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Socio-Economic and Institutional Factors as Determinants for the Performance of Primary School Children in Northern Pakistan

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Abstract: This study was undertaken to find the factors that influence student outcomes in government primary schools in district Mardan. Multistage sampling was used. The sample was calculated through proportional allocation. The data was collected through questionnaires. The regression result showed that students' outcomes are significantly influenced by the education of the guardian and the education of the household head. Middle-class children get good marks compared to lower-middle or above-middle class. A boy student gets 7 marks less than a girl student. The cost other than the tuition fee also affects student outcome and free lunch is a strong predictor of percentage marks. The study recommends that Schools should be provided with proper funding. Special attention may be given to lower middle-class students to improve their percentage marks. The gender difference must be kept in mind and attempts must be made to devise ways to improve male student's marks.

Key Words: Students' Outcomes, Primary Schools, Linear Regression, Ordered Logistic Regression, Gender Effect.

JEL Classification:

Introduction

Most of economists and worldwide development organizations think that education is necessary which brings economic development and improves quality of life (Lucas 1988; Barro 1991; Mankiw, Romer, and Weil 1992; World Bank 2001; UNDP 2003). Education makes sure to get hold of knowledge and abilities which enables individuals to raise their efficiency and to develop the quality of life. This improvement in the output also shows the way towards the latest foundations of earnings that increase the economic development of the country (Saxton, 2000). Educators, researchers, and trainers give priority to the quality of student's performance at all levels so, they are trying to bring positive changes and improvement in the students' performance in their academic achievement (Crosnoe et al, 2004).

Education is a crucial procedure for every universal public; this is viewed as one of the primary mainstays of the universal public (Adams, 1998). Education is the concern of a

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wide choice of improvements on this planet. In the world, only those countries have gained position and improvement which have been a sound instruction agenda for education (Ball, 1990). Fundamental education is the base for any future instruction. Unfortunately, in Pakistan, no reasonable thought is given to Primary School. Elementary guidance of education instruction might awaken the light of education among the people. Unfortunately, because of the political instability of our state, the education system suffered a lot (Ashraf, 1983). In the present scenario of globalization and modernization, education is considered as the underlying step for each human development. It assumes a remarkable part in the development of human capital and relates to a person's prosperity and opens doors for better living (Battle& Lewis, 2002). Training is mainly the effective weapon that a person can use to change this world (Seligman, 2004). Pakistan lies among the countries, which is suffering from the problem of illiteracy. The reasons for illiteracy are so many such as poverty, overpopulation, feudal lords, low allocation of budget, male-dominated society, less educated parents, and lack of schools in the rural areas. The situation is very critical and it causes so many problems. Our government is trying to overcome the problem but still, the literacy rate is increasing gradually. The total figure of illiterates has increased radically from 20.25 million in 1951 to 48.8 million in 1998 (Breines, 2003).

Schooling is the way to show aptitude and learning. Such instruction simplifies the way to improve the learning or education system. Training plays a vital role in improving the quality of education and its objectives and developing the confidence level of the students as well as the teachers. Their confidence is seen in the output and result.

Academic achievements are conditional in many respects. The participation and performance are considered more skewed towards girls (the EFA Global Monitoring Report, 2003) and it was pointed out by UNESCO that some developing countries have shown that girls are outperforming boys in academic outcomes as well as academic progression. In Kenya Certificate of Primary Education (KCPE) female students obtained the top seven positions (Lucianne, 2013). It means gender effects are prominent in academic achievements but in the case of very little access to education by girls, the difference is insignificant (Chege, 2007). In developing countries intellectual male students are stigmatized as the study is considered a feminine activity (Legewie &DiPrete, 2012) and we can assert that the guardian's gender may have effects on the student's achievements (Chandrasekhar & Millette, 2006).

The effect of socioeconomic factors is also considered to be significant for students' achievement because such factors relate to the fulfilment of students' needs in the first place (Gamoran, 1997). The effects that the background of a student and their parent's socioeconomic status exert on academic achievement, are more prominent at primary and low secondary levels and these are the same across developed and developing countries (Simon and Alexander, 1980). Besides socioeconomic variables, school and teacher variables may also influence a student's performance (Saha, 1983; Avolos & Haddad, 1979).

Habibullah and Ashraf (2013) show that in Pakistan, children from families having low socio-economic backgrounds achieve good grades. Gender in this case proves a significant factor and females show higher grades than male students. The education of the mother and nutritional status is not significant and sports activities are associated with good grades. In the same year, Ali (2013) asserted that schools are short of facilities and there is political interference in rural areas of Khyber Pakhtunkhwa, Pakistan. The low number of teachers and poor check and balances and punishment mechanisms drastically affects the attempts to improve student's achievements. Socioeconomic variables and the education of parents are also influencing academic achievements in inner city territories in Pakistan (Farooq et al., 2011). Rahman and Din (2009) also confirm the strong effect of parents' education and father/guardian

income on students' educational achievements in Khyber Pakhtunkhwa. In 2013, the new government initiated various educational reforms for the achievement of universal primary education. Education at the primary level is supposed to be free and some other contributions to needy students are also provided in some places. However, the effect of other factors is expected to be prominent besides school fees.

Pakistan is yet struggling with the least proficiency rate on the planet even more than 70 years of presence. It is simply because of the educational issues in Pakistan. The framework could not change as per the needs and social type of the general population. Sadly, the essential education in Pakistan is especially overlooked as no consideration is paid to the essential level. Every government is responsible for looking after the affairs of education and fulfilling the needs and requirements of advanced education but unfortunately, our government has ignored the essential segment. Due to this, our education system is degraded day by day. Like all other issues, socioeconomic and institutional factors also lie in the major categories which are mostly studied and discussed factor with educational experts contribute to the academic performance of learners. The most prevailing case is that the socioeconomic conditions of students affect the features of their educational performance. The grounded socioeconomic condition brings environmental insufficiencies, which can result in a low self-worth of the learners (US Department of Education, 2003). The gap lies in the fact that most of the studies carried out in Pakistan are from a sociological perspective and very few econometric estimations are made as to what factors can significantly alter the academic achievement of students and to what extent. This study will make attempt to make an econometric estimation of students' academic performance.

Objectives of the study

Research Questions

1. What are the factors that affect the educational performance in primary schools in the District Mardan?
2. Do administrative factors affect the performance of Primary school students?
3. Is there any dissimilarity in the quality of students' achievement in relation to their gender?

Hypothesis of the study

There are three hypotheses of the study; these are as under.

H_1. Administrative factors affecting performance in primary schools.

H_2. Socio-economic status, parents' education and their profession affect the quality of students' academic performance.

H_3. There are dissimilarities in the quality of student's achievement in relation to their gender.

Significance of the Research Paper

The recent study will highlight the factors that are affecting the performance of primary school students in district Mardan. The end results of this research study will be helpful to the governmental and non-governmental organizations that are concerned about primary education within the province of Khyber Pakhtunkhwa and especially in district Mardan.

Literature Review

The review of literature related to a research topic plays a significant part in a study. It highlights the history and background of the research problem and gives direction. It helps the reader to understand the research topic in the best way and at the same time it explains the diverse methodologies adopted by various researchers to get to the bottom of the problem. Having such an idea in mind the following accessible literature on the performance of primary school children is reviewed.

Ali (2013) analyzed the reasons which affect the educational performance of primary

school students of Rustam, District Mardan. This study was based on descriptive analysis and the simple random method was used. The number of 20 primary schools was chosen by the author in the Rustam area. The closed-ended questions were asked from the different teachers and students of the selected primary schools. The study shows that there is a shortage of facilities, some political interference also involved there and the number of teachers is also less as compared to classes. There are weak checks and balances and poor systems for the penalties and rewards of teachers in their academic attainments. The instructive policies are unsuccessful in creating good and positive adjustments in the educational success and performance of the students. The analysis recommends that improvement can be brought by the facilitation of teachers and also to keep a proper check and balance upon them with no political interventions.

Ashraf et al. (2013) concentrate on deciding the elements influencing the scholarly execution of understudies in grade schools an aggregate of 600 understudies crammed the analysis of which 300 were taken from the private and 300 from untie part schools. The indicated period of youngsters was 11.37±1.52in the company of a male-to-female fraction of 1:1.8 in state-funded schools and 1:0.9 in tuition-based schools. Financial condition was named great, reasonable and poor utilizing the parent's occupation and number of relatives working. Just about 34% of kids having a place open and 65% to non-public schools were ordered as great. 65% of fathers and 58% of mothers of the school children were educated which were government funded while; these statistics were 62% and 67% between tuition-based school youngsters. Commonly 25 percent of school kids do not routinely have breakfast. Right around half open and 20 percent tuition tuition-supported school kids remained absentees once a week. Normally 35% of children did not have enough rest and 22 per cent offspring of open and 14% of non-public schools were practising some kind of sickness. In the sight of BMI general 24 per cent of youngsters were underfed while corpulence was seen in the 3 per cent of open and 11 per cent of non-publically school understudies. Fathers' and mothers' support in completing school work from home was twice extra in those focused in non-public schools (11 per cent open and 22 per cent private) thus demonstrating a higher scholarly execution of understudies in the non-public school (poor execution seen in 40% open and 16% private). Subjective ways assessed as of learning tendencies and the general psychosocial stipulation was huge in the two nature of school youngsters and the school clause of 43 per cent open and 54 per cent tuition based school were as well good. The greater part of the schools had no games or physical preparation offices.

Aturupane*et al.* (2013) studied the impact of school quality, health of children and socio-economic issues on the academic performance of students in Sri Lanka. The academic performance of class four students was tested. This paper shows that the ratios of enrollment in Sri Lankan primary schools are very good but still the academic performance of many students is not good enough. To find the reason for the issue, different aspects of students studied by the researchers, like their family status, health, environment of their schools, character etc. The result showed that parents' education has a positive impact on students' academic performance, as the students whose mothers were educated their performance was high because the mothers were helping their children in work, similarly, fathers' income also affected on performance of students because they were having good nutrition facilities and vice versa. The study also examines that the school's environment like infrastructure facilities also has a role in child academic performance. It is recommended that extra time should be given to children for work, and health facilities should be arranged by the government.

Hassan and Ali (2014) consider the causes influencing the scholarly execution of grade school both in broad daylight and private segments. The examination was led in the region of Peshawar. There are 647 open essential schools and 247 are private

elementary schools in the Peshawar area. 20 private and 20 open-grade schools were chosen for the information accumulation. Shut finished poll with 3 scale (Yes, Don't know and No) was planned and appropriated to 320 educators out in the open and non-public schools. 297 polls were obtained back and afterwards utilized for the information examination. The reaction rate was 88.3 per cent. The information contains all our factors. Strategic relapse (multinomial) was utilized as a part of SPSS v 20 for the information investigation.

Suleman and Gul (2015) worked on the components that influence the nature of essential instruction in Kohat Division, Pakistan. A sum of 240-grade school heads and 800 educators were chosen in a similar locale utilizing a straightforward irregular examining system. The idea of the examination was distinct and a semi-organized survey was utilized to request reactions from the members. Factual investigation has been performed; Chi-square and straightforward rates are registered for information. The discoveries demonstrate that the absence of instructive offices, deficient qualified staff, poor supervision and administration, political obstruction, ugly pay rates bundles for essential educators, unsuitable assessment and examination framework, poor educational module, insufficient spending plan for training, defilement, poor execution of instructive strategies, absence of coordination amongst schools and group, parental low financial status, parental negative mentalities, ignorance of guardians, and absence of in-benefit preparing programs for educating staff.

Mayo (2016) tried to discover the elements influencing the scholastic execution of stranded youngsters in Bindura District elementary schools in Zimbabwe. The enlightening study configuration was utilized as a part of this examination. The populace was 300 instructors and 50 stranded kids. An example of 80 educators and 10 kids arbitrarily chose to take an interest in this exploration. Information was gathered utilizing surveys and meets. The SPSS program was utilized to examine the information. The examination discovered that stranded kids did not perform well scholastically amid class work. They didn't do the homework allotted by the instructors. The investigation discovered that instructors did not have the information or aptitudes to help stranded youngsters with educating and learning. The investigation prescribed that educators ought to be outfitted with abilities to oversee stranded kids scholastically. The examination prescribed that temporary parents should be made mindful through workshops on how to help stranded youngsters with class work appointed to be done at home. More research ought to be done on how stranded kids can be propelled to learn.

Rahim (2017) conducted a study on improving educational performance in KP. The motivation behind this examination is to investigate the effect of the appointment of outcome-related specialists to open elementary schools through Parent-Teacher Councils on the learning results of grade school children in the Khyber Pakhtunkhwa territory, Pakistan. The learning results were estimated in three branches of knowledge (Urdu, English, and Mathematics). Primary data was collected from 222 open elementary schools in the KP Province. Results reveal that school measures, separate classrooms and children participation are critical in deciding Urdu perusing aptitudes; though school estimate mono review schools and PTR (grades 3-5) are noteworthy in deciding English perusing abilities and also numeracy abilities.

Israr (2018) studied the condition of social safety in girls' primary schools. The study was conducted in the rural area of Hoti, Mardan (KPK). The research showed that a clean environment inside the schools also plays a very significant role in academic performance. It also affects the attendance of students in schools. The objective of this study was to identify the right to use suitable sanitation facilities and find students' difficulties with respect to weak hygiene conditions. 40 respondents from government girls' primary schools were randomly selected from Union Council Hoti and the interview of 12 teachers was also taken randomly to know about the weak sanitation system in those schools. Both

of the open and close-ended questions were concluded in the questionnaire. The results of the analysis showed that more than 50 per cent of respondents used tap water while there was less use of tube wells, some of the schools had appropriate latrine facilities while in some schools it was poor, and many of the respondents answered that school waste is disposed out of schools. The study concluded that it is still a challenging effort for the authorities to provide a suitable sanitation system, to allocate funds and to monitor it strongly.

It is concluded that many researchers examined different socio-economic factors, parents' literacy, paying attention towards child education, high income, and institutional attention play vital roles in the best performance of children in primary schools.

Research Methodology

Methodology is the foundation upon which the entire structure of research stands. This chapter relates to the methodology of the present study. Following are the details about sampling and model estimation in order to fulfil study objectives.

Research Area

District Mardan is the second-largest district of Khyber Pakhtunkhwa. The total population of District Mardan was about 2, 373, 061 according to the 2017 census. The gender ratio is 50.60% male and 49.39% female with a 3.01 annual growth rate. Most of the population lives in rural areas (81.5%) while 18.5% resides in urban areas. The literacy rate of the district population (having an age of 10 years or more) is 49.95% which has become better by 34 % since 1981. The male education ratio is more than females which is 60.50% and 28.38% respectively (Development Statistics of KPK, 2017).

Sampled Population

All government primary schools in district Mardan constituted the population for this study while the sample consisted of selected primary schools in district Mardan through the following procedure.

Sample Size and Technique

The present study is an observational study in nature and a survey technique was used. Primary data was collected from primary schools in district Mardan through a questionnaire. For this survey, the sample was taken using 5% as the level of significance. The sample size was selected by the following procedure.

We used a multi-stage sampling procedure for the selection of appropriate samples. The data about schools was taken from Khyber Pakhtunkhwa Elementary and Primary Education Department. These are four clusters (given in Table 3.1) based on location and student gender.

Table 1

Mardan District Primary School statistics

Urban boys Schools	Urban girls Schools	Rural boys Schools	Rural girls Schools	Total(N)
82	56	746	564	1448

Source: Data collected from DEO Mardan by author.

The total population of schools were 1448. The study intended to collect data from each school randomly without going into further details about class-level stratification as the data was not readily available. So in the first step, a collective sample from this total was calculated by the following Yamane sample size formula:

n =

Where:

N is the total population

N is the required sample size and e is the error margin taken as 5%.

Hence the calculated sample size is 313. The study then used proportionate sampling as follows for more accuracy.

Proportionate Sampling

Proportionate sampling is a sampling strategy (a method for gathering participants for a study) used when the population is composed of several subgroups that are vastly different in number. The number of participants from each subgroup is determined by their number relative to the entire population. The following formula is used for sampling.

ni = ×n

Where ni refers to sub-sample in the ith category

Ni to the total number in the ith category

N to the total population and n to the total collective sample.

The final sample, including the sub-sample, is given in Table 2.

Table 2

Final Sample

Urban boys schools	Urban girls schools	Rural boys schools	Rural girls schools	Total
18	12	161	122	313

Source: Data collected from DEO Mardan by author.

Estimation Techniques

The study performed descriptive analysis in order to describe the sample. For this purpose, frequency tables were estimated in SPSS. For regression analysis, estimation was done in STATA. The following model was estimated based on the literature:

Outcome =f (location, student gender, guard gender, distance km, salary head, free lunch, proper fund, staff adequacy, social group1, social group2, head edu, TC)

Or

O = f (L, SG, GG, D, SH, FL, PF, SA, SG1, SG2, HE,Tc) -------(1)

Where:

O refers to outcome which is the percentage result of a student in the previous examination.

L refers to location, urban location is equal to 1 and rural is 0.

SG refers to student gender, where a male student was coded as 1 and a female as 0.

GG to guard gender, and is 1 if the guard is male and 0 otherwise.

D shows the distance from the child's home to the school, which is measured in KM.

SH refers to the head's salary/earnings per month,

FL shows free lunch and was coded as 1 if it is given in school and 0 in case not.

PF shows proper fund, and if proper fund is lacking then will be coded as 1 and zero vice versa.

SA refers to staff adequacy, it's a dummy and staff adequacy will be coded as 1 and 0 otherwise.

SG1, social group 1 will be coded as 1 if a person belongs to the lower middle and 0 otherwise.

TC, total cost consists of all the costs other than admission and are taken (or transformed) on a monthly basis.

SG1 shows the lower middle class and SG2 shows the social group of middle as 1 and 0 otherwise.

HE shows the education level of the head of the family. And if a person is metric=1 and 0 otherwise.

Equation 1 after estimation becomes:

$$O=\alpha+\beta_1 L+\beta_2 SG+\beta_3 GG+\beta_4 SH+\beta_5 FL+\beta_6 PF+\beta_7 SA+\beta_8 TC+\beta_9 SG1+\beta_{10} SG2+\beta_{11} HE+\beta_{12} D \text{ ----(2)}$$

Data Collection Tool

The study employed a questionnaire used in the HEC-Thematic research project named "Costing out education needs for Khyber

Pakhtunkhwa". It used the part related to this study.

Results and Discussion

This chapter shows data analysis and its discussion. The descriptive analysis gives a picture of the overall sample and the regression analysis gives the details of the factors that could be significant or insignificant towards students' achievement.

Regression Analysis

Table No.3 shows the estimated coefficient of the regression model in which students' percentage marks are the dependent variable. The independent variables included the education of the household head, social group one and two, the availability of proper funds to the school, the adequacy of staff, the distance between a child's home and his or her school, the location, gender of the student, the availability of free lunch, the salary of the head (household head) the gender of the guardian of the student (in some cases, the male parent is away for earning livelihood and female) parent takes care of the child) and total cost besides tuition fees (school fee is not charged by a child). The other total costs included the stationary costs, cost of clothing, pocket money, and payments for parties). As the table * shows, there is a strong positive relationship between education of the head and a student percentage mark. It suggests that there will be a 4-point increase in a student's percentage marks if their parent/head education level increases. Aturupane et al. (2013), Barnard (2004), Farooq et al. (2011), Rahman and Din (2009), and Caldas and Bankston (1997) showed that parent's education has a positive impact on students' academic performance and hence our results confirm this previous assertion. For social group 2, accounting for the middle class as a reference category, there a 6 points more marks if a child belongs to the middle class, the incidence is highly significant. Caldas and Bankston (1997) show that the socioeconomic status of the family has a very important role in the performance of every child. The effect of socioeconomic factors was found significant by Gamoran, (1997). The effects that the background of a student and his/her parent's socioeconomic status exert on academic achievement, are more prominent at primary and low secondary levels and these are the same across developed and developing countries (Simon and Alexander, 1980). Habibullah and Ashraf (2013) show that in Pakistan, children from families having medium socio-economic backgrounds achieve good grades. Gender in this case too proves a significant factor and female students show higher grades than males. Besides socioeconomic variables, school and teacher variables may also influence student performance (Saha, 1983; Avolos & Haddad, 1981). Our result shows that if a school lack proper funding, there will be a 6.88 points decrease in students' percentage outcome in a highly (5% level of significance) significant manner, but the staff adequacy issue has no prominent effect on students' results; an increase in one Km of distance from a student's home to the school has 0.27 marks effect on a student result. The effect is little but significant. A student belonging to the urban location will get 1.27 fewer marks than a rural area student. Similarly, a male student in a government primary school gets 7 points fewer marks than a female student. The EFA global monitoring report, 2003) pointed out that in some developing countries female students are outperforming males in academic outcomes as well as academic progression. In Kenya Certificate of Primary Education (KCPE) girls obtained the top seven positions (Lucianne, 2013). It confirms gender effects are prominent in academic achievements and there is a significant difference in marks obtained by a male pupil and a female pupil. In developing countries, academic male students are stigmatized as the study is considered a feminine activity (Legewie & DiPrete, 2012) and we can assert that the guardian's gender too may have effects on student' achievements (Chandrasekhar & Millette, 2006).

A very strong increase of 10.12 marks will be obtained by those students which gets free lunch at school. A one-rupee increase in the salary of the household head may increase marks by .0005 points in a significant way.

Sentamu (2003) showed that the salary of the head has a significant impact on students' performance. Socioeconomic variables and the education of parents are also influencing academic achievements in inner city territories in Pakistan (Farooq et al., 2011) Rahman and Din (2009) also confirm the strong effect of parents' education and father/guardian income on student's educational achievements in Khyber Pakhtunkhwa. A male guardian can cause a decrease in marks by 4.8 points in a highly significant manner which means that a female guardian has a proper check and balance on their children's school activities and work. Previous research showed that the students whose mothers were educated their performance were high because the mothers were helping their children with work, similarly, a father's income also affected the performance of students (Aturupane et al (2013), Barnard (2004), Farooq et al. (2011), Rahman and Din (2009), Caldas and Bankston (1997)). The total cost incurred to a student, besides school fees which are not charged, can increase the per cent marks by .00131 points.

The regression model is statistically significant with a significant f value and almost 50 per cent variation in the dependent variable, the student's outcome is explained by independent variables collectively.

Table 3

Regression Coefficients

Student percentage	Coef.	Std. Err.	t	P>t	[95% Conf.Interval]	
Location	-1.727564	.8865659	-1.95	0.052	-3.472359	.017232
Student gen	-7.177869	.9102536	-7.89	0.000	-8.969283	-5.386455
Guard gender	-4.838623	1.753023	-2.76	0.006	-8.288639	-1.388607
Distance km	.2763046	.1369514	2.02	0.045	.0067789	.5458303
Salary Head	-.0004959	.0000803	-6.18	0.000	-.0006539	-.0003379
Free Lunch	10.1258	1.567863	6.46	0.000	7.040187	13.21141
Proper Fund	-6.881572	1.043749	-6.59	0.000	-8.93571	-4.827434
Staff adequ	1.179293	1.095078	1.08	0.282	-.9758625	3.334448
Social group1	-2.528812	1.361216	-1.86	0.064	-5.207738	.150113
Social group2	6.162101	1.207287	5.10	0.000	3.786114	8.538089
Head edu	4.029872	1.094981	3.68	0.000	1.874908	6.184835
Total cost	.0013167	.0002258	5.83	0.000	.0008723	.0017611
_cons	77.80202	2.932636	26.53	0.000	72.03048	83.57356

F(12, 295) = 26.13 (0.000) Adj R-squared = 0.4955Root MSE = 6.4245

Table 4

Heteroskedasticity Corrected Standard Errors

Student percentage	Coef.	Std. Err.	t	P>t	[95% Conf.Interval]	
Location	-1.727564	.7905816	-2.19	0.030	-3.283458	-.1716687
Student gen	-7.177869	1.108434	-6.48	0.000	-9.359309	-4.996429
Guard gender	-4.838623	2.128502	-2.27	0.024	-9.027595	-.6496505
Distance km	.2763046	.1175731	2.35	0.019	.0449163	.5076929
Salary head	-.0004959	.0001442	-3.44	0.001	-.0007796	-.0002121
Free Lunch	10.1258	1.902856	5.32	0.000	6.380907	13.87069
Proper Fund	-6.881572	1.265815	-5.44	0.000	-9.372744	-4.390399
Staff adequ	1.179293	1.619776	0.73	0.467	-2.008488	4.367074
Social grp1	-2.528812	1.737836	-1.46	0.147	-5.94894	.8913147
Social grp2	6.162101	1.48919	4.14	0.000	3.231318	9.092885
Head Edu	4.029872	1.307283	3.08	0.002	1.457088	6.602656

Student percentage	Coef.	Std. Err.	t	P>t	[95% Conf.Interval]	
Total cost	.0013167	.000298	4.42	0.000	.0007302	.0019031
_cons	77.80202	3.521458	22.09	0.000	70.87166	84.73239

F(12, 295) = 32.24 (0.000) R-squared = 0.5152 Root MSE = 6.4245

The percentage marks regression outcome was also tested through ordered logistic regression. As the percentages in different ranges show a natural order, the ordered/ordinal logistic is a suitable method. The first group consisted of those students who obtained percentage marks below 60, the second from 61 to 70, the fourth from 71 to 80 and the fifth 81 and above.

Ordinal Logistic Regression Model

There are several occasions when the outcome variable is polychotomous. Such outcome variables can be classified into two categories-multinomial and ordinal. While the dependent variable is classified according to their order of magnitude, one cannot use the multinomial logistic regression model. A number of logistic regression models have been developed for analyzing ordinal response variables (Amstrong & Sloan, 1989; Anderson 1984; McCullagh, 1980). Moreover, when there is a need to take several factors into consideration, special multivariate analysis for ordinal data is the natural alternative. There are various approaches, such as the use of mixed models or another class of models, probit for example, but the ordinal logistic regression models have been widely used in most of the previous research works (Anderson, 1984; Scott, Goldberg & Mayo, 1997; McCullagh & Nelder, 1989; Brant, 1990, Lee 1992; Ananth & Kleinbaum, 1997; Bender & Grouven, 1997; Hendrickx, 2000; Walters, Campbell & Lall, 2001; Lall, Campbell, Walters SJ, Morgan, 2002; Hosmer, DW, Lemeshow, 2000). There are several ordinal logistic regression models such as the proportional odds model (POM), two versions of the partial proportional odds model-without restrictions (PPOM-UR) and with restrictions (PPOM-R), continuous ratio model (CRM), and stereotype model (SM). The most frequently used ordinal logistic regression model in practice is the constrained cumulative logit model called the proportional odds model (Lemeshow (2000), Agersti (1996); Pongsapukdee V, Sukgumphaphan(2007).

Table 5 shows ordered logistic regression coefficients. The results show that students' gender has a significant effect on students' percentage outcomes and a male student will get almost 2 per cent less marks in log odds while going to a higher student marks level, keeping other variables intact. The same is the case for a male guardian where the male guardian will decrease log odds by 1.19 while going to higher levels. The availability of free lunch will add 2.87 marks in log odds in progression to a higher level of marks. Distance too has a positive but very minimal effect while a head salary increase by one rupee had a very little but negative effect. If a school lacks proper funding, the progression of students may be decreased by 1.67 log odds. Adequacy of staff will also add to student's marks as well as the education of household heads and social groups (middle class). The chi-square value is statistically significant which shows our model is fit and almost 31% variation in the dependent variable is brought by independent variables. the ordered logistic regression has confirmed the effect of independent variable in linear form regression and we can say that these factors are significant.

Ordered logistic regression

Iteration 0: log pseudolikelihood = -471.99933
Iteration 1: log pseudolikelihood = -395.40026
Iteration 2: log pseudolikelihood = -392.67509
Iteration 3: log pseudolikelihood = -392.67034
Iteration 4: log pseudolikelihood = -392.67034

Table 5

Coefficients of Ordered Logistic Regression

Levels	Coef.	Std. Err.	z	P>z	[95% Conf.Interval]	
Location	-.379462	.2968925	-1.28	0.201	-.9613606	.2024366
Student gen	-1.933368	.3433733	-5.63	0.000	-2.606368	-1.260369
Guard gender	-1.190194	.5649018	-2.11	0.035	-2.297382	-.0830072
Distance km	.0997036	.0484853	2.06	0.040	.0046743	.194733
Salary Head	-.0002319	.0000325	-7.14	0.000	-.0002956	-.0001683
Free lunch	2.87057	.5479866	5.24	0.000	1.796536	3.944604
Proper Fund	-1.678383	.3628331	-4.63	0.000	-2.389523	-.9672437
Staff Adequ	1.356624	.4087123	3.32	0.001	.555563	2.157686
Social grp1	-.1750446	.4447861	-0.39	0.694	-1.046809	.6967201
Social grp2	1.911423	.4237661	4.51	0.000	1.080856	2.741989
Head Edu	1.902332	.3822814	4.98	0.000	1.153074	2.65159
Total cost	.0006313	.0000894	7.06	0.000	.000456	.0008065
/cut1	-8.978568	1.45799			-11.83618	-6.120959
/cut2	-3.839707	1.003917			-5.807348	-1.872066
/cut3	.0470672	.9872118			-1.887832	1.981967
/cut4	1.947454	.9726941			.0410082	3.853899

LR chi2(12) = 242.18(0.000)Log likelihood = -274.8 Pseudo R^2 = 0.3059

Table 6 represents odds ratios which too confirms the effects of independent variables.

The Odds Ratio

Iteration 0: log likelihood = -395.87614

Iteration 1: log likelihood = -288.64293

Iteration 2: log likelihood = -275.27904

Iteration 3: log likelihood = -274.79124

Iteration 4: log likelihood = -274.78797

Iteration 5: log likelihood = -274.78797

Table 6

Coefficients of Ordered Logistic Regression

Levels	Odds Ratio	Std. Err.	z	P>z	[95% Conf.Interval]	
Location	.6842295	.2031426	-1.28	0.201	.3823723	1.224383
Student gen	.1446601	.0496724	-5.63	0.000	.0738021	.2835494
Guard gender	.3041621	.1718217	-2.11	0.035	.1005217	.9203445
Distance km	1.104843	.0535686	2.06	0.040	1.004685	1.214986
Salary Head	.9997681	.0000325	-7.14	0.000	.9997045	.9998317
Free Lunch	17.64707	9.67036	5.24	0.000	6.028727	51.65588
Proper Fund	.1866755	.067732	-4.63	0.000	.0916734	.3801293
Staff Adequ	3.883064	1.587056	3.32	0.001	1.742922	8.651095
Social grp1	.8394196	.3733622	-0.39	0.694	.3510561	2.007159
Social grp2	6.762703	2.865804	4.51	0.000	2.947203	15.51782
Head Edu	6.701504	2.561861	4.98	0.000	3.167917	14.17656
Total Cost	1.000631	.0000895	7.06	0.000	1.000456	1.000807
/cut1	-8.978568	1.45799			-11.83618	-6.120959
/cut2	-3.839707	1.003917			-5.807348	-1.872066
/cut3	.0470672	.9872118			-1.887832	1.981967
/cut4	1.947454	.9726941			.0410082	3.853899

LR chi2(12) = 242.18(0.00) Pseudo R2 = 0.3059Log likelihood = -274.78797

Conclusion

This study arrives at different conclusions. The results of past research are confirmed by this study as well. It concluded that the gender effect is very strong and effective in explaining students' percentage marks and female students get more marks. The education of the household head also plays a very positive role in student's percentage marks. If the ultimate guardian is a mother, the student's result will be better. That is to say, the gender of the guardian is also influencing a student's outcome. The lower middle class doesn't affect a student's percentage gain but a student belonging to the middle class gets better marks. If a school lacks proper funding, a student's marks are negatively affected in a significant manner. It is also asserted that urban area students of government primary schools get lower marks than rural area schools. The monthly income of the father also has an influence on a student's marks. So it is concluded that it's not just the intelligence quotient that affects a student's outcome, there are various other factors besides IQ which has an influencing effect on a student's marks.

Recommendations

Based on the findings of the study, the following recommendations are forwarded.

1. Schools should be provided with proper funding.
2. Special attention may be given to lower middle-class students to improve their percentage marks.
3. Education for all must be ensured, educated parents must educate Pakistan.

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