Public Disclosure Authorized

Public Disclosure Authorized

WPS4847

POLICY RESEARCH WORKING PAPER 4847

No More Cutting Class?

Reducing Teacher Absence and Providing Incentives for Performance

F. Halsey Rogers
Emiliana Vegas

The World Bank
Development Research Group
Human Development and Public Services Team
&
Human Development Network
Education Team
February 2009

Policy Research Working Paper 4847

Abstract

Expanding and improving basic education in developing countries requires, at a minimum, teachers who are present in the classroom and motivated to teach, but this essential input is often missing. This paper describes the findings of a series of recent World Bank and other studies on teacher absence and incentives for performance. Surprise school visits reveal that teachers are absent at high rates in countries such as India, Indonesia, Uganda, Ecuador, and Zambia, reducing the quality of schooling for children, especially in rural, remote, and poor areas. More broadly, poor teacher management and low levels of teacher accountability afflict many developing-country education systems. The paper presents evidence on these shortcomings, but also on the types of incentives, management, and support structures that can improve motivation and performance and reduce avoidable absenteeism. It concludes with policy options for developing countries to explore as they work to meet Education for All goals and improve quality.

This paper—a product of the Human Development and Public Services Team of the Development Research Department and the Education Team of the Human Development Network—is part of a larger effort in the department to improve education outcomes by raising teacher performance. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at hrogers@worldbank.org and evegas@worldbank.org.

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

Produced by the Research Support Team

No More Cutting Class?
Reducing Teacher Absence and Providing Incentives for Performance

F. Halsey Rogers and Emiliana Vegas[1]

[1] Rogers is Senior Economist, Development Research Group, World Bank. Vegas is Senior Education Economist, Human Development Network, World Bank. This paper was prepared for the forthcoming volume *Identity and Motivation, Systems and Support: Teachers and Teacher Issues in Developing Country Contexts*, edited by Jackie Kirk and Martial Dembélé and published by id21 Insights Education. We are grateful to Elizabeth King, Karthik Muralidharan, Menno Pradhan, and the late Jackie Kirk for their comments. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

1. Teacher absence

In trying to achieve Education for All goals, few inputs are more essential than having a teacher present in the classroom. It is obvious why the teacher's absence will affect educational quality: if students end up doing 'busy work' or playing in the schoolyard, little learning is likely to take place. But teacher absence can also affect educational access and school completion rates, if poor quality discourages parents from making the sacrifices necessary to send their children to school. More important, high rates of teacher absence often signal deeper problems of accountability and governance that are themselves barriers to educational progress.

This paper reviews the issue of teacher absence for education policymakers and researchers. First, it explores what is known about the extent of the problem and its causes; and second, it lays out some possible approaches to reducing teacher absenteeism by improving incentives and support for teachers. We should note at the outset that in both cases – teacher absence and incentives – rigorous evidence has only recently begun to become available. Still, there is already enough evidence to show that teacher absence is a serious problem in some countries and regions, but also that governments can tackle it through their policies and programs.

How prevalent is the problem of teacher absence?

This straightforward question is not easy to answer. One difficulty in studying teacher absence is that administrative records of teachers' attendance may not be accurate. Inaccuracies are possible even in well-run school systems, of course. A teacher may come to school but have to leave early to deal with a family emergency, for example, and even if a colleague covers, the absence may not make it into the log book. But in the countries with the highest absence rates, administrative records may be an especially poor guide to actual teacher attendance. If poor governance and low levels of accountability undermine teachers' incentives to attend school, those same factors are likely to reduce the accuracy of official attendance records. In environments with weak institutional capacity and accountability, the head teachers who keep such records may know that there will be few spot checks of their accuracy, and that even if inspectors were to find discrepancies, there would likely be no consequences. Administrative records may be poor even if head teachers are not trying to cover for themselves and/or their subordinates: when accountability mechanisms are weak, keeping such records is not likely to be a priority.

Absence of primary-school teachers: Comparative cross-country findings

Given these issues, what do we know about teacher attendance in developing countries? One study, in which one of us was involved, set out to bypass the problem of faulty administrative records by measuring attendance through direct observation of teachers during surprise visits to primary schools in 2002-03 (Chaudhury, Hammer, Kremer, Muralidharan, and Rogers, 2006). The research team used this same methodology across six countries on three continents, in each case in a random nationally representative sample of primary schools, which made cross-country comparisons possible. Teachers were counted as absent only if they were ordinarily scheduled to teach at the time of the surprise visit.[2]

Table 1: Absence rates of primary-school teachers, 2002-03

	Absence rate (%)
Six-country study:	
Bangladesh	16
Ecuador	14
India	25
Indonesia	19
Peru	11
Uganda	27
Other comparable surveys:	
Papua New Guinea	15
Zambia	18

Note: Estimates are taken from surprise visits to representative random samples of schools in 2002-03.

Sources: Chaudhury *et al*, 2006 (for the six-country study); World Bank, 2004 (PNG); Das *et al*, 2007 (Zambia)

Absence rates in these six countries averaged 19 percent (unweighted average), and they ranged from manageable to alarming, depending on the country (see Table 1). In Peru, the highest-income country in the sample, some 11 percent of full-time

[2] This applied also to head teachers, who were included in the absence calculations only for times when they were scheduled to be teaching class.

primary school teachers were absent at the time of a surprise visit during school hours (see also Alcázar, Rogers, Chaudhury, Hammer, Kremer, and Muralidharan, 2006). At the other end of the spectrum, 25 and 27 percent of teachers were absent from Indian and Ugandan schools, respectively. The other three countries fell between these extremes, with the unweighted average absence for the six countries coming in at a high 19 percent. These results were consistent with roughly contemporaneous estimates from two other countries where survey teams also directly observed teacher attendance: Papua New Guinea, where primary school absence was estimated at 15 percent[3] (World Bank, 2004), and Zambia, at 18 percent (Das, Dercon, Habyarimana, and Krishnan, 2007).

It is important to note that this was the absence rate from the school, rather than only from the teacher's assigned classroom. If the teacher was present in the school but out of the classroom, or in the classroom but not teaching, he or she was nonetheless marked as being in attendance.[4] Hence these are actually conservative definitions of absence, in that the actual rate of absence from teaching duties was sometimes considerably higher.[5]

Some regions within these countries suffered from even more serious absence problems. Among the states of India, the variation in absence was even greater than across the six countries. Teacher absence ranged from a low of 15 percent in Maharashtra, one of the most developed Indian states, to a high of 38 percent in Bihar and 42 percent in Jharkhand. Similar patterns were found within Peru: while Lima had an absence rate of only 7 percent, teachers in remote schools averaged 20 percent absence.

Teacher absence at the secondary level

More recently, a handful of other World Bank studies have used the direct-observation methodology to measure teacher absence at the lower secondary level.

---

[3] According to the authors of the PNG study, "the rate is an underestimate of the true rate since schools that were closed 'because there weren't enough teachers' were replaced by schools that were open" (World Bank, 2004). By contrast, in other studies such as the India teacher study reported in Kremer *et al* (2005) and Chaudhury *et al* (2006), teachers at schools that were closed simply due to teacher absence were in fact counted as absent.

[4] See Chaudhury *et al* (2006) for further details on the assumptions and calculation methods.

[5] One commenter noted that some schools, typically in desirable urban areas, have too many teachers, and suggested that this could cause some of the recorded absence. But because only teachers scheduled to be in classrooms at the time of the visit were included in the absence calculations, such underutilization of teachers should not affect the calculated absence rates.

National average absence rates in these countries have been somewhat lower than in the case of the primary schools shown above, at 7 to 8 percent in Lao PDR and 16 percent in Cambodia (Benveniste, Marshall, and Santibañez, 2007; World Bank, 2008). In Mongolia, a mixed sample of schools covering different ages, from Grades 1 through 10, recorded average absence rates of 16 percent in rural areas but only 5 percent in urban areas (World Bank, 2006).

There are reasons why absence might be lower at the lower-secondary level than in primary: secondary schools are less likely to be in remote locations and the parents of secondary-school students are likely to be better-educated and wealthier, both of which may increase accountability. But because few studies report separately the absence rates at both the primary and lower-secondary level in the same country, we do not know whether absence is really less prevalent at higher levels of schooling, or whether Lao PDR and urban Mongolia simply have lower absence rates than other countries. One clue may be provided by a study of Bangladesh (Chaudhury, Hammer, Kremer, Muralidharan, and Rogers, 2004), which finds a secondary-school absence rate 2 percentage points higher than the primary rate. This suggests that there may at least be no general tendency toward lower secondary-school absence rates.

Changes over time

To assess how teacher absence is likely to respond to particular policies and initiatives, it would be useful to know how the problem changes over time. Rigorous evidence on this question is just now beginning to appear. The only countries for which we know of nationally representative surveys directly observing teacher absence more than a year apart are Uganda and Indonesia. In the case of Uganda, in 2006 survey teams returned to the schools that had been surveyed in 2002-3. Although no report on the findings is yet available, preliminary estimates suggest that the nationwide average absence rate fell by several percentage points.[6] In the Indonesian case, too, preliminary analysis shows a reduction of similar magnitude between 2002/3 and 2008, with an even larger average drop in panel schools that were visited in both rounds.[7]

---

[6] This statement is based on personal communication from the author, James Habyarimana.

[7] Based on calculations by the team, which includes one of us (Rogers). For these findings, see "Can Teacher Effort Be Improved? Evidence from Indonesia (preliminary analysis)", presented by Menno Pradhan at the 2008 World Bank Human Development Forum (Washington, DC, November 3),.

In addition, there is good longitudinal evidence from the country-sized Indian state of Andhra Pradesh (with a population of over 76 million). There, absence rates have been measured frequently since 2005 at a representative random sample of schools, as part of a series of experiments with interventions to improve school quality (Muralidharan and Sundararaman, 2008). A comparison with the findings from 2003, which were generated by one of the same researchers, shows no statistically significant improvements. Absence rates dropped only slightly in the control schools, from 25 percent in 2003 to 24 percent in 2005-06. Surprisingly, even in the schools in which researchers introduced teacher performance bonus payments on an experimental basis, absence remained stagnant at 25 percent – even as the incentive payments improved teachers' preparation and accelerated student learning.

Benchmarking absence

How does the problem compare with levels of teacher absence in wealthier countries? It would be useful to know the answer to this question as a benchmark for developing-country education systems. Unfortunately, no comparable survey of teacher attendance based on direct observation has been done in a developed country, to our knowledge. Officially recorded absence levels are typically on order of 5 to 6 percent (Ballou, 1996; Miller, Murnane, and Willett, 2007; Podgursky, 2003). It is possible that in some locations unrecorded absences are frequent enough to compare with Peru's 11 percent overall absence level, but it seems impossible that unrecorded absence could match Indian or Ugandan levels.

Comparison with administrative records

Earlier, we justified direct-observation survey methods with the assumption that administrative records may be a poor indicator of actual teacher absence rates. By comparing reported absence rates with those directly observed by survey teams, it is possible to gauge whether this assumption is valid. Evidence from a number of studies suggests that it is. For example, in Ecuador, over one-quarter of absent teachers were incorrectly reported by head teachers as being present (Rogers *et al*, 2004). In the ongoing work conducted by Muralidharan and Sundararaman in Andhra Pradesh, the researchers find that the official absence rate recorded on the day prior to the unannounced visits was 18 percent, while the absence rate measured by direct physical observation on the day of the visit was 25 percent.[8]

[8] Based on personal communication from Karthik Muralidharan.

Which teachers are most absent?

To design policy to improve school quality, it is important to know the pattern of absences: who is most absent, and when? As Chaudhury *et al* (2006) point out, if a small number of teachers account for most of the absences, then governments that want to tackle the problem need to identify those missing teachers and tailor its policies accordingly. If it turns out that the missing teachers are "ghosts", in the sense that they either do not exist or are on the rolls merely to draw a salary, then the solution will likely involve culling them from the system. If the absent teachers are missing school not because of malfeasance but because of extended illness, as could happen in countries hit hardest by the HIV/AIDS crisis, then school systems may need to focus their efforts on making sure that classes are quickly covered by other teachers.

This type of analysis has to be done on a country-by-country basis; like the levels of absence, the reasons for it vary across countries. Without tracking each teacher's attendance very frequently – on a weekly basis, say – it is difficult to be sure of that teacher's underlying propensity for absence. But by looking at the overall distribution of absences across a handful of visits to the same schools over weeks or months, it is possible to infer how often teachers are typically absent.

The evidence from the multi-country study in 2002-03 suggests that it is typically not just a small group that is responsible for absence. In all but one of the six countries analyzed by Chaudhury *et al* (2006), frequent absence appears to be a system-wide problem, with many teachers being absent at higher rates than would typically be expected in a developed-country school system.[9] This implies that the reasons for absence are also likely to be systemic in nature – such as system-wide failures in accountability, low levels of pay, poor housing and transportation for teachers, or simply low expectations of teacher performance across the board. Later in this section, we discuss which of these systemic explanations is most likely to be valid; but as a preface, it is worth noting that there is little evidence that low base pay levels are the culprit.

Another way of answering the "who is absent?" question is to compare absence rates for groups of teachers with different characteristics. The evidence shows that these individual characteristics typically do not have a great deal of explanatory power. In multivariate analysis in the six-country study, characteristics such as

[9] An exception is Ecuador, where it appeared in 2002-03 that a small minority of teachers may have accounted for a large share of the absence (Rogers, Lopez Calix, Chaudhury, Hammer, Cordoba, Kremer, and Muralidharan, 2004).

marital status, age, union membership, tenure at the school, and education level do not robustly predict absence. There is some tendency for males to be more absent, and for teachers who are originally from the local area (and who may therefore be more integrated into the community) to be less absent. But overall, the paucity of robust individual predictors – other than those related to the teacher's position at the school, which will be discussed below – reinforces the conclusion that high absence reflects systemic problems rather than problems with certain types of teachers.

What are the effects of teacher absence?

It might be argued that, for two reasons, teacher absence does not deserve much attention. First, perhaps the cost of absence is not great. After all, absent teachers are far from the only problem afflicting many developing country school systems. Many schools suffer from a lack of facilities, equipment, and textbooks. Students are frequently absent, which reduces the efficacy of even well trained and motivated teachers. And in practice, even when they are present, many teachers are poorly trained and motivated. Without all these complementary inputs into the learning process, one could imagine that the difference between more and less frequent teacher absence may not translate into a significant difference in learning gains. Indeed, some suggestive evidence from the United States finds exactly this in one New York school district: researchers concluded that "teacher absence from the classroom . . . for the most part does not appear to be associated with students' academic performance", failed to find any significant effects of teacher absence (Ehrenberg, Rees, and Ehrenberg, 1991). Moreover, if teachers are absent for training or even personal leave that improves their productivity while at work, their absence may not slow student learning at all.

A second argument might be that teacher absence is built into the system and is an inevitable cost of poverty. Perhaps the government cannot afford to pay teachers well enough, and they have to supplement their salaries with outside work during school hours. This could translate into a *de facto* reduction in work hours expected of each teacher. If teachers then coordinated their planned absences, so that colleagues could cover for them or students can plan to be absent on the same days as the teachers, that could mitigate the inevitable costs of absence. It is not clear whether this situation occurs anywhere in practice, but we recognize it as a possibility, and one that is consistent with the claim that low salaries are responsible for excessive absence.

These arguments are probably not correct, as we will explain below. The evidence on costs of absence remains scanty, and much more is needed. Nevertheless, what we know so far supports neither the notion that absence is low-

cost nor the idea that absence is viewed by all participants as a necessary (if unfortunate) result of poverty.

Teacher absence slows student learning

Recent studies examine the issue of teacher absenteeism using US data, although without the benefit of an experimental design.[10] In their study of a large urban school district, Miller, Miller, Murnane, and Willett (2007) find that a substantial share of absences are discretionary, and that higher absences lead to significantly lower student achievement. Another recent study from North Carolina that used a rich longitudinal data set of teachers and students found that teacher absences are associated with lower student achievement in primary school (Clotfelter, Ladd, and Vigdor, 2007). Moreover, absence is more prevalent in schools serving disadvantaged children. The authors found that schools in the poorest quartile averaged almost one extra sick day per teacher than schools in the highest income quartile, and schools with persistently high rates of teacher absence were much more likely to serve low-income than high-income students. This suggests that in the US, teacher absenteeism compounds the disadvantages already faced by students in poor communities; as we will show below, the same is true in developing countries.

Surprisingly, some of the best evidence on absence and student learning comes from a handful of developing-country studies. These studies have the advantage of direct observation of teacher attendance by study teams, which gets around problems of inaccurate administrative records. One such study is by Das *et al* (2007), who focus on primary schools in Zambia. That study involved repeated surprise visits to the same schools over the course of the year, together with measurement of the students' learning gains. By correlating each student's learning gains with the absence of his or her teacher, the authors conclude that absence has a surprisingly large effect: each additional 5 percent increase in teacher absence reduces learning by 4 to 8 percent of a year's learning for the typical student. The study controls for many other observable inputs into student learning, such as classroom equipment and even family-provided inputs. This makes it more likely that the learning effect really is due to absent teachers and not to differences in some other input that is correlated with teacher absence.

---

[10] One note on terminology: The term "absenteeism" is widely used in this literature. In this chapter, we prefer the term "absence", which we view as less judgmental, but sometimes use "absenteeism" when referring to high levels of apparently volitional absence, or when citing work that uses the term.

Another innovative recent study provides experimental evidence on how teacher absence affects learning gains (Duflo, Hanna, and Ryan, 2007). The experiment provided attendance-based bonuses for teachers at NGO schools in rural Rajasthan, India, by using cameras to monitor attendance and then verifying the results with random spot checks. Compared with the teachers in the schools that had been randomly assigned as controls, teachers eligible for the bonuses had much lower absence rates – only 21 percent, compared with 42 percent for the control teachers. Perhaps surprisingly, student learning increased substantially as well in the experimental schools, by 0.17 standard deviations. The authors estimate that reducing absence by 10 percentage points would increase child test scores by 0.10 standard deviations. Because schools had been randomly assigned to experimental and control groups, we can be sure that this is purely a teacher effect: all other inputs were, on average, the same across the two groups.

A few other studies have also estimated the link between absence (measured through direct observation) and student attendance and achievement. In the case of India, Kremer and others (2005) find that higher teacher absence leads to lower predicted student achievement of 4th-graders – about .02 standard deviations lower for each 10-percentage-point increase in absence – and also to lower student attendance. For Indonesia, Suryadarma, Suryahadi, Sumarto, and Rogers (2006) find that an additional 10 percentage points in the average absence rate of teachers at a school is associated with a .09-standard-deviation decrease in math scores of 4th-graders (with no effect on verbal test scores).[11] These studies do not track student learning over time, however, nor are they able to correlate an individual student's achievement with the absence of his or her own teacher, so these estimates of the effects of absence are less reliable than those discussed above.

The finding that teacher absence slows student learning should not be surprising. In many developing country school systems, substitute teachers are not available. It might be possible to combine classes when one teacher is absent, but in many cases class sizes are already large enough that the combined class would be of a size that clearly retards learning. In other cases (as in rural India) primary schools are sometimes staffed by a single teacher, so that when the teacher is absent, the school must close entirely. If this happens often enough, students and families may become discouraged, increasing student absenteeism and compounding the costs of teacher absence.

[11] The authors thank Daniel Suryadarma for this calculation.

Absenteeism does not reflect an implicit contract with teachers

Grant, then, that teacher absence has costs in terms of student learning. But what if it is part of a tacit understanding between teachers and the public, in which teachers offset low pay by being allowed to miss a substantial number of school days? To paraphrase the colloquial US expression, perhaps the government pretends to pay teachers, and the teachers pretend to work. Teachers' unions sometimes offer a version of this story when they argue that salaries are so low that absence in unavoidable, either because teachers need to supplement their salaries through outside jobs or because low pay makes their logistics (transportation or housing, for example) especially challenging.

The evidence does not generally support this view of teacher absence. First, in many developing countries, teacher pay does not appear to especially low, at least as measured by the teachers' wages in alternative professions. Teachers' salaries often reach two to five times their country's per capita GDP, so wages that seem low in absolute terms are quite reasonable in relative terms (Bruns, Mingat, and Rakotomalala, 2003). And while part of this premium may reflect the scarcity of educated workers in the economy, which may bid their wages up, this argument applies more to the minority of teachers with a university degree than to the majority who may have less education. Although comparisons are difficult, recent work on Indonesia – which at the time had a relatively poorly paid teaching corps – suggests that teachers with only a high school education earn more than similarly educated workers in other professions (Filmer, 2002).

Another indication of the level of teacher salaries relative to those of outside opportunities is the level of potential supply for the positions: there are often large numbers of candidates with the requisite qualifications queuing up for positions in the teaching corps. Indeed, private schools often take advantage of this excess supply by hiring teachers at a fraction of the wage paid by the government schools. In India, for example, teachers in rural private primary schools typically make one-quarter to one-fifth as much as their public-school counterparts (Kremer and Muralidharan Forthcoming).

A second reason to doubt the tacit-understanding of absence story is that key stakeholders – including, most importantly, average citizens – show no recognition of such an implicit bargain with teachers. In recent international polling, citizens in many countries cite teacher absenteeism as a problem.[12] Anecdotally, households in some high-absence countries are clearly outraged by the flagrant disregard that some

[12] The source for this statement is unpublished poll data provided by Stephen Knack.

teachers show for the official teaching schedule. The influential Public Report on Basic Education in India (PROBE Team, 1999, p. 63), for example, included the following typical vignette:

> *When the investigators reached the primary school in Jotri Peepal (Bharatpur, Rajasthan) shortly after noon, no teacher was in sight. One teacher, who had apparently left for lunch, soon appeared. He said that the school actually had three teachers, but that the headmaster and another teacher had gone elsewhere on official duty.*
>
> *The villagers contradicted this story. They said that the two absconding teachers did not turn up at all. The only one who did was the one the investigators had met . . . . He too was highly irregular and opened the school at will.*

There is no indication in this story that the villagers viewed themselves as having made an implicit bargain with the absent teachers. Instead, they clearly felt cheated: here were three teachers with job security and relatively good wages who did not "turn up" at school as they were supposed to, and so children were left untaught.

Moreover, if absence reflected an implicit contract, the efficient way to implement it would be to have both teachers and students absent on the same days. For example, if teachers regularly stayed away from school on Fridays, parents could recognize this pattern and keep their children home on those days – in the same way that during harvest season, schools close in rural areas in some countries so that both teachers and students can help with the harvest. But in fact, we tend to see no such pattern. In countries that we have investigated, absences do not tend to be heavily concentrated on particular days of the week, and days of the week are often not even significant predictors of absence in a statistical sense.

Why are teachers absent?

The short answer to this question is that we do not know for certain, in part because we lack independently verified information with which to answer this question. When we ask head teachers or the teachers themselves, we obtain answers that vary substantially from setting to setting. However, one consistent pattern was that two common explanations – illness and "other official duties" – appear to explain only a small percentage of absences, even if we take the head teachers' statements at face value. Overall, only about 10 percent of absences were attributed to illness in the multi-country study (Chaudhury *et al*, 2006), although there is some evidence that illness is more important as an explanation in Zambia, where the HIV/AIDS epidemic has hit especially hard (Das *et al*, 2007). And "other official duties" that cause teachers to miss school, such as election monitoring and public health campaigns, appear to be a minor reason for absence even in India, where they

are often cited as being important (Kremer *et al*, 2005). In fact, in the Indian case between 10 and 15 percent of teachers are absent at any given time during the school day without even reported authorization – despite the fact that the level of ostensibly authorized absences runs considerably higher than what should be allowable.

But there are reasons to doubt that interviewing teachers about reasons for absence will yield accurate responses. Like other workers, teachers themselves may sometimes claim socially acceptable excuses such as illness when they are actually absent for other reasons. Head teachers, too, may prefer to make excuses for their teachers, rather than to acknowledge unexcused absences or informal arrangements that allow frequent absence. As noted above, the head teachers' reports of attendance – which can be verified by enumerators – are not fully accurate; their reports on harder-to-verify reasons for absence are likely to be even less accurate.

Factors that do not explain absence: Low base salaries

An alternative approach is to put less weight on what teachers say, and more on what they do. Which types of teachers are more likely to be absent, and in what geographical and institutional contexts? Careful analysis of these questions allows us to test out different hypotheses about what is driving teacher absence.

Chaudhury *et al* (2006) carry out this type of analysis for the six countries in which they had fielded comparable surveys. By analyzing each country individually and also aggregating them for a multi-country analysis, they assess the likely role of various factors in explaining teacher absence.

One candidate explanation is low levels of teacher salaries. This explanation sometimes appears in media accounts of absenteeism, as when teachers note that to support themselves or their families, they have to moonlight in outside jobs that sometimes pull them away from their teaching duties. If this explanation were correct, the lowest-paid civil-service teachers would be the most absent. This is typically not the case, however, and in fact the opposite may be true. The highest-ranked teachers – the head teachers and their deputies – in fact tend to be more absent than other teachers. And in some cases teachers who are more highly educated, and hence who are paid more according to civil-service pay scales, are also more likely to be absent.

Poor incentives and accountability

A lack of accountability and incentives for performance likely explains more of the problem of teacher absence. The data provide several clues pointing us in this direction. First, as noted above, higher-ranking teachers tend to be more absent; but

these are precisely the teachers who have more power and who are therefore harder to hold accountable. Second, absence is higher in remote schools that are farther away from Ministry of Education offices, and are probably less subject to official supervision. Third, we sometimes find higher absence among teachers in communities where the students' parents are less educated, which may reflect communities that are less able to monitor and enforce performance of teachers.

Another indicator that accountability matters for absence is the gap between teacher attendance in public and private schools. In their nationally representative sample of Indian schools, Kremer *et al* (2005) find that private-school teachers have absence rates one-third lower than their public-school counterparts in the same villages – despite the fact that private-school salaries are only one-fifth to one-quarter that of public-school salaries. In Pakistan, Das, Pandey, and Zajonc (2006) find an even larger attendance gap: public-school teachers are absent 3.2 days per month, compared with an already high 1.8 days per month for private-school teachers. A plausible explanation for this difference is that private schools can fire teachers for poor effort, whereas public schools cannot. In India, despite the very high absence rate, only one in 3000 public-school head teachers had ever fired a teacher for excessive absence (Kremer *et al* 2005).

These insights from the data are consistent with analyses of the incentives for performance faced by many teachers. Vegas (2007), in her discussion of teacher pay structures, notes that the great bulk of compensation is unrelated to assessments of how well the teacher is performing, in terms of either effort or student outcomes. The analysis of teacher incentives and management by Alcazar *et al* (2006) shows that Peru fits this characterization, with little incentive for performance. Even without pay incentives, the possibility of promotion could provide motivation to at least the better teachers, but in practice promotions are awarded not only on the basis of merit but also on the basis of connections and corruption.

In short, teachers tend not to be held accountable for their performance in the classroom. Not all teachers take advantage of this lack of accountability, of course. Most of the time, most teachers are at their posts, trying to teach in what are often difficult conditions. The problem is that when teachers do lack the professionalism and sense of duty to meet their responsibilities, they are not usually held accountable.

Absenteeism signals broader accountability problems

Above, we discussed some estimates of the costs of excessive teacher absence in terms of student learning. But beyond those costs, high levels of absence are likely to signal a broader accountability and incentive problem that has other costs as well.

One example of such costs is low activity levels of teachers when they are present in the school. In schools or areas with high levels of teacher absence, one might expect that the teachers that were present on any given day would have to work harder, to make up for their absent colleagues. In practice, at least within India, the opposite appears to be the case: states and schools with higher absence rates tend to have lower levels of teacher activity for teachers who are present at school. For example, in the state of Maharashtra, the absence rate was 15 percent, about 60 percent of teachers were not engaged in teaching when the survey teams arrived. By contrast, in Bihar and Jharkhand, where absence rates were about 40 percent, only 25 to 26 percent of teachers were actively teaching (Kremer *et al*, 2004). This pattern of inactivity compounds the learning costs for students, and it likely indicates of a systemic problem with accountability for results or even for desired behaviors.

2. Reducing teacher absence: Incentives and other policies

How can developing-country policymakers tackle the problem of teacher absence, and more generally increase accountability and improve performance of teachers? This section focuses on financial and other incentives that can improve teacher inputs and learning outcomes. We recognize, of course, that for many teachers the profession is a calling. They are motivated to teach by their sense of professionalism: they believe deeply in the mission of educating young people, and they derive rewards from seeing their efforts lead to learning.

But while these non-financial motivations are important, the evidence shows that teacher incentive structures also matter. They affect who chooses to enter and remain in the teaching profession, as well as how well teachers do their day-to-day work in the classroom. Some of the better evidence is for the case of the United States, where there is growing concern about the declining quality of teachers. For example, research shows that the increase in US labor market opportunities for women reduced the pool of qualified applicants for teaching positions. [13] Salary levels affect employment decisions of incumbent teachers as well as entrants: other research suggests that teacher salary scales in the U.S. are so compressed that the best teachers are likely to leave the profession for higher-salaried jobs in other occupations.[14] And among those who stay in the profession, whether pay is based on performance may affect their effort levels and effectiveness. In the U.S., test scores are higher in schools that offer individual financial incentives to teachers for good performance, though it is unclear whether the finding is due to high-performing schools' adopting teacher incentive programs or to the responses of teachers to these programs (Figlio and Kenny, 2006).

In less developed countries, research also indicates that how teachers behave, including how often they show up to their classrooms, can be affected by monetary and other types of incentives. For example, a recent evaluation of a performance-based pay bonus for teachers in Israel concluded that the incentive led to increases in student achievement, primarily through changes in teaching methods, after-school teaching, and teachers' increased responsiveness to students' needs (Lavy, 2004).

---

[13] Corcoran *et al.* (2004) and Hoxby and Leigh (2004) present evidence that the quality of teachers in the U.S. has declined over time due to changing labor market opportunities.

[14] Hoxby and Leigh (2004) present evidence that the decline in teacher quality in the U.S. is due not only to increased opportunities for women outside of teaching, but also to the highly compressed teaching wage structure

In this section, we first summarize the many types of incentives that exist to motivate teachers, both initially and throughout their careers. Next, we describe the evidence on pay for performance schemes for teachers. Then, we turn to effort to change systems for monitoring and evaluating teachers and their expected impacts on teacher performance. Finally, we discuss evidence from recent efforts to motivate teachers through non-monetary incentives.

How should we think about motivating teachers to perform better?

Many people think of teacher incentives exclusively as salary differentials and other monetary benefits. Indeed, differences in pay can act as an incentive to attract and retain qualified teachers or, conversely, discourage qualified applicants and talented practitioners already in the profession. But there are many other kinds of incentives, many of which are non-monetary. Vegas and Umansky (2005), in their review of teacher incentives in Latin America, define several types of incentives affecting teachers, including:

1. *Internal motivation*: the opportunity to educate children, and thereby improve their well-being, can serve as a powerful incentive to attract individuals into the teaching profession. Though its presence is important to many teachers, most people would agree that idealism alone is not sufficient to produce adequate performance.

2. *Social prestige and recognition*, which can incite people to become teachers.

3. *Job stability*. The threat of losing one's job can act as a powerful incentive, though it is virtually absent from the teaching profession in the region. In many countries, the prevalence of union contracts strongly protect teachers' jobs, which may serve to attract potential teachers to the profession

4. *Pensions and other non-salary benefits, such as health insurance*. Reliable government pensions that provide for a decent living after a teacher retires can attract people to the career as well as create an incentive for teachers to remain in their jobs. Although not sufficiently researched, pensions may be one of the more influential incentives encouraging people to work as teachers.

5. *Professional growth*. The presence of opportunities for advancement throughout a career can serve to motivate teachers to excel in their work. Unfortunately, this type of teacher advancement ladder is largely absent in the

teaching profession in many developing countries.

6. *Non-salary job characteristics*, such as the availability of adequate facilities and materials with which to teach. In many countries, the lack of such basic infrastructure makes teaching a difficult, often unattractive profession to qualified professionals.

7. *Sense of mastery in one's job*. People who feel that they can be capable and effective as teachers are more likely to choose to become a teacher.

8. *Having to satisfy clients and respond to supervisors* can be a strong incentive for performance on the job.

9. *Salary differentials and other monetary benefits.* Differences in salary and overall compensation exist between teachers and non-teachers, and among teachers themselves. Changes in the salary differential between teachers and non-teachers can make teaching a more or less attractive profession to highly qualified individuals. Among teachers, salary differentials may be based on seniority, training, characteristics of the school or its students, performance, or other variables. In most countries, teacher salary differentials are based almost exclusively on training and years of service; they are rarely based on performance.

These nine types of incentives can together work to attract, retain, and motivate effective teachers. Not all of them are likely to have direct effects on attendance, but it is useful to understand the evidence on the policies that can affect them and how they affect teachers' performance. In this section, we review that evidence, focusing on what is known about their effects on effort and attendance.

Paying more for increased teacher effort

To improve teacher effort and, consequently, student learning outcomes, some countries have recently experimented with performance-based pay mechanisms for teachers. These schemes usually rely on aspects of teacher performance that can be measured and evaluated and, in some cases, also their students' performance. Understanding how performance-based pay mechanisms are designed and linked to teacher performance is important in predicting and evaluating their impact. In some cases, teachers have been found to respond adversely to incentives by, for example, reducing collaboration among teachers themselves, excluding low-performing

students from classes, cheating on or manipulating the indicator on which rewards are based, decreasing the academic rigor of classes, or "teaching to the test" to the detriment of other subjects and skills (see Cullen and Reback, 2002; Figlio and Getzler, 2002; Figlio and Winicki, 2002; Jacob and Levitt, 2003; Murnane and Cohen 1986).

In Chile, the SNED (National System of Performance Assessment) offers monetary bonuses to schools that perform best among a group of similar schools in terms of student achievement, with the bonuses distributed among the teachers in the winning schools. Teachers in winning schools receive what has typically amounted to one-half of one month's salary, or between 5 and 7 percent of a teacher's annual salary. Although impact evaluations of the SNED are difficult owing to the absence of a natural control group, a quasi-experimental evaluation of the program's impact found preliminary evidence that the incentive has improved student achievement in those schools that face relatively good chances of winning the bonus, although the effect appears only cumulatively after a number of years (Mizala and Romaguera, 2005).

By contrast, Mexico's Carrera Magisterial Program has been less successful in raising teacher effort. Carrera Magisterial is a voluntary program that rewards participating teachers with higher pay based on assessments include test of their students and peer reviews of their teaching. The purpose of the reform was to establish incentives for teachers to improve their qualifications and effectiveness in the classroom and to create a means by which teachers could receive promotions without being promoted out of the classroom and into administrative positions. The size of the bonuses offered by Carrera Magisterial are quite substantial, amounting to between 24.5 percent of teachers' base wage for the first promotion and 197 percent of base wage for the highest (fifth) promotion. An evaluation of the program found no apparent effect on student performance as measured by a standardized exam (McEwan and Santibañez, 2005).

In the United States, several states are experimenting with pay incentives to reduce teacher absences and increase performance. In North Carolina, for example, a policy was introduced to allow teachers to take additional sick days after having exhausted their supply of "free" days, at the cost of $50 per day. An evaluation of the program indicates that the probability of taking additional sick days declined when teachers were charged a fee for each additional day off (Clotfelter, Ladd and Vigdor, 2007).

A few experimental evaluations have recently looked at the impact of teacher incentives on teacher effort. Because of random assignment into treatment and control groups, the findings from these evaluations are considered more reliable than

those of quasi-experimental evaluations. Unfortunately, experimental evaluations are often possible only in small samples, thus limiting their generalizability. Recent randomized controlled experiments have yielded mixed but promising results of the impact of incentives on teacher effort, including attendance. An experiment in Rajasthan, India, monitored teacher attendance using cameras and then based part of the teachers' salary on their attendance rates. Not only did attendance improve, but so did student learning (Duflo and Hanna, 2005). An experiment in Kenya with incentive pay based on student test score gains found that the program increased learning, but apparently only as a result of "teaching to the test" (Glewwe, Ilias, and Kremer, 2003). By contrast, a larger-scale experiment in government schools in Andhra Pradesh, India, found that when teachers were paid bonuses (either individually or collectively) based on their students' learning rates, teacher attendance rates did not change but student learning did improve (Muralidharan and Sundararaman, 2008).

Paying teachers more to take on less desirable jobs

Governments around the world are struggling with attracting qualified teachers to less desirable schools. In some countries, these schools tend to be located in rural or remote areas. In other countries, these schools are located in urban areas, where a majority of poor and disadvantaged populations are concentrated. In either case, the limited evidence available suggests that these disadvantaged schools will also suffer from higher teacher absence rates, as well as being staffed by less qualified teachers. Teachers typically prefer working in schools with students from middle- and upper-income households, as opposed to those from lower-income backgrounds. Research from the U.S., for example, shows that teacher mobility is related more to student socio-economic characteristics than to teacher salaries: schools serving large numbers of academically disadvantaged, racial or ethnic minority students tend to lose a substantial fraction of teachers each year both to other schools (with more advantaged students) and to other professions (Hanushek, Kain and Rivkin, 2001). A key policy challenge is to ensure that all classrooms are staffed with high-performing teachers.

One possible mechanism for achieving this goal is to pay teachers a bonus, or to give them additional housing or transportation benefits, for locating in less desirable schools. Unfortunately, while many countries have adopted such programs, there is little rigorous evaluation of the programs' effects on teacher qualifications or student learning, let alone on absenteeism (McEwan, 1999). But two recent studies that have examined these incentives yield mixed results. One is an evaluation of a rural teacher pay in Bolivia, which sheds some light on its effect on teacher performance.

As in many other countries, the rural teacher pay differential in Bolivia is intended to compensate teachers for the perceived hardship of living and working in a rural area. As a result of recent urbanization and demographic growth within cities, some designated rural schools have been incorporated into urban areas. In those cases, urban and rural teachers work in neighboring schools, sometimes even the same school, with indistinguishable groups of students. This chance occurrence creates a situation in which teacher quality can be compared between teachers who are classified as rural (and thus earn higher wages) and those classified as urban. An evaluation of this program found no meaningful differences between the test scores and other educational outcomes of students of urban-classified and rural-classified teachers with the same background characteristics. This result suggests that the rural pay differential is not successful getting teachers to perform better (Urquiola and Vegas, 2005).

In the US state of North Carolina, an incentive program was introduced to retain math, science and special education teachers in high-poverty or low-performing high schools. The program involved an additional US$1,800 per year to teachers who remain teaching in these schools. The evaluation found that teacher turnover rates in these schools declined by around 12 percent, but the evaluation did not explore the extent to which the decline in teacher turnover resulted in increased student learning outcomes (Clotfleter, Glennie, Ladd and Vigdor, 2006).

Improving performance by changing how teachers are monitored and evaluated

Some governments have opted for substantial reforms in how teachers are monitored and evaluated, often linking the results of these evaluations to increases in compensation. In the early 2000s, Chile introduced a nationwide performance evaluation system of individual teachers which introduces pay promotion criteria linked to performance. Every three years, each teacher's performance is evaluated based on a portfolio, self-assessment, peer assessment, supervisor assessment and video-recordings of a class. Based on these submissions, teachers are classified into one of four categories – master, effective, average, or poor. Salary increases and promotions are directly linked to the outcome of the evaluation. In addition, teachers classified as average or poor need to be mentored and participate in training. If a teacher is evaluated as poor two consecutive times, she or he is dismissed.

While the impact of the program on teacher effort or education quality has not been evaluated, it is promising in that it contains an effort to define teacher quality based on characteristics and performance efforts that can be monitored and evaluated, to make these explicit, and to hold teachers accountable and reward them

according to performance. Further, it establishes transparent criteria for dismissing the worst performers. Because the evaluation relies on multiple perspectives, including the supervisor's, peers, and the teacher herself, teachers perceive it as fair and teachers unions agreed to the new system.

Another promising policy is to increase the monitoring of teacher attendance by involving communities. Several countries in Latin America, including El Salvador, Honduras, Mexico and Nicaragua, have experimented with policies that devolve authority over school management to communities. These school-based management reforms tend to strengthen the accountability relationship between teachers (and schools) and communities. Research evidence suggests that these reforms can result in, among others, less teacher absence, more teacher work hours, more homework assigned and closer parent-teacher relationships.[15] For example, a quasi-experimental evaluation of the EDUCO program in El Salvador found that this school-based management reform has had important effects on teacher behavior and student outcomes, including fewer school closings, less teacher absence, more meetings between teachers and parents, and longer work hours for teachers. The changes, in turn, are related to higher achievement in language in EDUCO schools (Sawada and Ragatz, 2005).

Similar findings resulted from a quasi-experimental evaluation of the Honduran PROHECO (Proyecto Hondureño de Educación Comunitaria, or Honduran Community Education Project). Like EDUCO, PROHECO is a school-based management reform for rural primary schools. The evaluation found that PROHECO teachers are less frequently absent due to activities related to union participation (PROHECO teachers are not part of the civil service and thus are not unionized), although they tend to be more frequently absent as a result of teacher professional development. It also found that PROHECO teachers teach more hours in an average week than do comparison teachers and that they have smaller classes and assign more homework. The examples lend credence to the idea of greater efficiency and teacher effort in decentralized schools. Yet, school-based management in Honduras has not had much effect in some important areas where people expected it would. Namely, little evidence was found that teachers in community-managed schools differ from their colleagues in conventional schools in terms of their classroom processes, planning, or motivation. Importantly, however, PROHECO students score higher on math, science, and Spanish exams than do students in similar non-PROHECO schools (Di Gropello and Marshall, 2005).

---

[15] See, for example: Di Gropello and Marshall, 2005; Sawada and Ragatz, 2005, Parker 2005, and Gertler, Patrinos, and Rubio-Codina, 2006.

Can non-monetary incentives induce more teacher effort?

Policy-makers can contribute to teacher performance through the provision of non-monetary incentives. These can range from providing teachers increased support in the classrooms, to increasing training opportunities, to improving the infrastructure of schools as well as the availability of teaching materials. These interventions may not only have direct effects on student learning, but also improve the motivation of teachers by feeding into their sense of professionalism and efficacy.

While the evidence on the impact on these policies is relatively scarce, a recent quasi-experimental study of a mentoring program in New York City found some evidence that mentoring could reduce teacher absence and improve retention (Rockoff, 2008). In particular, the study found that teacher retention within a particular school is higher when a mentor has previous experience working in that school, a finding that the author attributes to the hypothesis that an important part of mentoring may be the provision of school specific knowledge. Importantly, the study found that the time spent working with the mentor matters: student achievement in both reading and math were higher among teachers that received more hours of mentoring. This finding has implications for developing countries. Research has consistently shown that during the first years of teaching, teachers tend to be less effective (though the relationship is not linear; that is, after only 2-3 years of experience, the "experience premium" fades) (Darling-Hammond, 2000).

Similarly, the multi-country absence study cited earlier found evidence in some cases that the quality of the school's infrastructure may help predict attendance. Schools that scored higher on an index of available infrastructure and equipment had significantly higher attendance rates than those that scored low, and in some cases the difference was quite large. On average across the six countries in the study, schools with the best infrastructure and equipment had a predicted teacher absence rate only about half that of those with the worst infrastructure, even after controlling for other factors (Chaudhury *et al*, 2006). There are a variety of reasons why this might be, but one plausible story highlights the non-financial returns to teaching. If teachers find their work environment to be more pleasant and more conducive to promoting student learning, they are less likely to avoid it.

To improve attendance, policymakers' best bet is likely to be to focus on improving teachers' marginal incentives – that is, the incentives that they face each morning when deciding whether to call in sick that day (Kremer *et al*, 2005). Until teacher compensation is made more dependent on performance than it currently is, salaries will not provide that incentive. So education administrators will likely need to move ahead with both financial and non-financial incentives, as they seek to

weight these day-to-day calculations by teachers toward greater attendance and effort.

3. Confronting teacher absence: No recipe, but some ingredients

Armed with all this new evidence on teacher attendance, performance, and incentives, what guidance can we give to education policymakers and administrators about how to reduce teacher absence? By now, it should be obvious that there is no simple answer. The best method for combating absence and encouraging better performance in any given school system will depend on the context – including the profiles of teachers, the general quality of governance in the country or region, the amount of support and monitoring by the education ministry, and the extent of community involvement in school management.

But if there is no single recipe, there are nonetheless several ingredients that policymakers should add to the mix. First and most important is simply to *devote policy attention* to the issue of teacher effort. Often when student results are poor, the education establishment identifies the problem as a lack of skills: if only teachers were better trained, whether in subject matter or in pedagogy, student results would improve. But better skills have no effect on learning if the teacher does not make the effort to use them. Teacher absence – at least in the many cases when it is volitional – is just one glaring indicator of a lack of teacher effort, and a reminder that policymakers need to pay attention to both skills and effort.

It is hard to tackle a problem without measuring it, and so policymakers also need to *measure teacher absence* accurately. Regular administrative records of attendance can provide some indication of where the problem areas are, but are unlikely to be a very good gauge of actual attendance levels. For example, head teachers may cover for absent teachers, or teachers may be marked as present if they attend during any part of the school day, so that absence at any point of time is understated. If there are any indications of an attendance problem, education policymakers should commission occasional independent surveys of schools to monitor absence directly. These surveys serve as both a check on the accuracy of administrative records, and perhaps also a mechanism for increasing their accuracy, if head teachers understand that a finding of systematic inaccuracies can have consequences.

Third, policymakers should have a *willingness to experiment* with mechanisms for improving attendance and teacher effort more generally, and to monitor and evaluate those experiments carefully. As this review shows, the rigorous evidence on absenteeism and incentives is still too scarce to draw any general lessons about

"best practice" policies – even if such policies were not heavily context-dependent, as they are likely to be. But the most promising policies for experimentation are almost certainly those that: (1) make teacher salaries and promotions dependent in part on performance, not just on qualifications and experience; (2) introduce mechanisms for accountability, for example through greater community involvement in school management; and (3) increase the intrinsic and non-pecuniary rewards for good attendance, for example by turning schools into pleasant learning environments that offer adequate support for the teachers.

References

Alcázar, Lorena, F. Halsey Rogers, Nazmul Chaudhury, Jeffrey Hammer, Michael Kremer, and Karthik Muralidharan. 2006. "Why Are Teachers Absent? Probing Service Delivery in Peruvian Primary Schools." *International Journal of Education Research*, 45, pp. 117-36.

Ballou, D. 1996. "The condition of urban school finance: Efficient resource allocation in urban schools." Washington, DC: National Center for Education Statistics.

Benveniste, Luis, Jeffery Marshall, and Lucrecia Santibañez. 2007. "Teaching in Lao PDR." East Asia and the Pacific Region, World Bank, and Ministry of Education, Lao PDR.

Bruns, Barbara, Alain Mingat, and Ramahatra Rakotomalala. 2003. *A Chance for Every Child*. Washington, DC: World Bank.

Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan, and F Halsey Rogers. 2004. "Roll Call: Teacher Absence in Bangladesh." Unpublished, World Bank.

Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan, and F Halsey Rogers. 2006. "Missing in Action: Teacher and Health Worker Absence in Developing Countries." *Journal of Economic Perspectives*, 20:1, pp. 91-116.

Clotfelter, Charles, Elizabeth Glennie, Helen Ladd and Jacob Vigdor (2006). "Would Higher Salaries Keep Teachers in High-Poverty Schools? Evidence from a Policy Intervention in North Carolina." NBER Working Paper No. 12285. Cambridge, MA: National Bureau of Economic Research.

Clotfelter, Charles T., Helen F. Ladd, and Jacob L. Vigdor. 2007. "Are Teacher Absences Worth Worrying About in the U.S.?" NBER Working Paper No. 13648. Cambridge, MA: National Bureau of Economic Research.

Cullen, J. B., and R. Reback. 2002. "Tinkering toward Accolades: School Gaming under a Performance Accountability System." University of Michigan, Ann Arbor. Processed.

Darling-Hammond, Linda. 2000. "Teacher Quality and Student Achievement: A Review of State Policy Evidence." *Education Policy Analysis Archives* 8 (1).

Das, Jishnu, Stefan Dercon, James Habyarimana, and Pramila Krishnan. 2007. "Teacher Shocks and Student Learning: Evidence from Zambia." *Journal of Human Resources*, 42 4, pp. 820-62.

Das, Jishnu, Priyanka Pandey, and Tristan Zajonc. 2006. "Learning Levels and Gaps in Pakistan." World Bank Policy Research Working Paper 4067.

Di Gropello, Emmanuela and Jeffrey Marshall. 2005. "Teacher Effort and Schooling Outcomes in Rural Honduras." In *Incentives to Improve Teaching*, ed., Emiliana Vegas. Washington, DC: World Bank.

Duflo, Esther, Rema Hanna, and Stephen Ryan. 2007. "Monitoring Works: Getting Teachers to Come to School." Cambridge, MA: Massachusetts Institute of Technology.

Ehrenberg, Ronald G., Daniel I. Rees, and Eric L. Ehrenberg. 1991. "School District Leave Policies, Teacher Absenteeism, and Student Achievement." *Journal of Human Resources*, 26:1, pp. 72-105.

Figlio, David N. Lawrence W. Kenny, 2007. "Individual teacher incentives and student performance," *Journal of Public Economics* 91 (5-6): 901-914.

Figlio, D. N., and L. Getzler. 2002. "Accountability, Ability, and Disability: Gaming the System." NBER Working Paper 9307. National Bureau of Economic Research, Cambridge, Mass.

Figlio, D. N., and J. Winicki. 2002. "Food for Thought: The Effects of School Accountability Plans on School Nutrition." NBER Working Paper 9319. National Bureau of Economic Research, Cambridge, Mass.

Filmer, Deon. 2002. "Teacher Pay in Indonesia." Processed, World Bank, Washington, DC.

Gertler, Paul, Harry Patrinos and Marta Rubio-Codina. 2006. Empowering Parents to Improve Education: Evidence from Rural Mexico. World Bank Policy Research Working Paper No. 3935.

Glewwe, Paul, Nauman Ilias and Michael Kremer. 2003. "Teacher Incentives." Poverty Action Lab Paper No. 11. Cambridge, MA: Poverty Action Lab. (Available at: http://www.povertylab.com/papers/Teacher%20Incentives.pdf)

Hanushek, Erik A., John F. Kain and Steven G. Rivkin. 2001. "Why Public Schools Lose Teachers." NBER Working Paper 8599. Cambridge, MA: National Bureau of Economic Research.

Jacob, B. A., and S. D. Levitt. 2003. "Rotten Apples: An Investigation of the Prevalence and Predictors of Teacher Cheating." *Quarterly Journal of Economics* 118(3): 843–77.

Kremer, Michael and Karthik Muralidharan. Forthcoming. "Public and Private Schools in Rural India," in *School Choice International*. Paul Peterson and Rajashri Chakrabarti eds.

Kremer, Michael, Karthik Muralidharan, Nazmul Chaudhury, Jeffrey Hammer, and F. Halsey Rogers. 2004. "Teacher absence in India.": Unpublished, Harvard University.

Kremer, Michael, Karthik Muralidharan, Nazmul Chaudhury, Jeffrey Hammer, and F. Halsey Rogers. 2005. "Teacher absence in India: A snapshot." *Journal of the European Economic Association*, 3:2-3, pp. 658-67.

McEwan, Patrick. 1999. "Recruitment of rural teachers in developing countries: An economic analysis" *Teaching and Teacher Education* 15, pp. 849-859.

McEwan, Patrick and Lucrecia Santibáñez. 2005. "Teacher and Principal Incentives in Mexico." In *Incentives to Improve Teaching*, ed., E. Vegas. Washington, DC: The World Bank.

Miller, Raegen T., Richard J. Murnane, and John B. Willett. 2007. "Do teacher absences impact student achievement? Longitudinal evidence from one urban school district." NBER Working Paper 13356.

Mizala, Alejandra and Pilar Romaguera. 2005. "Teachers' Salary Structure and Incentives in Chile." In *Incentives to Improve Teaching*, ed., E. Vegas. Washington, DC: The World Bank.

Muralidharan, Karthik and Venkatesh Sundararaman. 2008. "Teacher Performance Pay: Experimental Evidence from India." UC San Diego and the World Bank.

Murnane, R. J., and D. K. Cohen. 1986. "Merit Pay and the Evaluation Problem: Why Most Merit Pay Plans Fail and a Few Survive." *Harvard Education Review* 56: 1–17.

Parker, C. 2005. "Teacher Incentives and Student Achievement in Nicaraguan Autonomous Schools." In *Incentives to Improve Teaching* ed. Emiliana Vegas. Washington DC: The World Bank.

Podgursky, Michael. 2003. "Fringe benefits." *Education Next*:Summer.

PROBE Team. 1999. *Public Report on Basic Education in India.* New Delhi, Oxford: Oxford University Press..

Rockoff, Jonah E. 2008. "Does Mentoring Reduce Turnover and Improve Skills of New Employees? Evidence from Teachers in New York City." NBER Working Paper No. 13868. Cambridge, MA: National Bureau of Economic Research.

Rogers, F. Halsey, Jose Roberto Lopez-Calix, Nancy Cordoba, Nazmul Chaudhury, Jeffrey Hammer, Michael Kremer, and Karthik Muralidharan. 2004. "Teacher Absence and Incentives in Primary Education: Results from a New National Teacher Tracking Survey in Ecuador," in *Ecuador: Creating Fiscal Sapce for Poverty Reduction*. Washington, DC: World Bank.

Sawada, Y. and A. Ragatz. 2005. "Decentralization of Education, Teacher Behavior, and Outcome: The Case of El Salvador's EDUCO Program." In *Incentives to Improve Teaching,* ed., E. Vegas. Washington, DC: The World Bank.

Suryadarma, Daniel, Asep Suryahadi, Sudarno Sumarto, and F Halsey Rogers. 2006. "Improving Student Performance in Public Primary Schools in Developing Countries: Evidence from Indonesia." *Education Economics*, 14:4, pp. 401-29.

Vegas, Emiliana. 2007. "Teacher Labor Markets in Developing Countries." *The Future of Children* 17 (1): 219-232.

World Bank. 2004. "Papua New Guinea: Public Expenditure and Service Delivery." World Bank: Washington, DC.

World Bank. 2006. "Mongolia: Public Financing of Education: Equity and Efficiency Implications." World Bank East Asia and Pacific Region: Washington, DC.

World Bank. 2008. "Lao PDR: Public Expenditure Tracking Survey in Primary Education and Primary Health -- Making Services Reach Poor People." *Poverty Reduction and Economic Management Unit, East Asia and Pacific Region, World Bank.*