School Based Management, Local Capacity and Educational Outcomes
Lessons from a Randomized Field Experiment*

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Abstract

Education systems in developing countries are often centrally managed in the top-down structure. Recently, there has been growing interest in school based management. In environments where schools have different needs and where localized information plays an important role, it may be attractive to adopt a decentralized system. However, capacity at the local level to make informed decisions and effectively implement them is a key prerequisite for the success of such reforms. This research uses comprehensive data from a large scale field experiment in the Gambia to analyze this issue, examining schools that received either management training with a grant or a grant only, and then incorporating schools' baseline levels of capacity. [In the current draft, we report midpoint results one year into the program and we will have the final follow-up survey results in the coming weeks.]

Keywords: Whole School Development, Experiment, Student Test Scores, School Management Manual, School Management Committee

JEL Classification: O15, I21, C93

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1   Introduction

The decentralization of school management in developing countries has received growing attention from both academics and practitioners in developing countries. There is limited but growing rigorous evidence on the effectiveness of such policies (World Bank 2007, Barrera-Osorio et al. 2009). The problems of local capture have often been pointed out in the literature as the main drawback of decentralization (Bardhan and Mookherjee 2002, Reinikka and Svensson 2004). However, even under the environment where local capture is limited or controlled, the capacity at the local level to make informed decision and effectively implement them is crucial to the success of decentralization policies. Local leadership may have significant additional information relative to the central authorities about local needs, the local politics, and other constraints. However, local leadership may also lack competency to implement the process necessary to tackle those problems. This paper uses a large field experiment in the Gambia to evaluate and draw lessons from a comprehensive school management program – called Whole School Development, or WSD – and a school grant program. Particular attention is given to the importance of the baseline local capacity and its import as a determinant of the success of decentralization policy.

What is the Whole School Development program? Broadly, whole school development proposed "making all educational programs and supporting activities and resources in the school more effective and efficient in responding to the needs and goals of students and society" (Bayona and Sadiki 1999).   In other words, school improvement must include improved school management, better teacher training, improved inputs, etc., intervening at all of these levels simultaneously.   Some version of school reform informed by the WSD philosophy has been implemented in Ghana, Sri Lanka, South Africa, and elsewhere (Akyeampong 2004).

In this particular application in the Gambia, the objectives of the WSD are to improve the quality of teaching and learning to enhance student learning outcomes and to build the capacity of the whole school in order to be able to meet improvement targets.[1] In WSD schools, head teachers and representatives from the parent-teacher association receive training in a variety of areas: school leadership and management, community participation, curriculum management, teacher professional development, teaching and learning resources

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[1] The WSD approach is a broad effort from the Ministry of Basic & Secondary Education (MoBSE), implemented by the Basic Education Support for Poverty Reduction (BESPOR) with support from the UK Department for International Development (DFID).

(e.g., textbooks and libraries), and the school environment. In the course of this, the school stakeholder community develops a school development plan addressing each of these areas with guidance from a centralized WSD management committee associated with the Ministry of Education. In order to help the schools initiate the implementation of their plan, the Ministry of Education provides a grant worth approximately 500 USD.

In another set of schools, a grant of the same size was provided but without the comprehensive school management training program. A new school constitution has been developed by the Ministry of Education to enhance cooperation in schools between teachers and the community. Acceptance of the new constitution was a prerequisite for receipt of the grant. All schools receiving grants (both schools with WSD and grant and also grant-only schools) were to use the grant towards some aspect of the school development plan that deals directly with teaching and learning (i.e., constructing teacher housing would not be an acceptable use).

The objective of the impact evaluation accompanying these programs is to estimate the causal impact of participation in WSD and school grants on various aspects of the school environment and ultimately on student learning outcomes. In addition, this impact evaluation will provide country-level evidence on the effectiveness of school improvement grants versus grants in conjunction with a particular program of school management capacity building. This impact evaluation is part of the World Bank's Africa Program for Education Impact Evaluation.

This impact evaluation demonstrates the positive externality that impact evaluations can play in generating valuable educational data through baseline data collection. In this case, the most obvious examples are teacher and student absenteeism data, which previously were unavailable in the Gambia (and which are both striking).

Results one year into the program demonstrate that the whole school development program increased structures supported by the program (i.e., schools were more likely to have committees recommended in the training) and also reduced teacher absenteeism, but student absenteeism and test score performance remained unchanged.

[In coming weeks, the final data for two years into the program will be available, so we will be able to compare WSD to the grant-only schools (not included in the first follow-up survey) and observe whether the program has impacted student outcomes. Finally, because of head teacher transfers, we will use the final data to explore not only the intent-to-treat estimates – reported here – but also instrumental variables impacts,

isolating the impact of having a head teacher trained who remains in the school.]

2 Sample and Experimental Design

2.1 The sample

The sample is a census of lower basic schools public and government aided schools in regions 2, 3, 4, and 6 (276 schools). Two regions were excluded: Region 1 was excluded on the basis that it was too urban distinctive from the rest of the country. Region 5 was excluded because of its prior exposition to a variant of the WSD. Of the 276 schools, 3 schools were excluded from the samples because they were new schools and had only grade 1 and 2 or were close during the time of the survey.

2.2 Experimental design

Of the 273 remaining schools, 90 schools were assigned to the WSD treatment, 94 schools to the grant only treatment, and 89 schools served as control group. The schools were clustered in groups of 2 or 3 schools on the basis of geographic proximity for the randomization. This was done mainly to limit contamination while allowing useful exchange and cooperation between close schools. The randomization was further stratified by the size of the schools and their accessibility.[2] We will discuss the effectiveness of the randomization in detail in Section 4, but each group proved to be similar at baseline, suggesting that differences at follow-up are due to the different treatments.

3 Data

The data for this study were collected by the Gambia Bureau of Statistics under the supervision of the field coordinator. The baseline data were collected in 2008, the first follow-up data were collected in 2009, the second follow up data were collected in 2010. In the 2009 follow-up, data were collected in the WSD and Control schools only. The Grant schools were not visited at that time because the disbursement of the grants was not completed and many schools who had received their grant had not yet used it.[3] At each round, teams of enumerators arrived at schools unannounced (in order to avoid strategic attendance by

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[2] Accessibility is defined by the Ministry through "hardship status." Schools that are most remote receive additional funding from the Government.

[3] This information was obtained from the regional directorate who were the key intermediaries for the grant disbursement process. This problem of slow disbursement by local committees was also observed in western Kenya by Conn et al. (2008).

teachers and students) at each school and collected information about the school and the students, conducted classroom observation, and gave a literacy and numeracy test.[4] Unless otherwise indicated, the follow-up data were collected at each of the three rounds of data collection.

3.1 School data

The data on the school as a whole were obtained through a comprehensive interview with head teacher, the deputy head teacher, or the person in charge of the school on the day of the visit in the school. This includes information observed (like the condition of the buildings, the number of classrooms, and other facilities) and other information obtained from the head teacher about the school finances, record keeping, community participation etc. To improve the accuracy of the information collected, we requested to see written records to substantiate responses whenever applicable.

3.2 Classroom visits

In each school, we randomly selected two classrooms to conduct classroom observations. The goal of the classroom visit was to gather information about teaching practices, the classroom environment, and student participation. It also served to substantiate the absenteeism data from the administrative records by comparing the student register to the number of students present in the given classroom. Each classroom visit lasted for fifteen minutes, followed by a five-minute interview with the teacher.

3.3 Student written literacy and numeracy test

Forty students were selected randomly at each school and were given a written numeracy and literacy test. At the baseline, those tested were twenty third-grade students and twenty fifth-grade students. At the first follow up in 2009, we gave the test to students in fourth and sixth grades to allow for tracking of the baseline students. At the second follow-up in 2010, the test was given again to third and fifth grade students. (Students in third grade at baseline would now be in fifth grade, and students in fifth-grade at baseline would have completed primary school.) In total, 8,959 students were tested at baseline, roughly evenly distributed across the three treatment groups.

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[4] The schools were given a bracket of time during which a team of enumerators will visit them. The actual date were not disclosed.

3.4 Student interview and oral literacy test

Of the forty students who took the written test, ten were selected randomly to take an orally administered reading and comprehension test and received a further interview about their socio-demographic characteristics, school performance, and other information. These students were tracked in 2009 in the WSD and Control school, and in 2010 in all the schools whenever possible.[5] Students for the pupil interview were selected randomly from among those who participated in the written test. At baseline, we interviewed 2,696 students in total: 879 from WSD schools, 920 from grant only, and 897 from the control schools.

3.5 Teacher content knowledge

In 2009, an instrument testing *teacher* knowledge of content (similar to the student written test, with additional questions) was designed and administered during the data collection. A short background interview was also administered to the teachers who took the test.

3.6 Qualitative data

In 2010, we added many open ended question addressed to the head teachers to collect some information about their own visions regarding the functioning of school. We also addressed similar questions to a few households whose children are in the relevant schools.

4   Econometrics Framework and Identification

In an impact evaluation, the goal of employing random assignment to allocate participation in the program is to achieve a situation in which each of the groups has similar characteristics in advance of the program. If the treatment and control groups are balanced at baseline, then differences in teaching activities and students learning outcomes between the groups in the follow up survey can be attributed to the WSD and schools grant programs, rather than to some pre-existing difference between the groups. Using the data from the baseline survey, we have examined basic characteristics across the different groups. A detailed list of indicators and their means across groups are included in Tables 1 (student characteristics) and 2 (school characteristics).

The baseline survey explored a host of school characteristics. This section

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[5] Most of the 5th grade at the baseline have finished the basic cycle by the time of the second follow up.

demonstrates, across selected school characteristics, how schools in each impact evaluation group compare. Balance is not perfect across all characteristics; indeed, given the array of characteristics that describe each school, it is statistically unlikely that three groups would be perfectly identical. However, we observe no systematic differences across the groups. For example, the condition of the main school building is rated comparablely across the different groups, but WSD schools on average have close to five school buildings whereas the other two groups have closer to four. (This difference is mildly statistically significant.) While that might indicate greater affluence among WSD schools, we find that WSD schools are not exceptionally high in their access to a tap for drinking water (23% of WSD schools versus 20% of grant-only schools and 33% of control schools) nor in their access to electricity from the national grid (4.6% versus 4.3% and 6.7%). Across an array of other characteristics, there are no apparent systematic differences across the treatment groups. In terms of student characteristics, the groups are comparable as well. The repetition rate is identical (9%) in all three groups. The control group performed slightly better on the baseline reading test. However, the outcomes from all three groups are within the same level of performance.

5   Findings and Discussions

5.1   Descriptive statistics

The baseline data carries important information about the state of the basic education in the Gambia. We found that overall, the schools have the basic infrastructure in good conditions. The main buildings (classrooms and staff headquarter) are overall in good condition throughout the four regions. Of the 273 schools visited, 9% require some minor repairs for the walls, roofs, floors etc. One percent of the schools was in very bad condition and needed total rehabilitation; these schools were all located in one region. Schools in another region are the most in need of minor repairs (15% of the schools in that area).

In 97% of the 526 classrooms visited, most of the students were seated on a chair with a table. The teaching areas were equipped with a chair and a table in 92% of the classrooms visited. The student-teacher ratios are similar across regions at about 40 students per teacher

When the head teacher was the actual respondent, 69% of them reported keeping finance records and were able to show them. When the deputy head teachers responded (when the head teacher was absent), only 30% of them reported that the school kept records of finances and were able to show them. Forty-one percent of schools conducted classroom observation

to ensure the quality of the teaching and were able to show the records of such activity. That number is still only 49% when the head teacher was the respondent.

All the schools reported the existence of some form of Parent-Teacher Association. However, 65% of them have no funding.

Head teachers were asked to report the most important challenge that the school faces in its effort to provide proper education to the student. The most recurrent responses were the lack of resources (34%) and the lack of proper teacher training (14%).

Within the surveyed schools, teacher absenteeism ranged from about 12% of teachers absent on the day of the survey in two regions to about 30% in another region (Figure 3). In addition, during the classroom visits, 32% of the teachers reported having missed at least one day of class during the previous week. Forty-eight percent of teachers had a written lesson plan (Figure 1). Region 6 had the greatest number of teachers with a lesson plan. In Region 6, 62% of teachers had a written lesson plan.

Student absenteeism is measured as the percentage of the class that is absent on the day of the survey in two randomly selected classes in each school: specifically a randomly selected classroom of classes 4 and 6 where possible; where not possible, a randomly selected other class. Student absenteeism is high as observed in the 526 classroom visits (Figure 2). It ranges from about 20% of the total number of students enrolled in some regions to nearly 40% in another.

On average, third graders are 10 years old and the fifth graders are 12 years old. Half of the students live in homes with improved latrines. Only 20% of the students reported having electricity. Ninety percent of students had a radio at home, 82% of households owned a telephone, and 69% owned a bicycle. The analysis of student performance in Grades 3 and 5 are difficult to interpret definitively due to the lack of internationally benchmarked standards for learning outcomes. However, it was found that in terms of both literacy and numeracy, student performance is lower than expected (per the curriculum) in Grade 3 but improves substantially by Grade 5, indicating that students are indeed learning in school. There was considerable heterogeneity in student performance within each grade, particularly in math skills. It is also important to note that in almost all types of tests girls under-performed compared to boys. This phenomenon needs to be explored further.

In 2009, over one thousand teachers were given a content knowledge test. The overall level of difficulty of the test was about that of sixth grade. We found that the overall performance was poor. The overall average score of all the teachers is 79%. The overall score

is comparable across regions of the country and does not exceed 80% in any of the four participant regions. Only two to three teachers (2.55%) out of 100 teachers scored 95% or more and less than 1% of the teachers scored perfect score. Whereas 66% of the teachers scored less than 75%, only a handful (1.26%) scored less than 50%. Figures 4 and 5 show the performance on selected questions. For example, 36% of the teachers could not divide 864 by 24, and 46% percent of the teachers could not chose the synonym of the word "Enormous" from among the four words "Heavy", "Hard", "Huge", and "Rotten."

The challenge of teacher content knowledge is seen across the board, as we found no subgroup that performed substantially higher than the others. Even though the results show some differences by the training received and classes taught, the overall level of performance is still low even for the most trained and experienced subgroups.

5.2   Midpoint results

A year after the implementation of the WSD, we collected data in all the WSD and control schools. The goal of this round of data collection was to ensure that the WSD was actually properly implemented (internal validity), to monitor the evolution of the process, and to collect some intermediate variable to assess the early impact.   The key results described in this section are reported in Tables 3, 4, and 5.

We observed that the first grade enrollment is nearly 16 students higher on average in the WSD schools relative to the control schools. This difference is split equally between the two genders. This finding may suggest a better sensitization and integration of the communities near WSD schools in the school management, as the WSD advocates for. Indeed, one important aspect of the WSD is the community participation.   (Alternatively, more students may be attracted to schools received lots of government attention.)   All the schools in both groups reported having a PTA, however, over 70% of them are not funded. Fundraisers and member contributions remain weak. The WSD group (45%) reported more having received support in cash and kind from the community than the control group (35%).

Over 65% of the schools have a staff code of conduct in both groups. Even though the control group reported more teacher mentoring systems (6% more and statistically insignificant), there are more trained mentors (14% more and statistically significant) in the WSD group relative to the control group. Written school policies were infrequently observed

in both groups, but the WSD group have more often developed them than the control (45% in WSD and 36% in the control).

We observed higher take up rate of the WSD concept in the WSD schools than the control schools. We assessed the take-up by looking at some basic elements that indicates whether the WSD is functioning or not. It is important to keep in mind that the control schools were given all the documentation of the WSD, except though they did not receive the training and the grant. We have consistently observed a higher rate of establishment of each of the six School Management Committees (SMC) recommended by the School Management Manual (SMM). For example, 84% of the WSD schools have set up a curriculum management committee whereas only 51% of the control schools have done so. Similarly, for each of the other five SMCs, we observed statistically significant differences in favor of the WSD. Only about one third of the schools have adopted the new PTA constitution in both groups, with a 3-percentage point edge in the WSD schools.

In term of teacher preparedness, the control schools have done a better job. We were able to see teachers written lesson notes, for the day of the visit, in more control classrooms (41%) than we saw in the WSD classrooms (32%). We have also observed 11% more lesson plans in the control classrooms than the WSD classrooms.

Pupil participation in term of asking questions to teachers is poor. It is slightly higher in the WSD classrooms (26%) than the control classrooms (23%), but the difference is not statistically significant.   The use of textbooks during the visit was more frequent in the control group (47%) than the WSD group (38). However, the workbooks were used more in the WSD group (54%) than in the control group (49%).

Absenteeism remains pervasive. About 25% of the students were missing on average, when we compare the number of students present to the number of students listed on the register. We also picked five days randomly from the register and found an average of nearly 37% absenteeism over those 5 days. The numbers are nearly identical in both groups. More teachers in the control group (7% more) reported having missed at least one day of class in the previous week. Based on that measure, the teacher absenteeism figure has remained the same as at the baseline in the control group (32% of teachers reported having missed a day during the previous week) whereas it has dropped by 6 percentage points in the WSD group. However, the average percent of teachers absent over 5 random days, based on the records, indicates a relatively low absenteeism (6%) and no difference between the two groups.

We found no difference between the two groups in terms of student performance. Fourth

graders read about 21 words per minute and sixth graders read 41. International standards suggest that about 45 words per minute are required comprehension (Abadzi 2008).

The midpoint findings show some improvement in record keeping and many aspect of the schools' functioning in WSD schools. There is a higher rate of adoption of the concept in the WSD schools and its components within the WSD group compared to the control group. No difference were observed regarding student performance and we believe that it may have been too early to observe such effect. However, the main findings provide reasons to be hopeful regarding a positive impact of the WSD on the ultimate outcome that is the students learning. Further results (two years after the program) are on the way and we expect to draw some important lesson from the third round of data that should be finalized in the coming weeks.

[The following are sections to be added in the coming weeks.]

5.3   Final results (from data two years into the program)

5.4   Uncovering the mechanisms

5.5   The role of local capacity

5.6   What head teachers take with them

6   Conclusions

Analysis to be done

a) Compare outcomes of each treatment with the control: Impact of each treatment

b) Comparison between WSD and Grant tell us about the effect of the training in school management. This is particularly true after documenting for the internal validity of the WSD training: Was the training done as planned? Why or why not? Answer this incorporating information on implementation capacity.

c) Look for interaction terms between treatment and local capacity

d) IV analysis using initial training as ITT and whether the trained head teacher remained at the school as the treatment

Questions to answer

1) What are the impacts of these two programs

2) Is the capacity in place for the implementation of the WSD and the Grant?

3) Is the local capacity a more important factor than the lack of resources for the effective management of schools in The Gambia?

4) What are the other determinants of the success of these two programs?

5) How much do transferred head teachers take with them to new schools?

6) Overall, what can we say about the conditions under which each of these program will be most effective?

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Tables and Figures

A   Tables

Table 1: Baseline Group Comparison on Student Characteristics

	3rd grade			5th grade		
	WSD	Grant	Control	WSD	Grant	Control
Student age	10.20	10.20	10.10	12.73	12.59	12.64
	(1.71)	(1.72)	(1.67)	(1.83)	(1.78)	(1.67)
Number of siblings	4.90	4.70	4.75	4.70	4.70	4.80
	(2.79)	(2.68)	(2.63)	(2.66)	(2.64)	(2.64)
Ate breakfast today	0.69	0.71	0.73	0.67**	0.73	0.74
	(0.46)	(0.46)	(0.44)	(0.47)	(0.45)	(0.44)
Ate lunch yesterday	0.96	0.95	0.94	0.94	0.97	0.95
	(0.20)	(0.23)	(0.23)	(0.24)	(0.16)	(0.22)
Electricity at home	0.19*	0.21	0.24	0.20	0.17	0.20
	(0.40)	(0.41)	(0.43)	(0.40)	(0.39)	(0.40)
Radio at home	0.91	0.92	0.93	0.88	0.89	0.87
	(0.29)	(0.28)	(0.25)	(0.33)	(0.32)	(0.34)
TV at home	0.37	0.38	0.38	0.40	0.36	0.36
	(0.48)	(0.49)	(0.49)	(0.49)	(0.48)	(0.48)
Telephone/Mobile at home	0.83	0.81	0.82	0.81	0.86	0.83
	(0.38)	(0.39)	(0.38)	(0.39)	(0.35)	(0.0.37)
	Student Performance			Student Performance		
Rate of repetition	0.09	0.09	0.09	0.08	0.07	0.08
	(0.29)	(0.29)	(0.29)	(0.26)	(0.26)	(0.26)
Correct letter per minute	36***	37***	43	58	57*	60
	(25)	(23)	(23)	(24)	(25)	(24)
Correct words per minute	11	9***	12	27	26	26
	(17)	(15)	(18)	(24)	(22)	(23)
Observations	462	462	445	423	458	447

Standard deviations in parentheses. *** 1% Significance Level, **5% Significance Level, *10% Significance Level. The test of comparison of mean is between each treatment group and the control group.

Table 2: Baseline Group Comparison on School Characteristics

	WSD	Grant	Control
Number of students	455	433	426
	(59)	(41)	(45)
Student-teacher ratio	25.41	28.69*	25.65
	(0.93)	(1.28)	(1.01)
Tap drinking water	0.23	0.20*	0.33
	(0.04)	(0.04)	(0.05)
Received cash/kind from community	0.38	0.31	0.29
	(0.05)	(0.05)	(0.05)
Number of meetings with parents	4.39**	3.70	3.69
	(0.27)	(0.24)	(0.25)
Has mentoring system	0.86	0.82	0.81
	(0.04)	(0.04)	(0.04)
Written staff code of conduct	0.39	0.43	0.44
	(0.05)	(0.05)	(0.05)
Know required contact hours	0.87*	0.72	0.76
	(0.02)	(0.05)	(0.04)
Lack of resources is main problem	0.36	0.35	0.30
	(0.05)	(0.05)	(0.05)
Observations	90	94	89
Classroom Obsevations			
Lesson Notes	0.31	0.33	0.27
	(0.04)	(0.04)	(0.03)
Percent pupils absent	0.15*	0.21*	0.26
	(0.06)	(0.02)	(0.02)
Percent without enough bench and chairs	0.04	0.02	0.03
	(0.01)	(0.01)	(0.01)
Hours/week English	3.67	3.57	3.81
	(0.15)	(0.15)	(0.13)
Observations	175	180	173

Standard deviations in parentheses. *** 1% Significance Level, **5% Significance Level, *10% Significance Level. The test of comparison of mean is between each treatment group and the control group.

Table 3: Community participation, school management, and school characteristics (First follow up in 2009)

	WSD	Control	Difference	P-value
Received support/aid from the community	0.46 (0.05)	0.35 (0.05)	0.11 (0.07)	0.15
Does the school have a PTA	1 (0	0.99 (0.01)	0.01 (0.01)	0.32
PTA fund raisers	0.1 (0.03)	0.11 (0.03)	-0.01 (0.05)	0.83
PTA member contribution	0.09 (0.03)	0.05 (0.02)	0.04 (0.04)	0.23
PTA not funded	0.71 (0.05	0.75 (0.05	-0.04 (0.07	0.57
Number of meetings with the parents or PTA	4.45 (0.31)	3.92 (0.26)	0.53 (0.4)	0.19
Mentoring system in place for junior teachers	0.47 (0.05)	0.53 (0.05)	-0.06 (0.08)	0.41
Mentors trained	0.7 (0.05)	0.57 (0.05)	0.14* (0.08)	0.08
Leadership and Management committee in place	0.94 (0.03)	0.75 (0.06)	0.19*** (0.06)	0
Community Participation committee in place	0.79 (0.05)	0.63 (0.07)	0.16** (0.08)	0.04
Curriculum Management committee in place	0.84 (0.04)	0.51 (0.07)	0.33*** (0.08)	0
Teachers professional dev. committee in place	0.8 (0.05)	0.61 (0.07)	0.19** (0.08)	0.02
Teaching and learning resources com. in place	0.81 (0.05)	0.59 (0.07)	0.22** (0.08)	0.01
Learners welfare committee in place	0.88 (0.04)	0.71 (0.06)	0.17** (0.07)	0.01
First grade enrollment	91.82 (9.85)	76.29 (7.02)	15.53 (12.12)	0.2
Student-teacher ratio (Lower Basic)	53.18 (11.55)	53.18 (7)	0 (13.11)	1
Seen records of the teachers attendance	0.91 (0.03)	0.89 (0.03)	0.02 (0.05)	0.64
Teacher Absenteeism/ Average 5 random days	0.06 (0.01)	0.06 (0.01)	0 (0.01)	0.94
School has a library	0.53 (0.05)	0.6 (0.05)	-0.07 (0.08)	0.43
Observations	88	89		

Standard deviations in parentheses. *** 1% Significance Level, **5% Significance Level, *10% Significance Level. The test of comparison of mean is between each treatment group and the control group.

Table 4: Teaching practices and absenteeism

(First follow up - 2009)

	WSD	Control	Diff.	P-value
Teacher absent (at our arrival)	0.11	0.12	0.01	0.73
	(0.02)	(0.03)	(0.04)	
Student Absenteeism (Day of test)	0.26	0.24	0.02	0.55
	(0.02	(0.01	(0.02	
Student Absenteeism (Five random days average)	0.38	0.36	0.02	0.71
	(0.04)	(0.03)	(0.05)	
Teacher has written lesson plan	0.56	0.67	-0.11**	0.04
	(0.04)	(0.04)	(0.05)	
Teacher has a written lesson note for todays lesson	0.32	0.41	-0.09*	0.08
	(0.04)	(0.04)	(0.05)	
Teacher missed at least one day last week	0.26	0.33	0.07	0.16
	(0.03)	(0.04)	(0.05)	
Call out children by their names	0.48	0.35	0.13**	0.03
	(0.04)	(0.04)	(0.06)	
Address questions to the children during class	0.69	0.75	0.06	0.27
	(0.04)	(0.04)	(0.05)	
Encourages the children to participate	0.61	0.68	0.07	0.23
	(0.04)	(0.04)	(0.06)	
The children used textbooks during the class	0.38	0.47	-0.09*	0.09
	(0.04)	(0.04)	(0.05)	
The children used workbooks during the class	0.54	0.45	0.08	0.14
	(0.04)	(0.04)	(0.06)	
Observations	88/ 169	89/177		

Standard deviations in parentheses. *** 1% Significance Level, **5% Significance Level, *10% Significance Level. Based on school data and classroom visits data

Table 5: Student performance (First follow up in 2009)

Reading test	4th Grade				6th Grade		
	WSD	Control	P-value		WSD	Control	P-value
Correct letters per minute	55	57	0.26		73	75	0.17
	(1.23)	(1.23)			(1.15)	(1.1)	
Correct words per minute	23	25	0.33		41	41	0.75
	(1.18)	(1.15)			(1.08)	(1)	
Written test							
Overall	47.2	48.22	0.5		60.59	61.79	0.4
	(0.46)	(0.45)			(0.49)	(0.45)	
Math	47.04	49.75	0.2		65.95	68.19	0.23
	(0.65)	(0.66)			(0.67)	(0.62)	
Literacy	45.82	45.94	0.93		57.19	57.76	0.67
	(0.44)	(0.41)			(0.47)	(0.43)	
Observations	411	403		431	460		

Standard deviations in parentheses. *** 1% Significance Level, **5% Significance Level, *10% Significance Level. Same students at the baseline. The score of the wrtten test is the average score expressed in percentage.

B. Figures

Figure 1: Do you have written lessons notes for today's lesson?

Has a Written Lesson Note?

32%

25%

44%

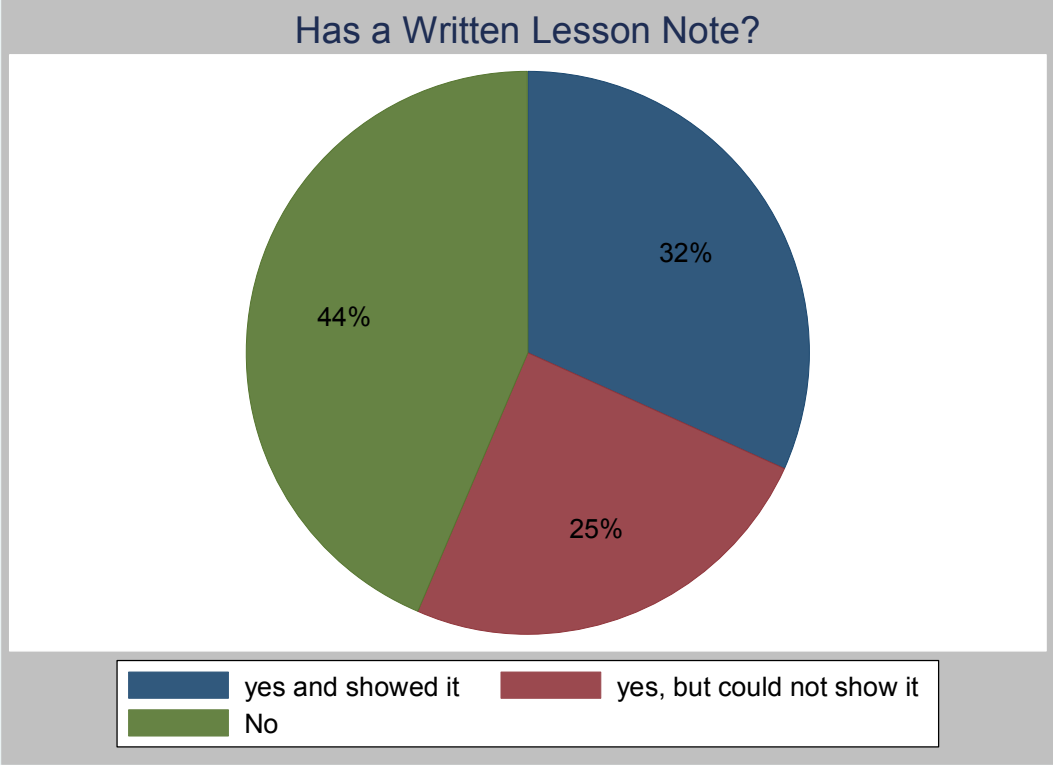yes and showed it   yes, but could not show it

No

Figure 2:   Percent student absenteeism (Difference between number of students registered and the number of students present the day of the visit)
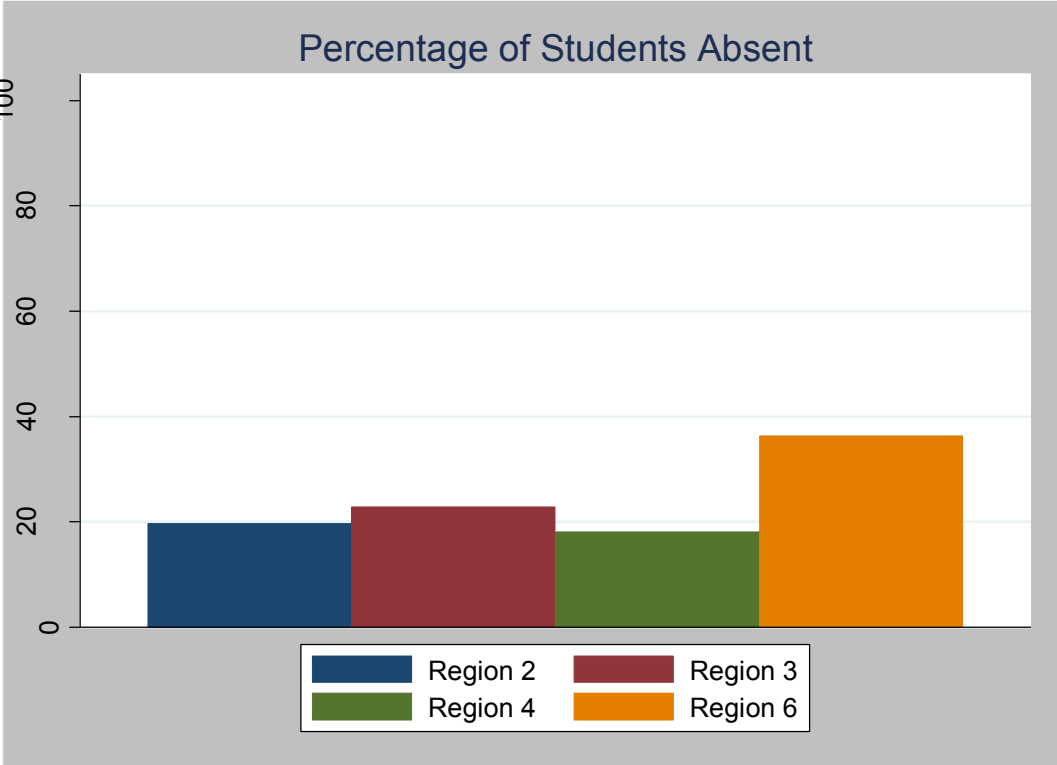
Figure 3: Percent teacher absenteeism (Difference between number of teachers required to be present and the number of teachers present the day of the visit)
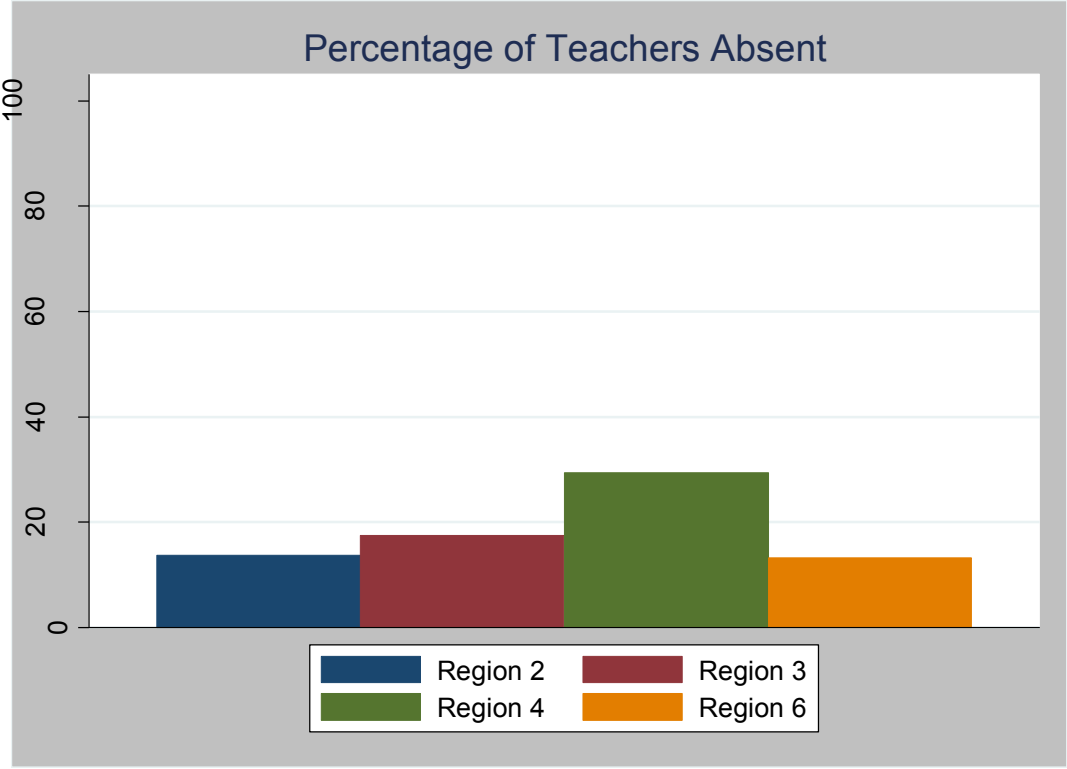
Figure 4: Teacher content knowledge test, selected math

Selected math Questions (Full sample)

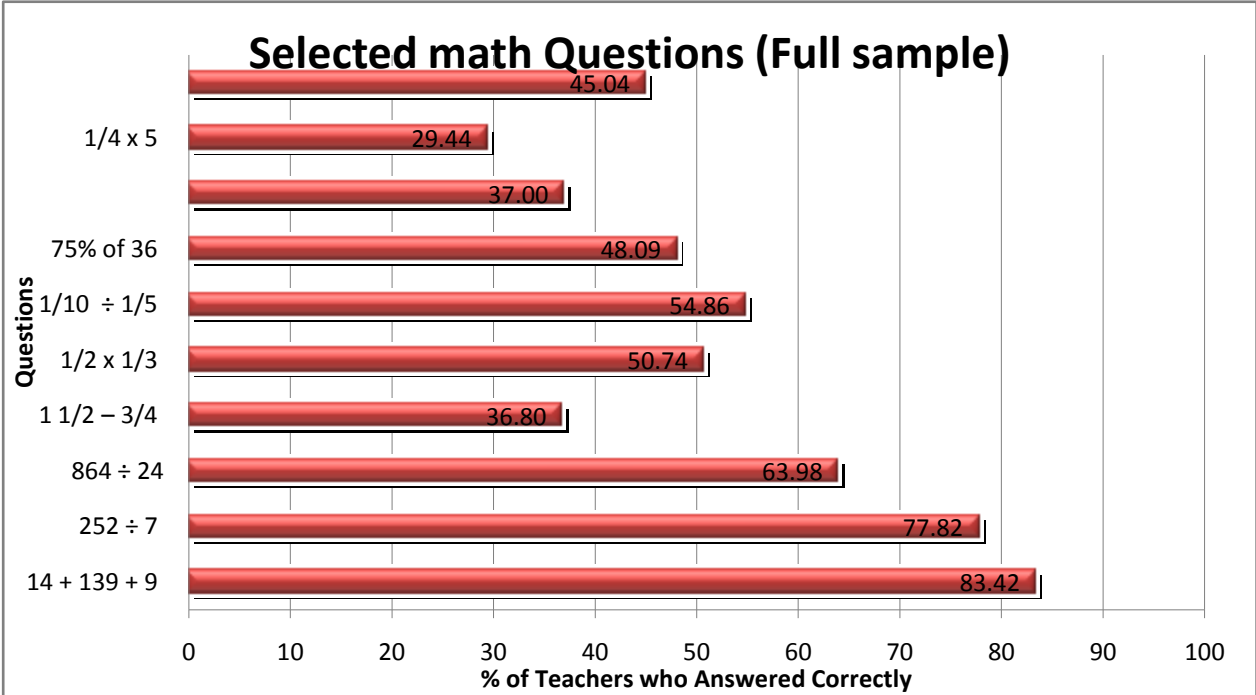| Questions	% of Teachers who Answered Correctly
1/4 x 5	45.04
	29.44
75% of 36	37.00
1/10 ÷ 1/5	48.09
1/2 x 1/3	54.86
1 1/2 − 3/4	50.74
864 ÷ 24	36.80
252 ÷ 7	63.98
14 + 139 + 9	77.82
	83.42

Figure 5: Teacher content knowledge test, selected english questions

Selected Literacy Questions (Full Sample)

Questions	% of Teachers who Answered Correctly
The children worked in ___ silence during the test. (Complete, Common,…)	85.28
ENORMOUS: Heavy/Hard/Huge/Rotten	54.07
EVEN: Sandy/ Level/ Rocky/Hard	69.58
STARTLED : Began/Scattered/Frightened/Deafened	40.73
MYSTERIOUS: Pleasant/Stange/Quiet/ Frightening	48.38