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Education Quality and Public Satisfaction: Public Accountability of Public Schooling System in Pakistan

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Abstract: Provision of quality education and its accountability is a challenge in developing economies. Present study performed an indirect accountability analysis through public satisfaction; using the nationally representative data of Pakistan. This study also identifies the behavioural determinants of public satisfaction for schooling services. The results of district satisfaction ranking show that majority of the districts with the highest satisfaction are from KPK, while the bottom 10 are from Baluchistan where enrollment rate is quite low and other supply side indicators are also showing very low rank. The finding of the behavioural analysis, based on logit model, shows that rural households with low education are less satisfied, the results show that educated households who use some other schooling options are not satisfied with public schooling services, the likelihood of satisfaction of the owner of the house are 10-12% lower than those who live in a rental property. The social connectivity and awareness indicate that the likelihood of satisfaction is low for those households who have TV, PC/laptop and mobile phones.

Keywords: Pakistan, social accountability, public satisfaction, education satisfaction, social awareness.

Introduction

Countries all over the world consider education to be essential and critical for the sustainable development of an economy. The realized importance of the education made countries adapt SDG 4 “Ensure inclusive and equitable quality education and life-long learning opportunities for all”. The Seminal work of Lucas Jr (1988); Mankiw, Romer, and Weil (1992) recognized the vital role of human capital in growth. This human capital mainly depends on education structure including access to school, quality of education, school infrastructure and facilities, trained and qualified teachers, pupil-teacher ratio etc. Similar to other developing economies access to education and quality education; both are two great challenges in Pakistan. The existing net primary enrollment rate though increasing but still it is just 68(%)

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Figure 1
Net Enrollment Rate in Pakistan, (% of primary school age children)

This situation is worse in case of female enrollment as depicted by Figure 1. Investment in education empowers individuals to create opportunities and earn their livelihoods; government spending on education in Pakistan has been very negligible below 3% of GDP for decades. The increase in this spending is very critical to increase the access to education and improve the quality of education. Since there is heavy reliance of public schooling, due to non-affordability, as the Pakistan Social and Living Standard Measurement Survey 2014-15 shows that 56.2% of the respondents always used public school facilities however large proportion of them 38% never used the facility of public school. It is stated by the 43% of these households who do not use school services is due to unavailability of teachers and insufficient school facilities. 26% of those not using school services are the ones who can't afford it. Furthermore, the distance to school also accounted for not using this service as 3% reported this reason for not attending schools.

The obligatory nature of education services compels the government to establish educational institutions, but still a large chunk of the population avoids public schools due to low quality and bad performance of public schools. The accountability of public schools is very important especially in case of Pakistan; where various education standards are working and masses have very low affordability. In this drastic situation there is a dire need of good public schooling system. However, the measurement of performance is subjective and there is no direct data available for this purpose; a good proxy of performance of school facilities may be public satisfaction regarding public schools, which is common in literature as in case of Beijing, China (Shen & Wang, 2011), for USA (Friedman, Bobrowski, & Markow, 2007), in case of UK (Favero & Meier, 2013; Charbonneau & Van Ryzin, 2012).

In domestic context, i.e. in case of Pakistan the literature related to education quality, public school's performance, and their accountability is much scanty as Haq (2009) explored the objective and subjective indicators of human well-being for 100 districts of

Pakistan using PSLM survey data for 2006-07. The indicators used for subjective well-being are satisfaction with education, health and policing facilities and perception of economic status. Principal Component Analysis is used for statistical analysis. The findings indicated that education and economic status are important predictors of human well-being. Further objective indicators of education literacy rate, net primary enrollment and gender equality raises satisfaction with education facilities. Similarly, [Ijaz, Irfan, Shahbaz, Awan, and Sabir \(2011\)](#) examined the quality of services provided by public sector business schools and factors that determine the students' satisfaction with these institutes. The study used the SERVQUAL model for measurement of service quality. The data was collected from graduate and undergraduate students of 4 public universities in Lahore city. Using structure equation modeling technique, they found that students are satisfied with the services provided by business schools in public sector as these institutions have good reputation, better infrastructure, skilled and qualified faculty, and scholarship facility.

In a study related to student satisfaction [Butt and Ur Rehman \(2010\)](#) found that courses offered, teachers' skills and expertise, learning environment and classroom facilities raises students' satisfaction. However, teachers' skills and expertise is the dominant factor of students' satisfaction. While in case of parental preferences related public and private schools. [Ahmed and Sheikh \(2014\)](#) conducted a survey in 8 tehsils of Punjab. Parents' perception of the quality of school (infrastructure, academic and teacher quality) and post study employment opportunity, socio-economics status (family income or wealth, parents' education), access to school and expenditure on school are the important determinants of school choice. In a similarly study [Rehman, Khan, Tariq, and Tasleem \(2010\)](#) examine the same relationship using survey data from 200 secondary students' parents in KPK. The study used Binomial Logistic Regression for estimation. It is found that family size, parents' education level, parents' income, teacher qualification and school performance impacts parents' decision of school choice. Many parents prefer private schools as they believe that private school students learn and perform better. However, they believe that the learning environment in public school is not adequate.

[Kisida and Wolf \(2015\)](#) investigated the impact of school choice on parental satisfaction using the data from district of Colombia Opportunity Scholarship Program over the period 2004-2009. The study used the instrumental variable analysis to analyse the relationship. It is revealed that parents of students accessing private schools using a voucher are more satisfied with the schools of their children. They prefer private schools because private schools better learning environment and cater to the need of their children. Similarly, in case of New York city; [Charbonneau and Van Ryzin \(2012\)](#) found that measures of students' performance significantly predict the parental satisfaction. The percentage of low income students is negatively associated with parents' satisfaction. The analysis suggests that school performance and parents' satisfaction is statistically related. In another study for New York city, ([Favero & Meier, 2013](#)) found positive impact of income on satisfaction.

In order to find the determinants of satisfaction, [Friedman et al. \(2007\)](#) surveyed of parents from 121 schools in 27 districts across USA, during 2002-2005. The result of the multiple regression analysis indicated that parent communication and involvement, the

physical facilities (library, computer, and other equipment), curriculum are important predictors of parents' satisfaction even after controlling for the district and demographic factors.

In case of Beijing China, (Shen & Wang, 2011) examined citizen satisfaction with education. They found that education quality, education fairness and transparency are important predictors of satisfaction. Further it is indicated that urban dwellers with access to better educational facilities and higher educational attainment are less satisfied than the disadvantaged rural dwellers. Age and gender have no significant impact on satisfaction with education. In another study of similar fashion. Alderman, Orazem, and Paterno (2001) identified the factors which affect the school choice (public school, private school or not schooling) in low-income neighbourhoods in Lahore, Pakistan. The study used multinomial legit model for analysis. The findings indicated that school fees, distance to school, and quality of school impacts households' school choice decision significantly. Lower fees in private schools, and proximity will not only increase enrollment by switching public to private schools but also those poor households with children out of school will also enroll their children in private schools.

In case of Indonesia, (Lewis & Pattinasarany, 2009) assessed the impact of objective measures of service quality and governance conditions on satisfaction with local education services. They used the data derived from World Bank Governance and Decentralization Survey 2 (GDS2). The regression model is estimated using ordered probit method. They found that good condition of classroom and ease of access to school increase the probability of being satisfied with education services. While the pupil-teacher ratio and percentage of teachers in civil service impact the likelihood of being satisfied negatively. The results also indicated that the probability of being satisfied increases with the education level of household head. The probability of households with at least one child going to school to be satisfied is more than those with no child going to school. Further the likelihood of being satisfied declines with the increase in relative socio-economic status of household. This study is an addition in the pool of existing literature by adding new evidences from a developing economy; it examines the behavioural determinants of public satisfaction regarding schooling in Pakistan. This study analysis many unique behavioural variables which are very rare in literature; the study added social networking, social awareness and usage of technological. The explanatory factors, incorporated in this study, are divided into five dimension i.e. demographic factors, employment status, wealth, social connectivity and access. Furthermore, this study examines the effect of government policies and intervention in public schooling system on public satisfaction at district level, which is very important for image building and making popular to any government. The success of the policies usually considers in term of output and outcome, this study relates the output and outcome of the public schooling services i.e. enrollment rate, number of teaching staff and number of school with public satisfaction in all the districts of Pakistan. This study also helps to identify the districts that are least satisfied and/or are the most disadvantaged or where the large proportion of children does not have access to school and therefore need larger investment.

Methodology

Data and Measurement

In this study a representative data for entire country was taken from the latest Pakistan Social and Living Standard (PSLM) survey 2014-15. The selected sample which we utilize for our analysis is of 47988 households. All the information is related to the household heads. The dependent variable is satisfaction with school services, which is obtained through the PSLM questionnaire in which respondents were asked whether they are satisfied with school services or not. The answer is binary either 1 (satisfied) or 0 (Not satisfied). Since this satisfaction depends on various socio economics factors, the list of explanatory variables is exhaustive. The explanatory factors, incorporated in this study, are divided into five dimensions i.e. demographic factors, employment status, wealth, social connectivity and access.

In order to keep the effect of different socio-economic dimensions separate, and for the sake of robustness, we formulated 6 cumulative models; where in each successive model new variables, based on household's heads' socio-economic characteristics, are incorporated. The model1 contains demographic information of the household heads, such as gender; 1 for male, age, region; 1 for rural, number of male in the family (m_sum) and education. Model 2 added a new variable, into model1, related to employment status i.e. unemployment; 1 for unemployed. The next model 3 and model 4 are about wealth of the household, which is measured through total annual income, divided into 4 slabs, and ownership of the dwelling; a dummy contains 1 if the household head is the owner of the house. Social connectivity and awareness related variables are incorporated in model 5; these variables are whether the household head have TV, laptop/PC/tablet and mobile phone, these social connectivity or awareness variables contain 1 if the household head have these facilities. In the last model6 a new variable school distance is added, which is for access to school services; this variable contains commuting time.

In the next fold of analysis all the districts of Pakistan are ranked on the basis of enrollment rate, number of schools, number of teaching staff and satisfaction with school. Enrollment rate is the net enrollment rate at primary level (age 5-9). Enrollment rate is ranked from highest to lowest (highest ranked as 1 and lowest ranked as 114). In order to gauge the performance of these intuitions we generated the satisfaction index, based on PSLM (2014-15) data set, total number of satisfied are divided by total number of respondents from each district. This school satisfaction ranges from 0-1, where 1 showing 100(%) respondents are satisfied and zero showing none is satisfied. This variable is also ranked from most satisfied to least satisfied (1 to 0). The other two variables (number of schools and teaching staffs) are also ranked from largest number to smallest. Finally, these indices and ranking are compared with the supply side factors i.e. number of schools and teaching staff in each district.

Econometric Model

The response variable is binary as it takes on the value 0 and 1, indicating either respondent is satisfied with school services or not therefore we use Logit model. The shape of the outcome variable is nonlinear and s-shaped curve (Lawson & Montgomery, 2006). In order to model the y_i^* is unobserved household satisfaction with school services that is linearly related to x_i , x_i' is the vector of explanatory variables, β is the vector of coefficients and u_i is the error term. The latent variable specification takes the form:

$$y_i^* = x_i' \beta + u_i$$

The observed outcome variable is determined by whether y_i^* exceeds the threshold value:

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* < 0 \end{cases}$$

Then the probability that public is satisfied is given by:

$$P(y_i = 1 | x_i', \beta) = P(y_i^* > 0) = P(x_i' \beta + u_i > 0) = 1 - F_u(-x_i' \beta)$$

We can estimate the parameters of this model using maximum likelihood method, for which the function is:

$$L(\beta) = \sum_{i=0}^n y_i \log(1 - F(-x_i' \beta)) + (1 - y_i) \log(F(-x_i' \beta))$$

We cannot interpret the coefficient of the binary model as marginal effect on dependent variable. Marginal effect of regressors is given by:

$$\frac{\partial E(y_i | x_i, \beta)}{\partial x_{ij}} = f(-x_i' \beta) \beta_j$$

However, for some better and easy interpretation these results can also be presented in term of odds ratio i.e. the probability of success divided by probability of failure.

Results and Discussion

Demand and Supply Conditions

In this section we link the satisfaction with access i.e. enrollment rate, and two key supply side factors i.e. number of teachers and number of schools in each district. The comparison of top 10 most satisfied and least satisfied districts is mentioned in following Table 1 & Table 2 for top most satisfied districts and least satisfied districts respectively.

Table 1
Access to school and public satisfaction with school (Top 10 Districts)

Districts	Rank in Enrolment rate	Rank in Teaching staff	Rank in No. of schools	Rank in Satisfaction with school
Peshawar	40	3	43	1
Nowshera	32	38	60	2
Mardan	30	2	20	3
Kalat	57	100	95	4
Khuzdar	48	90	75	5
Charsadda	37	25	46	6
Sherani	93	121	119	7
Sahiwal	18	64	65	8
Mastung	8	108	104	9
Lodhran	66	77	80	10

Source: Authors' own estimation

Table 1 shows the rank of 10 districts with the highest satisfaction and their rank in enrollment rate, number of teaching staff and schools. The worth mentioning thing of this Table is that all top 10 districts belong to KPK and Balochistan, except for Lodhran which is in Punjab. The majority of the districts are from KPK though their enrollment and other supply side conditions are not much better, but still people are satisfied. The plausible reason of this mismatch is that in these regions people have fewer choices in terms of education standards and number of private schools; hence they feel comfortable with existing system. Table-02 shows the 10 districts with the least satisfaction rate. Here again the results are polarized as 9 out of 10 districts belong to Balochistan and one i.e. Tharparkar is from Sindh; in all these districts the enrollment rate is quite low and other supply side indicators are also showing very low rank.

Table 2
Access to school and public satisfaction with school (Bottom 10 Districts)

Districts	Rank in Enrolment rate	Rank in Teaching staff	Rank in No. of schools	Rank in Satisfaction with school
Kila Abdullah	111	99	113	105
Ziarat	80	115	110	106
Gwadar	17	117	102	107
Harnai	112	118	121	108
Lasbela	103	95	117	109
Jhal Magsi	69	111	96	110
Kharan	76	119	86	111
Tharparkar	71	24	1	112
Zhob	105	106	105	113
Barkhan	74	101	94	114

Source: Authors' own estimation

In order to have more insights of these phenomena we analysed the correlation among these variables which is mentioned in Table 3. It shows the correlation among enrollment, number of teaching staff, and number of schools in a district with demand side indicator that is satisfaction with school. All the supply indicators are positively correlated with satisfaction with school. However, these correlations are bit weak (< 5); may be low as satisfaction with schools not only depend on number of teaching staff and schools but highly depend on the quality indicators such as trained and qualified teachers, pupil-

teacher ratio among others.

Table 3
Correlation Matrix

	Satisfaction with school	Teaching staff	Enrolment rate	No. of schools
Satisfaction with school	1			
Teaching staff	0.31	1		
Enrolment rate	0.41	0.4	1	
No. of schools	0.09	0.76	0.13	1

Source: Own estimation based on PSLM data 2014-15

Empirical Results

The results of demand and supply gap analysis indicate that these variables have positive impact on satisfaction but this impact is very low in magnitude, hence there are various other factors which affect the public satisfaction. Following the defined methodology, the estimated logistic regression based results are mentioned in Table 4 & Table 5; these tables are based on odd ratios, where any value greater than 1 indicates positive impact, less than 1 indicates negative likelihood and 1 indicates that no impact. The estimated models are divided on the basis of socio-economic variables, shows the likelihood of being satisfied with school services.

Table 4
Estimated Odds Ratio Based on Logit Regression

Public School Satisfaction(1=Satisfy)	Demographic	employment status	Wealth1
	Model1	Model2	Model3
Region	0.509 [0.000]	0.509 [0.000]	0.758 [0.242]
Gender	0.611 [0.000]	0.611 [0.000]	0.605 [0.000]
Age	1.013 [0.000]	1.013 [0.000]	1.014 [0.000]
M.sum	0.915 [0.000]	0.915 [0.000]	0.917 [0.000]
Sch_ser_utilization[Once in a while]*Education	1.125 [0.001]	1.126 [0.001]	1.143 [0.000]
Sch_ser_utilization[Often]*Education	0.547 [0.000]	0.548 [0.000]	0.553 [0.000]
Sch_ser_utilization[Always]*Education	1.496 [0.000]	1.496 [0.000]	1.519 [0.000]
Unemployed		0.872 [0.575]	0.875 [0.581]
Income.slabs 1			1.007 [0.969]
Income.slabs 2			1.353 [0.030]
Income.slabs 3			1.286 [0.119]
Income.slabs 4			1.3 [0.186]
Region#c.inc_slabs (Rural*Income)			0.913 [0.083]
_cons	11.963 [0.000]	11.974 [0.000]	8.973 [0.000]

Source: Authors' own estimation, [] Indicates P-values based on robust standard errors.

Table 5
Estimated Odds Ratio Based on Logit Regression

Public School Satisfaction(1=Satisfy)	Wealth2	Social Connectivity/Awareness	Access
	Model4	Model5	Model6
Region	0.762 [0.253]	0.943 [0.808]	1.02 [0.934]
Gender	0.604 [0.000]	0.668 [0.000]	0.648 [0.000]
Age	1.014 [0.000]	1.009 [0.000]	1.009 [0.000]
M_sum	0.917 [0.000]	0.919 [0.000]	0.922 [0.000]
Sch_ser.utilization[Once in a while]*Education	1.145 [0.000]	1 [0.991]	0.994 [0.877]
Sch_ser.utilization[Often]*Education	0.555 [0.000]	0.495 [0.000]	0.495 [0.000]
Sch_ser.utilization[Always]*Education	1.521 [0.000]	1.314 [0.000]	1.273 [0.000]
Unemployed	0.871 [0.570]	0.817 [0.410]	0.812 [0.402]
Income_slabs 1	1.005 [0.977]	1.047 [0.787]	1.097 [0.587]
Income_slabs 2	1.347 [0.033]	1.469 [0.007]	1.49 [0.005]
Income_slabs 3	1.281 [0.125]	1.294 [0.117]	1.312 [0.097]
Income_slabs 4	1.297 [0.190]	1.143 [0.511]	1.22 [0.323]
Region#c.inc_slabs (Rural*Income)	0.914 [0.090]	0.927 [0.162]	0.932 [0.189]
own_house	0.892 [0.049]	0.884 [0.036]	0.901 [0.078]
Having TV		0.483 [0.000]	0.547 [0.000]
Having PC/Tablet/Laptop		0.632 [0.000]	0.666 [0.000]
Having Phone/Mobile		0.643 [0.000]	0.679 [0.000]
School Distance			0.603 [0.000]
_cons	9.789 [0.000]	143.266 [0.000]	181.238 [0.000]

Source: Authors' own estimation, [] Indicates P-values based on robust standard errors.

The regional variable indicates that rural residents' likelihood of satisfaction is less than the urban residents; however, this variable is not consistent throughout the analysis. The gender variable is highly significant throughout all the models; indicates that the likelihood of satisfaction of a male household head is 35(%) less than female headed households. The variable age odd ratios, though significant, but almost equal to 1, indicating no positive or negative effect on satisfaction. The number of male members in the family (m_sum) indicates that likelihood of satisfaction is 8(%) lower for those families who have more male members. The educational status is used in an interactive with usage of public school services; the estimated results show that likelihood of satisfaction of those who rarely use school service is insignificant; however, it is significant for those who utilize this service often and always. The results show that the likelihood of satisfaction for educated household heads is 50(%) less than low educated household heads, who

often utilize this service. In contrast to this those who always use public school service have likelihood of satisfaction 27-51(%) more than the less educated.

The employment status is insignificant in all the models, indicating the public perception regarding schooling does not depend on employment status. The income variable is significant for slab2 indicating that likelihood of satisfaction of this groups is positive, however for higher income groups it is insignificant. The interaction of income and region (rural/urban residential status) is significant in 2 models; which indicates that the likelihood of satisfaction of rural household is 9(%) lower for high income households. The wealth of the household is also proxied by owning a house, this variable is significant in all the models indicates that likelihood of satisfaction is 10-12(%) less than those who do not own any house, indicating that wealthier people are less satisfied with schooling services.

Social connections and awareness is very important in perception building in any society, keeping this view we added the variables i.e. households who have television, have computer and the third variable is about having a mobile or not. The results of these variables are highly significant; indicating that the likelihood of satisfaction is low for those households who have these facilities. Finally, in model6 a variable access to school is added, which shows that likelihood of satisfaction is significantly low for those families where school are far.

Conclusion and Recommendations

Provision of quality education for all the citizen is a key responsibility of any government, the better the public facilities the higher the public satisfaction. This study highlights the efficiency of public schooling system through subjective measure of public satisfaction, furthermore it examines the relationship between subjective measure and objective measure i.e. this study also compares the district level enrollment rate, number of teachers and number of school with public satisfaction in that district. This comparison provides the answer of following questions, as in general perceptions it is considered that high enrollment rate, large number of teaching staff and numbers of schools show the efficiency of schooling services, however, the question is that do the general public also consider these outputs in terms of efficiency or do these outcomes increase the public satisfaction.

The results of district satisfaction ranking show that the top 10 district across the Pakistan are Peshawar, Nowshera, Mardan, Kalat, Khuzdar, Charsadda, Sherani, Sahiwal, Mastung, and Lodhran. The 9 districts out of 10 belong to KPK and Balochistan except for Lodhran which is in Punjab. The majority of the districts are from KPK, though their enrollment and other supply side conditions are not much better, but still people are satisfied. The plausible reason of this mismatch is that in these regions people have fewer choices in terms of education standards and number of private schools; hence they feel comfortable with existing system.

The lowest satisfaction condition was found in Kila Abdullah, Ziarat, Gwadar, Harnai, Lasbela, Jhal Magsi, Kharan, Tharparkar, Zhob, and Barkhan. Here again the results are polarized as 9 out of 10 districts belong to Balochistan and one i.e. Tharparkar is from

Sindh; in all these districts the enrollment rate is quite low and other supply side indicators are also showing very low rank. The results of comparative analysis compel to conclude that the outcome indicators' role to make the public satisfied with school services is not much decisive; however, they are important in many cases.

The analysis of behavioural determinant of public satisfaction helps to identify the other factors which are important in public image building and accountability. The empirical findings show that rural households with low education are less satisfied, indicating that low educated households do not understand the importance of education, so to increase the satisfaction it is necessary to make them aware with of the importance of education. The role of household's heads' education is positive for those households who always use public schools or for those who rarely use it, but it is interesting that the likelihood of satisfaction for those who often use public school and have high level of education is 45-50(%) lower compared to low educated households. This behaviour indicates that on the one hand education increases the importance of schooling while on other hand it provides the sense of comparison among different schooling systems. These results show that educated households who use some other schooling options are not satisfied with public schooling services, this finding also endorsed by the effectiveness and popularity of those public schools which are administered by the NGOs and other private individuals, people always prefer these school over public schools .

The income of households has no significant impact on household satisfaction, except that the middle income groups which is significantly more satisfied than others, in order to examine the wealth effect, which increases the choices in terms of affordability for households, we also added housing status which shows that the likelihood of satisfaction of the owner of the house are 10-12(%) lower than those who live in a rental property. The results of the model5 i.e. social connections and awareness indicate that the likelihood of satisfaction is lower for those households who have TV, PC/laptop and mobile phones. Finally, in model6 a variable access to school is added, which shows that likelihood of satisfaction is significantly low for those families living in areas where schools are far.

The public satisfaction regarding schooling system is not good in Pakistan, the analysis highlights various challenges for the government, as the results of wealth and utilization of school services models show that, those who have alternative options are not satisfied with public schooling. The growing network of private education is one of the biggest challenges for public schools, as it provides alternative opportunities, even at government level many schools have been handed over to private organizations, which are working as a perfect substitute of public schooling. The wide spread use of mobile phones and large number of television channels, which keeps people updated and disclose the hidden truths, decreasing the public satisfaction. This implies that government should take serious action regarding public school's performance. The study results show that 56(%) of the households who never use the public school's services mentioned the reason not to use these services is lack of facilities; so government should consider this issue. Although there is no fee in public school but still 27(%) households mentioned it is unaffordable, the issue of affordability is much complex as people send their children to school in early ages, after primary or usually boys drop the school as they reach to the age 10-11 and go for work, to support their family. This is the issue of affordability that in rural areas

especially they cannot sacrifice the earning opportunity of young boys.

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