominantly serve low socio-economic status students are especially at risk of poor school performance due to the lack of interest from the community including parents.

Evidence indicates that there is a need of increased parental involvement in children's education at primary level. England and Australia are the two countries with the longest history of parental involvement at the school level. Worldwide, other countries, including, Canada and the United States, are moving towards increase parental involvement. Becher (1984) point out that recognition has been given to the crucial role that parents' play as well as emphasis on the rights and responsibilities of the parents to influence children's education. Over thirty years many research studies have focused on parental involvement in education. Cox, Donald & Emmanuel Jimenez, (1989) discuss that there is no evidence for Pakistan regarding the issue under consideration due to non-availability of in-depth data.

The empirical evidence shows that parental involvement is one of the key factors in securing higher student achievement and sustained school performance (Harris, Chrispeels & Janet 2006). It would appear that involving parents in schooling leads to there more engagement in teaching and learning processes. The importance of parents' educational attainments and behaviors on children's educational attainment has been well documented.

There are mixed evidence on the effects of school quality on student achievement. Hanushek. (1995) had examined the effect of school quality on student achievement by providing review of over 90 studies. He found very mixed evidence concerning the effect of class size, teacher education, teacher experience, teacher salary and expenditure per pupil. However, many of the studies cited by Hanushek (1995) suffer from identification problems related to endogenous school choice.

Paul and Hanan (1994) also reviews studies on school quality and tried to correct endogenous school choice using the Ghana data. They examine the effect of school quality on student achievement after correcting for the selectivity bias using the characteristics of the schools chosen as an instrument

for school choice. They find that teacher experience raised the student achievement test scores. Alderman et al. (2001) in their study of schooling choice of low-income families in urban Lahore find that private schools catering to the urban poor charge low fees and the total educational expenditure on all (uniform, fees and transport etc) in private schools is often comparable to that in government schools.

Emmanuel et al. (1988) addressed both analytical issues (i.e. sample selection bias and bias due to omitted unobserved characteristics such as innate ability). They studied the problem of endogenous sample selection in comparison to private and public schools. They applied Heckman (1979) Two-Step Correction Procedure. Their work is based on less developed countries,<sup>2</sup> like Tanzania, Thailand, Colombia, Dominican Republic and the Philippines. David and Kruger (1992) analyzed the historical trend in the United States, with the observations of schools during 1920s and 1930s; they captured some differences in organization or level of resources that would be more appropriate for developing countries. For more discussion see David and Kruger (1992), Betts (1995), Heckman et al. (1994), Hanushek et al. (1996) and Speakman & Fins Welch (1995). Finally a large and widely discussed U.S. study in literature; Coleman et al. (1982) analyzed that private schools are more efficient than public schools in improving the student achievement scores.

### **III. Objectives of the Study**

In the past many studies have been done in this context by developing various models to assess the student achievement score. There are slight variations in methodological approach and sample selection. The objective of this study is to examine whether substantial differences exist in the students achievement in both types of school private and public in Pakistan. The two specific objective of the study are:

- To find out the affect of socioeconomic background and school quality on children's achievements score.
- To Determine the Factors influencing Choice of School.

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<sup>2</sup> They focus on improving learning achievement, particularly among the poorer countries.

#### IV. Methodology

Based on the literature study identified two types of factors that affect the student achievement; first, school inputs and second, socioeconomic characteristics i.e. family background. Equation 1 and 2 estimates the effect of these two factors on student achievement score. Simple Ordinary Least Square (OLS) Technique is used to estimate the parameters of equation 1 and 2. The estimated parameters of these equations will show the effectiveness of school and non-school factors on student achievement of private and government schools respectively.

$$PSA_i = \alpha_p + \beta_{pi} \sum_{i=1}^n X_i + \gamma_{pi} \sum_{i=1}^n Y_i + \mu_{pi} \quad (1)$$

Where

- PSA = Private School Student Achievement Score
- X = Set of Socioeconomic Variables
- Y = Set of School characteristics Variables

$$GSA_i = \alpha_g + \beta_{gi} \sum_{i=1}^n X_i + \gamma_{gi} \sum_{i=1}^n Y_i + \mu_{gi} \quad (2)$$

Where

- GSA = Government School Student Achievement Score
- X = Set of Socioeconomic Variables
- Y = Set of School characteristics Variables

But the achievement score is also dependent on the choice of school made by parents. There are several factors that affect the choices made by families for their children schooling. This causes a selection bias problem. Students with privileged family backgrounds also tend to attend private schools. It is therefore very difficult to infer how they would do in Public schools. To capture the selection biasness another regression model is adopted, in which, a dummy variable indicating school choice is first regressed on the factors influencing the decision of parent's to chose schooling-public vs. private. Choice of school is an important decision that directly affects the student achievement. It again depends upon the socioeconomic factors, as given in equation (3).<sup>3</sup>

$$CASC_i = \alpha_0 + \beta_{ji} \sum_{i=1}^n x_i + \gamma_{ji} \sum_{i=1}^n y_i + \mu_{ji} \quad (3)$$

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<sup>3</sup> Alternatively equation 1 and 2 can be estimated by one equation, with a dummy variable for Public and Private Type of schools but it may not address the endogeneity bias.

Where

CASC = Category of School

X = Set of Socioeconomic Variable

Y = Set of School Characteristics Variable

Furthermore to capture the effect of selection of school on the overall student achievement score, study regressed the predicted value from the choice of school regression model on the overall student achievement score [see equation (4)]. In other words by using the predicted values study tries to avoid the possible endogeneity that could have generated because of the simultaneity problem. Further to this school characteristics and socioeconomic behavior also effect child's learning ability that again influences student achievement. Ability depends on child own age as well as school and socio-economic background to which child belongs. But variable age does not show much variation, hence not included in the analysis. Predicted value from equation 3 therefore not only indicates choice of schooling but also predict child's learning ability as well.

$$SATS_i = \beta_0 + \beta_i \sum_{i=1}^n X_i + \gamma_i \sum_{i=1}^n Y_i + \lambda \hat{CASC} \quad (4)$$

Where

SATS = Student Achievement Test Score both private and government school.

X = Set of Socio-Economic Variables

Y = Set of School Characteristics Variables

$\hat{CASC}$  = Estimated value from equation (3)

Using the predicted value from equation 3 to estimate equation 4 yields a system of equations often term as two-stage least square (2sls) regression.

## V. Data Source

Data for the study is taken from an earlier study conducted by System (Private) limited for the World Bank. The study was conducted at national level. Of the total sample, 586 cases of Karachi were selected for this study. The study conducted by System (Private) Limited covers both public and private school students studying in 5<sup>th</sup> grade. The student achievement score is calculated on the basis of test of Urdu and Math's. Information is taken at both school and household level. The objective was to estimate the factors influencing the learning achievement of 5<sup>th</sup> grade.

## VI. Estimation of Factors Influencing Student Achievement Score

Table 1 shows the results of factors effecting students' achievement score in both types of schools public and private. Both school related factors and socio-economic background is explored. School related factors includes teachers qualification (both academic and professional), teachers' salary, teaching experience and dummy variables showing type of school (girls, boys or co-education) while parent's characteristics include their education level and father's occupation. In order to explore the family educational background based on gender, number of school going girls and boys are also included in the analysis.

Among the variables representing teacher resources result shows the significant effect of teacher's salary but the effect is negative. Negative effect of teacher's salary means that higher the salary package offer the lower will be the motivation to teach. The finding is in contrast to what earlier literature have suggested; that is the strong positive relation between teacher salary and student achievement. But for Pakistan it is not surprising because of the almost non existence of evaluation system in both private and public schools. Beside that due to political pressure in government schools it is very difficult to lay-off nonperforming teachers. Thus raising pay is not a powerful way to motivate teachers to apply more effort as wages can only serve as an effort for motivating device when the threat of dismissal is credible. The effect of academic or professional qualification and experience is also insignificant in increasing the student achievement score.

Higher education expenditure shows significant positive impact on private school student efficiency while the effect is significantly negative on student learning in public school. The reason is may be because parents' invest in their children coaching/tuition if they are studying at private school. Thus higher investment means higher human capital formation for the children learning at private school. While in public school higher education expenditure is not leading to the desire formation of human capital due to provision of low quality of education in the public school.

**Table: 1. Student achievement test scores for the private/public schools**

<b>Variables</b>	<b>Private</b>	<b>Public</b>
Teachers Academic Qualification	0.3875 (0.0187)* *	-0.2008 (0.2503)
Teachers Professional Qualification	0.3866 (0.3059)	-0.0752 (0.8348)

Teachers Salary	-0.0008 (0.0009)*	-0.0006 (0.0478)**
Teaching Experience (# year of he or she is Teaching)	0.0893 (0.1431)	-0.0777 (0.2798)
Log Education Expenditure	3.1912 (0.1025)***	-3.4252 (0.0596)**
# School going girls	-0.7106 (0.0918)***	-0.8751 (0.0559)**
# School going boys	0.5363 (0.2042)	-0.2511 (0.5250)
<b>Father Education Level</b>		
Primary	-0.2698 (0.7498)	-1.3118 (0.1394)
Middle	1.8958 (0.0518)**	0.7117 (0.4640)
Matric	-0.2455 (0.8322)	0.5130 (0.6048)
Inter	-0.5152 (0.7259)	-2.3962 (0.2831)
Graduate	2.4862 (0.0228)**	-0.7090 (0.5589)
<b>Mother Education Level</b>		
Primary	-0.5793 (0.5016)	0.3570 (0.6692)
Middle	-1.6093 (0.3375)	-0.1591 (0.8856)
Matric	-2.0034 (0.2243)	0.4765 (0.7448)
Inter	-6.7390 (0.0008)*	1.8985 (0.2781)
Girls School	0.9259 (0.3122)	0.1554 (0.8603)
Boys School	-0.2032 (0.7947)	-0.5832 (0.4064)
Dummy for Rural Areas	-1.0279 (0.1185)	-0.5398 (0.4102)
<b>House hold Head Occupation</b>		
Private	1.1833 (0.4102)	-2.3258 (0.1185)
Self employee	1.1216 (0.3903)	-1.2781 (0.3308)
Independent	3.1931 (0.0543)**	-0.8664 (0.6471)
Professional	4.5775 (0.0096)*	- -



	Unemployed	0.4372 (0.7486)	-1.7110 (0.2706)
Constant		2.0154 (0.7432)	30.7141 (0.0000) *
N		272	304
F-Stat		2.41	0.93
Prob. F		0.00	0.56
R-Square		0.16	0.085

Note: \*, \*\* & \*\*\* shows significant at 1%, 5% or 10% level, respectively. Numbers in parenthesis are p-values. Excluding category from mother’s and father’s education level is “illiterate”; from type of school variable excluding category is “co-education” while from occupation status excluding category is “other profession”

### 6.1. Logistic regression for the choice of school types

The estimation of logistic regressions equation for school choice is reported in table 2. The difference between table 1 and 2 is that table 2 also include variables like distance to school, school fee and gender of the teacher. The dependent variable is equal to one if choosing private school otherwise zero. Any factor having significant effect will imply that the factor is influencing the choice of private schooling. Study starts by exploring the school related factors because these factors have greater influence on the parental choice of schooling. First, teacher academic and professional qualification, the effect is significant only for the teacher’s academic qualification. Result show that parent choice of private schooling is positively influence by the academic qualification of teachers while teacher’s salary has negative influence on the parent’s choice. Moreover, teacher’s year of experience has insignificant effect.

**Table: 2. Choices of school by parent’s (Public/Private)**

Variable	Dependent Variable Private=1	Otherwise=0
Teachers Academic Qualification	0.2642 (0.0000) *	
Teachers Professional Qualification	0.0486 (0.6670)	
Teachers Salary	-0.0005 (0.0000) *	
# year of Teaching	0.0009 (0.9632)	
Log Education Expenditure	1.4055 (0.0186) **	
# School going girls	-0.1495 (0.2277)	

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# School going boys	-0.1357 (0.3288)
Father Education Level	
Primary	-0.2672 (0.3393)
Middle	-0.5418 (0.0676) ***
Matric	-0.2811 (0.3739)
Inter	-0.7275 (0.1637)
Graduate	-2.1661 (0.0005) *
Mother Education Level	
Primary	0.0993 (0.7099)
Middle	0.6073 (0.1316)
Matric	0.3308 (0.5507)
Inter	0.6766 (0.4463)
Girls School	-1.1335 (0.0001) *
Boys School	-1.7359 (0.0000) *
Dummy for Rural Areas	-0.5880 (0.0062) *
House hold Head Occupation	
Private	0.2087 (0.6185)
Self employee	-0.0418 (0.8997)
Independent	0.2016 (0.6949)
Professional	-
Unemployed	-0.6554 (0.0885) **
School Fee	-0.0061 (0.2290)
Distance	0.0787 (0.2235)
Dummy for female teachers	-0.1788 (0.3845)
Constant	-4.0550

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	(0.0283) *
N	573
Wald chi2(26)	109.3
Prob > chi2	0
Pseudo R2	0.19

Note: \*, \*\* & \*\*\* shows significant at 1%, 5% or 10% level, respectively. Numbers in parenthesis are p-values. Excluding category from mother's and father's education level is "illiterate"; from type of school variable excluding category is "co-education" while from occupation status excluding category is "other profession".

Second school fee, distance to school and children being taught by female have insignificant effect on parental choice but the overall education expenditure shows the significant positive effect of parent choosing private schooling for their children. The reason might be that parent's choose private schooling for their children to provide them quality education, thus their decision is respective of what the school fee is, how much the far the school is and who is teaching (male or female) as long as their children receiving good education. The result also shows inverse relationship between parents living in rural areas and choice of private school. Choosing the private schooling for the children based on type of school implies that parents' often not prefer single' sex schools as shown by the negative coefficient of both the dummies, school for boys or girls.

Turning the discussion to socioeconomic or family background, shows that father education negatively influence the decision of choosing private school for their children while the mother education is positively related to the decision although the effect of mother education is insignificant. Mother's education attainment insignificantly related to choosing private school for children indicate that father's is solely responsible for the making the choice of schooling for the children (as indicated by the significant co-efficient of father having either middle level education or graduate). Although the effect of fathers higher education on choosing the private school for their children is negative but after making the decision in the overall achievement test score the effect is positive. Finally, father occupation shows insignificant effect while increase in the number of school going boys and girls in the household decreases the probability of a parent choosing private school although the effect is insignificant.

## 6.2. Student achievement score and choice of schooling

Table 3 shows the overall result of both types of schools including the predicted values from the choice of school regression. The significant effect of

some of the variables changes at aggregate level. Some variables have little or insignificant effect while certain other factors influence the dependent variable significantly when the data is aggregated as compared to the data taken in sections. For example, result shows statistically significant effects of teacher academic qualification which was insignificant in table 1 although the effect is negative showing that overall teacher's academic qualifications are not effective in improving the student achievement scores. This may be because in Pakistan inadequate training leads undesirable performance by the teacher thus teacher having good qualification but inefficient training leads to decline in the student achievement score. Education level of father shows positive significant effect while result for mother's education levels indicates the negative significant effect on student achievement once again confirming that fathers have more say for taking the decision related to child schooling.

**Table: 3. Overall Effect on Students Achievement Score Both Types of School**

<b>Variable</b>	<b>Overall Score</b>
Choosing Private School	8.6480 (0.0213) **
Teachers Academic Qualification	-0.4431 (0.0433) **
Teachers Professional Qualification	0.0651 (0.8099)
Teachers Salary	0.0004 (0.3441)
# year of Teaching	0.0018 (0.9696)
Log Education Expenditure	-3.3791 (0.0403) **
# School going girls	-0.4058 (0.1950)
# School going boys	0.3713 (0.2272)
<b>Father Education Level</b>	
Primary	-0.1385 (0.8313)
Middle	2.0894 (0.01) *
Matric	0.7639 (0.3239)
Inter	0.7022 (0.6073)

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Graduate	5.2971 (0.0023) *
<b>Mother Education Level</b>	
Primary	0.0056 (0.9928)
Middle	-1.6340 (0.0770) **
Matric	-1.4351 (0.1529)
Inter	-3.7842 (0.0224) **
Girls School	2.4271 (0.0187) **
Boys School	3.0547 (0.0241) **
Dummy for Rural Areas	0.3049 (0.5968)
<b>House hold Head Occupation</b>	
Private	-0.7913 (0.4388)
Self employee	0.0973 (0.9146)
Independent	0.7407 (0.5502)
Unemployed	0.8993 (0.4122)
Constant	21.53 (0.0000) *
N	573
F-Stat	1.43
Prob. F	0.0872
R-Square	0.0545

Note: \*, \*\* & \*\*\* shows significant at 1%, 5% or 10% level respectively. Numbers in parenthesis are p-values. Excluding category from mother's and father's education level is "illiterate"; from type of school variable excluding category is "co-education" while from occupation status excluding category is "other profession".

Result also shows that variables representing number of school going boys and girls in a household have insignificant effect. Education expenditure shows negative and significant impact on children achievement score. Education expenditure was positive and significant for private school while

negative and significant for public school in table 1. At the aggregate level the effect might be capturing the dominant effect of public school. As in Pakistan the number of public school is more dominant in number then private schools. Study interpret the negative effect as higher education expenditure leads to lower achievement may be because with limited household income the higher the expenditure the lower will be the demand for getting education thus student achievement score decline. Result also shows positive and significant effect of single sex schools on the overall student achievement although the effect was previously positive only for the girls school and negative for the boys school.

Finally, student achievement score also influence by the choice of school by the parent's; private or public. This decision influences the achievement score significantly. The variable capturing the selection bias is basically the predicted probabilities of parent choosing the private school from the logistic regression. The reason as explain earlier is to avoid the possible endogeneity problem in the variable. In this case selecting private school for the children by the parents found to have highly significant and positive effect on the student achievement score.

Thus overall study confirms that student achievement scores differ across public or private schools. The difference is because of the teachers characteristic, socioeconomic background from which the student belong and the choice of schooling by the parents.

## **VII. Conclusions**

This paper has estimated the determinants of student achievement score in both types of school - public and private, using a sample of fifth graders. The study ran three sets of regressions: First student's achievement test score across private and public school was regressed on socioeconomic background and some school related factors. Second logistic regression was estimated to determine the choice of school types (public vs. private) and at the final stage effect of choice of schooling, school related factors and socioeconomic background of the student were used to determine the overall student achievement score. The data for this study came from a survey held for evaluating public and private primary schools performance in Karachi through random sampling.

One interesting finding is that teacher characteristic such as salary is negatively and significantly correlates with private and public school

performance score. Prior studies lacked access to data on teacher salaries in Pakistan; this result is consistent with the view that raising pay is not a powerful way to motivate teachers to apply more effort because wages can only serve as a motivating device when the threat of dismissal is credible which often lack in Pakistan.

As far as the effect of parents education on the student achievement score is concerned; probability of choosing private school although negatively influence by the father's education but in the overall achievement score and the private school student achievement score its effect is positive and significant. On the basis of this study, one can conclude that highly educated fathers may not send their children to private school but the higher education is providing vision to invest in human capital of their children may be providing help in getting education directly.

## References

- Academy of Educational Planning and Management, AEPAM, (1999). Measuring learning achievement of primary level in Pakistan. Ministry of Education, Islamabad. *National Study No. 135*.
- Alderman H., Peter F. Orazem & Elizabeth M. Paterno (2001). School quality, school cost and the public/private school choices of low-income household in Pakistan. *The Journal of Human Resources, Vol. 36*, pp. 304-326.
- Becher, R. (1984). *Parent involvement: A review of research and principles of successful practices*. Washington, D.C. National Institute of Education.
- Betts, Julian R. (1995). Does school quality matter? Evidence from the National Longitudinal Survey of Youth. *The Review of Economics and Statistics, Vol. 77*, pp. 231-247.
- Coleman, James, Hoffer, T. & Kilgore, S. (1982). Cognitive outcomes in public and private schools. *Sociology of Education, Vol. 55*, pp. 65-76.
- Cox Donald & Emmanuel Jimenez (1989). The relative effectiveness of private and public schools: Evidence from two developing countries. *Living Standards Measurement Study, Working Paper No. 60*; Washington, D.C.
- David Card & Alan B. Krueger (1992). Does school quality matter? Return to Education and the Characteristics of Public Schools in the United States. *Journal of Political Economy, Vol. 100*, pp. 1-40.
- Emmanuel J., Lockheed M. & Wattanawaha N. (1988). The relative efficiency of private and public schools: The case of Thailand. *World Bank Economic Review, Vol. 2*, pp.139-164.
- Hanushek, Earic. (1995). Interpreting recent research on schooling in developing countries. *World Bank Research Observer, Vol. 10*, pp. 227-246.
- Hanushek, Earic., Steven G. Rivkin & Lori L. Taylor (1996). Aggregation and the estimated effects of school resources. *Review of Economics and Statistics, Vol. 78*, pp. 611-627.
- Harris Alma, Chrispeels & Janet Hageman (2006). Improving schools and educational systems: International perspectives. *Taylor & Francis*, London.
- Harris, A. & Charispeel (2006). Improving schools and educational system: International perspectives. *Taylor and Francis*, London.



- Heckman, James J., Anne Layne-Farrar & Petra Todd (1994). Does measured school quality matter? University of Chicago, Department of Economics Processed Book Review, Title is, Does Money Matter? *The Effect of School Resources on Student Achievement and Adult Success*, pp. 192-288.
- Heckman's-lee (1979). Sample selection bias as a specification error. *Econometrica*, Vol. 47, pp. 153-161.
- Paul G. & Hanan J. (1994). Student achievement and schooling choice in low-income countries evidence from Ghana. *Journal of Human Resources*, Vol. 29, pp. 843-864.
- Sheldon, R. (2003). The changing influence of socioeconomic status on student achievement: Recent evidence from Australia. Paper Presented at the Annual Meeting of the *American Educational Research Association*, Chicago, 21-25 April.
- Speakman, R. & Fins Welch (1995). Does school make a difference? A reassessment. Mimeo, Texas A. and M. University.

**Annex 1**

**Variables used and their Description**

<b>Variables</b>	<b>Description</b>
Teacher's Academic Qualification	Measures in number of schooling years
Teacher's Professional Qualification	Index equals 1 if a teacher is CT, 2 if teacher is PTC & 3 if teacher is Bachelor of education while 0 if have no professional qualification
Teacher's Salary	Monthly Salary in Rupees
Teaching Experience	Number of years he or she is teaching
Education Expenditure	Monthly over all Education expenditure in Rs.
Number of School going girls and boys	Number of school going children by gender
School Fee	Monthly school fee in Rs.
Distance	Distance to school in km
Father's Education Level	Father's education level; illiterate primary, middle, matric, inter & graduate
Mother's Education Level	Mother's education level; illiterate primary, middle, matric & inter
Type of school	Categorical variable, boys, girls or co-education
Household Head's Occupation	Occupational categories: private, self employed, independent, professional, unemployed & others

**Annex 2**

**Descriptive Analysis**

<b>Variables</b>	<b># Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Teachers Academic Qualification	586	12.06	1.87	10	16
Teachers Professional Qualification	586	0.72	0.91	0	3
Education Expenditure	576	856	355	205	2646
Teachers Salary	586	2075	1232	300	5800
Teaching Experience	586	4.52	4.95	0	30
School Fee	586	30.69	20.88	1	71
Distance	586	2.21	1.56	1	8
Students Achievement Score	586	14.69	5.63	0	43