Quality of Education among Primary School Children receiving Mid-Day Meal: Evidence from a Quasi-Experiment

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2 August 2014

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Abstract

This paper on the basis of Quasi-experiment shows that 'quality of education' of the students of the government owned primary schools getting mid-day meal are not satisfactory. Lack of giving sufficient importance on education by the parents for their children mainly coming from low socio-economic back ground is the major cause behind that.

Key words: Mid day meal, Quality of education, Non-random sample, Quasi-experiment.

JEL Classifications: C93, D10, G18, I21

Quality of Education among Primary School Children receiving Mid-day Meal: Evidence from a Quasi-Experiment

Introduction:

Government of India had launched Midday meal scheme in August 1995 for the students of government primary schools to provide them nutritional support, to improve school enrolment and retention of children in school. At present, cooked food is provided for the beneficiaries. The basic motivation of this policy is to stop hunger among the children in school time because in empty or half-fed stomach, they cannot focus on learning. The public expenditure for this program has gone up from Rs.73240 cores in 2007-08 to Rs.132105 cores in 2013-14. It has been sown that mid-day meal program is successful to enhance the nutritional status (Afridi, 2010) as well as school attendance among the students particularly in the primary level coming from different low socio-economic background (Afridi, 2011). But no investigation has yet done to evaluate the 'academic achievements' among the students of government primary schools getting 'mid-day' meal. The programme can be claimed to be successful for economic development and removal of poverty if and only if students can get good quality of education in their childhood so that they can work as skilled worker with high wage in their adulthood. So from welfare point of view of this program, investigation on quality of education among the beneficiaries is more important than retention of students in the school. To evaluate that, we have to depend on 'quasi experimental study' to compare the learning outcome of the students studying in government primary

schools and receiving mid-day meal and the learning outcome of the students of almost homogeneous type government aided primary schools who are non-beneficiaries of mid- day meal.

Experimental design and Methodology:

Government of India has played a dominant role in the provision of educational services through operation of 'government schools', largely managed by the state governments or/and local bodies and privately managed but publicly funded 'government aided schools'. The aided schools are operated by charitable trust, voluntary organizations and religious bodies but receive substantial funding from the government. Government owned schools apart from providing free education and textbooks also provide *mid- day meals* in order to lure children to school. In the government aided public schools the teachers are paid the same pay scale of a government school primary teacher which comes directly from the state government treasury. Besides that these schools receive substantial funding from the government. But not all the government aided school arranges mid-day meal for its students.

We have conducted a micro level field experiment in semi-urban Kalipahari area which is situated near the outskirts of Asansol, a medium town of West Bengal, India where earning members of the majority of the households are informal workers. Initially we have chosen 3 governments owned and 3 governments aided primary schools from the same locality. Both schools are under the domain of public school. Incidentally the students of the chosen government aided schools are not getting the benefit

of mid-day meal. The aided schools are here run by the missionaries and this type of school charge a minimum tuition fee (almost \$1) per month from their students. Both types of schools follow same syllabus, medium of education is in regional language and follows the same rule of passing for every student till class 8 (i.e. 100% pass among the students whether they learn the subject or not). Incidentally, there is little difference in infrastructures among both types of schools. It was observed that teachers of the government primary school are not required to devote much school time for supervision and distribution of mid-day meal. So they just like government aided primary school can devote major school time in teaching. Hence, both types of schools in terms of infrastructure are almost homogenous in nature.

Children studying in class 3 and 4 have chosen as sample for our investigation. They are between the age group 8 to 10. It can be expected that the children at these age should have acquired the basic reading, writing and arithmetic skill. Before initiating the experiment, we have checked attendance registrar of Class 3 and Class 4 students of both the schools and observed that majority of the students of both type of schools had more than 80% attendance in the last reference month. This proves homogeneity among the students of both types of school in terms of attendance. To keep near homogeneity of the sample students in terms of economic background, we have taken those sample students whose average monthly household income was between Rs.6000 to Rs.9000.

It is observed that the sample is purposive and non-random in nature. So we have to depend on quasi- experiment study in 'impact evaluation' in which sample selection bias problem may arise. In our 'impact evaluation', students of the purely government owned primary schools providing mid-day meal for their students were considered as 'treatment group' and students of the government aided primary schools not getting the benefit of mid-day meal were considered as 'control group'. Total number of sample students in our small experiment was 200. Out of which 80 students belonged to treatment group (48 boys and 32 girls) and the remaining 120 students (45 boys and 75 girls) belonged to control group. In this experiment, an achievement test of class 3 standard was conducted among the students of both the schools in regional language after school hour and after taking prior permission from the respective school administration. We know that, a solid foundation in mathematics and language is necessary for primary school children to navigate the information in technological age. So our test contained questions ranging from recognition of numbers, subtraction, and addition as well as division of numbers. However, no test was taken on reading and the sample students were just asked to write down their name and the name of their parents. Total time allotted for the test was 45 minutes and a total mark of our evaluation test was 20. The test was conducted in two consecutive days with the help of respective school teachers. This was done to minimize the possibility of transfer of information about the questions from the students of the sample schools

covered in first part to the students of the sample school going to be covered in the next day.

In our model, the choice of school type by the head of a household for his/her child may be endogenous if there are attributes and some decision making variables which can influence it and also may be correlated with the 'academicscore'. In order to resolve this problem, two-step treatment effect method (developed by Heckman) has been applied because the values of the outcome variable are observed in both the samples belong to treatment group as well as of control group.

The treatment effect model is expressed in two equations: the original regression equation and the selection equation which denotes the intervention condition.

The best fitted regression equation can be expressed as

$$academicscore_i = \beta_0 + \beta_1 pvttuition + \beta_2 sex + \beta_3 cwh + \beta_4 pubpvt + \beta_5 bmi + \varepsilon_i ....Eq.(1)$$

Here 'academicscore$_i$' is the outcome variable which indicates the score of the ith student in the achievement test out of 20.

The 'selection equation' is

$$pubpvt = \gamma_1 mincome + \gamma_2 motivation + ⍰_i ....Eq.(2)$$

Here 'pubpvt = 1' if the student belongs to government owned primary school or '0' for the students of government aided primary school.

According to Heckman's treatment effect model, Eq.(2) is a selection equation- and it has to be estimated by Probit regression which is important

to predict the probability of a sample household to send his child in government owned primary school

Here both μ_i and ε_i are normally distributed and 'ρ' is the correlation between ε_i and μ_i. Following Heckman, total absence of sample selection bias in our quasi-experiment can be claimed if and only if '$\rho = 0$'

From the 'probit estimate' mentioned in Eq.(2), we can get the parameter estimate γ_1 and γ_2 from which we have $\widehat{\lambda}_i$ for each 'i'. In Eq.(1) this $\widehat{\lambda}_i$ will be treated as an additional explanatory variable whose parameter estimate $\widehat{\delta} = \widehat{\rho}\widehat{\sigma_\varepsilon}$. Hence Eq.(1) can be rewritten as

$$academicsore_i$$
$$= \beta_0 + \beta_1 pvttuition_i + \beta_2 sex + \beta_3 cwh_i + \beta_4 pubpvt_i$$
$$+ \beta_5 caste_i + \beta_6 bmi_i + \delta\widehat{\lambda}_i + \zeta_i \ldots \ldots \ldots \ldots \ldots \ldots . Eq. (1A)$$

Given that 'pubpvt' is an endogenous dummy variable in Eq.(1A), the assessment task is to use the observed variables to estimate the regression coefficients while controlling for selection bias induced by non ignorable treatment assignment.

The description of the variables used as regressors in Eq.(1A) are as follows:

i.   cwh=> Children from the economically poor background often have to do different types of household work. This reduces their study time and may create an impact on his/her academic achievement. In Eq.(1), 'cwh' is treated as dummy variable and takes the value 1 if it is detected that 'child works in house' (chw), otherwise '0'.

ii.   **pvttuition=>** One can expect that receiving additional inputs in the form of tuition have better learning outcomes than those who do not. Here 'pvttuition' is treated as dummy variable and equals to 1 if the sample child has private tutor otherwise 0[1]. It is checked that decision of the parents to send their children to private tuition is not influenced by their income pattern or their education level. It is also observed that a certain percentage of students of both types of school attain private tuition but that does not reduce time spent in school or doing household work if necessary.

iii.   **'bmi'=>** It is expected that physically healthy children learn well. Adequate nutrition in the childhood is necessary for brain development which helps the children to bear quality learner. Here, Body Mass Index (bmi) is used as an indicator to delineate nutritional status of a child. It has been calculated as the ratio of body weight (kg) to the square of the height (m).

iv.   **'sex'=>** We want to find out if any gender difference is observed in the learning achievement. It is also treated as dummy variable where for 'boys' sex = 1 and '0' for girls.

According to Desai (2010), parents with relatively poor economic background prefer to send their children in public primary school. Higher direct cost of education in private school is the major cause behind that. But in our framework, the monthly tuition fee of the government aided primary school is very low (below $1 per month) which occupies very small fraction of the total monthly income of the household and there is no

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[1] The number of private tutor if exists was 1 and in all situations a tutor is paid Rs.100 per month.

other direct cost of education. This means direct cost of education is affordable among all our sample households between our income strata. Hence, we have to consider another decision making variable i.e. 'motivation' in selection equation presented in Eq.(2).

(i). 'motivation'=> this variable accommodates parents' valuation on education. During the time of field investigation, each parent was asked whether education is 'very important', 'necessary' or 'not important' for his child. It was observed that education is 'very important' or 'necessary' for some parents who think proper education of their children in their childhood will help them to get better paid skilled work in their adulthood. These types of parents are motivated enough and give more importance on quality of education of their children. There are few parents also who think in opposite direction. They value less on their children's education. They think that their children will have to become an informal worker again in their adulthood. It is observed that 'motivation' is positively influenced by the education level of the parents mainly of mother. Gender bias and infrastructural difference between two types of school were here ignored during the time of choosing type of school by the parents. Now if the parents responded that education is 'very important' or 'necessary' for their children then we consider the value of the dummy variable as 1, otherwise'0'.

(ii). 'mincome'=> Average monthly income of the sample household in the last reference month.

Results and Discussions:

The two step treatment effect regression was run in STATA 10. Table-1 gives the result of Eq.(1A) and Table-2 gives the result of Eq.(2)

Table-1: Dependent variable: 'academicscore':

The Explanatory variables:	Values of the co-efficient and significant or not
pvttution	1.404*
sex	.0056
cwh	-.0777
bmi	0.538
pubpvt	-5.3767*
constant	6.8413*
$\hat{\lambda}$	2.612*

Wald $\chi^2(8) = 216.80*$

Table-2 : Selection Equation: Dependent variable: pubpvt

The explanatory variables:	Values of the Co-efficient and significant or not
mincome	-.000048*
motivation	-1.671*
constant	4.843*

*=> Significant at 1% level and **=> Significant at 5% level

From Table-2, it is observed that only less motivated parents from comparatively weaker socio-economic background are more prone to send their children in government owned primary school. They are more prone to do that not only for mid-day meal but also because they give less value on their children's education. It was observed that, parents for quality of education of their children still have more faith in government aided

schools because they think the schools are much more disciplined and monitored.

From Table-1 one can see that the parameter estimate of $\widehat{\lambda_i}$ i.e. $\hat{\delta}$ is significant at 1%. This establishes the fact that co-relation co-efficient between εi and u_i i.e. $\hat{\rho} \neq 0$. So application of Heckman Two Step Treatment Effect method is appropriate in this Quasi-experiment It is observed that 'academic achievement' of the sample students belong to government owned primary school is worse than the students of the 'government aided primary schools where midday meal is not provided. Apart from that, getting private tuition is also positively influencing the academic performance of the sample students. But 'bmi' of a student and gender have no influence the learning ability of the sample students.

Conclusions:

This quasi-experimental investigation shows that mid-day meal programme is not successful enough to maintain quality of education among the beneficiaries. Actually the less motivated parents from weaker socio-economic background generally prefer to send their children in the public primary school. Lack of motivation of the parents about their children's education is the prime cause behind that outcome. To improve academic achievement among the students of government owned primary schools, campaign is required to generate positive perception about these schools among all types of the parents. Besides that motivation should be enhanced both among the parents and their children so that they can realize the importance of education for their future.

References:

Desai Sonalde. B. et.al. (2010): *Human Development in India*; Chapter-6 on Education. Oxford University Press

  Afridi.F. (2010): 'Child welfare program and child nutrition: Evidence from a mandated School meal program in India'. *Journal of Development Economics*, Vol.92, pp.152-165.

Afridi.F. (Nov. 2011): 'The Impact of School meals on School participation in Rural India'; *Journal of Development Studies* (Special Section on Impact Evaluation) Vol.47(11) pp. 1636-1656