Nigeria: Bauchi

TEACHERS

SABER Country Report 2012

79958

Policy Goals

1. Setting clear expectations for teachers

In Bauchi, there are clear expectations for what teachers and students are supposed to do, but teachers may not have enough time to fulfill their duties.

2. Attracting the best into teaching

While compensation and requirements may attract quality candidates, many may not choose the occupation to avoid working in poor working conditions in schools.

3. Preparing teachers with useful training and experience

Minimum education requirements may provide some preparation, and required practical professional experience helps teachers hone their skills.

Matching teachers' skills with students' needs

There are no incentives to work in hard-to-staff schools or encourage teachers to study subjects with teacher shortages. As a result, there may be a lack of quality teachers in some areas and subjects.

5. Leading teachers with strong principals

Principals are required to have both administrative and teaching experience, and policies require them to help teachers improve their work.

6. Monitoring teaching and learning

Teacher performance is monitored, but student performance is not used to help teachers improve their practice or improve administrators support to them.

7. Supporting teachers to improve instruction

Teachers may receive support as a result of performance evaluations, but professional development is not integrated into the teaching career.

Motivating teachers to perform

There are some performance-related incentives in place and sanctions for lowperformance, but mechanisms to hold teachers accountable could be strengthened.

Status

Established



Established



Latent

•000















The Importance of Teacher Policies

Research suggests that teacher quality is the main school-based predictor of student achievement and that several consecutive years of outstanding teaching can offset the learning deficits of disadvantaged students (Hanushek and Rivkin, 2006; Nye et al, 2004; Park and Hannum, 2001; Rivkin et al, 2005; Rockoff, 2004; Sanders, 1998; Sanders and Rivers 1996; and Vignoles et al, 2000). However, it is not yet clear exactly which teacher policies can raise teacher effectiveness (Goldhaber, 2002 and Rivkin et al, 2005). Thus, devising effective policies to improve teaching quality remains a challenge.

There is increasing interest across the globe to attract, retain, develop and motivate great teachers. While the World Bank has ample experience in supporting teacher policy reforms in developing countries, until recently there was no systematic effort to offer data and analysis that can provide policy guidance on teacher policies.

A new tool, **Systems Approach for Better Education Results** (SABER)—Teachers, fills this gap by collecting, analyzing, synthesizing, and disseminating comprehensive information on teacher policies in primary and secondary education across a range of different education systems. In this report, we discuss how SABER-Teachers has been applied in Anambra, Nigeria. Our goal is to enable policymakers to learn about how other countries address the same policy challenges related to teacher management and thus how to make well-informed policy choices that will lead to improved learning outcomes. ²

Overview of SABER-Teachers

SABER-Teachers collects data on 10 core teacher policy areas in order to offer a comprehensive overview of teacher policies in each education system. These policy areas are listed in Box 1. It is important to highlight that SABER-Teachers' main focus is on the policies formally adopted by education systems. While in some cases the data collected also address how the teacher policy goals are achieved in practice, the nature of our data collection approach (based on interviews with key informants and official document review) do not allow for a thorough assessment of policy implementation. Therefore, complementary research will be useful in most settings.

Box 1: Key Teacher Policy Areas

Teacher Policy Dimensions

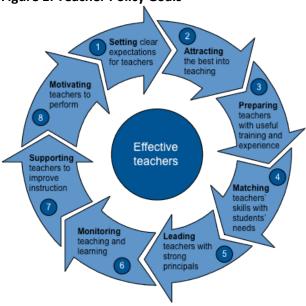
- Requirements to enter and remain in teaching
- Initial teacher preparation
- Recruitment and employment
- Teachers' workload and autonomy
- Professional development
- Compensation (salary and non-salary benefits)
- Retirement rules and benefits
- Monitoring and evaluation of teacher quality
- Teacher representation and voice
- School leadership

To analyze these data and offer informed policy guidance, *SABER-Teachers* analyzes progress on eight teacher policy goals. *SABER-Teachers* used three criteria to select these teacher policy goals. They are: (i) linked to performance through evidence provided by research and studies; (ii) a high priority for resource allocation; and (iii) actionable. The 8 teacher policy goals are presented in Figure 1.

¹ In order to offer guidance to policy makers in client countries on how to raise education quality, the Education Unit at the World Bank's Human Development Department has launched System Assessment and Benchmarking for Education Results (SABER), an initiative that seeks to collect information about different education systems' policy domains, analyze it to identify common challenges and promising solutions, and make it widely available to inform countries' decisions on where and how to invest in order to improve education quality. SABER - Teachers is one such policy domain.

² The focus of the initiative is the design of teacher policies as opposed to their implementation on the ground. A number of complementary activities will be looking at implementation in a sample of countries as this will involve a different methodological approach and will require more financial and human resources.

Figure 1: Teacher Policy Goals



The eight teacher policy goals exclude other objectives that countries might want to pursue to increase the effectiveness of teachers. These were excluded because there is to date insufficient empirical basis on which to make specific policy recommendations, either because evidence on policy interventions in that area remains unclear or because the top-performing education systems take very different approaches to reach these objectives.³ For a more detailed report on the eight teacher policy goals and the evidence supporting this selection, please see Vegas et al (2010).

Findings in Nigeria

SABER-Teachers collected policy data for Nigeria's Anambra, Bauchi, and Ekiti states. Table 1 presents the extent to which each education system has progressed in the eight SABER-Teachers policy goals. Our analysis indicates that each teacher policy system has relative strengths and weaknesses. However, across the three systems, we observed some general patterns, which are the focus of this report.

Table 1: Levels of Development of Teacher Policies in Nigeria

Nigeria			
	Anambra	Bauchi	Ekiti
1. Setting clear expectations for teachers	Established O	Established O	Established O
2. Attracting the best into teaching	Established O	Emerging	Established O
3. Preparing teachers with useful training and experience	Established O	Established O	Established O
4. Matching teachers' skills with students' needs	Emerging	Latent	Latent
5. Leading teachers with strong principals	Established O	Established O	Established O
6. Monitoring teaching and learning	Emerging	Emerging	Emerging
7. Supporting teachers to improve instruction	Established O	Established O	Emerging
8. Motivating teachers to perform	Emerging	Established O	Established O

Setting clear expectations for teachers: All education systems in these states are Established in this policy goal, which means they have developed: (i) explicitly defined standards for what students should know and be able to do, as well as curricula to guide teaching and learning; (ii) officially stipulated tasks for teachers; and (iii) delineated official time allocations that enable teachers to fulfill their duties.

Attracting the best into teaching: With the exception of Bauchi, the other states are Established in this policy goal, which means they have: (i) entry requirements that allow screening of talented individuals; (ii) attractive pay and benefits; (iii) appealing working conditions; and (iv) attractive career opportunities

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³ For example, SABER-Teachers collects information on teacher organizations (as part of the policy area of "teacher representation and voice") and will make it publicly available. Yet no clear trend has emerged regarding whether (and if so, how) governments should engage with these organizations in policy formulation or consultation. To be sure, many studies have looked at the impact of unionization on schools' productivity (Argys and Reese, 1995; Eberts and Stone, 1986; and Hoxby 1996), student learning (Kingdon and Teal, 2008; Kleiner and Petree, 1988; Kurth, 1987; Register and Grimes, 1991; and Steelman et al, 2000), teachers' wages (Ballou and Podgursky, 2002; Baugh and Stone, 1982; Bee and Dolton, 1995; and Dolton and Robson, 1996), working conditions (Eberts, 1984; Murillo et al, 2002; and Zegarra and Ravina, 2003) and education policy (Goldschmidt and Stuart, 1986 and Woodbury, 1985). But even top-performing countries differ widely in how much they engage, to what extent they regulate, and how they organize teachers' unions. Data collected by SABER-Teachers will offer guidance on how to approach these issues in the future.

within the teaching profession. In Bauchi, there is an opportunity to strengthen its policies in this domain.

Preparing teachers with useful training and experience: In this policy goal, all systems are Established, which means they have developed: (i) minimum standards for pre-service training programs; (ii) requirements for classroom experience for all teachers; and (iii) induction or mentoring programs to help smooth the transition from training into teaching.

Matching teachers' skills with students' needs: This policy goal remains a challenge in all states. Anambra is Emerging in this policy goal, while Bauchi and Ekiti are lagging behind. Top-performing education systems have established incentives to attract teachers to work in hard-to-staff schools and/or to teach certain subjects such as math and science.

Leading teachers with strong principals: All education systems in these states are Established in this policy goal, which means they have developed: (i) requirements to become a principal and attract talented candidates; (ii) established incentives for principals to perform well; (iii) provide autonomy to principals to make decisions related to instruction or personnel management for their schools.

Monitoring teaching and learning: In this policy goal, all states are Emerging, which indicates an opportunity to strengthen its policies in this domain. High-performing education systems have established student learning assessment systems and teacher performance appraisal mechanisms—factors that have been shown to enhance student learning outcomes.

Supporting teachers to improve instruction: With the exception of Ekiti, the other states are Established in this policy goal, which means teachers are provided with performance data to help them improve teaching practices, and these data are also used by principals to develop professional development plans for teachers. In Ekiti, there is an opportunity to strengthen its policies in this domain.

Motivating teachers to perform: With the exception of Anambra, the other states are Established in this policy goal, which means there are minimum mechanisms to hold teachers accountable as well as rewards and sanctions for high- and low-performing teachers, respectively. In Anambra, there is an opportunity to strengthen its policies in this domain.

Findings in Bauchi, Nigeria

1. Setting clear expectations for teachers Established







Setting clear expectations for teachers is important for several reasons. First, expectations for student and teacher performance influence how potential entrants perceive the profession. The clearer these expectations, the more likely an education system is to get the type of teacher it seeks. Second, expectations guide teachers' work. The more specific they are, the better teachers can organize their time and resources to meet them. Finally, expectations can help align the goals of different key aspects of the profession (e.g., pre-service training, professional development and teacher appraisals). The more institutionalized these expectations are, the more likely all of these aspects will be working towards a common purpose and thus the more likely it will be achieved. SABER - Teachers considers three policy levers education systems can use to reach this goal:

- Are there clear expectations for what students should know and be able to do?
- Are there clear expectations for what teachers are supposed to do?
- Do teachers have enough time to fulfill their duties?

In Bauchi, there are clear expectations for what teachers and students are supposed to do, but teachers may not have enough time to fulfill their duties. Expectations for what students should know and be able to do are clear. Nigeria has a national curriculum, which sets the contents in detail, informing teachers of required subject content that should be taught to students at different grades. In addition, expectations for what teachers are supposed to do are explicitly laid out in legal regulations and teachers are guided by performance goals. However, in Bauchi, teachers may not have enough time to fulfill their duties. Similar to top-performing education systems, Bauchi's school year consists of 800 hours or more at both the primary and the secondary level. However, teachers' working time is defined as the number of hours spent at school. While this definition is wider than the number of teaching hours, it is limited by not recognizing that lesson planning and grading may take place outside of the number of hours spent at school. Primary and secondary school teachers working time is between 1000 to 1520 hours per year. In comparison, working time in most successful systems ranges between 1,520 and 1,650 hours in both levels, and in

the highest-performing, it is 1,650 hours or more. In Bauchi, the number of hours that teachers are expected to devote to teaching is 60% to 76% of their working time. Again, most successful education systems with data make teaching hours 30 to 50% (primary) of working hours, suggesting that they build in time for other tasks that teachers need to carry out, such as administrative duties and grading assignments, among others.

2. Attracting the Best into Teaching **Emerging**







Getting talented people to go into teaching is essential for several reasons (Guarino, Santibáñez & Daley 2006). First, more able individuals make better teachers (Boyd, et al. 2008). The better the quality of the teaching force, the more likely an education system is to have effective teachers. Second, top candidates maximize the impact of teacher training (whether traditional or abridged). If the quality of student teachers is too low, training is likely to focus more on making up for their deficits in knowledge and skills and less on turning them into effective teachers. Finally, luring top talent into teaching has a "multiplier" effect: if teaching attracts qualified people, competitive candidates who had not considered teaching might be drawn to it. SABER - Teachers considers four policy levers education systems can use to reach this goal:⁴

- Are entry requirements set up to attract talented candidates?
- Are pay and benefits appealing for talented candidates?
- Are working conditions appealing for talented candidates?
- Are there attractive career opportunities?

In Bauchi, entry requirements are set up to attract talented applicants and pay and benefits are appealing. There is an established process to screen applicants to pre-service teacher training, and there are requirements to become either a primary or secondary

⁴ One issue that is not included in this list because of lack of clear guidance from available evidence on how to tackle it is that of the "flexibility" of the profession. Several studies find that some women prefer to teach because they can take leaves of absence to take care of their families without incurring wage penalties when they come back (Flyer & Rosen 1997; Stinebrickner 1999a, 1999b, 2001a, 2001b). Yet, it is unclear that education system want to attract these candidates any more than other groups.

school teacher. However, less than 50% of primary teachers meet these requirements. school Approximately 51% to 89% of applicants enter preservice teacher training programs in Bauchi, indicating that entry requirements are somewhat competitive. A concurrent training program (which allows for students to acquire subject matter knowledge and pedagogical skills simultaneously) and an alternative model of teacher training (which includes alternative pathways into teacher training and makes it easier to recruit students from other fields) exists for primary school teachers. In addition, pay and benefits are appealing for talented candidates, with highly competitive starting salaries (80% or more of GDP per capita). Teachers in Bauchi are generally paid on time, and pay changes considerably over a teacher's career. Teachers receive monetary bonuses for teaching a specific subject and for teaching at specific grades/levels; however, pay does not take into account performance evaluations. Teachers are entitled to both retirement and health benefits.

While there are attractive career opportunities, working conditions could be made more appealing for talented candidates. Approximately 50% to 69% of schools comply with the standards for infrastructure, hygiene, and sanitation. In addition, there are 31 to 50 primary school students per teacher, and 51 or more secondary school students per teacher. It is worth noting that top-performing education systems usually have less than 25 students per teacher. Attractive career opportunities exist; at the school level, upon the decision of either, principals, school owners or municipal authorities, teachers can take on leadership positions. In addition, teachers can apply for both principal posts and academic posts, such as, academic master teachers and heads of lead-teachers, departments.

3. Preparing Teachers with Useful **Training and Experience**

Established





Equipping teachers with the skills they need to succeed in a classroom is crucial. First, few (if any) individuals are born effective teachers. Teachers needs subject matter knowledge, classroom management skills and lots of practice in order to be successful in a classroom. In addition, preparation puts all teachers on an equal footing, giving them a common framework to

work and improve their practice. SABER - Teachers considers three policy levers education systems can use to reach this goal: 5

- Are there minimum standards for pre-service teaching training programs?
- Are individuals required to have classroom experience to be allowed to teach?
- Do teachers have a smooth transition from preservice training into their first job?

In Bauchi, there are minimum standards for preservice training, individuals are required to have classroom experience, and beginning teachers are required to participate in an induction or mentoring program. There is an accreditation process for preservice teacher training programs, and specifications on subject content have been established. specifications for initial teacher training, primary school teachers devote more hours to pedagogy than subject matter, while secondary school teachers devote more hours to subject matter than pedagogy. Primary and secondary school teachers are required to have 3 to 6 months of practical professional experience. In comparison, most successful school systems have mandatory classroom experience of at least a year and often longer, for both primary and secondary school teachers. In Bauchi, beginning teachers are required to participate in an induction or mentoring program of at least a year to help smooth their transition from training into the classroom.

4. Matching Teachers' Skills with Students' Needs



Ensuring that teachers work in schools where their skills are most needed is important for promoting equity and efficiency. First, it is a way of ensuring all students in an education system have an equal opportunity to learn: without purposeful incentives, teachers tend to gravitate towards schools with better working conditions, which often serve better off students (Boyd, et al. 2005a; Hanushek, et al. 2004b).

Second, it is a way of ensuring teachers are distributed efficiently—i.e., to minimize the number of surplus teachers at a given grade, subject or geographic area. Finally, ensuring teachers are a good match for their school can also increase their effectiveness and reduce turnover rates (Boyd, et al. 2002, 2005b; Jackson 2010). SABER - Teachers considers two policy levers education systems can use to reach this goal:

- Are there incentives for teachers to work at hardto-staff schools?
- Are there incentives for teachers to teach critical shortage subjects?

In Bauchi, teachers are not provided with monetary incentives to work in hard-to-staff schools; critical shortage subjects have been identified, but no incentives exist. Teachers working in hard-to-staff schools, such as those serving students from disadvantaged populations, are not entitled to receive either bonuses or a better compensation packages. In addition, teaching experience is used in making transfer decisions; using seniority as a basis for approving transfer requests may motivate the most seasoned and potentially best teachers to leave hard-to-staff schools. In several countries, the practice of allocating teacher positions based on seniority has resulted in higher turnover rates in hard-to-staff schools, as well as a larger proportion of teacher entrants, who may not be as effective as more experienced teachers. Bauchi has identified critical shortage subjects, but not created monetary incentives for teachers to focus on them.

5. Leading Teachers with Strong Principals



The quality of school heads is second only to classroom teaching as a predictor of student learning (Eberts & Stone 1988; Leithwood, et al. 2006). Quality principals attract and retain quality teachers (Boyd, et al. 2009a; Ingersoll 2001a, 2001b; Papa Jr., Lankford & Wyckoff 2002). Also, capable principals can spearhead much-

⁵Much research has been devoted to the issue of turnover. Several studies have noted that it is not always the most effective teachers who leave (Boyd, et al. 2007; Hanushek, et al. 2005; West & Chingos 2008). Yet, these studies also concede that there is still considerable room for schools to enact targeted policies aimed at retaining only the most effective performers.

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needed change at the school level, so having strong leaders is important not only to ensure acceptable levels of performance but also to drive improvements. Finally, good principals can facilitate teachers' work and continuous improvement. The more capable a principal is, the more he or she can support teachers, create a sense of community, make teachers feel valued and ease their anxiety about external pressures (Mulford 2003). SABER - Teachers considers three policy levers education systems can use to reach this goal:

- Are requirements to become a principal set up to attract talented candidates?
- Do principals have incentives to perform well?
- Can principals make key decisions to improve teaching?

In Bauchi, entry requirements for school leadership exist; however, principals are not provided with performance-based incentives and their decisionmaking authority could be strengthened. Clear requirements and selection processes exist to become a school principal. Principals must have completed an educational level of at least the ISCED 5B, a minimum of 20 years of professional teaching experience, a minimum of 5 years of professional administrative experience, satisfactory performance in a supervised internship, and participated in an induction or mentoring program. In Bauchi, principal pay is highly competitive: principals are paid 140% or more of GDP per capita, but there are no performance-based incentives. While principals must participate in regular performance evaluations, they are not allowed to receive monetary bonuses based on their performance on the job. In addition, principals are required to provide guidance to teachers and decide on the distribution of time during school hours, but they do not have a say or decide on teacher hiring, firing, dismissals, or promotions.

6. Monitoring Teaching and Learning



Assessing how well teachers are teaching and whether students are learning is essential to devise strategies for improving teaching and learning. First, teacher and student evaluations help identify good practices, which can then be shared among the teaching staff to improve school performance. Second, identifying low-performing teachers and students is necessary to support them in a timely manner. Education systems

need to be able to know when to provide struggling classrooms with adequate support to improve. Finally, such information is useful for accountability purposes. SABER - Teachers considers three policy levers education systems can use to reach this goal:

- Is there enough student achievement data to inform teaching?
- Is there enough teacher performance data to inform teaching?

In Bauchi, teaching and teacher performance evaluations are regularly conducted, but student achievement data is not used to inform instruction. Bauchi has not participated in any assessments of student learning at any level (international, national, or sub-national). In comparison, top-performing systems conduct regular national or sub-national assessments of student learning. In Bauchi, participation in both internal and external evaluations is mandatory for all public school teachers. Internal evaluations occur regularly (daily, weekly, per term), while external evaluations occur at least once every 5 years when the school is evaluated. Evaluations in Bauchi rely on 5 or more sources and use at least 3 out of the following criteria to assess teaching: teacher knowledge, classroom practices, student background and student learning. In Bauchi, no teachers failed their last round of external evaluations. Further, it is possible to track teachers over time.

7. Supporting Teachers to Improve Instruction



Helping teachers be more effective in the classroom is vital. First, all teachers can improve—regardless of how effective they are at one point in time. Therefore, support mechanisms are necessary to help teachers reach their potential and perform at their best. Second, changes in classroom assignments and/or student populations can pose new challenges to teachers. Thus, during periods of transitions, teachers will need additional help to sustain their performance. Finally, support mechanisms can go a long way in preventing burnout and reducing turnover. Even motivated teachers may choose to leave if they are consistently ineffective, do not know how to improve and receive little support. SABER - Teachers considers two policy levers education systems can use to reach this goal:

- Is teacher performance data used to improve teaching?
- Is there professional development to improve practice?

In Bauchi, teacher performance data from evaluations are used to inform classroom practice, but professional development requirements could be strengthened. The schools conduct teacher performance evaluations and use these results to inform teachers as to how they can develop their instructional practices. performing teachers, as judged on the evaluation results, may be assigned a supervisor or professional development. Further, professional development exists, but is not required and not used in a focused approach to improve instruction. Professional development includes 5 or more types of activities other than courses and workshops or education conferences and seminars. The content of professional development for both primary and secondary school teachers is broad, including 5 or more aspects related to teaching, such as: (i) knowledge and understanding of subjects; (ii) understanding and teaching the curriculum; (iii) relating the curriculum to meeting the required learning standards; (iv) classroom management; (v) knowledge and understanding of instructional practices in main subjects; (vi) teaching students with special learning needs; or (vii) school management and administration. Further, individual teachers are not responsible for paying for their professional development.

8. Motivating Teachers to Perform



Incentives help education systems signal priorities. The more aligned incentives are with the behaviors and outcomes they expect from teachers, the more likely they will obtain them. Incentives are also a way of recognizing teachers' work. Teaching is a challenging job and incentives can let teachers know the results they have achieved are valued so that they continue working hard to sustain them. In addition, some types of incentives can influence the profile of the teaching profession and make it more competitive, dynamic and performance-driven. The presence of incentives can have affect the attractiveness of the teaching profession. SABER - Teachers considers three policy levers education systems can use to reach this goal:

- Are there minimum mechanisms to hold teachers accountable?
- Are there rewards for high-performing teachers?
- Are there sanctions for low-performing teachers?

There are some performance-related incentives in place and sanctions for low-performance, but mechanisms to hold teachers accountable could be strengthened. There are no requirements for primary or secondary school teachers to remain in the profession, but teachers can be dismissed for misconduct or child abuse. Teacher absenteeism is taken into account in performance evaluations, and may result in penalties such as salary deductions and/or dismissal. In addition, there are some rewards for highperforming teachers, including: monetary bonuses, better chances of promotion, and more public recognition. The percentage of a teacher's salary affected by performance is unknown, and there are some sanctions in place for low-performing teachers. Performance on the job is used to decide whether to grant an open-ended appointment, and there is a mandatory probationary period. In Bauchi, there are pay cuts for low-performing teachers and unsatisfactory performance on an evaluation may result in dismissal.

Improving Teacher Policies: Priorities for Bauchi, Nigeria

Overall, Bauchi has achieved acceptable levels of development in five of the eight core SABER-Teacher policy goals. This indicates that Bauchi has succeeded in setting clear expectations for teachers, preparing teachers with useful training and experience, leading teachers with strong principals, supporting teachers to improve instruction, and motivating teachers to perform. Yet, Bauchi has room to improve in the goals of attracting the best into teaching, matching teachers' skills with students needs, and monitoring teaching and learning.

Attracting the Best into Teaching

There are four policy levers that are key to attracting the best into teaching: (1) entry requirements that allow that attract talented candidates; (2) attractive pay and benefits; (iii) appealing working conditions; and (4) attractive career opportunities within the teaching profession.

In this policy goal, Bauchi is Emerging, while Anambra and Ekiti rate Established. Bauchi in particular could benefit from strengthening entry requirements and improving working conditions. In Bauchi, there are requirements to become a teacher, but less than 50% of primary school teachers meet them. Meeting the requirements to enter teaching is important because recent studies have found that no single observable can predict teacher effectiveness, but that a combination of multiple measures can help identify good teachers (Rockoff, et al. 2009). Similarly, Bauchi has standards for infrastructure, hygiene, and sanitation, but only 50% to 69% of schools comply with them. There is considerable evidence that teachers care a great deal about where they work (Boyd, et al. 2005a; Hanushek, Kain & Rivkin 2004a; Hanushek, et al. 2004b; Jackson 2010). Schools that have poor working conditions have a harder time attracting and retaining able candidates; therefore, Bauchi might consider measures to improve infrastructure as well as its high student-teacher ratios.

Matching Teachers' Skills with Students' Needs

There are two policy levers that governments can use to reach the goal of matching teachers' skills with students' needs: (1) establishing incentives for teachers to work at hard-to-staff schools; and (2) establishing incentives for teachers to teach critical shortage subjects.

Both Bauchi and Ekiti rate Latent in this policy goal, while Anambra is Emerging. In Anambra, teachers are entitled to incentives for working in hard-to-staff schools or for teaching critical shortage subject, but teachers do not have these incentives in either Bauchi or Ekiti. One way in which education systems can foster a more equitable distribution of teachers is by using incentives; however, the evidence suggests that the design of these incentives programs matters. Bauchi might consider paying teachers more for working in hard-to-staff schools and/or providing incentives to teachers to teach critical shortage subjects. In addition, across these three education systems, teaching experience is used in deciding transfer priorities. Even in education systems with well-designed incentives to attract teachers into hard-to-staff schools, the distribution of teachers may still be inequitable if experienced teachers (who can be more effective than novice teachers) are given priority in transfer assignments. Thus, using seniority as a basis for approving transfer requests may motivate the most seasoned and potentially best teachers to leave hardto-staff schools.

Monitoring Teaching and Learning

There are two policy levers that are key to monitoring teaching and learning: (1) establishing student learning assessment systems; and (2) teacher performance appraisal mechanisms.

While Anambra and Ekiti have participated in selected international assessments of student learning, Bauchi remains without any assessments of student learning at any level. Making student achievement data available to teachers is key to inform their diagnosis of the strengths and weaknesses of their students and their lesson planning: the more information teachers have about the learning levels of their students, the better they can prepare to contribute to their students' learning progress. Nigeria's education systems could benefit from partaking in more frequent international assessments, and instituting national or sub-national assessments of students learning.

References

- Abadzi, H. (2007). "Absenteeism and Beyond: Instructional Time Loss and Consequences." Policy Resarch Working Paper 4376. Washington, DC: The World Bank.
- Ahn, T., & Vigdor, J. (2010). "The Impact of Incentives on Effort: Teacher Bonuses in North Carolina." PEPG Working Papers Series. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Alexander, C., & Fuller, E. J. (2004). "Does Teacher Certification Matter? Teacher Certification and Middle School Mathematics Achievement in Texas." Paper presented at the Annual Meeting of the American Educational Research Association. San Diego, CA.
- Alfonso, M., Santiago, A., & Bassi, M. (2010). An Alternative Pathway into Teaching: Placing Top University Graduates in Vulnerable Schools in Chile. Inter-American Development Bank.
- Angrist, J., & Lavy, V. (1999). "Using Maimonides' Rule to Estimate The Effect of Class Size on Scholastic Achievement." *The Quarterly Journal of Economics*, 114(2), 533-575.
- ---. (2001). "Does Teacher Training Affect Pupil Learning? Evidence from Matched Comparisons in Jerusalem Public Schools." *Journal of Labor Economics*, 19(2), 343-369.
- Argys, L. M., & Reese, D. I. (1995). "Unionization and School Productivity: A Reexamination." Research in Labor Economics, 14, 49-68.
- Ashton, P., & Crocker, L. (1987). "Systematic Study of Planned Variations: The Essential Focus of Teacher Education Reform." *Journal of Teacher Education*, 2-8.
- Averett, S. L., & McLennan, M. C. (2004). "Exploring the Effect of Class Size on Student Achievement: What Have We Learned over the Past Two Decades?". In G. Johnes & J. Johnes (Eds.), International Handbook on the Economics of Education. Cheltenham, UK and Northampton, MA: Edward Elgar Publishing Ltd.
- Bacolod, M. P. (2002). "Do Alternative Opportunities Matter? The Role of Female Labor Markets in the Decline of Teacher Supply and Teacher Quality, 1940-1990." *Economics Working Paper 02-03-02*. Irvine, CA: University of California, Irvine
- Bacolod, M. P., DiNardo, J., & Jacobson, M. (2009).

 "Beyond Incentives: Do Schools Use

- Accountability Rewards Productively?", *NBER*Working Paper 14775. Cambridge, MA: National
 Bureau of Economic Research (NBER).
- Ballou, D. (2001). "Pay for Performance in Public and Private Schools." *Economics of Education Review, 20*(1), 51-61.
- Ballou, D., & Podgursky, M. (1998). "Teacher Recruitment and Retention in Public and Private Schools." *Journal of Policy Analysis and Management, 17*(3), 393-417.
- ---. (2001). "Teacher Compensation: Let the Market Decide." *Education Next*.
- ---. (2002). "Returns to Seniority among Public School Teachers." *Journal of Human Resources, 37*(4), 892-912.
- Baratz-Snowden, J. (2009). "Fixing Tenure: A Proposal for Assuring Teacher Effectiveness and Due Process." Washington, DC: Center for American Progress (CAP).
- Barber, M., & Mourshed, M. (2007). How the World's Best-Performing School Systems Come Out on Top. London, UK: McKinsey & Co.
- Barro, R., & Lee, J. W. (1997). "Schooling Quality in a Cross-Section of Countries." *NBER Working Paper 6198*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Baugh, W. H., & Stone, J. A. (1982). "Teachers, Unions and Wages in the 1970s: Unionism Now Pays." *Industrial and Labor Relations Review, 35*(3), 368-376.
- Bee, M., & Dolton, P. J. (1995). "The Remuneration of School Teachers: Time Series and Cross Section Evidence." *Manchester School, 63,* 11-22.
- Betts, J. (1995). "Does School Quality Matter? Evidence from the National Longitudinal Survey of Youth." *Review of Economics and Statistics*, 77(2), 231-247.
- Bloom, H. S., Levy Thompson, S., & Unterman, R. (2010).

 Transforming the High School Experience: How

 New York City's New Small Schools Are Boosting

 Student Achievement and Graduation Rates.

 New York, NY: MRDC.
- Borko, H. (2004). "Professional Development and Teacher Learning: Mapping the Terrain." *Educational Researcher*, 33(8), 3-15.
- Boyd, D., Grossman, P., Ing, M., Lankford, H., Loeb, S., & Wyckoff, J. (2009a). "The Influence of School Administrators on Teacher Retention Decisions." Retrieved July 26, 2010, from http://www.teacherpolicyresearch.org/portals/

1/pdfs/TeacherRetentionAdministrators22May 2009.pdf

- Boyd, D., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2006a). "How Changes in Entry Requirements Alter the Teacher Workforce and Affect Student Achievement." *Education Finance and Policy*, 1(2), 176-216.
- ---. (2007). "Who Leaves? Teacher Attrition and Student Achievement."
- ---. (2009b). "Teacher Preparation and Student Achievement." *Educational Evaluation and Policy Analysis, 31,* 416-440.
- Boyd, D., Hammerness, K., Lankford, H., Loeb, S., Ronfeldt, M., & Wyckoff, J. (2009c). "Recruiting Effective Math Teachers, How Do Math Immersion Teachers Compare?: Evidence from New York City." New York, NY: National Center for the Analysis of Longitudinal Data in Education Research (CALDER).
- Boyd, D., Lankford, H., Loeb, S., Rockoff, J. E., & Wyckoff, J. (2008). "The Narrowing Gap in New York City Teacher Qualifications and Its Implications for Student Achievement in High-Poverty Schools." *Journal of Policy Analysis and Management, 27*(4), 793-818.
- Boyd, D., Lankford, H., Loeb, S., Ronfeldt, M., & Wyckoff, J. (2009d). "The Role of Teacher Quality in Retention and Hiring: Using Applications-to-Transfer to Uncover Preferences of Teachers and Schools."
- Boyd, D., Lankford, H., Loeb, S., & Wyckoff, J. (2002).
 "Initial Matches, Transfers, and Quits: Career
 Decisions and the Disparities in Average
 Teacher Qualifications Across Schools."
 Stanford, CA: Stanford University.
- ---. (2005a). "The Draw of Home: How Teachers'
 Preferences for Proximity Disadvantage Urban
 Schools." *Journal of Policy Analysis and*Management, 24(1), 113-132.
- ---. (2005b). "Explaining the Short Careers of High-Achieving Teachers in Schools with Low-Performing Students." *American Economic Review*, 95(2), 166-171.
- ---. (2005c). "Improving Science Achievement: The Role of Teacher Workforce Policies."
- ---. (2006b). "Analyzing the Determinants of the Matching of Public School Teachers to Jobs: Estimating Compensating Differentials in Imperfect Labor Markets." *NBER Working Paper 9878*. Cambridge, MA: National Bureau of Economic Research (NBER).

- Brewer, D. J. (1993). "Principals and Student Outcomes: Evidence From U.S. High Schools." *Economics of Education Review*, *12*(4), 281-292.
- ---. (1996). "Career Path and Quit Decisions: Evidence from Teaching." *Journal of Labor Economics, 14,* 313-339.
- Brown, C. A., Smith, M. S., & Stein, M. K. (1995).

 "Linking Teacher Support to Enhanced

 Classroom Instruction." Paper presented at the annual meeting of the American Educational Research Association (AERA). New York, NY.
- Carnoy, M., Brodziak, I., Luschei, T., Beteille, T., & Loyalka, P. (2009). *Teacher Education and Development Study in Mathematics (TEDS-M): Do Countries Paying Teachers Higher Relative Salaries Have Higher Student Mathematics Achievement?* Amsterdam, the Netherlands: International Association for the Evaluation of Educational Achievement (IEA).
- Case, A., & Deaton, A. (1999). "School Inputs and Educational Outcomes in South Africa." *Quarterly Journal of Economics, 114*(3), 1047-1084.
- Chaudhury, N., Hammer, J., Kremer, M., Muralidharan, K., & Rogers, F. H. (2005). "Missing in Action: Teacher and Health Worker Absence in Developing Countries." *PEPG Working Paper Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Chingos, M. M., & Peterson, P. E. (2010). "It's Easier to Pick a Good Teacher than to Train One: Familiar and New Results on the Correlates of Teacher Effectiveness." *PEPG Working Papers Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Clark, D., Martorell, P., & Rockoff, J. E. (2009). "School Principals and School Performance." *CALDER Working Paper 38*. Washington, DC: The National Center for Analysis of Longitudinal Data in Education Research (CALDER).
- Clotfelter, C., Glennie, E., Ladd, H., & Vigdor, J. (2006).

 "Would Higher Salaries Keep Teachers in High-Poverty Schools? Evidence from a Policy Intervention in North Carolina." *NBER Working Paper 12285*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Cohen, D. K., & Hill, H. (1997). "Instructional Policy and Classroom Performance: The Mathematics Reform in California." Paper presented at the annual meeting of the American Educational Research Association (AERA). New York, NY.

- Corcoran, S. P., Evans, W. N., & Schwab, R. S. (2002).

 "Changing Labor Market Opportunities for
 Women and the Quality of Teachers 19571992." NBER Working Paper 9180. Cambridge,
 MA: National Bureau of Economic Research
 (NBER).
- Darling-Hammond, L. (1999a). "State Teaching Policies and Student Achievement." *Teaching Quality Policy Brief*. Seattle, WA: Center for the Study of Teaching and Policy, University of Washington.
- ---. (1999b). "Teacher Quality and Student Achievement:
 A Review of State Policy Evidence." *Research Report*. Seattle, Washington: Center for the Study of Teaching and Policy, University of Washington.
- Darling-Hammond, L., Barnett, B., & Thorenson, A. (2001). "Does Teacher Certification Matter? Evaluating the Evidence." *Educational Evaluation and Policy Analysis*, 23(1).
- Darling-Hammond, L., Holtzman, D., Gatlin, S. J., & Vazquez Hellig, J. (2005). "Does Teacher Preparation Matter? Evidence About Teacher Certification, Teach for America and Teacher Effectiveness." *Education Policy Analysis Archives*, 13(42).
- Decker, P. T., Mayer, D. P., & Glazerman, S. (2004). *The Effects of Teach For America on Students:*Findings from a National Evaluation. Princeton,
 NJ: Mathematica Policy Research, Inc.
- Dee, T. S. (2001). "Teachers, Race and Student Achievement in a Randomized Experiment." NBER Working Paper 8432. Cambridge, MA: National Bureau of Economic Research (NBER).
- ---. (2005). "Teachers and the Gender Gaps in Student Achievement." *NBER Working Paper 11660*. Cambridge, MA: National Bureau of Economic Research (NBER).
- di Gropello, E., & Marshall, J. H. (2005). "Teacher Effort and Schooling Outcomes in Rural Honduras." In E. Vegas (Ed.), *Incentives to Improve Teaching:* Lessons from Latin America. Washington, DC: The World Bank.
- Dolton, P. J. (1990). "The Economics of UK Teacher Supply: The Graduate's SDecision." *The Economic Journal, 100*, 91-104.
- Dolton, P. J., & Robson, M. (1996). "Trade Union Concentration and the Determination of Wages: The Case of Teachers in England and Wales." British Hournal of Industrial Relations, 34(4), 539-556.

- Dolton, P. J., Tremayne, A., & Chung, T.-P. (2003). "The Economic Cycle and Teacher Supply." *Paper Commissioned for 'Attracting, Developing and Retaining Effective Teachers' Activity*. Paris, France: Directorate for Education-Organisation for Economic Cooperation (OECD).
- Dolton, P. J., & van der Klaauw, W. (1999). "The Turnover of Teachers: A Competing Risks Explanation." *The Review of Economics and Statistics*, 81(3), 543-552.
- Donaldson, M. L., & Johnson, S. M. (2010). "The Price of Misassignment: The Role of Teaching Assignments in Teach For America Teachers' Exit From Low-Income Schools and the Teaching Profession." *Educational Evaluation and Policy Analysis*, 32(2), 299-323.
- Duflo, E., Hanna, R., & Ryan, S. P. (2008). "Incentives Work: Getting Teachers to Come to School." Cambridge, MA: Abdul Latif Jameel Poverty Action Lab.
- Eberts, R. W. (1984). "Union Effects on Teacher Productivity." *Industrial and Labor Relations Review, 37*(3), 346-348.
- ---. (2002). "Teacher Performance Incentives and Student Outcomes." *Journal of Teacher Education, 37*(4), 913-927.
- Eberts, R. W., & Stone, J. A. (1986). "Teacher Unions and the Cost of Public Education." *Economic Inquiry*, 24, 631-643.
- ---. (1988). "Student Achievement in Public Schools: Do Principals Make a Difference?". *Economics of Education Review, 7*(3), 291-299.
- Evertson, C., Hawley, W., & Zlotnik, M. (1985). "Making a Difference in Educational Quality through Teacher Education." *Journal of Teacher Education*, 36(3), 2-12.
- Feistritzer, C. E., & Chester, D. (2000). "Alternative Teacher Certification: A State-by-State Analysis." Washington, DC: National Center for Education Information.
- Feng, L., Figlio, D. N., & Sass, T. (2010). "School Accountability and Teacher Mobility." *NBER Working Paper 16070*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Ferguson, P., & Womack, S. T. (1993). "The Impact of Subject Matter and Education Coursework on Teaching Performance." *Journal of Teacher Education*, 44, 155-163.
- Figlio, D. N. (1997). "Teacher Salaries and Teacher Quality." *Economics Letters*, *55*, 267-271.

- Flyer, F., & Rosen, S. (1997). "The New Economics of Teachers and Education." *Journal of Labor Economics*, 15(1, Part 2), S104-S139.
- Fuchs, T., & Woessmann, L. (2004). "What Accounts for International Differences in Student Performance? A Re-Examination Using PISA Data." CESifo Working Paper No. 1235.
- Fuller, B., & Clarke, P. (1994). "Raising School Effects While Ignoring Culture? Local Conditions and the Influence of Classroom Tools, Rules and Pedagogy." *Review of Educational Research*, 64(1), 119-157.
- Fuller, E. J. (1999). "Does Teacher Certification Matter?
 A Comparison of TAAS Performance in 1997
 Between Schools with Low and High
 Percentages of Certified Teachers." Austin, TX:
 University of Texas at Austin, Charles A. Dana
 Center.
- Garet, M., Porter, A., Desimone, L., Birman, B., & Yoon, K. S. (2001). "What Makes Professional Development Effective? Results From a National Sample of Teachers." *American Education Research Journal*, 38(4), 915-945.
- Glazerman, S., Isenberg, E., Dolfin, S., Bleeker, M.,
 Johnson, A., Grider, M., et al. (2010). Impacts of
 Comprehensive Teacher Induction: Final Results
 from a Randomized Controlled Study.
 Washington, DC: Institute of Education
 Sciences.
- Glazerman, S., & Seifullah, A. (2010). An Evaluation of the Teacher Advancement Program (TAP) in Chicago: Year Two Impact Report. Washington, DC: Mathematica Policy Research, Inc.
- Glewwe, P., Ilias, N., & Kremer, M. (2003). "Teacher Incentives." *NBER Working Paper 9671*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Goldhaber, D. (2002). "The Mystery of Good Teaching: Surveying the Evidence on Student Achievement and Teachers' Characteristics." *Education Next*, *2*(1), 50-55.
- ---. (2007). "Principal Compensation: More Research Needed on a Promising Reform." Washington, DC: Center for American Progress (CAP).
- ---. (2010). "Lessons from Abroad: Exploring Cross-Country Differences in Teacher Development Systems and What They Mean for U.S. Policy." In D. Goldhaber & J. Hannaway (Eds.), *Creating a New Teaching Profession*. Washington, DC: The Urban Institute Press.

- Goldhaber, D., & Brewer, D. J. (2000). "Does Teacher Certification Matter? High School Teacher Certification Status and Student Achievement." Educational Evaluation and Policy Analysis, 22(2), 129-145.
- Goldschmidt, S. M., & Stuart, L. E. (1986). "The Extent and Impact of Educational Policy Bargaining." *Industrial and Labor Relations Review, 39*(3), 350-360.
- Goodman, S., & Turner, L. (2010). "Teacher Incentive Pay and Educational Outcomes: Evidence from the NYC Bonus Program." *PEPG Working Papers Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Greenwald, R., Hedges, L. V., & Laine, R. D. (1996). "The Effect of School Resources on Student Achievement." *Review of Educational Research,* 66(3), 361-396.
- Grissmer, D. W., & Kirby, S. N. (1987). *Teacher Attrition: The Uphill Climb to Staff the Nations' Schools*.
 Santa Monica, CA: The Rand Corporation.
- Grogger, J. (1996). "School Expenditures and Post-Schooling Earnings: Evidence from High School and Beyond." *Review of Economics and* Statistics, 78(4), 628-637.
- Grossman, P., Loeb, S., Cohen, J., Hammerness, K., Wyckoff, J., Boyd, D., et al. (2010). "Measure for Measure: The Relationship between Measures of Instructional Practice in Middle School English Language Arts and Teachers' Value-Added Scores." *NBER Working Paper 16015*. National Bureau of Economic Research (NBER).
- Guarino, C. A., Santibáñez, L., & Daley, G. A. (2006).

 "Teacher Recruitment and Retention: A Review of the Recent Empirical Literature." *Review of Educational Research*, 76(2), 173-208.
- Guyton, E., & Farokhi, E. (1987). "Relationships among Academic Performance, Basic Skills, Subject Matter Knowledge." *Journal of Teacher Education*, 38, 37-42.
- Hanushek, E. A. (1986). "The Economics of Schooling: Production and Efficiency in Public Schools."

 Journal of Economic Literature, 24(3), 1141–
 1177
- ---. (1995). "Interpreting Recent Research on Schooling in Developing Countries." *Working Paper 3*. Rochester, NY: Wallis Institute of Political Economy, Rochester University.
- ---. (1997a). "Assessing the Effects of School Resources on Student Performance: An Update."

- Educational Evaluation and Policy Analysis, 19(2), 141-164.
- ---. (1997b). "Understanding the 20th Centry Growth in U.S. School Spending." *Journal of Human Resources*, 32(1), 35-68.
- ---. (2002). "Publicly Provided Education." In A. J. Auerbach & M. Feldstein (Eds.), *Handbook of Public Economics, Vol. 4*. Amsterdam, the Netherlands: Elsevier Science B. V.
- ---. (2003). "The Failure of Input-Based Schooling Policies." *The Economic Journal, 113,* F64-F98.
- ---. (2009). "Teacher Deselection." In D. Goldhaber & J. Hannaway (Eds.), *Creating a New Teaching Profession*. Washington, DC: Urban Institute Press.
- ---. (2010). "Economic Aspects of the Demand for Teacher Quality." Stanford, CA.
- Hanushek, E. A., Kain, J. F., O'Brien, D. M., & Rivkin, S. G. (2005). "The Market for Teacher Quality." *NBER Working Paper 11154*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (1999). "Do Higher Salaries Buy Better Teachers?", *NBER Working Paper 7082*. Cambridge, MA: National Bureau of Economic Research (NBER).
- ---. (2004a). "The Revolving Door." *Education Next, 4*(1), 76-82.
- ---. (2004b). "Why Public Schools Lose Teachers." *The Journal of Human Resources, 39*(2), 326-354.
- Hanushek, E. A., & Pace, R. R. (1994). "Understanding Entry into the Teaching Profession." In R. G. Enhrenberg (Ed.), Choices and Consequences: Contemporary Policy Issues in Education. Ithaca, NY: ILR Press.
- ---. (1995). "Who Chooses to Teach (and Why)?".

 Economics of Education Review, 14(2), 101-117.
- Hanushek, E. A., & Rivkin, S. G. (2006). "Teacher Quality." In E. A. Hanushek & F. Welch (Eds.), Handbook of the Economics of Education (Vol. 2). Amsterdam: Elsevier.
- ---. (2010). Generalizations about Using Value-Added Measures of Teacher Quality. Paper presented at the Paper Presented at the annual meetings of the American Economic Association.
- Hawk, P. P., Coble, C. R., & Swanson, M. (1985). "Certification: It Does Matter." *Journal of Teacher Education*, *36*(3), 13-15.
- Henry, G. T., Thompson, C. L., Bastian, K. C., Fortner, C. K., Kershaw, D. C., Purtell, K. M., et al. (2010).
 "Teacher Portals: Teacher Preparation on Student Test Scores in North Carolina." *Chapel*

- Hill, NC. Carolina Institute for Public Policy, University of North Carolina at Chapel Hill.
- Herrmann, M. A., & Rockoff, J. E. (2009). "Work Disruption, Worker Health, and Productivity: Evidence from Teaching." New York, NY: Columbia Business School.
- Hess, F. M., & Kelly, A. P. (2005a). "Learning to Lead? What Gets Taught in Principal Preparation Programs." *PEPG Working Paper Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- ---. (2005b). "Textbook Leadership? An Analysis of Leading Books Used in Principal Preparation." PEPG Working Paper Series. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Hoxby, C. M. (1996). "How Teachers' Unions Affect Education Production." *The Quarterly Journal of Economics*, 111(3), 671-718.
- ---. (2000). "The Effects of Class Size on Student Achievement: New Evidence from Population Variation." *Quarterly Journal of Economics*, 115(4), 1239-1285.
- Hoxby, C. M., & Leigh, A. (2004). "Pulled Away or Pushed out? Explaining the Decline of Teacher Aptitude in the United States." *The American Economic Review*, 94(2), 236-240.
- Ingersoll, R. M. (2001a). "A Different Approach to Solving the Teacher Shortage Problem." *Policy Brief.* Seattle, WA: Center for the Study of Teaching and Policy, University of Washington.
- ---. (2001b). "Teacher Turnover, Teacher Shortages and the Organization of Schools." *Research Report*. Seattle, WA: Center for the Study of Teaching and Policy, University of Washington.
- Jackson, C. K. (2010). "Match Quality, Worker Productivity, and Worker Mobility: Direct Evidence From Teachers." *NBER Working Paper* 15990. Cambridge, MA: National Bureau of Economic Research (NBER).
- Jackson, C. K., & Bruegmann, E. (2009). "Teaching Students and Teaching Each Other: The Importance of Peer Learning for Teachers." NBER Working Paper 15202. Cambridge, MA: National Bureau of Economic Research (NBER).
- Jacob, B. A. (2010a). "Do Principals Fire the Worst Teachers?", *NBER Working Paper 15715*. Cambridge, MA: National Bureau of Economic Research (NBER).
- ---. (2010b). "The Effect of Employment Protection on Worker Output: Evidence from Public

- Schooling." *PEPG Working Papers Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Jacob, B. A., & Levitt, S. D. (2002). "Rotten Apples: An Investigation of the Prevalence and Predictors of Teacher Cheating." *NBER Working Paper 9413*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Jepsen, C., & Rivkin, S. G. (2009). "Class Size Reduction and Student Achievement: The Potential Tradeoff between Teacher Quality and Class Size." *The Journal of Human Resources, 44*(1), 223-250.
- Kane, T. J., Rockoff, J. E., & Staiger, D. O. (2006). "What Does Certification Tell Us About Teacher Effectiveness? Evidence from New York City." NBER Working Paper 12155. Cambridge, MA: National Bureau of Economic Research (NBER).
- King, E., & Ozler, B. (1998). "What's Decentralization Got to Do with Learning? The Case of Nicaragua's School Autonomy Reform." Working Paper on Impact Evaluation of Education Reforms. Washington, DC: The World Bank
- Kingdon, G., & Teal, F. (2008). "Teacher Unions, Teacher Pay and Student Performance in India: A Pupil Fixed Effects Approach." *PEPG Working Paper Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Kleiner, M., & Petree, D. (1988). "Unionism and Licensing of Public School Teachers: Impact on Wages and Educational Output." In R. Freeman & C. Ichiowski (Eds.), When Public Sector Workers Unionize (pp. 305-319). Chicago, IL: University of Chicago Press.
- Koretz, D. (2002). "Limitations in the Use of Achievement Tests as Measures of Educators' Productivity." *Journal of Human Resources*, 37(4), 752-777.
- ---. (2008). "A Measured Approach: Value-Added Models Are a Promising Improvement, but No One Measure Can Evaluate Teacher Performance." *American Educator*.
- Kremer, M., & Chen, D. (2001). "An Interim Report on a Teacher Attendance Incentive Program in Kenya." *Mimeo*. Cambridge, MA: Harvard University.
- Krueger, A., & Whitmore, D. M. (2001). "The Effect of Attending a Small Class in the Early Grades on College Test-Taking and Middle School Test

- Results: Evidence from Project STAR." *Economic Journal, Royal Economic Society, 111*(468), 1-28.
- Kurth, M. (1987). "Teachers' Unions and Excellence in Education: An Analysis of the Decline in SAT Scores." *Journal of Labor Research*, 8, 351-387.
- Lankford, H., Loeb, S., & Wyckoff, J. (2002). "Teacher Sorting and the Plight of Urban Schools: A Descriptive Analysis." *Educational Evaluation* and Policy Analysis, 24(1), 37-62.
- Lavy, V. (2002). "Evaluating the Effect of Teachers'
 Group Performance Incentives on Pupil
 Achievement." *The Journal of Political Economy,*110(6), 1286-1317.
- ---. (2004). "Performance Pay and Teachers' Effort, Productivity and Grading Ethics." *NBER Working Paper 10622*. Cambridge, MA: National Bureau of Economic Research (NBER).
- ---. (2007). "Using Performance-Based Pay to Improve the Quality of Teachers." *The Future of Children,* 17(1), 87-109.
- ---. (2008). "Gender Differences in Market
 Competitiveness in a Real Workplace: Evidence
 from Performance-Based Pay Tournaments
 among Teachers." NBER Working Paper 14338.
 Cambridge, MA: National Bureau of Economic
 Research (NBER).
- ---. (2009). "Performance Pay and Teachers' Effort, Productivity and Grading Ethics." *The American Economic Review*, *99*(5), 1979-2011.
- ---. (2010). "Do Differences in Schools' Instruction Time Explain International Achievement Gaps in Math, Science and Reading? Evidence from Developed and Developing Countries." *NBER Working Paper 16227*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Leigh, A. (2009). "Teacher Pay and Teacher Aptitude." *Working Paper*. Canberra, Australia: Australian National University.
- Leithwood, K., Day, C., Sammons, P., Harris, A., & Hopkins, D. (2006). Seven Strong Claims about Successful School Leadership. Nottingham, UK: National College for School Leadership (NCSL).
- Liu, E., Johnson, S. M., & Peske, H. G. (2004). "New Teachers and the Massachusetts Signing Bonus: The Limits of Inducements." *Educational Evaluation and Policy Analysis*, 26(3), 217-236.
- McEwan, P., & Santibáñez, L. (2005). "Teacher and Principal Incentives in Mexico." In E. Vegas (Ed.), Incentives to Improve Teaching: Lessons from Latin America. Washington, DC: The World Bank.

- Miller, R. T., Murnane, R. J., & Willett, J. B. (2008). "Do Teacher Absences Impact Student Achievement? Longitudinal Evidence From One Urban School District." *Educational Evaluation and Policy Analysis*, 30(2), 181-200.
- Mitchell, D. E., Scott, L. D., & Covrig, D. (1999). "Cultural Diversity and the Teacher Labor Market: A Literature Review." *Research Paper*. Riverside, CA: University of California, Riverside.
- Mizala, A., & Romaguera, P. (2005). "Teachers' Salary Structure and Incentives in Chile." In E. Vegas (Ed.), *Incentives to Improve Teaching: Lessons from Latin America*. Washington, DC: The World Bank.
- Monk, D. H. (1994). "Subject Area Preparation of Secondary Mathematics and Science Teachers and Student Achievement." *Economics of Education Review, 13,* 125-145.
- Monk, D. H., & King, J. (1994). "Multi-Level Teacher Resource Effects on Pupil Performance in Secondary Mathematics and Science." In R. G. Ehrenberg (Ed.), Contemporary Policy Issues: Choices and Consequences in Education (pp. 29-58). Ithaca, NY: ILR Press.
- Mont, D., & Rees, D. (1996). "The Influence of Classroom Characteristics on High School Teacher Turnover." *Economic Inquiry, 34*, 152-167.
- Mulford, B. (2003). "School Leaders: Changing Roles and Impact on Teacher and School Effectiveness."

 Paper commissioned for the 'Attracting,

 Developing and Retaining Effective Teachers'

 Activity. Paris, France: Organisation for Economic Co-Operation and Development (OECD), Directorate for Education.
- Murillo, M. V., Tommassi, M., Ronconi, L., & Sanguinetti, J. (2002). "The Economic Effects of Unions in Latin America: Teachers' Unions and Education in Argentina." Washington, DC: Inter-American Development Bank.
- Murnane, R. J. (1996). "Staffing the Nation's Schools with Skilled Teachers." In E. A. Hanushek & D. K. Cohen (Eds.), *Improving America's Schools: The Role of Incentives*. Washington, DC: National Research Council-National Academy Press.
- Murnane, R. J., & Cohen, D. K. (1986). "Merit Pay and the Evaluation Problem: Why Most Merit Pay Plans Fail and Few Survive." *Harvard Educational Review*, *56*(1), 379-388.
- Murnane, R. J., & Olsen, R. J. (1989). "The Effects of Salaries and Opportunity Costs on Duration in

- Teaching: Evidence from Michigan." *The Review of Economics and Statistics*, 71, 347-352.
- ---. (1990). "The Effects of Salaries and Opportunity Costs on Length of Stay in Teaching: Evidence from North Carolina." *The Journal of Human Resources*, 25(1), 106-124.
- Murnane, R. J., Singer, J. D., & Willett, J. B. (1988). "The Career Paths of Teachers: Implications for Teacher Supply and Methodological Lessons for Research." *Educational Researcher*, 22-30.
- Noell, G. H., & Gansle, K. A. (2009). "Teach for America Teachers' Contribution to Student Achievement in Louisiana in Grades 4-9: 2004-2005 to 2006-2007." Baton Rouge, LA: Louisiana State University.
- Nye, B., Konstantopoulos, S., & Hedges, L. V. (2004). "How Large Are Teacher Effects?". *Educational Evaluation and Policy Analysis*, 26(3), 237-257.
- Papa Jr., F. C., Lankford, H., & Wyckoff, J. (2002). "The Attributes and Career Paths of Principals: Implications for Improving Policy." Albany, NY: University at Albany, SUNY.
- Park, A., & Hannum, E. (2001). "Do Teachers Affect Learning in Developing Countries?: Evidence from Matched Student-Teacher Data from China." Paper presented at the Conference Rethinking Social Science Research on the Developing World in the 21st Century. Park City, Utah: Social Science Research Council.
- Podgursky, M. (2009). "A Market-Based Perspective on Teacher Compensation Reform." *Working Paper* 2008-07. Nashville, TN: Vanderbilt, Peabody College.
- Podgursky, M., & Springer, M. G. (2008). "Teacher Performance Pay: A Review." *Journal of Policy Analysis and Management, 24*(4), 909-949.
- Raymond, M., Fletcher, S., & Luque, J. (2001). "Teach for America: An Evaluation of Teacher Differences and Student Outcomes in Houston, Texas."

 Stanford, CA: Center for Research on Education Outcomes (CREDO).
- Register, C. A., & Grimes, P. W. (1991). "Collective Bargaining, Teachers and Student Achievement." *Journal of Labor Research*, 12(2), 99-109.
- Rice, J. (2003). "The Incidence and Impact of Teacher Professional Development: Implications for Education Productivity." In M. L. Plecki & D. H. Monk (Eds.), School Finance and Teacher Quality: Exploring the Connections. Yearbook of

- the American Education Finance Association. Larchmont, NY: Eye on Education.
- Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). "Teachers, Schools and Student Achievement." *Econometrica*, 73(2), 417-458.
- Rockoff, J. E. (2004). "The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data." *American Economic Review*, *94*(2), 247-252.
- ---. (2008a). "Does Mentoring Reduce Turnover and Improve Skills of New Employees? Evidence from Teachers in New York City." New York, NY: Columbia Business School.
- ---. (2008b). "Does Mentoring Reduce Turnover and Improve Skills of New Employees? Evidence from Teachers in New York City." *NBER Working Paper 13868*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Rockoff, J. E., Jacob, B. A., Kane, T. J., & Staiger, D. O. (2009). "Can You Recognize an Effective Teacher When You Recruit One?". New York, NY: Columbia Business School.
- Rockoff, J. E., & Speroni, C. (2010). "Subjective and Objective Evaluations of Teacher Effectiveness: Evidence from New York City." New York, NY: Columbia Business School.
- Rockoff, J. E., Staiger, D. O., Kane, T. J., & Taylor, E. S. (2010). "Information and Employee Evaluation: Evidence from a Randomized Intervention in Public Schools." *NBER Working Paper 16240*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Rogers, F. H., & Vegas, E. (2009). "No More Cutting Class? Reducing Teacher Absence and Providing Incentives for Performance." *Policy Research Working Paper 4847*. Washington, DC: The World Bank.
- Rothstein, J. (2010). "Teacher Quality in Educational Production: Tracking, Decay, and Student Achievement." *The Quarterly Journal of Economics*, 125(1), 175-214.
- Rowan, B., Chiang, F. S., & Miller, R. J. (1997). "Using Research on Employees' Performance to Study the Effects of Teachers on Students' Achievement." *Sociology of Education, 70*, 256-284.
- Sanders, W. L. (1998). "Value Added Assessment." School Administrator, 11(55), 24-27.
- Sanders, W. L., & Rivers, J. C. (1996). "Cumulative and Residual Effects of Teachers on Future Student Academic Achievement." *Research Progress*

- *Report*. Knoxville, TN: University of Tennessee Value-Added Research and Assessment Center.
- Santiago, P. (2004). "The Labor Market for Teachers." In G. Johnes & J. Johnes (Eds.), *International Handbook on the Economics of Education*. Cheltenham, UK and Northampton, MA: Edward Elgar Publishing Ltd.
- Sawada, Y., & Ragatz, A. B. (2005). "Decentralization of Education, Teacher Behavior and Outcomes." In E. Vegas (Ed.), *Incentives to Improve Teaching:*Lessons from Latin America. Washington, DC:
 The World Bank.
- Sclafani, S., & Tucker, M. S. (2006). "Teacher and Principal Compensation: An In-ternational Review." Washington, DC: Center for American Progress (CAP).
- Springer, M., Ballou, D., & Peng, A. X. (2008). "Impact of the Teacher Advancement Program on Student Test Score Gains: Findings from an Independent Appraisal." *PEPG Working Papers Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Steele, J. L., Murnane, R. J., & Willett, J. B. (2009). "Do Financial Incentives Help Low-Performing Schools Attract and Keep Academically Talented Teachers? Evidence from California." *NBER Working Paper 14780*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Steelman, L. C., Powell, B., & Carini, R. M. (2000). "Do Teacher Unions Hinder Educational Performance? Lessons Learned from State SAT and ACT Scores." *Harvard Educational Review*, 70(4).
- Stinebrickner, T. R. (1998). "An Empirical Investigation of Teacher Attrition." *Economics of Education Review*, 17(2), 127-136.
- ---. (1999a). "Estimation of a Duration Model in the Presence of Missing Data." *The Review of Economics and Statistics, 81*(3), 529-542.
- ---. (1999b). "The Reasons that Elementary and High School Teachers Leave Teaching: An Analysis of Occupational Change and Departure from the Labor Force." *Research Report*. Ontario, Canada: University of Western Ontario.
- ---. (1999c). "Using Latent Variables in Dynamic,
 Discrete Choice Models: The Effect of School
 Characteristics on Teacher Decisions." *Research*in Labor Economics, 18, 141-176.
- ---. (2001a). "Compensation Policies and Teacher Decisions." *International Economic Review,* 42(3), 751-780.

- ---. (2001b). "A Dynamic Model of Teacher Labor Supply." *Journal of Labor Economics, 19*(1), 196-230.
- Stoddard, C. (2003). "Why Has the Number of Teachers per Student Risen while Teacher Quality Has Declined? The Role of Changes in the Labor Market for Women." *Journal of Urban Economics*, *53*(3), 458-481.
- Temin, P. (2002). "Teacher Quality and the Future of America." *Working Paper 8898*. Cambridge, MA: National Bureau of Economic Research (NBER).
- Toch, T., & Rothman, R. (2008). Rush to Judgment: Teacher Evaluation in Public Education. Washington, DC: Education Sector.
- Urquiola, M. (2006). "Identifying Class Size Effects in Developing Countries: Evidence from Rural Bolivia." *The Review of Economics and Statistics,* 88(1), 171–177.
- Urquiola, M., & Vegas, E. (2005). "Arbitrary Variation in Teacher Salaries: An Analysis of Teacher Pay in Bolivia." In E. Vegas (Ed.), *Incentives to Improve Teaching: Lessons from Latin America*. Washington, DC: The World Bank.
- Vandenberghe, V. (2000). "Leaving Teaching in the French-Speaking Community of Belgium: A Duration Analysis." *Education Economics*, 8(3), 221-239.
- Vegas, E. (2007). "Teacher Labor Markets in Developing Countries." *The Future of Children, 17*(1), 219-232.
- Vegas, E., & De Laat, J. (2003). "Do Differences in Teacher Contracts Affect Student Performance? Evidence from Togo."
- Vegas, E., Loeb, S., Romaguera, P., Paglayan, A. S., Goldstein, N., & Ganimian, A. J. (2010). "SABER -Teachers: Objectives, Rationale, Methodological Approach, and Products." Washington, DC: The World Bank.
- Vegas, E., Murnane, R. J., & Willett, J. B. (2001). "From High School to Teaching: Many Steps, Who Makes It?". *Teachers College Record*, 103(3), 427-449.
- Vignoles, A., Levacic, R., Walker, J., Machin, S., & Reynolds, D. (2000). "The Relationship between Resource Allocation and Pupil Attainment: A Review." *Report 228*. London, UK: Centre for the Economics of Education, London School of Economics and Political Science.
- Wenglinsky, H. (2000). "How Teaching Matters: Bringing the Classroom Back into Discussions of Teacher

- Quality." Policy Information Center Report, Educational Testing Service (ETS).
- West, M. R., & Chingos, M. M. (2008). "Teacher Effectiveness, Mobility, and Attrition in Florida: A Descriptive Analysis." *PEPG Working Paper Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Wiley, D., & Yoon, B. (1995). "Teacher Reports of Opportunity to Learn: Analyses of the 1993 California Learning Assessment System." *Educational Evaluation and Policy Analysis*, 17(3), 355-370.
- Winters, M. A., Ritter, G. W., Marsh, R. H., Greene, J. P., & Holley, M. J. (2008). "The Impact of Performance Pay for Public School Teachers: Theory and Evidence." *PEPG Working Paper Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Woessmann, L. (2004). "The Effect Heterogeneity of Central Exams: Evidence from TIMSS, TIMSS-Repeat and PISA." *CESifo Working Paper 1330*. Munich, Germany: CESifo.
- ---. (2010). "Cross-Country Evidence on Teacher Performance Pay." *PEPG Working Papers Series*. Cambridge, MA: Program on Education Policy and Governance (PEPG).
- Wolter, S. C., & Denzler, S. (2003). "Wage Elasticity of the Teacher Supply in Switzerland." *Discussion Paper 733*. Bonn, Germany: Institute for the Study of Labor.
- Woodbury, S. (1985). "The Scope of Bargaining and Bargaining Outcomes in Public Schools." *Industrial and Labor Relations Review, 38*(2), 195-210.
- Xu, Z., Hannaway, J., & Taylor, C. (2007). "Making a Difference? The Effects of Teach for America in High School." National Center for Analysis of Longitudinal Data in Education Research (CALDER), Urban Institute.
- Zegarra, E., & Ravina, R. (2003). "Teacher Unionization and the Quality of Education in Peru: An Empirical Evaluation Using Survey Data."

 Washington, DC: Inter-American Development Bank.

The Systems Approach for Better Education Results (SABER) initiative collects data on the policies and institutions of education systems around the world and benchmarks them against practices associated with student learning. SABER aims to give all parties with a stake in educational results—from students, administrators, teachers, and parents to policymakers and business people—an accessible, detailed, objective snapshot of how well the policies of their country's education system are oriented toward ensuring that all children and youth learn.

This report focuses specifically on the area of teacher policies.

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