

RWANDA: Can performance pay for teachers improve students' learning?

Performance pay for teachers generates debate. Proponents argue that many school systems have low levels of accountability and advocate incentivizing teachers by linking their pay to either their own efforts or their students' learning. Critics, however, raise concerns that performance pay attracts people to the teaching workforce who are "in it for the money" and could diminish the intrinsic motivation to teach among teachers already in classrooms.

Whether this happens in practice is an empirical question. To inform the Rwandan government about its own incentive structure for teachers, researchers designed a two-year experiment in partnership with Rwandan Education Board and the Ministry of Education, with support from the World Bank's Strategic Impact Evaluation Fund. The evaluation was set up to separately measure the impact of performance pay on the composition of teachers attracted to the teaching force and its impact on their effort in the classroom once hired.

After two years, researchers found that offering performance-based bonuses for the top 20 percent of teachers did not attract teachers with lower teacher skills, compared to offers of fixed wage contracts. Once in school, offers of performance-based bonuses increased teachers' presence in the classroom and improved their pedagogical practices. The performance pay also helped them elicit higher test-score performance from their students. Following this work, the government requested the research team to propose options for improving teacher recruitment, motivation, and retention to support the implementation of a new national system of teacher hiring and deployment. This collaboration is ongoing and also extends to the government's investments in a comprehensive assessment for basic education. These policies may provide key infrastructure for implementation of performance pay at scale.



EDUCATION

Context

Rwanda has made huge strides in expanding access to education, achieving 97 percent net primary school enrollment by 2015. Learning, however, remains a problem, with more than 30 percent of students dropping out before they reach sixth grade and 85 percent repeating a grade at least once.

While several performance-pay programs already exist in Rwanda's public sector, the government has expressed interest in reforming the incentive structure for teachers to make it more evidence-based. Under the existing *imihigo* system, public sector employees in other sectors receive financial rewards of up to 5 percent of their salary based on subjective performance evaluations. In public schools, a substantial share of teachers' existing salaries is made up of bonuses that are discretionary in theory, but in practice, all teachers receive a fixed bonus amount. A key challenge put to the researchers by the Rwanda Education Board was to design a performance award scheme that would not only reward student learning, through test-score outcomes, but would include measures of teachers' inputs into the classroom, which they could better control themselves, and which would reinforce professional norms. The result was a "4Ps" contract, emphasizing preparation, presence, pedagogy, and pupils' learning.

To test the impacts of paying the bonuses according to teacher performance, the study took place during and after the recruitment for civil service teaching jobs for upper primary school in six districts in 2016, covering over 600 hiring lines, or more than 60 percent of the country's planned recruitment in that year. The bonuses tested in the evaluation were set to RWF 100,000, equivalent to about 15 percent of teachers' annual salary, and were to accrue to the top 20 percent of upper-primary teachers within a district. Teacher performance was a composite measure of teacher inputs (teacher presence in the classroom, lesson plan-

ning, and observed pedagogy) and students' test scores. Students' test scores at baseline were divided into percentile-based brackets, and teachers' incentives were based on endline percentiles within these brackets. The use of bracket-based percentiles yields two important benefits with respect to equity and sustainability: because every baseline ability bracket is competing separately, there should be equal incentives for teachers to improve the performance of children of different levels of initial ability; and because the incen-



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World Bank

tives are based on percentiles rather than specific score thresholds, exams used at baseline and endline or the following year need not have exactly the same questions, making teaching-to-the-test less likely in a longer-run implementation. Within-district rather than within-school competition can also help to ensure that teachers would not directly compete with their peers. The fixed-wage contract instead provided a top-up of RWF 20,000 to all upper-primary teachers in the school. Both types of contracts had the same total costs to the government.

Evaluation

To separately identify the effects of a compositional change in the teaching force attracted to contracts with performance-based pay and the incentivizing effects of performance pay when teachers are already in classrooms, the study used a two-stage randomization.

Researchers first randomly assigned 18 labor markets—defined as application pools for a specific subject in specific districts—to performance pay or fixed-wage contracts. In one set of markets, through the advertised contracts, potential applicants applied to

positions where recruits to new primary posts would receive a contract with the performance-based bonus for the 2016 and 2017 school years. In the other set of markets, potential applicants were told that recruits to new primary posts would receive the fixed-wage contract for the 2016 and 2017 school years. Since teachers rarely go to teach in another district, comparing the recruits attracted to these two different types of contracts that had been randomly assigned to these labor markets would show whether performance pay attracted a different type of teacher to the teaching workforce.

In the second stage of the randomization, 164 schools hiring these new recruits were assigned to either the performance-based or fixed-wage contracts. All upper-primary teachers within each school, including the new recruits, received the contract type that was assigned to the school, regardless of what their contract assignment in the first stage was. This meant that there were some teachers who thought they would receive performance-based contracts at the time of recruitment but then learned they would actu-

ally receive fixed-wage contracts; likewise, there were teachers who thought they would be receiving fixed-wage contracts when they were recruited but who then were hired with a performance-based contract. To mitigate potential disappointment, all new recruits were offered an RWF 80,000 retention bonus if they remained in their post until the end of the year. Comparing these two sets of teachers – those who actually received a contract with the performance-based bonus and those who actually received a fixed-wage contract – would show how performance pay might affect teacher effort on the job.

Researchers surveyed applicants, hired teachers, and head teachers. They also made unannounced visits to the schools to measure teacher presence, their lesson planning, and their pedagogy in classrooms.

They measured students' academic achievement three times – at baseline, midline, and endline – using an oral exam based on the national curriculum that covered five core subjects (Kinyarwanda, English, Mathematics, Sciences, and Social Studies).

Findings

Teachers recruited under performance contracts exerted at least as much effort in the classroom as those recruited under fixed-wage contracts.

Individuals recruited under the performance contract were more money-oriented in a game that tested their intrinsic motivation compared to individuals recruited under the fixed-wage contract. However, this difference observed in a lab-in-field experiment did not spill over to their performance in the classroom. Recruits from the labor markets where performance-based contracts had been advertised performed no worse than the fixed-wage recruits in terms of their presence, lesson planning, or classroom conduct. The type of advertised contract also did not affect student learning.

The experience of teaching under performance-based pay improved student learning.

Compared to students assigned to teachers who experienced fixed wage contracts, students assigned to teachers working

under performance-based pay scored 0.11 standard deviations higher per year on average across the two years, and 0.16 standard deviations higher in the second year of the study. Effectively, this means that in the second year, the performance-linked bonuses moved a student from the median (50th percentile) up to the 56th percentile of students. The net effect of being recruited and then working under performance contract was 0.20 standard deviations of learning gain among students in the second year.

The improvement in learning outcomes likely followed from the improvement in teacher presence and their conduct in the classroom.

Teacher presence was 8 percentage points higher among those who experienced the performance contract compared to those who experienced the fixed-wage contract (a relatively large impact given that baseline teacher presence was close to 90 percent.) Teachers who received performance contracts also scored higher on a scale that summed up their classroom practices.

Performance pay did not appear to stress out teachers; teachers with these contracts were no more likely to quit during the two years of the study than teachers working under fixed-wage contracts.

The retention rate was identical across the two experimental groups at around 80 percent and when asked about their intentions to leave the following year, the two groups were also statistically indistinguishable. Moreover, among the 20 percent of teachers who did decide to leave, there was no difference across the groups assigned to different contracts in terms of their observed skills in the subjects they were teaching.

Overall, the performance-based bonus appears to be cost-effective, as it was designed to be budget-neutral for the government.

The performance-based salaries were designed to be the same cost to government as the fixed-wage contracts. It is worth noting, however, that measuring performance could require some additional costs, depending on how the government measures performance at scale. At minimum the government can use student test scores. Other aspects of performance—teacher presence, preparation, and pedagogy—could potentially be measured by head teachers or district staff at modest cost.

Conclusion

Ensuring children around the world are not only in school but also learning is challenging. When framed as a way to motivate teachers and improve student learning, performance-based pay often generates debate. This evaluation in Rwanda among public upper primary schools demonstrates that a well-designed incentive structure can improve teacher effort in the classroom and benefit student achievement without attracting

less motivated teachers into the profession or increasing teacher turnover. Further research will be needed in other contexts to validate these findings and examine longer-term impacts, but policymakers should be encouraged by these results as they show that implementing appropriate performance pay structures can be a cost-effective way to improve the performance of teachers.

The Strategic Impact Evaluation Fund, part of the World Bank Group, supports and disseminates research evaluating the impact of development projects to help alleviate poverty. **The goal is to collect and build empirical evidence that can help governments and development organizations design and implement the most appropriate and effective policies for better educational, health, and job opportunities for people in low and middle income countries.** For more information about who we are and what we do, go to: <http://www.worldbank.org/sief>.

The Evidence to Policy note series is produced by SIEF with generous support from the British government's Foreign, Commonwealth and Development Office and the London-based Children's Investment Fund Foundation (CIFF).



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1818 H STREET, NW, WASHINGTON, DC 20433