
Inside Decentralization: How Three Central American School-based Management Reforms Affect Student Learning Through Teacher Incentives

Ilana Umansky • Emiliana Vegas

Despite decentralization reforms of education systems worldwide, there is little empirical evidence about the processes through which decentralization can improve student learning. Proponents theorize that devolving decisionmaking authority to the local level can improve communication, transparency, and accountability, making teachers and school principals more responsible for better performance and more capable of bringing it about. Yet some research has shown that decentralization can increase inequality and reduce learning for disadvantaged students. This article reports on retrospective evaluations of three Central American school-based management reforms. Using matching techniques, these evaluations investigate whether the reforms enhanced student learning and how they affected management processes and teacher characteristics and behaviors. The evidence indicates that all three reforms resulted in substantive changes in management and teacher characteristics and behavior and that these changes explain significant portions of resultant changes in student learning. This article contributes to the understanding of how decentralization reforms can improve learning and shows how education reforms, even when not conceptualized as affecting teacher incentives, can generate important changes for teachers that, in turn, affect student learning. JEL codes: I21, I28, H52, H75.

In countries around the world, governments are decentralizing the management of public services. Educational decentralization, often in the form of school-based management, is widespread in Africa, Asia, and Latin America. Many of these reforms spring from the notion that schools can better meet the needs of students

and communities by responding and being directly accountable to local stakeholders. The goals of educational decentralization frequently include improved education quality, greater relevance, expanded access, and increased efficiency. But exactly how educational decentralization will achieve these wide-ranging improvements has been left largely at the level of broad theoretical assumptions.

This article examines whether school-based management improves student learning. It investigates how school-based management reforms influence teachers and how that influence affects student outcomes. The goal is to broaden the conception of how education reforms affect teachers by influencing teacher incentives and to explore how to design and implement these reforms to maximize their beneficial effects on teaching and learning.

Three school-based management reforms in Central America are analyzed: Education with Community Participation (EDUCO) in El Salvador, the Honduran Community Education Project (PROHECO) and School Autonomy in Nicaragua. These three reforms have altered the incentives teachers face, changing teacher composition and behavior, with direct implications for student learning. This article shows that education reform design should consider the potential impact on teaching quality, even when reforms are not specifically intended to alter the incentives that teachers face.

This article draws on three background papers (Sawada and Ragatz 2005; di Gropello and Marshall 2005; Parker 2005) prepared for a regional study of teacher quality and incentives in Latin America published by the World Bank (Vegas 2005).

The article first looks at the literature on how school-based management reforms affect teachers and then proposes a theoretical framework for understanding these reforms as teacher incentive reforms. Next, it provides background information on the three Central American school-based management reforms and reviews the data and methodology in the analyses of these reforms. The following sections explore how the reforms affected teachers and students. The final section discusses policy implications and conclusions for designing and implementing reforms that can benefit teaching and learning.

The Literature on School-based Management Reforms and Teachers

Educational decentralization reforms have varied widely in their content, goals, areas of decisionmaking, and levels of educational responsibility (McGinn and Welsh 1999). Empirical analyses have also shown a wide range of impacts on education quality. Some studies have established a clear relationship between

educational decentralization and improved indicators of student learning, such as test scores, repetition rates, and dropout rates (Stoddard and Kuhn 2006; Lavy 2004; Galiani and Schargrotsky 2001; Eskeland and Filmer 2002; Jimenez and Sawada 2003). Other evidence, however, points to the importance of contextual issues for the effectiveness of educational decentralization reforms in improving learning outcomes. In the wrong context, educational decentralization can even diminish learning and exacerbate inequalities in learning outcomes (Gunnarson and others 2004; Galiani, Gertler, and Schargrotsky 2005; Hsieh and Urquiola 2003; Fuller and Rivarola 1998; McGinn and Welsh 1999).

Few studies have investigated the impact of decentralization on teachers and their work. Winkler and Gershberg (2000) propose a theoretical model for the ways decentralization could stimulate skilled and committed teachers. With localized resources, schools or local governments can make more appropriate decisions about professional development and training for teachers. With localized evaluation, school directors can provide feedback on teachers' work and how to improve it. Greater teacher autonomy in terms of curricula, pedagogy, or school improvement plans can motivate and enable teachers to improve learning in their schools.

Empirical research confirms some of these possible relationships. In a study of the Chilean voucher system, Vegas (2002) finds evidence that certain management strategies in schools are associated with higher student performance when controlling for student socioeconomic background. She finds that greater teacher autonomy in implementing projects and designing teaching plans is associated with better student outcomes when school decisionmaking power is close to the level of the teacher. In parallel with the work of Heneman (1997), this finding likely indicates that teachers are better able to translate greater autonomy into improved teaching if they have support from their supervisors.

Jimenez and Sawada (2003) demonstrate that direct community management of schools can improve teacher effort. They find that teachers in El Salvador's community-managed EDUCO schools exert significantly greater effort than teachers in centrally managed schools. The authors hypothesize that community control over the school budget allows community members to exert meaningful pressure on teachers and to design compensation systems that motivate greater teacher effort. This local accountability, they argue, is in turn the basis for higher student academic outcomes in EDUCO schools than in traditional schools.

Evidence from the United States, however, shows that accountability and school choice reforms have not resulted in greater teacher effort, as measured by weekly hours worked. For example, Stoddard and Kuhn (2006) find that average weekly work hours of U.S. teachers has increased steadily in both states with and without accountability and school choice reforms. They hypothesize that the

weak link between teacher effort and compensation may explain the lack of greater teacher effort as a result of the reforms.

In contrast to Winkler and Gershberg's (2000) theory of greater teacher autonomy under decentralization, evidence from the Nicaraguan School Autonomy reform suggests diminished autonomy for teachers participating in the reform (King and others 1996). Teacher survey data show that teachers in autonomous schools report less influence over school decisions than they had in traditional public schools. However, teachers also report that they are more punctual and less frequently absent in autonomous schools than they were in traditional schools.

In a qualitative study of 12 autonomous schools in Nicaragua, Fuller and Rivarola (1998) indicate that teachers' financial difficulties associated with the reform may have negative ramifications for teaching and learning. They find that teachers in autonomous schools spend considerable instructional time on collecting fees from students and have begun to offer more out-of-class tutorials for which children must pay.

The studies of decentralized and community-managed schools demonstrate the diversity in decentralization reforms, as well as the powerful implications of seemingly small details of planning and implementation. Whereas in El Salvador local accountability to parents seems to be improving teacher effort, in Nicaragua evidence suggests that user fees are draining classroom instructional time and teacher morale.

How Reforms Can Affect Teacher Characteristics and Behavior

This section develops a theoretical framework for understanding how school-based management reforms are likely to generate teacher incentives and what kinds of impact these incentives may have on teacher characteristics and behavior. It considers both how reforms might result in more skilled teachers and teaching as well as ways in which the reforms might result in lower quality teachers and teaching.

A useful point of departure for understanding the impact on teachers is principal-agent theory. Principals, such as employers, design compensation structures to get agents, such as employees, to work in the principals' interest (Ross 1973). In education, the principal-agent relationship can take multiple forms. Teachers, as agents, can be considered to be working on behalf of multiple principals, including parents, school principals, and education officials. In the case of school-based management reforms, the principal is generally the school council. Principal-agent theory assumes that the interests of principals and agents are frequently not aligned. Principals want high employee productivity and efficiency,

while agents want high compensation for little effort. Principals seek means of motivating agents to behave in ways that principals believe will result in high productivity and efficiency.

To what extent agents alter their behavior depends partly on their degree of risk aversion, their assessment of the risk involved in the behavior, and the desirability of the reward or aversion to the sanction (Baker 2002; Prendergast 1999). A potentially large reward or large sanction is more likely than a small reward or sanction to elicit substantial effort by a teacher to change behavior. Likewise, a reward or sanction for a change in behavior that involves little effort or risk is more likely to elicit the desired change than a reward for behavior that requires substantial effort or involves significant risk.

School-based management has the potential to generate several incentives and conditions that can affect teacher quality and teaching. These include greater accountability to local stakeholders, direct communication between communities and schools concerning their needs and interests, more flexible and meritocratic pay and employment, advancement structures associated with closer-to-the-source evaluation, school-based employment decisions, and weaker teachers unions. School-based management can make teachers more accountable to the needs and interests of the families of their students, particularly when local school boards or parent associations have the authority to hire and fire teachers or set teachers' wages. In theory, this very direct control over teachers' work generates strong incentives for teachers to satisfy community interests and could improve teachers' work and expand student learning.

In addition, having local school boards consisting of parents, community members, and students can improve the lines of communication between teachers, school managers, and administrators and the communities they serve. In centralized education systems, communication is indirect, often filtering imperfectly from communities to education ministries and then back to principals and teachers. The direct and localized communication in locally managed schools could also result in improved teaching and learning, particularly if the centralized system is inefficient and ineffective.

School-based management is also generally associated with weaker teachers unions, as teachers in these schools are often subject to local decisions rather than national guidelines established through collective bargaining. Previous research has indicated that weaker teachers unions are sometimes associated with improved teacher quality and teaching because in countries with strong teachers unions teachers' positions are typically based on rigid pay and advancement structures, such as seniority and education level, rather than on quality of work.

Incentives that could result in better teacher quality and teaching include both "stick" incentives and "carrot" incentives. If teachers perceive local management as disempowering and increasing their vulnerability to local stakeholders, then

school-based management could act as a stick incentive, with teachers working harder for fear of being fired. If, however, decentralization of authority gives teachers more autonomy and ownership in their schools, school-based management could create carrot incentives. Such incentives could also affect teachers in multiple ways, for example, by increasing their enjoyment of their work and their sense of making a difference in children's lives.

An alternate hypothesis is that school-based management does not, in most instances, improve teachers and their work. Weakened teachers unions and centralized guidelines may destabilize teachers' work, increasingly disempowering teachers and diminishing the quality of their teaching. Weaker teachers unions could also result in lower salaries and nonmonetary compensation, such as pensions and other benefits. The upshot is that teachers are more likely to abandon their jobs, and highly skilled individuals are less likely to enter teaching.

Locally managed schools in communities that lack the ability to manage their schools are susceptible to increased mismanagement and corruption. These schools may not receive the support that they need from centralized authorities, and they could end up with insufficient resources, training, and general support for teachers.

Central America's School-based Management Reforms and Their Evaluations

El Salvador was the first Central American country to experiment with school-based management reform. In the 1980s, many poor rural communities were cut off from central services because of the civil war. Lacking functioning schools, communities decided to create and run their own local schools. After the war ended, the central government acknowledged the success of these schools in providing education cost-effectively in remote areas and in 1991 decided to expand the program. Schools in the EDUCO program are managed by community associations with block grants from the central government.

In 1999, Honduras launched a similar reform, PROHECO, aimed at expanding and improving cost-effective, community-run primary and preprimary schools in isolated rural areas of the country. In both El Salvador and Honduras most communities without schools and with a minimum number of school-age children can receive government funds to start a locally managed school.

The reform in Nicaragua was different. Piloted in 1993, Nicaragua's School Autonomy program was aimed initially at urban secondary schools, in particular at existing schools with higher than average resources. As it has grown, the School Autonomy reform has incorporated many primary schools and rural schools.

By 2002, 63 percent of Nicaraguan students were in autonomous schools, and 37 percent of primary and secondary schools were autonomous schools.

All three reforms have in common the establishment of school councils, made up of community and school representatives, as legal entities with decisionmaking authority. The councils have the power to hire teachers and maintain school buildings. EDUCO also gave the council the authority to evaluate teachers and to build the local school. PROHECO decentralized control over selecting teachers, monitoring student and teacher performance, managing funds for school resources and improvement activities, and building the local school. The Nicaraguan reform gave councils the authority to hire administrative staff, manage the school budget, raise revenues, evaluate teacher performance, and make some pedagogical choices (di Gropello 2006).

The evaluations of the impact of these reforms on teaching quality and student outcomes used quasi-experimental techniques. In all countries, only a portion of schools participated in the reform. Because the reforms were not implemented under experimental conditions, with preselected treatment and control schools, the authors of the studies used matching techniques to establish control groups. Since participating schools may differ in systematic ways from other schools, the authors used econometric techniques to address problems of selection bias in constructing comparison groups.

The objective of these evaluations was to estimate the impact of the school-based management intervention, \mathbf{I} , on results of interest, \mathbf{Y} , such as characteristics of the teachers, specific teacher behaviors, and student learning outcomes. In general, \mathbf{Y} is determined not only by the program (if at all), but also by observed characteristics of the teacher, the school, and the community, \mathbf{X} ; by a host of factors also pertaining to the teacher, the school, and the community that are unobserved, \mathbf{Z} ; and by an error term, e , that captures any factors not included in \mathbf{I} , \mathbf{X} , or \mathbf{Z} . This relationship can be written as a linear function,

$$\mathbf{Y} = a\mathbf{I} + b\mathbf{X} + c\mathbf{Z} + e \quad (1)$$

where each variable and its coefficient estimate are vectors. Each variable is indexed by its level of aggregation (such as the teacher, school, or community) and time period, but for simplicity of exposition the subscripts have been omitted. The error or disturbance term represents stochastic or chance events that are independent of the right-side variables (\mathbf{I} , \mathbf{X} , \mathbf{Z}) in relation (1).

The main coefficient of interest is a . If the reform being evaluated were randomly assigned or placed, it would be possible to make a simple comparison of outcomes \mathbf{Y} with and without the reform to get this estimate. Generally, outside of an experiment, a good estimate of a cannot be obtained simply by comparing the mean values of \mathbf{Y} with and without the reform or by using simple standard estimation methods such as ordinary least squares. Several estimation problems

arise. One is that the reform being evaluated may itself reflect choices such that the without-the-reform state (or control or comparison group) is not the appropriate counterfactual.

If a school's choice or assignment into the program is based on expected benefits from participation, such as a school's need or likelihood of success, as is almost certainly the case in the Central American reforms, then the characteristics of those who participate will not be comparable to the characteristics of those who do not. When an experimental method of evaluation is not possible, several quasi-experimental evaluation methods can be used (Grossman 1994; Heckman and Smith 1995; Ravallion 2001). These include evaluation of participating schools before and after the reform; matched comparison, in which a comparison group is chosen to match the observed characteristics of the treatment group; propensity score matching, which involves constructing a comparison group based on its conditional probability of receiving treatment given a set of observable characteristics; and natural experiments, which are naturally occurring experimental conditions due to quirks, isolated changes, or idiosyncrasies in the identification of the treatment group.

For the three Central American reforms, the authors constructed ex post comparison or control groups. The authors then estimated the impact of school-based management on teaching and learning using a two-step process. First, they analyzed how characteristics of teachers and of the teaching and learning environment differ between the treatment and control groups. These are considered the first-order results. Because of data limitations, the three studies were not able to investigate these first-order effects to the same extent. Because the groups were selected to be comparable, however, the differences between the groups can be assumed to be the result of the school-based management reform. In a second step, the studies then looked at how these differences in teacher characteristics and teaching and learning environment are associated with higher or lower student performance. The analyses also looked at how simply being in the treatment group is related to student performance. These are considered the second-order results.

This two-step process enables determining whether the school-based management reforms are or are not associated with improved or diminished student learning and whether any differences in student learning are likely to be the result of specific changes in teachers and the teaching environment that resulted from the reforms. The causal nature of the relationships reported here are predicated on accurate data, appropriate methodologies, and the absence of sample-selection bias. The authors of all three background papers addressed these issues, in particular employing techniques to eliminate or test for the presence of sample-selection bias. Thus, the case for causality appears to be reasonably good.

The El Salvador background study uses both matched comparison and propensity score matching techniques to establish control groups (Sawada and Ragatz 2005). The condition of the EDUCO schools tends to be worse—in terms of basic utilities and resources—than that of the control group of centrally managed schools, suggesting that there may be a downward bias, if any, in the treatment effect estimates. Under such conditions Type I errors (false positives) are unlikely. The EDUCO study relies on school survey data from 1996 (more recent survey data were unavailable), national exam results, and municipality-level socio-economic indicators. First, the authors examine how EDUCO schools differ from traditional rural schools in teacher characteristics and behaviors as well as teacher management and school administration. Second, they look at how these factors are associated with student test scores in both the EDUCO and the traditional rural schools.

The Honduras study uses data from 2002 and 2003 school surveys and 2003 student test results (di Gropello and Marshall 2005). The treatment group data comes from the 2003 survey, while two different control groups are used, one drawn from data from the same 2003 survey and one from a 2002 survey. Overall, the authors find consistency in the results of the multivariate analyses between the two control groups. The authors use an instrumental variable analysis—which substitutes a modeled likelihood of being a PROHECO school for whether the school was actually a PROHECO school—to control for sample selection bias.

The study of School Autonomy in Nicaragua uses 2002 survey data and Spanish and math test data for third and sixth graders for both the treatment group and the control group (Parker 2005). Two propensity score matching techniques, nearest neighbor matching, and stratification matching are used to control for selection bias. The reform originally targeted schools with higher school and student resource levels. Because there is generally a direct relation between level of school and student background resources and student performance, this case more than the other two risks an upward bias in estimated impact coefficients. Notably, however, this also means that Type II errors (false negatives) are unlikely.

First-order Effects: Implications of School-based Management Reforms for Teachers

Analysis of first-order results reveals that the school-based management reforms are associated with several important changes in school management and teacher characteristics and behaviors but that these changes are inconsistent across countries. The reforms affect both who works as a teacher and the choices

and behavior of teachers as they teach. Although different in each country, school-based management appears to be causally linked to differences in teachers' education level and years of experience, number of days teachers are absent, number of hours a week they work, amount of homework they assign, teaching methods they use, and general attitude toward teaching.

Although seemingly counterintuitive, the three Central American cases suggest that schools that participate in the reforms do not always have more autonomy than traditional schools. Once other factors are controlled for, in only 3 or 4 of 10 areas do local stakeholders report significantly different degrees of school-level control over administrative processes in El Salvador's EDUCO schools than in traditional schools (table 1).

The areas in which local stakeholders report significantly greater influence in EDUCO schools compared with traditional schools are: hiring and firing administrators, hiring and firing school directors, and hiring and firing teachers. Although the limited areas of greater local management indicate a muted potential impact on teachers, the authority to hire and fire, and to hire and fire teachers, in particular, could potentially have a strong impact on the quality of teaching. Local hiring and firing could hold teachers more accountable to local stakeholders, such as the school principal, school council members, and parents, and it could motivate teachers to work harder or in different ways because of weaker job security or new or different criteria for evaluation.

Decentralization reforms also appear to alter the distribution of authority across local stakeholders. In all three cases, school-based management is designed to increase the involvement and decisionmaking power of parents. In El Salvador,

Table 1. EDUCO Schools Report Significantly More School-level Control Than Comparison Schools in Few Areas

| <i>Area</i> | <i>Ordinary least squares</i> | <i>Propensity score matching</i> |
|-------------------------------|-------------------------------|----------------------------------|
| Determine salary | 0.05 | 0.10 |
| Determine teacher incentives | 0.10 | -0.05 |
| Evaluate teachers | -0.01 | -0.05 |
| Give teacher incentives | 0.03 | 0.05 |
| Hire and fire administration | 0.33*** | 0.08 |
| Hire and fire director | .037*** | 0.39** |
| Hire and fire teachers | .037*** | 0.36** |
| Spend school money | -0.03 | 0.01 |
| Teachers association activity | -0.23** | -0.18* |
| Teacher supervision | -0.03 | -0.02 |

*Statistically significant at the 10 percent level; **statistically significant at the 5 percent level; ***statistically significant at the 1 percent level.

Source: Sawada and Ragatz 2005.

EDUCO parent associations report high levels of influence relative to traditionally managed schools. Of 29 administrative processes EDUCO parent association members were more likely to report greater control than their non-EDUCO counterparts in all areas, and these results were statistically significant in 26 of the 29 processes. In contrast, school directors in EDUCO schools report less influence than do directors in traditional schools, although only one of the 29 processes was statistically significant (hiring and firing of director). The results for teachers were not clear, as they were statistically significant in the ordinary least squares analysis but insignificant in the propensity score analysis.

In Honduras, the results are similar. PROHECO school principals report significantly less autonomy in their work than principals in traditional schools, and PROHECO teachers are significantly less likely to report a sense of control over school priorities than are teachers in traditional schools. As in the EDUCO reform, local authority appears to have shifted from school directors toward parents, as intended.

In Nicaragua, previous research has concluded that as a result of the reform much of the localized power has gone directly to the school principal rather than to school boards. Parent associations and teachers report little decisionmaking power in autonomous schools. Previous research also established that much of the decentralized authority was administrative or financial rather than pedagogical (Castillo 1998; Fuller and Rivarola 1998; King and others 1996).

Alongside these changes in school management, the reforms have resulted in changes in teacher characteristics and behavior. Table 2 summarizes some of the statistically significant findings regarding these changes. In both El Salvador and Honduras, decentralized schools are closed less frequently than are traditional schools. Evidence from El Salvador suggests that this is due largely to fewer organized labor stoppages. In El Salvador, teachers in decentralized schools are also less frequently absent. There is some evidence in Honduras that teachers in decentralized schools may also be absent less frequently because of less union participation, although they are more likely to be absent because of teacher professional development activity. Because more instructional time is consistently found to improve student learning, it is probable that these characteristics are an improvement over traditional schools. Although the relationship was not investigated econometrically, these changes in teacher behavior are likely in part to be the result of more localized management.

At the same time union-instigated stoppages are usually due to important concerns among teachers regarding pay and working conditions. Indeed, PROHECO teachers in Honduras are more likely to report being unsatisfied with their salary and are, on average, paid less than teachers at traditional schools. These differences may have a negative impact on willingness to remain in teaching, teacher motivation, or other important qualities of effective teaching.

Table 2. Statistically Significant Findings on Teacher Characteristics and Behavior in School-based Management Reform Schools Compared with Traditional Schools

| <i>Teacher characteristics and behavior</i> | <i>El Salvador EDUCO</i> | <i>Honduras PROHECO</i> | <i>Nicaragua School Autonomy</i> |
|---|--------------------------|-------------------------|----------------------------------|
| Educational attainment | More | Less | No difference |
| Years of experience | Less | Less | No difference |
| Work hours | More | More | — |
| Teacher absences/school closings | Less | Less | — |
| Use of alternative pedagogy | — | Less | — |
| Salary | Less | Less | — |
| Receives incentives | — | — | More |

— is no data are available.

Source: Vegas and Umansky 2005.

It is possible that the lower wages and more difficult working conditions of teachers in EDUCO and PROHECO schools discourage talented teachers from choosing to work in these schools. In El Salvador and Honduras, teachers in community-managed schools have fewer years of experience than those in traditional schools and receive lower salaries. In Honduras, PROHECO teachers have fewer years of schooling and report facing significantly more problems in receiving their salary on time. In Nicaragua, by contrast, where autonomous schools were pre-existing and are predominantly urban, teachers in autonomous and traditional schools have roughly the same education and experience level.

There are also differences between locally managed and traditional schools in teacher reports of how many hours they work at the school. In El Salvador, teachers in EDUCO schools report working more hours than their colleagues in traditional schools. Some of the additional hours may be due to statistically significant increased time spent meeting with parents. In Honduras, there is limited evidence that PROHECO teachers spend fewer hours on administrative tasks and more hours teaching. PROHECO teachers also assign more homework and have smaller classes than teachers in similar traditional schools, two factors that are often correlated with higher achievement. These examples lend credence to the idea of greater efficiency and teacher effort in decentralized schools. In Nicaragua, there are fewer statistically significant differences between treatment and control schools than in Honduras and El Salvador, although this may be partially due to data constraints.

While most of the first-order effects would be expected to boost teacher quality and student learning, in Honduras no evidence was found that teachers in community-managed schools are more motivated than are teachers in traditional schools. PROHECO teachers are not significantly more likely to feel valued, respected, or safe. The only significant difference between teachers in

PROHECO schools and teachers in traditional schools on questions dealing with teacher motivation is that traditional school teachers are more likely to feel close to parents. The decreased closeness of teachers and parents in PROHECO schools may result from the new power of parents on school councils to fire teachers.

In classroom processes, teacher planning, and school environment there are very few differences between teachers in PROHECO schools and those in traditional schools. One important exception, according to student surveys, is that teachers in PROHECO schools are significantly more likely to use traditional or frontal teaching methods. PROHECO students report that their teachers are more likely to use dictation and teach from the blackboard and are less likely to have students work in groups. This finding suggests that PROHECO schools may have been less successful than traditional schools at implementing Honduras' national pedagogical reform for more dynamic pedagogy.

With this understanding of some of the first-order effects of the Central American school-based management reforms on school management and teacher characteristics and behavior, the following section turns to how the reforms and their impact on teachers are associated with student learning outcomes.

Implications of First-order Effects of School-based Management on Student Learning

Several studies have shown that school-based management can improve student learning, while others have shown that it can increase inequality and harm learning, particularly for the poor. But few studies have analyzed the mechanisms that explain such mixed results. Do the greater roles of parents or principals improve accountability and communication and result in better, more relevant teaching? Do longer teacher working hours, better training, or different teaching methods affect learning? Where a school-based management reform fails to improve student learning or actually harms student learning, do any of the changes brought about by the reform explain this failure?

The three Central American reforms indicate that school-based management reforms can have varied impacts on student learning. Effects on management and teachers account for many of the mixed effects on learning (table 3).

In Honduras, PROHECO students score significantly higher on math, science, and Spanish exams than do students in traditional schools. The benefits of PROHECO are partly explained by the qualities and characteristics that differentiate PROHECO schools from otherwise comparable poor rural non-PROHECO schools. Specifically, the more hours per week a teacher works—higher in PROHECO

Table 3. Statistically Significant Findings on Student Outcomes in School-based Management Reform Schools Compared with Traditional Schools

| <i>Reform program</i> | <i>Spanish</i> | <i>Math</i> | <i>Science</i> | <i>Days absent</i> | <i>Repetition rate</i> | <i>Dropout rate</i> |
|--|---|---|----------------|--------------------|------------------------|---------------------|
| Honduras PROHECO | Positive | Positive | Positive | NS | Negative | Negative |
| El Salvador EDUCO | Positive | NS | — | NS | — | — |
| Nicaragua School Autonomy ^a | Grade 3, NS; Grade 6, negative | Grade 3, positive; Grade 6, negative | — | — | — | — |

NS is not statistically significant; — is no data are available.

^aThese results are from the propensity score matching models. The model without propensity score matching found no significant difference in either grade or subject between autonomous schools and traditional schools.

Source: Sawada and Ragatz 2005; di Gropello and Marshall 2005; Parker 2005.

schools—the greater student achievement in all three subjects. The frequency of homework—also greater in PROHECO schools—is associated with higher achievement in Spanish and math. Finally, smaller classes and fewer school closings—as in PROHECO schools—are related to higher student achievement in science.

In El Salvador, EDUCO students also perform better in Spanish than do students in traditional schools, background factors being held constant. Again, the benefit of EDUCO appears to come partly from the observed differences between teachers in EDUCO schools and teachers in traditional schools. Specifically, the greater amount of time EDUCO teachers spend meeting with parents partially explains why EDUCO students outperform their counterparts. There is some evidence that EDUCO students may also outperform traditional school students in math and may be less likely to be absent, but these results are much more tentative.

In Nicaragua, the School Autonomy reform does not appear to have led to increased student learning. Although students in autonomous schools have significantly higher average test scores in mathematics in third grade, by sixth grade autonomous school students score lower than do students in traditional schools in both Spanish and mathematics once background characteristics are taken into account. Furthermore, none of the differences in test scores between schools appear to result from changes in school management or teaching due to the reform, with one exception: greater technical assistance to teachers from principals appears to improve third-grade students' scores in Spanish. Why sixth-grade students perform worse than their counterparts in traditional schools is not explained by any of the variables included in the Nicaraguan analysis.

Policy Implications

The three school-based management reforms in Central America have had varying degrees of success in improving student learning. The PROHECO reform in Honduras seems to have had the most success in improving students' test scores in multiple subject areas. It did so through the instrumental means of keeping schools open more, giving more homework, having smaller classes, and having teachers work more hours per week. By the sixth grade, however, students in Nicaragua's autonomous schools are performing worse than those in traditional schools. What explains these differences, and what lessons can be drawn from school-based management reforms in Central America?

- (1) *It cannot be taken for granted that school-based management will result in well-run schools and empowered communities.* If school-based management is offered as a solution to pressing educational problems, school councils must be empowered to make meaningful improvements in schools and must be capable of doing so. For example, the evidence from El Salvador suggests that in many important areas EDUCO schools may have less decisionmaking power in practice than is intended.

Clearly, the effectiveness of school-based management will depend to a large extent on the capacity of local stakeholders to manage schools. The ability of communities and parents to identify, hire, and retain good teachers and promote good teaching practices can vary widely. They are not necessarily any more effective—perhaps significantly less so—than competent centralized management mechanisms. For example, PROHECO teachers in Honduras are significantly more likely to report month-long delays in receiving payments than are teachers in traditional schools. This suggests that the bureaucracy and inefficiencies of some centralized education systems may be replaced by general mismanagement of resources in decentralized systems.

To avoid these pitfalls, school-based management reforms may want to avoid placing large amounts of power in the hands of any one stakeholder. The excess of power granted to school principals in Nicaragua, analyzed elsewhere, may be problematic (King and others 1996). It is also critical for effectiveness and equity that all school councils be ready and able to perform their duties and functions. This requires both building capacity and providing resources, especially in poorer communities and communities with less management experience and capacity.

- (2) *Teacher behaviors appear to respond to the incentives created in locally managed schools.* There is evidence that, as a result of school-based management, teachers are working more hours, assigning more homework, and meeting more often with parents. These are promising changes, many of which appear to

contribute to increased student learning. In contexts of low teaching quality, these changes are critical steps in a positive direction.

- (3) *School-based management appears not to be improving teaching methods or teacher professionalization.* The reforms have clearly created new incentives for teachers, but most of these changes are capacity-utilization changes—smaller classes, more hours, fewer closings—not changes in the kind of teaching that is taking place inside classrooms. The reforms do not appear to result in positive changes in teaching methods, curricula, school environment, or teacher motivation level. In Honduras, PROHECO teachers appear to be more dependent on antiquated teaching methods and less likely to feel respected and safe at work than teachers in traditional schools. Teachers in locally managed schools in Nicaragua and Honduras report having less authority than do teachers in traditional schools. Complementary reforms or modifications of school-based management reforms are needed that result in greater teacher empowerment, better teacher skill development, and improved teaching methods.
- (4) *There may also be undesirable incentives in community-managed schools that could have negative implications for teachers.* Lower salaries as in Honduras, and less secure jobs in all three countries may discourage talented teachers from working in locally managed schools. Smaller class sizes in Honduras and technical assistance from principals in Nicaragua may in part be compensating for teacher weaknesses.
- (5) *The policy context surrounding the reform is bound to affect its impact.* In Nicaragua, the School Autonomy reform was implemented along with monthly student fees for basic and secondary education. These changes were perceived by some of the general public, however inaccurately, as an effort to privatize basic education in the post-Sandinista era and may have limited public acceptance of the reform. In all three countries, teachers' unions have tended to resist the school-based management reforms, which are seen as a threat to union power and teachers' job stability. The negative publicity and resistance from these unions may also limit the effectiveness of the reforms.

Conclusions

Previous research on educational decentralization has explored the impact of various decentralization reforms on indicators such as student learning and completion. But these analyses have largely looked at reforms as a “black box” rather than investigated the chain of effects that decentralization reforms put into action. The analysis of school-based management reforms in Central America reported here differs from previous work in that it first looks at how the reforms affected school management and teacher characteristics and behavior and then evaluates

how these changes in management and teachers are associated with improvements or deterioration in student learning.

Education reforms, even those not specifically designed to affect teachers, influence the characteristics of teachers and their daily work in classrooms. The analysis of school-based management reforms in Central America summarized in this article indicate that these reforms can have effects on teacher salaries, feelings of authority and autonomy, and hiring and firing practices, all of which generate strong teacher incentives. For example, the authority of EDUCO school councils to hire and fire teachers was found to be an important factor in better outcomes for EDUCO students compared with students in traditional schools serving similar populations in El Salvador. The positive impact of education reforms can be strengthened by understanding of teacher incentives and thinking through the implications of diverse kinds of reforms for teachers.

Note

Ilana Umansky is assistant director for International Education and Research at Sesame Workshop; her e-mail address is ilana.umansky@sesameworkshop.org. Emiliana Vegas (corresponding author) is senior education economist in the Latin American and Caribbean Human Development Department at the World Bank; her e-mail address is evegas@worldbank.org. The authors are grateful to Ariel Fiszbein, Beth King, Peter Mook, Guillermo Perry, Jeff Puryear, Halsey Rogers, Jaime Saavedra, Eduardo Vélez Bustillo, and three anonymous reviewers for helpful comments.

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