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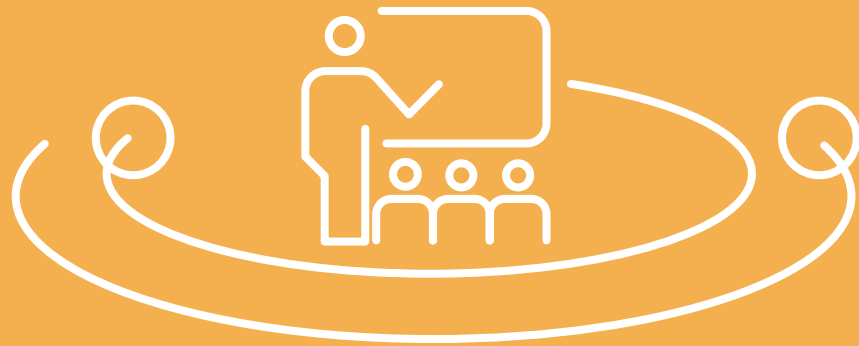
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SUCCESSFUL TEACHERS, SUCCESSFUL STUDENTS: RECRUITING AND SUPPORTING SOCIETY'S MOST CRUCIAL PROFESSION

OCTOBER 2021

WORLD BANK POLICY APPROACH TO TEACHERS
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“Teaching is the profession upon which all other professions depend.”¹

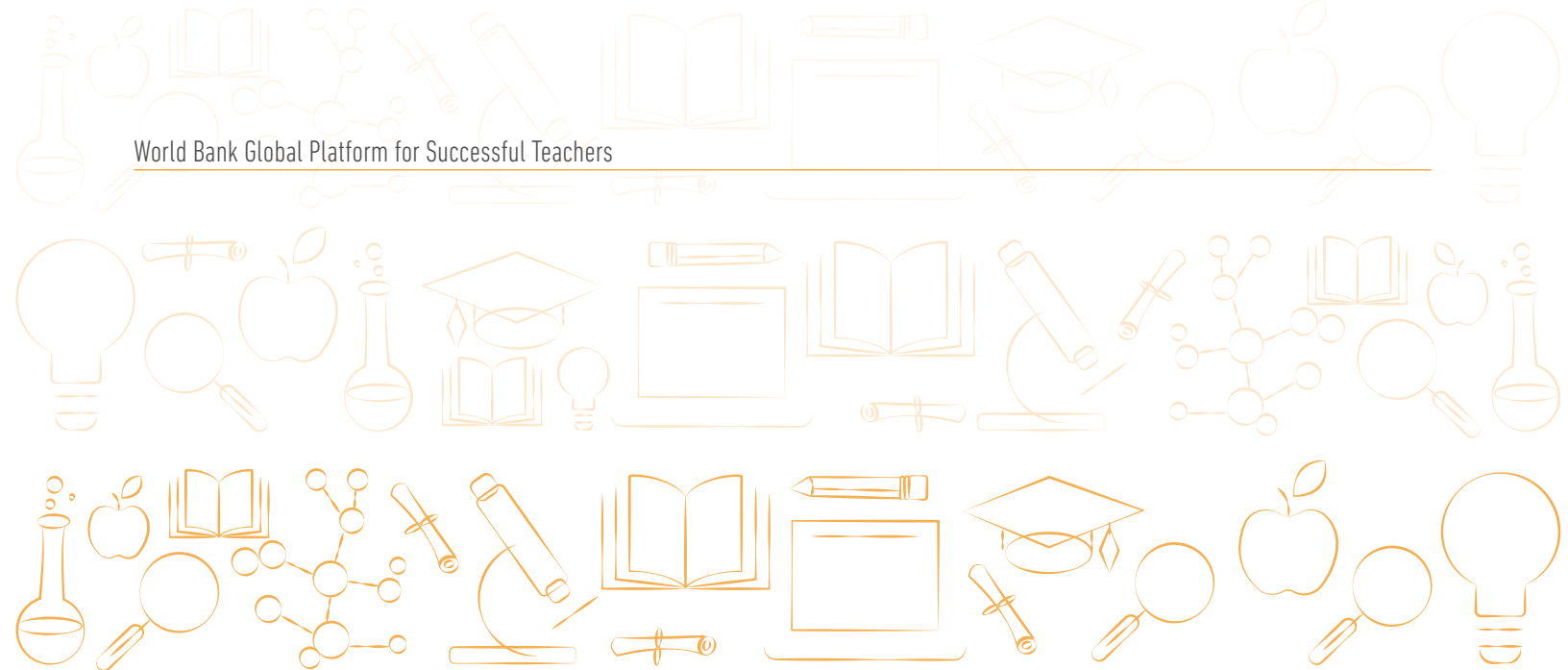
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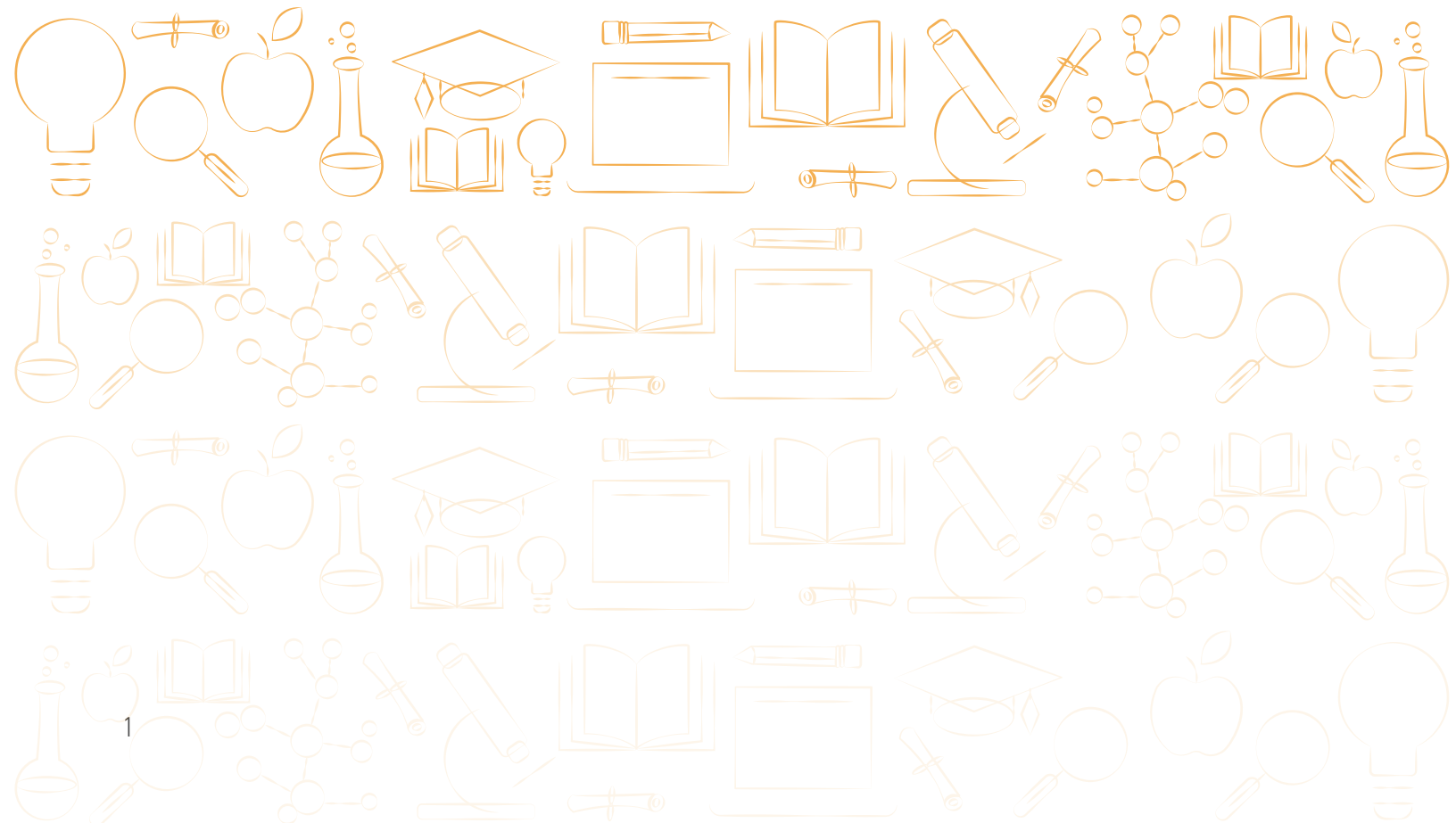
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The five principles discussed in this policy approach draw upon the World Bank's SABER Framework for Effective Teachers.

This is the second edition of this report. The first edition, by the same name, was published in January 2020.



WHY TEACHERS ARE IRREPLACEABLE



FOR MANY STUDENTS, TEACHERS ARE THE ADULTS WITH WHOM THEY WILL INTERACT THE MOST.

Successful teachers are likely to be the first role models that young people encounter outside the home. They teach content, make learning fun, shape students' attitudes, exemplify empathy, teach teamwork and respect, and build student confidence in several ways. Effective teachers prepare students for a world where they must interact with others, adapt quickly to change, and where success will hinge on knowledge as well as attitudes and behavior. Helping young people develop these skills is a complex task, especially when many come from deprived backgrounds. It requires routine human interface with people who combine deep knowledge, a conviction that all students can succeed, and empathy. Successful teachers are irreplaceable in this task—and will remain irreplaceable in the future.

COVID-19-related school closures changed the nature of interactions between students and teachers around the world. While students in some (mostly higher income) school systems remained in regular contact with their teachers through technology-enabled classes and continued to learn, many did not. As school systems try to recover from the pandemic, one thing is clear: content mastery, sound pedagogy, strong socio-emotional skills and classroom management skills, while still essential, are not enough. School closures will take place in the future, if not worldwide, then in individual countries for a variety of reasons. To be effective, teachers must also be able to use technology effectively to ensure learning beyond school walls, navigate unpredictable circumstances, and be flexible based on student needs.²

TEACHERS ARE SUCCESSFUL WHEN TEACHER POLICIES ARE DESIGNED AND IMPLEMENTED IN A MANNER THAT ATTRACTS HIGH-ABILITY INDIVIDUALS, AND PREPARES, SUPPORTS AND MOTIVATES THEM TO BECOME HIGH-PERFORMING TEACHERS.

A handful of countries, such as Finland, Japan and Singapore, boast a cadre of successful teachers. In most other countries — low-income, middle-income and high-income alike — teacher policies are either ineffective or lack internal consistency. For instance, in many countries, entry into teacher preparation programs lacks selectivity. Teacher qualifications are also set much lower than other profession. This immediately devalues the complexity of effective teaching. In even more, good teacher performance is not

recognized or rewarded. And in several countries, unprepared and poorly trained teachers are expected to teach a complex curriculum, which even they have a weak grasp on. Consequently, too many students across the world meet ineffective teachers every day, every year, as they go through school. Many drop out. These students have spent the most important part of their brain development years having learned little, while countries fail to recognize the costs of ineffective teachers and the benefits of investing in teacher performance.

THIS PAPER DESCRIBES THE VISION AND KEY PRINCIPLES GUIDING THE WORLD BANK'S SUPPORT TO COUNTRIES ON TEACHERS.

The World Bank's vision is to ensure all children are taught by effective teachers, with education systems supporting teachers to do their best. Effective teachers are teachers who combine deep content knowledge, high-quality practices, creativity and empathy to improve student learning today and their long-term readiness to learn. The World Bank considers it critical to observe the following principles to build cadres of effective teachers in middle and low-income countries:

Principle 1: Make teaching an attractive profession by improving its status, compensation policies and career progression structures

Principle 2: Ensure pre-service education includes a strong practicum component and essential digital skills to ensure teachers are well-equipped to transition and perform effectively in and beyond the classroom

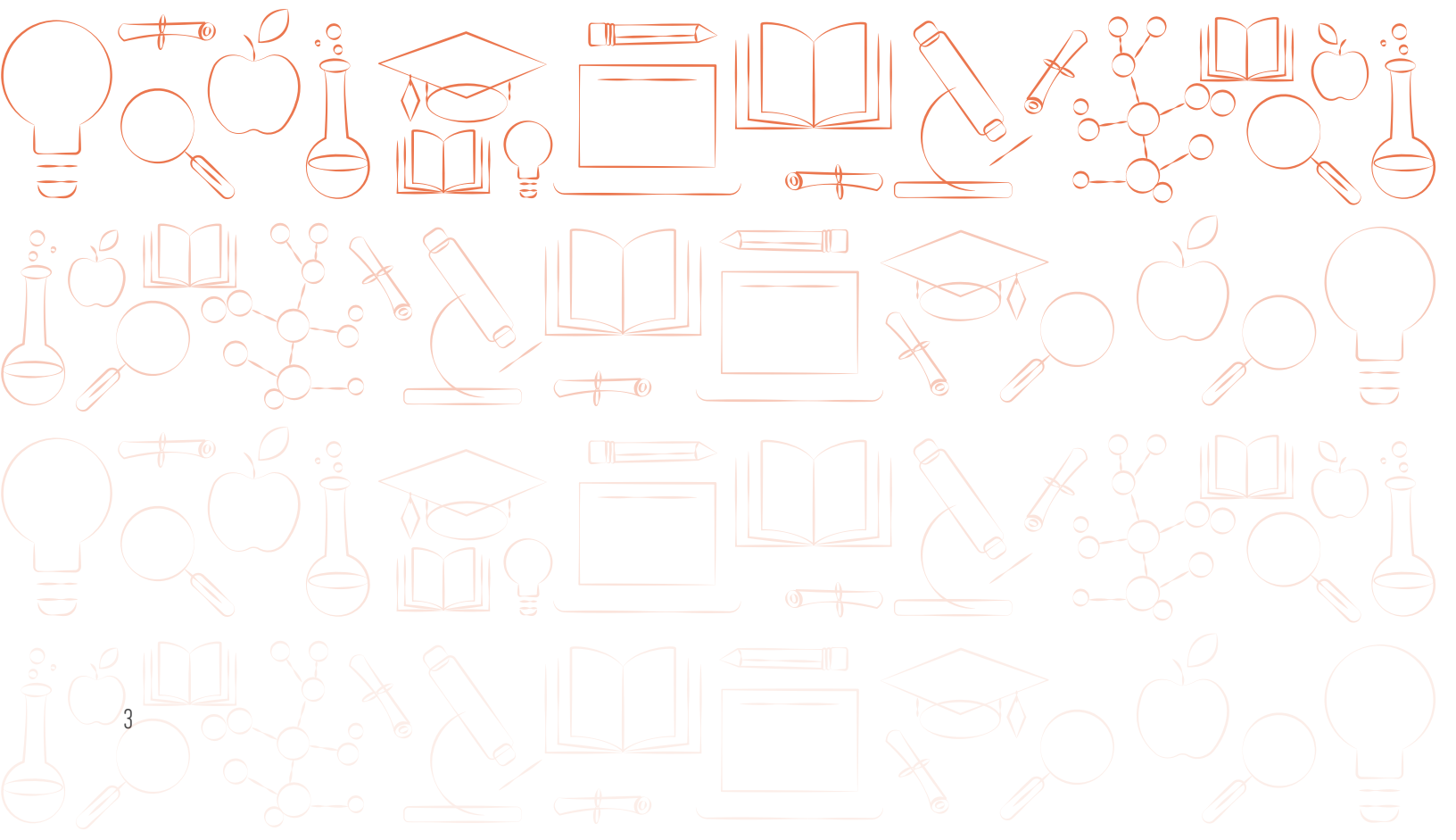
Principle 3: Promote meritocratic selection and effective deployment of teachers to ensure that all students have access to good teaching.

Principle 4: Provide continuous support and motivation, in the form of high-quality in-service professional development and strong school leadership, to allow teachers to continually improve.

Principle 5: Use technology wisely to enhance the ability of teachers to reach every student, factoring their areas of strength and development.



SOME BASIC FACTS ON TEACHERS



THE MOST EFFECTIVE INTERVENTIONS TO IMPROVE STUDENT LEARNING RELY UPON TEACHERS.

For instance, in a review of interventions across low- and middle-income countries, teacher-driven interventions such as structured pedagogy programs raised student language scores by 0.23 standard deviations and math scores by 0.14 standard deviations. This corresponds to approximately nine months and six months of learning respectively. Such programs include lesson plans and training to help teachers deliver new content and materials to students, and sometimes include mentoring and feedback. In contrast, community-based monitoring, centering on information campaigns to increase accountability, raised language scores by only 0.12 standard deviations, while computer-assisted learning programs did so by only 0.01 standard deviations. School-based management interventions actually had a small, negative association with test scores. Such interventions decentralize authority to the local level: school leadership, teachers, parents and community members and poor results may be associated with weak implementation and capacity constraints. In short, the interventions with the largest impacts worked through teachers.

TABLE 1: THE MOST EFFECTIVE INTERVENTIONS WORK THROUGH TEACHERS

INTERVENTIONS	LANGUAGE GAINS (SD UNITS)	MATH GAINS (SD UNITS)
STRUCTURED PEDAGOGY	0.23	0.14
COMMUNITY-BASED MONITORING	0.12	0.09
COMPUTER-ASSISTED LEARNING	0.01	0.02
SCHOOL-BASED MANAGEMENT	-0.01	0.01

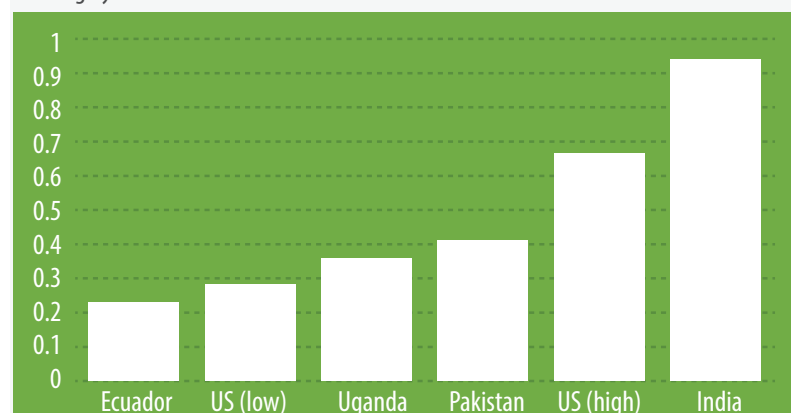
Source: Snilstveit et al. 2015.³

A SUCCESSFUL TEACHER CAN MAKE A MAJOR DIFFERENCE TO A STUDENT'S LEARNING TRAJECTORY.^{4,5,6,7,8}

Going from a low-performing teacher to a high-performing teacher increases student learning dramatically. The effect has been measured from more than 0.2 standard deviations in Ecuador to more than 0.9 standard deviations in India — the equivalent of multiple years of business-as-usual schooling (Figure 1).^{9,10,11} In contrast, a mediocre teacher does very little to prepare students for success. Effective teachers also have a substantial impact on the long-term well-being of students, affecting not only their academic achievement and how far they will study, but also their income once they enter the labor market.⁸ And teaching can be a tool for improving equity too: several years of outstanding teaching may in fact offset learning deficits of disadvantaged students.^{4,5,12,13}

FIGURE 1: THE IMPACT OF AN EFFECTIVE TEACHER ON STUDENT LEARNING (SD UNITS)

Moving from a 10th percentile teacher to 90th percentile teacher would increase learning by...



Source: Buhl-Wiggers et al. 2017; Bau and Das 2017.^{10,11}

IT IS, HOWEVER, DIFFICULT TO IDENTIFY WHO WILL BECOME AN EFFECTIVE TEACHER AND WHO WILL NOT.

Most observed characteristics of teachers, such as educational qualifications, pre-service education and experience (beyond the first few years), do not predict how effectively teachers will help students learn, what is often termed the “value-added” that teachers provide. A study looking at the relationship between teacher characteristics and teacher value-added in Pakistan found little relationship between teacher qualifications and teacher value-added in either government or private schools.¹¹ Similarly, in India, a study found little relationship between the qualifications of private school teachers and teacher value add.¹⁴ These findings are in line with the international literature on teacher value-added, which shows that the link between observable teacher characteristics and teacher value-added is weak.¹⁵ This is not because qualifications and experience are not critical — they are — but their quality is often too low to influence student learning positively.

BUT WE KNOW WHAT EFFECTIVE TEACHERS DO.

Effective teachers share certain behaviors and practices. In a study of East Asia's well-performing education systems — Japan, Korea, Singapore, Vietnam, and four provinces of China — a few things stand out. First, school systems in these countries ensure teachers have the requisite content knowledge and pedagogical approaches. In Shanghai, teachers come with strong content knowledge across a range of subjects, including English and Math.¹⁶ Teachers in Guangdong, China, performed at higher levels on a study assessing multiple dimensions of teaching than did teachers in other countries.¹⁷ Next, not only are teachers in these systems prepared with both deep content knowledge and a deep understanding of how students learn, they are able to provide concise and accurate explanations of this content as well as modify explanations based on circumstances. Furthermore, their pedagogical approaches share certain characteristics. For instance, they identify alternative pathways for students to learn content, and they focus on stimulating thinking and learning. As COVID-19 has made clear, effective teachers are also flexible, manage unpredictable situations well, and can use technology effectively to reach all students.

GETTING CONTENT AND PEDAGOGY RIGHT IS, HOWEVER, JUST ONE PART OF THE JOB.

Effective teachers do many other things, which may be difficult to detect until one sees a teacher in action. These tasks include planning and preparation, such as setting instructional goals; managing the classroom environment, by — for instance — establishing a culture for learning; instruction-related tasks, such as checking for student understanding of topics; and professional responsibilities, such as communicating with families.¹⁸ If schools must close suddenly and for prolonged periods of time, then effective teachers are able to plan the school day in a manner that restores some semblance of normalcy to student lives, assesses whether learning is taking place remotely, and reduces the sense of isolation some students might feel.

CLEAR, COHERENT, ALIGNED CURRICULA FACILITATE TEACHING EFFECTIVENESS.

Teachers need to be adept not only in content and pedagogical approaches, they need a strong understanding of the curriculum and learning goals for their discipline. Clear, coherent, and well-disseminated curricula, that are appropriately sequenced within and across grades, and that are aligned with learning materials make it easier for teachers to accomplish their goals.¹⁷ In too many cases, and especially in low- and middle-income countries, these resources are not available to teachers. Providing teachers with clear learning goals for content that is relevant, and appropriately sequenced for age and grade level free teachers to devote time to planning and executing all the other tasks a good teacher does. Education authorities are well served to ensure teachers have the clear and coherent curricula that promote learning.

BEYOND A SMALL SET OF COUNTRIES, TEACHERS DO NOT APPEAR TO HAVE THE SKILLS NEEDED TO BE EFFECTIVE.

While measuring teachers' content knowledge is not straightforward and data are scarce, available studies are not encouraging. In Sub Saharan Africa, the World Bank's Service Delivery Indicator (SDI) surveys in six countries show that 84 percent of grade 4 teachers have not reached the minimum level of competence.¹⁹ In Lao PDR, only 2.4 percent of all teachers had a score of 80 percent or more on a test of Lao language and math, and the average score on a test of pedagogy was 52 percent. A video study conducted in Indonesia that measured subject and pedagogical knowledge

of math teachers found that nearly 60 percent scored below 50 percent.^{20,21} In Afghanistan, a detailed study of teacher skills found that teachers fell behind grade-level competencies in numeracy and literacy skills.²² For instance, 56 percent of Grade 4 teachers could not solve a basic algebra problem. In Punjab, Pakistan, a recent study of public schools in three districts in Punjab, Pakistan, found that grade 4 math teachers correctly answered 77 percent of easy and medium difficulty questions from grade 3 and 4 math curricula and 65 percent of the questions from the grade 5 math curriculum.²³ To teach grade 4 math well, teachers need to know grade 4 math competencies (and for earlier grades) as well as more advanced competencies from grade 5. In Bihar, India, 25–33 percent of teachers were unable to answer basic questions in math and language.²⁴ For instance, when asked, "If 48 students are enrolled, and 36 are present today, what percentage is absent?", 36 percent could not answer.

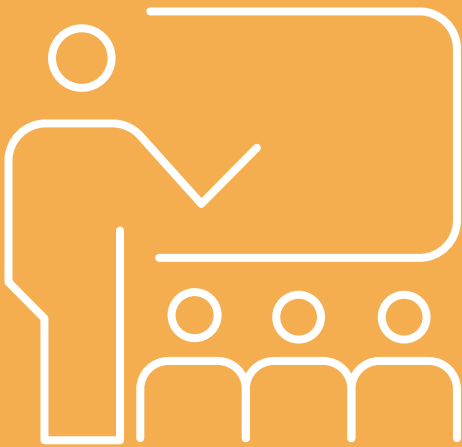
THERE ARE EVEN FEWER ASSESSMENTS OF TEACHERS' PEDAGOGICAL SKILLS IN LOW AND MIDDLE-INCOME COUNTRIES – AND THEY PAINT A SOBERING PICTURE.

One of the few sources of data on teachers' pedagogical skills — the World Bank's SDI survey — suggests large numbers of teachers do not choose the most effective pedagogy when asked how they would teach. In Sub-Saharan Africa, only a third of teachers answered the pedagogical questions correctly in the best performing countries, Kenya and Tanzania. In the worst performing country, Mozambique, only 15 percent answered the questions correctly. In Afghanistan, while only 65 percent of teachers could answer questions on number sequence correctly, their students perform considerably worse, suggesting that even if teachers know the content they are unable to impart it to students.²² In Bihar, India, many teachers who had adequate content knowledge were weak in explaining concepts.²⁴ For example, while almost 80 percent of teachers could correctly answer a long division problem (3 digit by 1 digit), only 11 percent of them were able to do all the steps correctly.

THE SCHOOLS OF TODAY AND TOMORROW WILL DEPEND UPON TEACHERS BEING FACILITATORS MORE THAN EVER BEFORE.

School systems in most countries have a long distance to cover in improving teacher quality today. Unaddressed, these challenges will only multiply as the demands from teachers increase. Teachers will need to empower every student to realize his or her potential. In the future, the skills that are likely to be valued most will continue to include domain-specific knowledge, but will also include skills such as agility, creativity, empathy, perseverance, teamwork and focus. These skills cannot be tested easily. Consequently, the role of teachers will need to shift to preparing students for success in life versus merely preparing students for tests. Teachers will need to inculcate a growth mindset in students, whereby students feel motivated enough to put in the effort and tenacity needed to improve their fortunes. They will need to focus on context mastery versus content mastery, that is, making lessons as relevant to a student's real world as possible.²⁵ They will need to be better prepared for unpredictable scenarios and prolonged school closures. This means that teachers themselves will need to have a growth mindset and become life-long learners.

WHY WE NEED TEACHERS: **KEY MESSAGES**



- Most effective education interventions work through teachers, making teacher policy design and implementation crucial to improve student learning.
- In well-performing countries, teachers do more than just master subject and pedagogy — they help all students learn how to learn. When schools closed for prolonged periods due to COVID-19, these teachers were able to continue engaging with students and ensure that learning continued. These skills, along with cultivating a growth mindset in students, will be important in schools of the future.
- In most countries, however, even the basics are not in place, with teachers frequently knowing much less than they need to teach effectively and assess whether students are learning. Even when they know the content, they are often not able to teach it. This is true regardless of whether the country is low or middle-income.

MAKING TEACHING AN ATTRACTIVE PROFESSION

PROFESSIONS ARE ATTRACTIVE WHEN THEY PAY WELL, PROVIDE AN ENVIRONMENT CONDUCIVE TO WORK, BUILD INTRINSIC MOTIVATION, AND OFFER LEARNING AND CAREER ADVANCEMENT OPPORTUNITIES. EACH OF THESE FACTORS IS POLICY-AMENABLE.

In addition to these, job prestige — the social status gains from being in a particular profession versus another — matters, but can be difficult to influence with policy. Prestige serves a sophisticated social function: whether a person's job is perceived as prestigious or not can have a huge impact on how they are viewed by others and even themselves. Better pay, conducive work environment, intellectual rigor of the job, learning and career advancement opportunities may add to job prestige, but so does job scarcity. Jobs that are scarce are also more likely to enjoy greater prestige. This creates a challenge for teaching jobs; rising demand for schooling inevitably makes such jobs more commonplace than scarce. Policy may need to overcompensate for the negative effects of status decline due to job abundance if it is to attract high-caliber candidates. This section discusses challenges and opportunities.

Teachers professional prestige matters — but teacher policies don't target this

STUDENTS LEARN MORE IN COUNTRIES WHERE TEACHING IS A WELL-REGARDED PROFESSION.

Teachers in OECD's top-performing countries report feeling valued as teachers. For instance, in Korea and Singapore, teaching is a highly valued profession. In these countries, 68 and 67 percent, respectively, of teachers agree that teaching is valued in society.

IN MOST COUNTRIES — BOTH WITHIN AND OUTSIDE THE OECD — THE TEACHING PROFESSION DOES NOT APPEAR TO ENJOY HIGH STATUS.

Teachers worldwide believe that teaching no longer enjoys the high social prestige it did thirty years ago.^{26,27,28} Two-thirds of respondents from a global survey across 21 countries (mostly high- and middle-income countries) judged the social status of teachers to be most similar to social workers or librarians; only in China did people compare teachers to doctors. On average, only 27 percent of respondents believed that students respected teachers.²⁹ Parents are more likely to encourage their children to become teachers in top-performing educa-

tion systems like Shanghai, China and the Republic of Korea than in most European countries, where respondents also think that students have less respect for teachers. This is echoed in surveys elsewhere as well. For example, 73 percent of teachers in rural schools in Ghana did not feel that they were respected in the community.²⁷ The Varkey Foundation's Global Teacher Status Index in 2018 reached similar conclusions, with China at the top and Brazil at the bottom in terms of teacher status rankings.³⁰

TEACHERS LIKELY PERCEIVE THEIR PROFESSIONAL STATUS AS INADEQUATE DUE TO SEVERAL FACTORS, EACH AMPLIFYING THE EFFECT OF THE OTHER.

States and societies fail to support teachers in many respects, diminishing the professional status of teachers in many ways. Key factors include teacher salaries, lowering of qualifications, poor working conditions, expansion of the teaching force and limited opportunities for learning and career advancement. In Bangladesh, Pakistan and Sri Lanka, government teachers are paid less than other government employees, such as government doctors, engineers and lawyers.²³ A study of thirteen Latin American countries found that teachers are underpaid relative to other professionals, while a study of fifteen African countries found a more mixed picture, with lower monthly salaries in many countries but higher hourly wages.^{31,32} Solely looking at the quantity of time worked might not be a good metric for the effort expended in teaching, stress levels in teaching, or the impact of effective teaching on human capital development relative to other professions. Top-performing countries, such as Singapore and Japan, recognize the importance of effective teaching, as well as the difficulty therein, and pay their teachers well against professions such as engineering and law. They also select the top students from a given high-school cohort. This gives teaching professional prestige in these countries. Furthermore, teachers often do not have the basics to be effective, such as school supplies and basic infrastructure.² In Latin America, a documented decline in teaching prestige in recent decades appears to stem not just from the massive expansion of schooling — something that has taken place more recently in other parts of the world, such as Africa — but also from changes in the female labor market. Women who previously only had one clear career opportunity—teaching— now have many, which is a positive move for society but means that teaching can no longer count on automatically attracting the most qualified women in the labor market.²⁶

TEACHERS THEMSELVES ENGAGE IN BEHAVIOR AND ACTIVITIES WHICH UNDERMINE THE REPUTATION OF TEACHING.

Such behavior includes high rates of teacher absence, little teaching when present, moonlighting as private tutors and political activity. In Lao PDR, teacher absence rates hover at 16 percent. In India, there was little change in teacher absence rates in schools over the 10-year period between 2002 and 2012, with 24 percent of teachers in government schools absent on average on any given school day. Among the nine countries in sub-Saharan Africa participating in the SDI surveys, primary school teacher absence rates range from an average of 14 percent in Nigeria to 43 percent in Mozambique.¹⁹ But the rates of teacher absence from class in all nine countries exceed the corresponding rates of absence from school by at least 20 percent, and as much as nearly five times. This suggests that in many countries teachers may report to work but not be teaching for the required time. Schools rarely have a system in place for covering teacher absences from the classroom, so teacher absences mean that little or no learning occurs during that time.

TEACHERS OFTEN MOONLIGHT AS PRIVATE TUTORS, WHICH COMPROMISES THEIR INTEGRITY AS TEACHERS AND DEVALUES THE PROFESSION.

In Nepal, 32 percent of private school students and 38 percent of government school students were being tutored by teachers from their school.³⁰ This might reflect perverse incentives, with teachers performing sub-optimally during regular school hours to create demand for their tutoring services.³³ At the same time, teachers might also provide tuitions because their salaries are low. In Cambodia, for instance, teacher salaries are low and often paid late, pushing teachers to provide private tutoring to increase their income. Teachers are often used in political work — to the extent this confers power on them, it could increase their status; but if it deters them from teaching, then it could compromise occupational prestige. Finally, teacher union leaders often mobilize teachers to undertake strikes against teacher reform policies, which add to the sense of a profession that is not interested in performance.

SIMPLE COMMUNICATION STRATEGIES HOLD PROMISE FOR IMPROVING TEACHER STATUS.

While improving teacher status involves addressing fac-

tors such as compensation, career progression, entry criteria and teacher preparation, discussed later in this paper, communication strategies can play an important role. A study of teacher status, mostly in OECD countries, shows that perceptions of teacher status and factors related to improving the status of teachers include building awareness of the complexity and intellectual demands of the job and teachers' contributions to society.³⁴ England, for instance, used several communication strategies, including posters to communicate the importance of the teaching profession along with the salary scale. The District of Columbia Public Schools system uses posters to emphasize the importance of teachers, with the tagline: "You don't need to be famous to be unforgettable."

In response to the low status of teachers among students and their families, public schools in Delhi, India, are working to change the image of teachers and make them more accessible to parents and children. To make teachers and schools more accessible to students and parents, Delhi schools have organized events on Teacher's Day (Samvaad, or dialogue) to bring teachers and students together to better understand each other's challenges and concerns both inside and beyond the classroom. Parent-teacher meetings are also organized on the same day in all Delhi public schools and heavily publicized to generate interest among parents and create a culture where schools are perceived as open institutions, with principals and teachers easily accessible to parents. Technology can play a key role in such communication campaigns, with the rise of social media and electronic communication.

These communication strategies may require fine-tuning. A large-scale effort to attract high school students into the teaching profession in Chile experimented with different messages. A message emphasizing recent gains in teacher salaries actually boosted applications from low-performing students, and a message emphasizing the satisfaction teachers derive from helping others reduced applications from high-performing students.³⁵ Any communication strategy should be piloted and tested with the targeted group.

Teacher compensation policies are rarely structured to attract or motivate the best

TEACHER COMPENSATION PACKAGES TYPICALLY COMPRISE THREE ELEMENTS — BASE PAY, BENEFITS AND ALLOWANCES — BUT RARELY BONUSES.

Teacher compensation packages tend to have the first three, with a small number of education systems adding a bonus. Teachers base pay (and subsequent increases) is usually based on educational qualifications, experience and education level taught, with base pay increasing as qualifications, experience and level taught increase. In general, pre-primary teachers are paid the least, while upper secondary are paid the most. In Denmark, Lithuania and Norway, upper secondary teachers with 15 years of experience earn between 25-30 percent more than pre-primary teachers with the same experience, while in Finland and the Slovak Republic, they earn 36-50 percent more, and in Mexico, 88 percent more. Exceptions include Iceland and Israel, where a pre-primary teacher earns 5-10 percent more than an upper secondary teacher.³⁶

THE TIME IT TAKES TO PROGRESS THROUGH DIFFERENT SALARY LEVELS, AND THE DIFFERENCE IN PAY BETWEEN ENTRY-LEVEL PAY AND SUBSEQUENT LEVELS, MIGHT BE IMPORTANT IN ATTRACTING HIGH-QUALITY CANDIDATES TO TEACHING.

OECD's most recent Education at a Glance shows that while base pay increases with educational preparation (proxied by professional degrees) and experience in all systems, countries vary significantly in terms of the time it takes to reach the top of the salary scale and the amount of the change. For instance, in Greece, Korea and Israel, lower secondary teachers reach the top of the salary scale after 35 years of service, whereas in Australia and New Zealand, it takes about 6-8 years. Similarly, salaries at the top of the scale are 104 percent higher than starting salaries in Israel, but 66 percent higher on average for the rest of the OECD.³⁶

TEACHING EFFECTIVELY IS A DIFFICULT JOB, BUT TEACHER PAY DOES NOT ALWAYS REFLECT THAT.

Teaching is a complex job for all the reasons mentioned previously. Yet, as discussed in the previous section, teachers are typically paid less than other professionals on a monthly basis, but in some education systems, they may work fewer hours, such that their hourly pay may compare well with other professions.³² Looking at the quantity of time worked might not be a sufficient met-

ric for the effort expended in teaching. Furthermore, the impact of teaching on human capital accumulation is long-term: an effective teacher teaching forty students for thirty years would have made a lasting impact on the lives of 1200 young people. Multiply this number by the number of effective teachers in a country, and the impact on productivity and economic growth is easy to see. Quantifying the emotional effort teachers expend relative to other professions is difficult; however, if one focuses on stress levels, several studies suggest teaching is a highly stressful profession, with teachers often tying with nurses for being the most stressful occupational category.^{37,38} Several strong education systems, such as Singapore and Japan pay their teachers generously.

ENSURING TEACHER BASE PAY IS COMPETITIVE WITH OTHER PROFESSIONS IS IMPORTANT FOR TWO REASONS.²⁹

First, if teachers are paid in the top 20 percent of the earnings distribution of a country, then it is likely that teaching will attract some of the most able graduates. Conversely, if teachers are poorly paid, then teaching will attract either the less able, or individuals using teaching as a "waiting room" before they get another job. While there will always be individuals who work purely for the intrinsic rewards of the job, this is unlikely to be a dominating factor.²⁹ Second, and related to the first, improving teacher pay improves teachers' standing in a country's national income distribution and hence the national status of teaching. The higher the status, the more competitive the applicant pool is likely to be. Of course, high pay alone will not guarantee student learning, but low pay is unlikely to attract high-quality individuals to teaching and secure the learning gains countries seek.

NOT ONLY SHOULD TEACHER PAY BE FAIR ACROSS OCCUPATIONS, IT SHOULD ALSO BE FAIR ACROSS TYPES OF TEACHERS DOING THE SAME JOB.

In several countries in South Asia and Africa, nonpermanent teachers — teachers hired for a fixed period of time or whose contracts can be terminated relatively easily — receive lower pay than their counterparts on regular contract. While expected to perform the same job as regular teachers, the bar on their qualifications is lower, which explains their lower pay. In reality, given the glut of teacher-applicants in several countries, those with the highest qualifications are chosen for nonpermanent assignments. Their qualifications are similar to regular

teachers; yet, they end up being paid less. This creates a sense of unfairness and disenchantment among such teachers.

INITIAL TEACHER PAY (AND SUBSEQUENT INCREMENTS) TEND TO BE BASED ON FACTORS THAT ARE NOT KEY TO IMPROVING STUDENT LEARNING — EDUCATIONAL QUALIFICATIONS AND YEARS OF EXPERIENCE.

Educational qualifications in most low and middle-income countries are of low quality, and while they provide candidates a qualification, they rarely prepare teachers adequately for their jobs (discussed subsequently). Similarly, the years of experience in a teaching job might have little impact on student learning, if the teacher continues to teach poorly. Using these elements as key determinants of base pay will therefore have little effect on attracting the kind of teachers who will improve student learning.

INSTEAD, FOR COUNTRIES TO GET THE MOST FROM THEIR EDUCATIONAL INVESTMENTS — THE BULK OF WHICH GOES TO TEACHER SALARIES — TEACHER BASE PAY (AND INCREMENTS) SHOULD RELATE TO FACTORS KNOWN TO INFLUENCE STUDENT LEARNING — CONTENT KNOWLEDGE AND TEACHING ABILITY.

Since these factors are not proxied accurately by most professional degrees, well-designed tests and evaluation by supervisors or peers could help identify how well a teacher performs relative to best practice in the sector, which in turn could be used to determine base pay. Additionally, teacher base pay (and increments) should be used to compensate teachers for job hardship, including working in difficult areas. Yet, this rarely happens. In Rajasthan (India), for instance, teachers in urban areas are paid more to adjust for cost of living; but those in remote rural areas are not, despite job hardship. Consequently, it is difficult to attract high-quality candidates to the places that need them the most—impoverished remote areas.

BENEFITS ARE AN IMPORTANT PART OF TEACHERS' COMPENSATION PACKAGE, ESPECIALLY FOR TEACHERS ON REGULAR CONTRACT.

Benefits are important because they can add considerably to the total remuneration. In Bangladesh, allowances, such as medical allowance and social benefits,

make up more than half of total remuneration and tend to increase even in years when public sector pay does not increase.²³ In Sri Lanka, in addition to basic pay, government school teachers receive standard cash benefits, such as a flat-rate cost of living adjustment allowance and a special allowance.³⁹ In India, take-home pay includes basic pay, grade pay, cost of living allowances, rent allowance, city compensatory allowances, and sometimes other allowances.

TEACHER SALARY INCREASES OR BONUSES BASED ON PERFORMANCE REMAIN THE EXCEPTION RATHER THAN THE NORM.

Traditional teacher salary policies do not have a bonus component to reward performance or distinguish between teachers based on performance. Theoretically, incentives could work to improve teacher effectiveness in several ways.⁴⁰ First, when incentives are aligned with specific behaviors (like regular attendance) and outcomes (for example, improved student test scores), they signal the intention of the education system to hold teachers accountable for achieving results. Second, incentives can motivate teachers to continue to perform well by recognizing their efforts and the results they achieve. And finally, incentives can influence the profile of the teaching profession by creating a performance orientation.

IN PRACTICE, LINKING TEACHER PERFORMANCE TO MONETARY BONUSES OR HIGHER SALARIES HAS SHOWN MIXED RESULTS.^{41,42,43}

Meta-analyses of teacher merit pay programs across countries typically find no effect; when they find an effect, the size is small. A recent evaluation of merit pay programs in developing countries found that effect sizes range from a minimum effect of -0.08 SD and a maximum effect of 0.32 SD increase in student test scores. The median reported effect size is a 0.056 SD increase.^{40,44,45} Furthermore, merit pay programs might crowd out the type of behavior they are trying to reward by encouraging sub-optimal behavior. One meta-analysis found that 27% of all merit pay programs that were rigorously evaluated reported sub-optimal effects such as cheating or teachers teaching to the test during program implementation. Furthermore, nearly 55 percent did not last beyond the evaluation period.⁴⁰ Of those that continued, only Chile has seen positive and significant outcomes on student achievement.

BOX 1: CHILE'S EXPERIENCE WITH PERFORMANCE PAY



Chile's experience shows that deliberate planning and phasing of reforms can create a conducive environment for monitoring and evaluating teacher performance and holding teachers accountable for student learning. In the 1990s, Chile implemented a program that awards a bonus to schools and to all teachers in the school for outperforming other schools on a national student exam. Schools serving students with similar demographic characteristics in

similar settings are grouped together. Teachers receive a bonus (not a permanent salary increase) equivalent to 5–7 percent of their annual salary. As much as 90 percent of the bonus award is divided among teachers, and the school director determines how to use the remaining 10 percent. Chile's program has had a cumulative positive impact on student performance in schools with reasonably good chances of winning the award. The success of Chile's education reforms and the gradual improvement in student performance are attributed to three important factors: consensus in policy and politics (using large-scale consultations to prioritize education as a political priority and build consensus on long-term proposals for reform); multipronged efforts to improve quality (slow phasing of multiple reforms have had a positive cumulative effect on quality improvement); and teacher professionalization (including rebuilding teacher morale through incentives and professional development).

Source: Breeding and others, 2018; Béteille and others, forthcoming; World Bank 2018^{17,23,40}

THE LOW EFFECT SIZES OF MOST MERIT PAY PROGRAMS MAY DERIVE FROM PROBLEMS WITH DESIGN AND IMPLEMENTATION, INCLUDING LACK OF TEACHER BUY-IN.

While performance pay programs could potentially improve student learning, many other things also need to be in place. These include matching size and kind of incentive to context; having good monitoring and evaluation mechanisms to track changes; built-in considerations for program sustainability and teacher buy-in.⁴⁰ Merit pay programs tend to be politically contentious, and strongly opposed by teacher unions. Countries with successful experiences with merit pay have been able to garner broad political support for the program and guard against corruption (see Box 1).

MERIT PAY PROGRAMS MAY SOMETIMES NEGLECT INTRINSIC MOTIVATION, WHICH IS IMPORTANT IN COMPLEX JOBS SUCH AS TEACHING.

Merit pay programs fall in the category of extrinsic reward programs or “carrot and stick approaches.” Such approaches might work well for standardized tasks or tasks which require repetition of a set method and compliance. But they may not work well for tasks requiring creativity or problem-solving, which require engagement versus compliance.^{46,47} Effective teaching, in particular, relies upon continuous problem-solving, creativity and engagement, since students vary in their learning abilities and trajectories and effective teachers must find a way to help every student. Carrot and stick approaches may even crowd out intrinsic motivation unless designed carefully. One effective program evaluated via a randomized evaluation in Andhra Pradesh (India) may have achieved its results because it also stimulated intrinsic motivation, with the program emphasizing “teacher excellence” rather than focusing on school and teacher accountability. While methodologies for monitoring accountability (for instance, classroom observation and interviews with head teachers and teachers) were built into the design of the evaluation, these were not emphasized as the primary goal of the incentive program.⁴³

INTRINSIC MOTIVATION RELIES UPON MASTERY, AUTONOMY AND PURPOSE.

Teachers in East Asia’s top-performing education systems demonstrate task mastery, being fully prepared to help students learn. Furthermore, professional development opportunities in these countries focus on helping teachers continuously update their skills, no matter how effective they are. Teachers are also given autonomy in solving classroom and other concerns in the manner they deem

most effective. Finally, effective teachers share a sense of purpose in ensuring all children are learning: “I don’t teach physics,” says Charles Chew, a teacher in Singapore, “I teach my pupils how to learn physics.”¹⁷ Policymakers seeking to improve the quality of their teaching cadre may want to focus efforts on helping teachers build their skills, letting them decide how to solve problems to elicit learning, and building a sense of purpose in teachers by improving the overall status of teaching. A key point about intrinsic pay being effective: teachers must be paid a fair wage to start with; otherwise their focus will be on the unfairness of the situation and the anxiety of making ends meet. Importantly, focusing on intrinsic motivation does not mean discouraging accountability. Effective education systems support their teachers but also ask a lot from them.

IN SUMMARY, DESIGNING EFFECTIVE COMPENSATION POLICIES WOULD REQUIRE ANSWERING THREE SETS OF QUESTIONS⁴⁸

(1) how teacher effectiveness should be measured; (2) what aspects of effectiveness should influence the different components of salaries (base and bonus); and (3) how challenging and substantial the effectiveness-based awards should be. The literature suggests teacher effectiveness should be estimated based on multiple sources of information such as direct observation of teaching practice and improvement in student test score. Base salaries should be determined by how well a person performs his or her job relative to best practice in the sector. This could be measured through supervisory or peer evaluation. Bonuses should be determined by how well teachers influence student learning. Finally, the literature suggests that bonuses should be differentiated (that is, varying dollar amounts based on effectiveness); challenging to earn (that is, a threshold not all teachers can achieve); and substantial (at least 5 percent of salary).

Career progression structures are rarely based on performance

WELL-PERFORMING COUNTRIES ARE ABLE TO ATTRACT HIGHLY-QUALIFIED CANDIDATES INTO TEACHING BECAUSE OF OPPORTUNITIES FOR CAREER ADVANCEMENT THROUGH CAREER LADDERS.

A career ladder establishes an ordered set of job positions with increasing responsibility and leadership, assigned based on teaching merit, with permanent status (versus

temporary status) and salary.⁴⁸ Offering teachers attractive career opportunities can draw the best candidates into teaching, incentivize them to stay, motivate them to perform well and utilize their expertise to improve the performance of other teachers. In most education systems teachers have the opportunity to seek promotion to the position of principal, typically based on years of experience. Beyond that, career progression opportunities tend to be limited.

HIGH-PERFORMING EDUCATION SYSTEMS ALSO OFFER TEACHERS OPPORTUNITIES FOR LATERAL PROMOTIONS TO OTHER ACADEMIC OR MANAGERIAL POSITIONS.

Lateral promotions enable teachers to grow professionally, yet remain closely connected to instruction if they choose.^{49,50} To be effective, career advancement decisions must be linked to systems that monitor and evaluate teacher performance. Additionally, in systems where career advancement structures work well, as in Shanghai, China, and Singapore, enhancing teachers' skills throughout their careers through professional development and formative assessment is a key component of the teacher performance management system. Shanghai uses the concept of professional communities to foster collaboration among teachers and encourage peer-to-peer learning and accountability. A five-tiered ranking system allows for professional advancement in teaching careers up to the level of "outstanding teachers" for teachers who demonstrate superior teaching practices (and who generally have many years of service). Regular evaluations determine promotions to a higher rank and are accompanied by salary increases.

SINGAPORE'S TEACHER PROFESSIONAL DEVELOPMENT AND CAREER PLAN CONSISTS OF A CAREER FRAMEWORK FOR ADVANCEMENT, AN APPRAISAL SYSTEM, AND A RECOGNITION AND FINANCIAL COMPENSATION SYSTEM.

When teachers enter the profession, they can choose one of three career tracks based on an initial assessment. The teaching track is for teachers who want to remain in the classroom and aspire to become "Master Teachers" or "Principal Master Teachers" who mentor other teachers, lead curriculum innovation, drive new pedagogies, and so on. The leadership track is for teachers who want to move on to leadership positions in the school or Ministry of Education. The specialist track is for teachers who want to develop deeper knowledge and skills in a specific discipline

and assume leadership roles in the ministry that focus on curriculum development and evaluation. Levels within each track are mapped to a range of coordinated experiences and training to prepare teachers for roles with greater responsibility. Movement along each track (or between tracks, if teachers choose) is based on an appraisal system that uses multiple sources of information to assess teachers. Singapore's Enhanced Performance Management System is a holistic appraisal tool that involves planning (for teaching goals, innovations in instruction, school improvements, and personal and professional development), regular support and coaching to the teacher, and an intensive performance evaluation. The performance evaluation results in a performance grade that is used, along with other information from the appraisal, to determine promotions, movement along the career ladder, and performance bonuses.²³

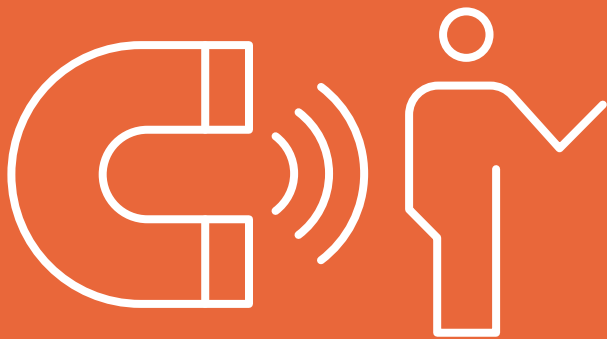
MOST OTHER COUNTRIES DO NOT HAVE LEGISLATION OR POLICIES IN PLACE FOR CAREER DEVELOPMENT.⁴⁸

Across Sub Saharan Africa and South Asia, promotions are based on qualifications and experience. Sri Lanka is a recent exception in South Asia, where the career framework offers mobility across roles associated with the classroom, to administrative positions, and to roles involving advisory or training services or becoming a teacher-educator. However, coordination of teacher career development between government institutions is weak, and teachers lack systematic information on opportunities and about whom to consult.

EFFECTIVE CAREER PROGRESSION STRUCTURES HAVE THREE FEATURES: (1) LEGITIMACY; (2) ACCESSIBILITY AND (3) FEASIBILITY.

How career progression structures policies are enacted makes a lot of difference to their success. First, career progression structures must be legitimate. Legitimacy rests upon clear and transparent selection processes; meaningful tasks being assigned to teachers in the ladder; ongoing communication with all teachers; and public recognition of the system. Second, they must be available to all teachers: all teachers should feel they have an opportunity to benefit from career ladders if they meet the criteria. Finally, feasibility means that supplemental resources are available, both in the form of additional financial resources to supplement the income of teachers who rise in the ladder, as well as the availability of professional development opportunities for such teachers.

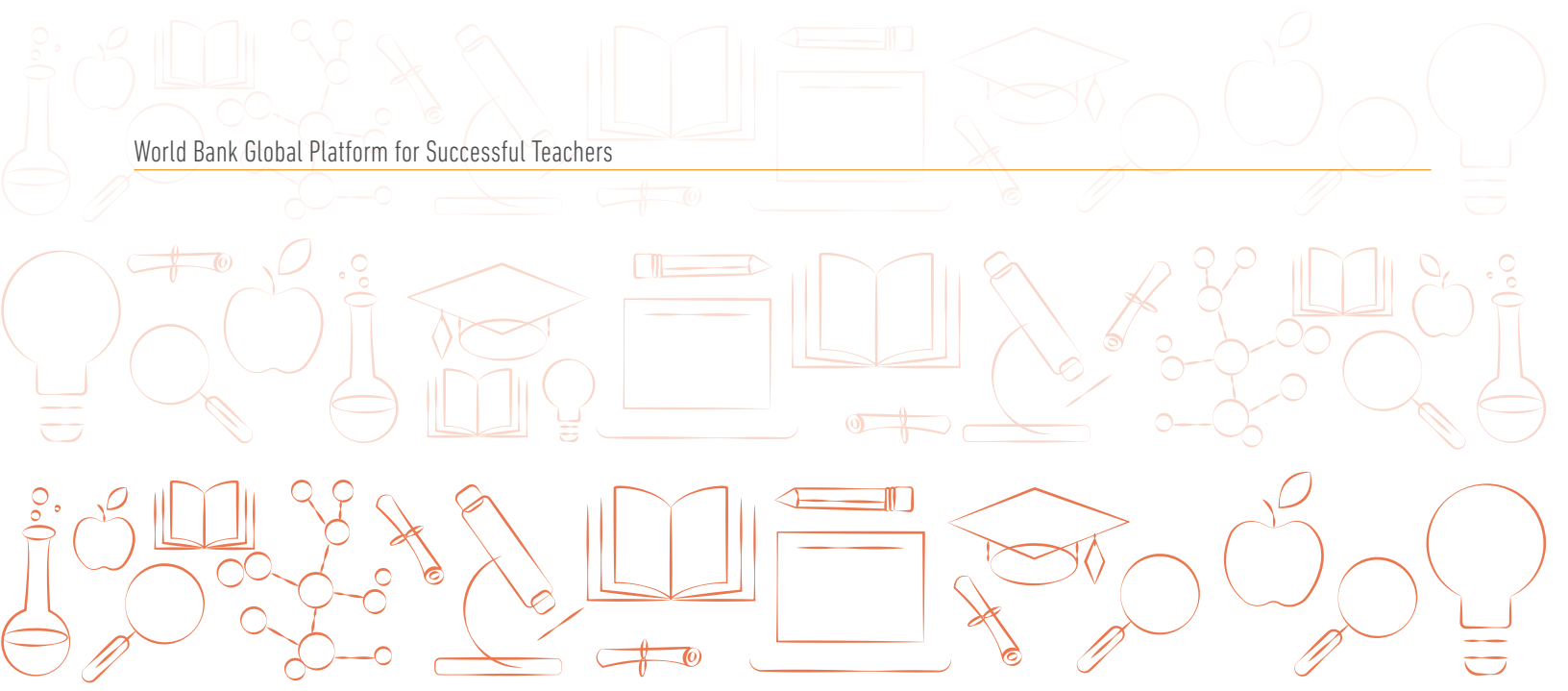
MAKING TEACHING AN ATTRACTIVE PROFESSION: KEY MESSAGES



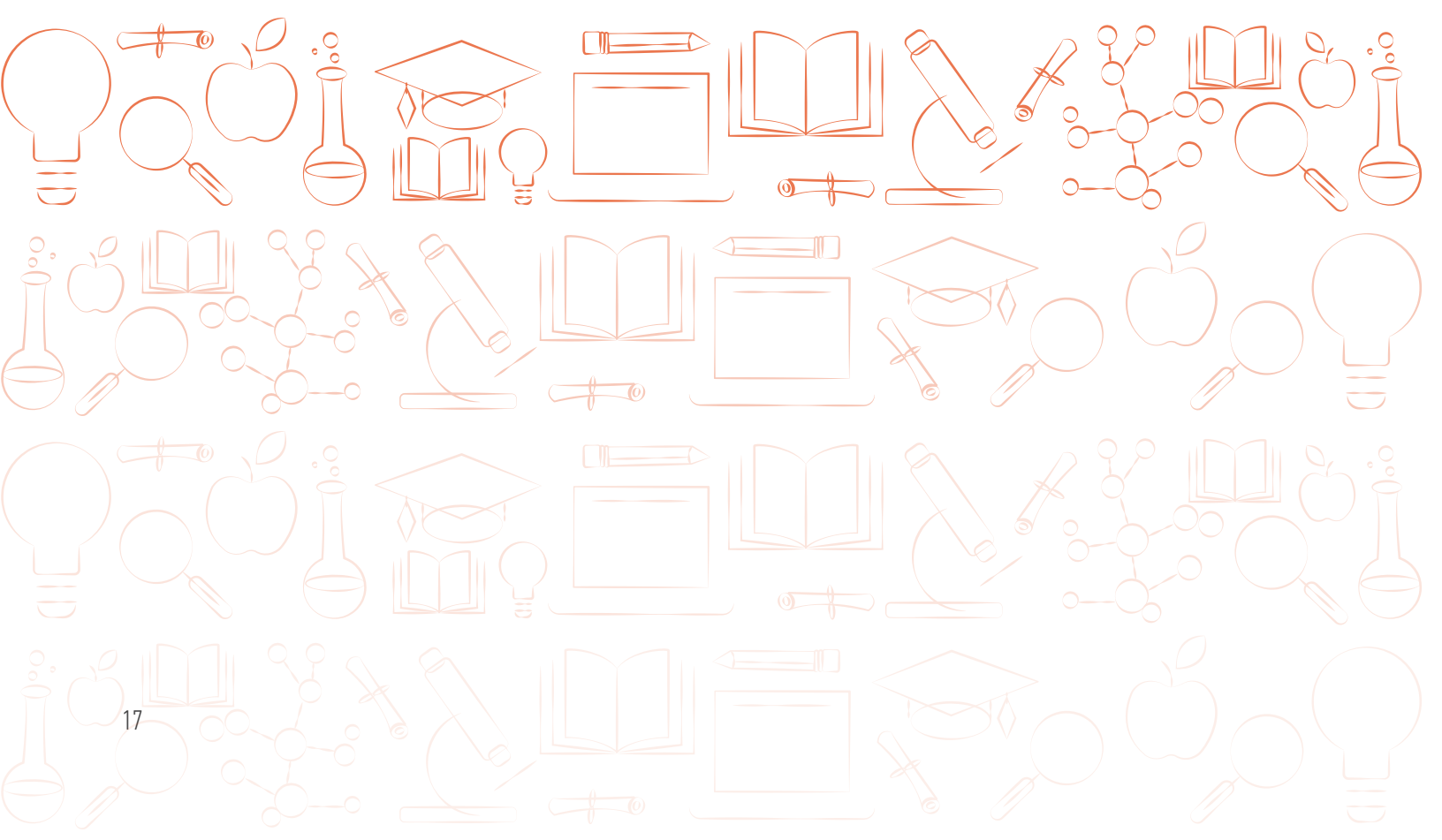
- Higher status for teachers is correlated with better student performance, but improving occupational prestige is challenging. There are no shortcuts. Common mechanisms include teacher compensation policies that resemble

those in professions with higher status and creating greater awareness about the difficulty of the job.

- Teacher compensation policies do not reward performance in most countries. Whether or not compensation policies rewarding performance are likely to be effective depends on whether the main constraints to better teaching lie within the reach of teachers, and if information and management systems would allow such a system to be credible. The specific design of compensation policies will vary across countries, but the underlying principles and goals are the same: providing sufficient incentives to attract and retain the best qualified for teaching, while maintaining intrinsic motivation for great teaching.
- For career progression structures to be effective, three factors are important: (1) legitimacy, (2) accessibility, and (3) feasibility.⁴⁸ Ongoing communication and committed leadership play a key role in making career progression structures successful.



PROVIDING TEACHERS WITH THE TOOLS THEY NEED BEFORE ENTERING THE CLASSROOM



TEACHERS NEED TO BE PREPARED WITH A WIDE RANGE OF SKILLS TO BE EFFECTIVE IN THE CLASSROOM.

To perform all the behaviors and tasks discussed previously, teachers must be prepared with both traditional and non-traditional skills before they join teaching. Traditional skills include content knowledge and sound pedagogy; non-traditional skills include being able to foster socio-emotional skills, such as empathy and creating a growth mindset in students. Teachers must also be able to manage heterogenous learning trajectories, as well as use technology to maximize learning gains for all students. COVID-19 has made the task even harder as teachers must become proficient with distance teaching and learning mechanisms. They must be able to use different types of technological aids effectively, and improvise when technology is limited or fails. This is a long and difficult wish list, especially when countries are some distance from ensuring teachers enter the classroom with the most basic traditional skills.

STRONG PRE-SERVICE EDUCATION PROGRAMS HELP TEACHERS COME PREPARED TO TEACH AND MANAGE CLASSROOMS.

A good pre-service education program is the first step toward equipping teacher-candidates with the content, pedagogical, technological, and managerial skills they need for becoming effective teachers. That is how it is with other professions. For instance, one cannot be a pilot without being well-trained beforehand. Ironically, however, the quantitative evidence on the causal impact of pre-service education on a teacher's ability to improve student learning is inconclusive. Most econometric analyses find relatively little impact of a teacher's pre-service education on student learning; furthermore, there is limited consensus on which factors in pre-service education affect student learning more.⁵¹ Uncertainty regarding the effects of teacher pre-service education comes largely from methodological challenges:⁵² teachers' abilities coming into training are correlated with the training programs they enter, and both may be correlated with the schools they are sent to teach in and their students' results. All these connections pose difficulties in isolating the impact of pre-service training.

IF WE LOOK AT PRE-SERVICE EDUCATION PROGRAMS IN COUNTRIES WHERE TEACHING IS A SOUGHT-AFTER CAREER AND STUDENT LEARNING IS HIGH, PATTERNS EMERGE.²³

FIRST, ENTRY INTO PRE-SERVICE IS HIGHLY SELECTIVE.

For instance, becoming a primary school teacher is highly competitive in Finland. Selection for primary school teacher education happens in two steps: first, candidates are selected based on scores in matriculation exams and out-of-school accomplishment records. Next, candidates take a written exam in pedagogy, their social and communication skills are observed in clinical settings similar to school situations, and top candidates are interviewed and asked to explain their motivation to become teachers. About 1 in every 10-12 applicants is accepted in teacher education programs to become a primary school teacher. In Singapore, the government recruits the top one-third of high school graduates to enter teacher education programs and does not require an entrance exam. In Korea, entrants into teacher education programs are among the top 10 percent of high school graduates.

SECOND, EFFECTIVE PRE-SERVICE EDUCATION CURRICULA CONTAIN AN EXTENSIVE PRACTICAL TEACHING COMPONENT, CLOSELY LINKED TO WHAT HAPPENS IN SCHOOLS.

In Finland, Korea, and Shanghai, a practicum comprising at least a six-month classroom teaching component is required for primary and secondary levels. The practicum follows a period of rigorous classroom-based training, and allows teacher candidates to learn to apply pedagogical skills, gain skills in classroom management and improve based on feedback. Combining well-structured classroom sessions with practical training acquires special significance as teachers increasingly have to teach groups of students at very different learning levels; without first-hand experience and immediate feedback during pre-service programs, teachers are likely to arrive unprepared to teach. Top-performing countries, such as Singapore, also integrate technology into the pre-service curriculum in multiple ways, from using technology for teaching language to volleyball to the sciences.⁵³

THIRD, PRE-SERVICE EDUCATION PROGRAMS ARE CLOSELY LINKED WITH UNIVERSITIES IN HIGH PERFORMING EDUCATION SYSTEMS.

This allows the curriculum to be informed by the latest research in learning and other fields, while also providing pre-service education a status similar to other undergraduate programs. In Shanghai, China, Shanghai Normal University prepares 60–70 percent of Shanghai teachers. In Singapore, the National Institute of Education prepares all teachers in close collaboration with the Ministry of Education and schools. If a new teacher needs extra support, the National Institute of Education gets immediate feedback from the schools and can adjust its trainings. This assumes a well-functioning higher education system. Finally, pre-service education programs in all these countries are tightly regulated by the government. At the primary level, they are generally provided by the government as well.

WHEN COMPARING THE TEACHER PRE-SERVICE EDUCATION LANDSCAPE IN WELL-PERFORMING EDUCATION SYSTEMS WITH THOSE IN MOST LOW AND MIDDLE-INCOME COUNTRIES, MOST OF THE PRE-CONDITIONS ARE NOT IN PLACE IN THE LATTER.

First, pre-service education programs are not selective. In most countries, there are no entrance tests nor systematic processes for entry into such programs. To put it bluntly, just about anyone can join a pre-service program. Second, the curriculum of pre-service education programs is divorced from the goals of school education as well as the realities of classroom practice. At both the elementary and secondary level, the curriculum is fragmented and outdated, and does not address subject knowledge adequately. New developments in specific subjects are not incorporated. The focus is on general methods of teaching such as lecture, classroom discussion, question and answer, and memorization. Student teachers do not learn pedagogy skills.^{54,55} Practice teaching in classrooms, for instance, lasts no more than a few weeks and provides only piecemeal experiences of a fully functioning teacher.

Third, unlike in well-performing countries, pre-service education colleges are typically stand-alone, not benefiting from the latest research on teaching or links with other departments. In some cases, universities have departments of education. But for the vast majority, teacher education is located outside the realm of higher education, with most institutes located outside of university campuses.⁵⁵

This is often also true of those institutes that are affiliated with universities such as colleges of teacher education. The programs are isolated, lack well-defined professional standards, have low visibility, and do not benefit from new knowledge generated in universities. A fall-out of this is that the institutional capacity to prepare teacher educators is insufficient. The programs are general and not able to address specific needs to develop subject experts. There is no policy for professional development for teacher educators.⁵⁴

A further concern in most countries, given the low selectivity of pre-service education programs, is that teacher-candidates come from the same low-quality schools where they will be heading to teach. There is little in the design of pre-service programs to help remediate the academic deficiencies teacher-candidates bring with them, many of who come from poor school systems, as they train to become teachers.

WHILE TOP-PERFORMING COUNTRIES HAVE PRE-SERVICE PROGRAMS THAT LAST AT LEAST TWO YEARS, A MORE FEASIBLE SOLUTION FOR OTHER COUNTRIES MIGHT BE TO COMBINE A SHORTER PRE-SERVICE PROGRAM WITH MORE INTENSIVE IN-SERVICE TRAINING.

For instance, Teach for America and its sister programs globally rely on a short-duration pre-service program combined with continuous in-service training. Studies based on test score data for Togo and Guinea find that while teachers need some pre-service training, a short training course of four to six months could prove as effective as longer pre-service programs when combined with additional support to teachers during the first year on the job and the recruitment of candidates with good general education.⁵⁶

ADULT LEARNING OFFERS IMPORTANT INSIGHTS INTO HOW BEST TO EDUCATE TEACHERS.

Research into how to most effectively help adults to learn reveals several key principles.⁵⁷ Some of the most relevant to training teachers are that adults require more practice to make principles stick in long-term memory than children. Evidence from in-service teacher professional development reinforces that programs with more opportunities to practice tend to be more effective.⁵⁸ Furthermore, adults learn better when asked to draw on their experience and when they can see the immediate usefulness of the skills they are learning. These principles point to more practical, less theoretical teacher preparation. Even if

teacher-candidates might strive to achieve goals to help students learn when they become teachers, these may get thwarted because of unanticipated challenges. Tools from the behavioral literature on adult learning might help teachers overcome such roadblocks and make progress toward their goal. For instance, a large literature suggests that when adults make if-then plans that specify an anticipated critical situation and then link to a suitable response, this helps them achieve their goals.⁵⁹

ICTS AND PROPERLY DEVELOPED MULTIMEDIA MATERIALS CAN ALSO ENHANCE THE INITIAL PREPARATION OF TEACHERS.

ICTs provide good training materials, facilitating simulations, capturing and analyzing practice-teaching, bringing world experience into the training institution, and training potential teachers in the use of technologies for teaching/learning. COVID-19 has made clear that the more teachers are familiar with ICT, and improvising as necessary, the more effective they are likely to be.

PREPARING TEACHERS: **KEY MESSAGES**



- Countries with high-performing education systems — such as Finland and Singapore — train their teachers well before they enter the classroom.
- In countries where teaching is a sought-after career, entry into pre-service training is selective.
- Effective pre-service education curricula contain an extensive practical teaching component, closely linked to what happens in schools. They also prepare teacher-candidates to use ICT effectively in teaching.

WHAT POLICIES FOR HIRING AND DEPLOYING TEACHERS ARE MOST EFFECTIVE?

POLICY MAKERS COMMONLY COMPLAIN THAT THEY ARE UNABLE TO HIRE THE BEST STUDENTS TO BECOME TEACHERS.

Comparing the reading and mathematics scores of high school students who profess plans to become teachers versus those who plan to become engineers reveals that prospective teachers tend to perform worse in both subjects (Figure 2). Improving the status of the teaching profession — discussed previously — is key to encouraging better candidates to enter the profession.

IMPROVED CONDITIONS AND PROFESSIONAL STATUS ENCOURAGE BOTH LOW- AND HIGH-QUALITY CANDIDATES TO ENTER THE TEACHING PROFESSION.

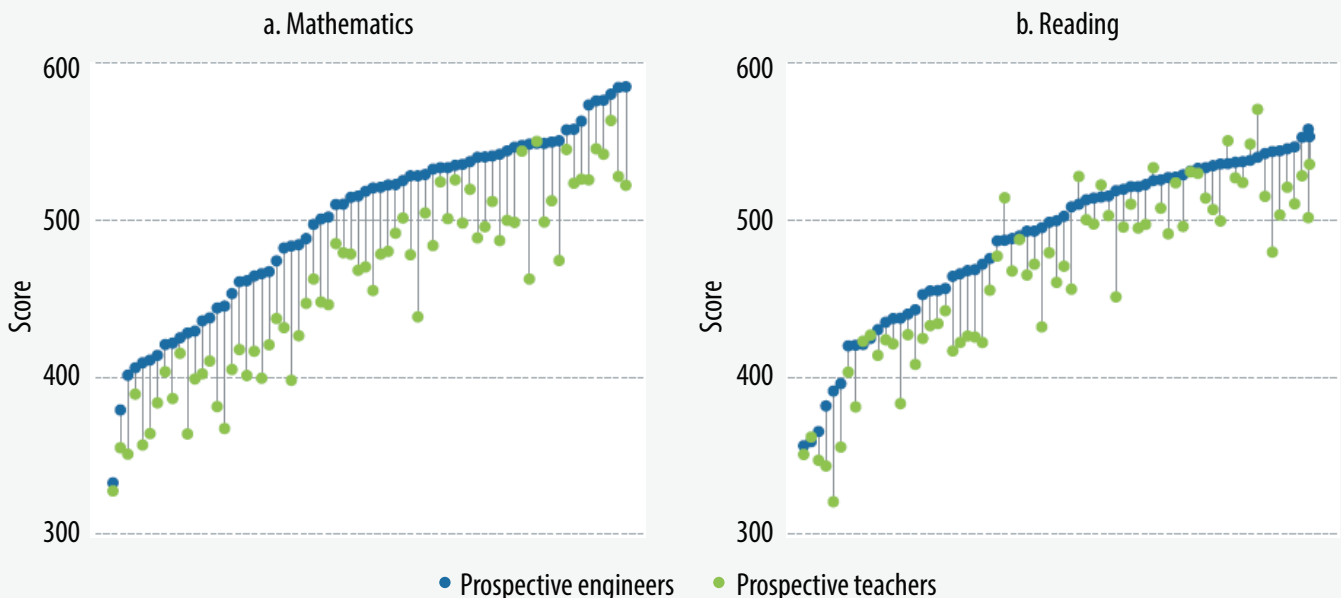
As working conditions improve, more candidates with potential to be excellent teachers will apply to become teachers. But so will candidates with the potential to be poor teachers, who are just as likely to be attracted by greater prestige and better working conditions. In Indonesia, a major increase in salaries was followed by a five-fold increase in students training to be teachers.⁶⁰ Because good conditions invite all kinds of candidates, countries with excellent education systems tend

to have highly selective professions: a small fraction of those who desire to become teachers have the capacity to do so. At the University of Helsinki in Finland, only one out of every ten to twelve students who applies to enter the teacher program is granted entrance (about 8 percent).⁶¹ In Singapore, only one of eight applicants to teacher education programs is admitted.⁶² Many countries allow a higher number of students to study education and then select only a fraction to become publicly employed teachers. Regardless, careful selection of the best candidates among those who would be teachers is essential.

MANY EDUCATION SYSTEMS HAVE NON-MERITOCRATIC CRITERIA FOR SELECTING TEACHERS.

Up until ten years ago, many teachers in Mexico had the right to decide who would get their job when they retired.⁶⁴ The result was often a selection of candidates of low ability.⁶⁵ In many African nations, the dramatic expansion of education in the last two decades has resulted in the hiring of many nonpermanent teachers, including community teachers or even parents. These teachers tend to have fewer qualifications and fewer benefits. As of 2014, the percentage of nonpermanent

FIGURE 2: PISA 2015 SCORES FOR PARTICIPATING COUNTRIES AND ECONOMIES, BY SUBJECT AND SELF-IDENTIFIED PROSPECTIVE OCCUPATION



Source: World Development Report 2018.⁶³

teachers in Madagascar was 87 percent; in Cameroon in 2011, it was 83 percent.¹² In Indonesia, recruitment of teachers has historically been a way for politicians to gain political support in the education system, although recent reforms have made that more difficult.⁶⁶ Political selection of teachers means that candidates are selected on characteristics that may have no relationship to their ability to teach.

MERITOCRATIC SELECTION OF TEACHERS YIELDS BETTER LEARNING OUTCOMES EVEN WHEN THE QUALITY OF ASSESSMENT SYSTEMS MEANS ONE CANNOT PREDICT WHO WILL BE A GOOD TEACHER WITH CERTAINTY.

In Mexico, selecting teachers through the use of a standardized test resulted in substantial improvements in student learning. But strikingly, the test itself does not effectively predict teacher effectiveness. How to reconcile these two facts? The former, non-meritocratic system of teacher selection drew a high proportion of low-performing candidates, whereas the meritocratic system draws a much wider array of candidates.⁶⁵ Even if the meritocratic selection process is imperfect — and it is indeed difficult to predict teacher effectiveness — simply having a meritocratic process draws a better sample of teachers. In a related experience, the municipality of Sobral in northern Brazil has student learning outcomes comparable to those in high-income countries, far outstripping the national average. One key factor was replacing the selection of school principals by political means with a meritocratic process, including a written exam, group activities, and interviews. This resulted in the replacement of two-thirds of existing school directors, and the impact was striking.⁶⁷ The parallel to teacher selection is clear. Many countries — Bangladesh, Chile, Colombia, El Salvador, India, Mexico, Pakistan, Peru, and some parts of Brazil — have moved to incorporate a test in their hiring practices.⁶⁸ In the future, systems may do more to incorporate social and emotional skills in teachers in the hiring process, such as grit.

BECAUSE PREDICTING TEACHER EFFECTIVENESS IS DIFFICULT, PROBATIONARY PERIODS ARE CRUCIAL.

In Mexico, the test did not predict teacher effectiveness. Likewise, in Ecuador, teachers are selected through use of the combination of a test and a demonstration class. Students whose teachers performed better in the selection process — the test, the demonstration class,

or both — did not go on to learn more.⁶⁸ As we showed above, meritocratic hiring still helps students, even if the tests are not highly predictive. But this underlines a larger trend, that identifying who will come be a great teacher can be extremely difficult. In the United States — where data and information systems tend to be of higher quality than in many low- and middle-income countries — the accumulated evidence suggests that school systems have “very little ability” to identify effective teachers at the time of hiring.¹⁵ Most characteristics that are potentially observed by employers are not systematically correlated with subsequent teacher effectiveness. As a result, measuring the additional learning that students gain from a given teachers, that is, the value added in the first year or so and then making a more permanent employment decision can be an effective way of ensuring the most effective candidates make it into the permanent corps of teachers.¹⁵ Of course, this depends on effective measurement of teacher value added. Adding a probationary period but without any way of evaluating teachers will help weed out only the most egregious of hires. One practical proposal to implement this — in India — is to frame the probationary period as a three- to five-year apprenticeship, where teacher apprentices can gain performance-linked credit towards a permanent hire over the course of the apprenticeship.⁶⁹ A variation on this proposal would be to incorporate this probationary period into the pre-service training, if that includes substantial practical teaching opportunities. It is important to note that any such system of measuring teacher effectiveness will be imperfect. It is important to have a system that will treat teacher candidates fairly, providing them with effective support to improve but the cost to students of retaining a low-performing teacher is high and — since teachers often stay in their positions for many years — revisited across many classes of students. The highest priority of an education system is to ensure that its students learn, and that requires effective teachers.

EVEN AFTER A PROBATIONARY PERIOD, EDUCATION SYSTEMS MUST BE ABLE TO DISMISS INEFFECTIVE TEACHERS WHO DO NOT IMPROVE AFTER RECEIVING EFFECTIVE SUPPORT.

An attractive element of the teaching profession is job security. But job security does not mean that teachers should not have to discharge their duties effectively. In many countries, teachers retain their posts despite having little mastery of the content they are to teach and with high rates of absenteeism.⁷⁰ Of course, teachers

who do not know the content should not be hired in the first place, and absenteeism may have multiple causes, including requests by school and district leadership for teachers to carry out non-school functions. Teachers who are not performing to standards should receive support and opportunities to improve. But with all of that in place, systems must retain the ability to dismiss ineffective teachers. In the United States (Washington, DC), a program provided support to low-performing teachers but ultimately dismissed them if they failed to improve. Dismissing low-performing teachers and replacing them improved student learning sizeably.⁷¹ Furthermore, just introducing the possibility of dismissal had two additional impacts: many low-performing teachers voluntarily retired from the profession, and teachers who remained significantly improved their performance.⁷² The balance between giving teachers time to improve and dismissing ineffective teachers will depend on the school system. If there are few candidates with which to replace low-performing teachers, then education systems will want to invest relatively more in improvement. In areas with many potential candidates, a system will want to invest more in replacement — after providing teachers with support and an opportunity to improve.

FAIR, EFFICIENT, AND TRANSPARENT TEACHER DEPLOYMENT POLICIES ARE CRUCIAL FOR ENSURING THAT CHILDREN IN HARD-TO-STAFF AREAS ALSO RECEIVE QUALITY EDUCATION.

In many countries, teacher recruitment is centralized: it takes place at the national or sub-national level, not at the school level. In those cases, teacher deployment practices are often unsystematic or opaque. As a result, some schools — typically those that are poorly-resourced or in difficult-to-reach areas — have fewer teachers (or fewer qualified teachers), while other schools have a surplus of better qualified teachers. For example, in Ghana only 40 percent of the variation in teacher staffing at schools across the country can be explained by variation in the numbers of students enrolled.¹⁹ In Chile, teachers in low socio-economic status schools have lower quality pre-service education on average, and teachers in rural schools tend to score worse on an array of quality measures.^{73,74} Similar patterns emerge in the United States.⁷⁵

The mismatch between teacher supply and demand in schools arises for at least two reasons. First, systems may fail when it comes to calculating teacher need at the school level. Second, teachers themselves may not

wish to teach in some types of schools. In Peru, 95 percent of school vacancies that received zero teacher applications were in rural areas.⁷⁶ In a system where pay depends only on seniority, as is true for several school systems, school location is important because it enhances or alters a teacher's working and living conditions. Absent effective and well-enforced deployment rules, teachers often find a way to get to the school of their choice and remain there. Consequently, some types of schools — typically schools with greater numbers of disadvantaged students — face teacher shortages.

School systems use an array of tools to attract teacher candidates to hard-to-staff areas — and to encourage them to stay there.⁷⁷ Some of these include financial incentives, a faster track towards promotion, additional training, or subsidized housing.^{78,79} The most commonly evaluated programs involve financial incentives. Most simply focus on getting teachers to hard-to-staff schools. In São Paulo, Brazil, a wage premium of 24 to 36 percent for teachers in schools in high-poverty neighborhoods reduced teacher turnover by 16 percent.⁸⁰ In the Gambia and Zambia, a bonus for rural teachers also boosted supply.^{79,81} Other policies have sought specifically to increase the supply of the best teachers. In Chile, the Chilean Pedagogical Excellence Assignment gives a bonus to excellent teachers, and the incentive is significantly higher if teachers work in schools that are disadvantaged. The award increase retention of talented teachers in disadvantaged schools.⁸²

While financial incentives have often been effective at boosting supply or increasing retention in rural or other hard-to-staff schools, they may not be sufficient—at the levels affordable by education systems—to close the gap. One modeling exercise informed by focus group interviews in a hard-to-staff area of the United States (Alaska) suggested that salaries would have to be double to fully staff schools.⁸³ Furthermore, short-term financial incentives (such as signing bonuses) may not result in teachers remaining in schools after the required conditions of their contract.⁸⁴ As a result, education systems will need to (and do, in practice) employ multiple strategies to address this challenge.

Other strategies to recruit and retain teachers in hard-to-staff schools are actively used, despite having fewer evaluations. Several countries in Latin America offer faster routes to promotion.²⁶ For other strategies, such as providing housing, researchers have conducted sur-

veys of how candidates value different incentives. For example, in Kenya and Tanzania, respondents were invited to compare salary bonuses to other material, non-monetary incentives (like housing, bicycles, or mattresses). But these kinds of hypotheticals can pose challenges when faced with realities, as exemplified in Malawi, where rural teachers actually living in provided housing were much less motivated by it than urban teachers who imagined it, perhaps because the actual housing was of low quality.⁸⁵

Financial and material incentives are not the only way forward. School systems with fair and transparent teacher deployment policies, such as South Korea or Karnataka (India), have succeeded in ensuring all schools have the teachers they need. Key characteristics of their deployment policies include: (1) mandatory service in disadvantaged areas for a certain period of time; (2) periodic rotation to new schools; (3) incentives for working in hard-to-staff areas; and (4) transparency in the allocation process. For instance, in Karnataka, all new teachers are required to work for five years in a hard-to-staff posting. Postings are categorized as Zone A, B and C, with C being the hardest to staff. Teachers accumulate points depending on how long they have served in different zones, with Zone C points weighing the most. Teachers with the most points have greater choice in selecting schools in future rotations.

The exact modality will depend upon the specific reasons that teachers avoid hard-to-staff schools in a given country, as well as the financial resources an education system can bring to bear. One thing is clear: well-defined and transparent deployment rules are a prerequisite for ensuring equitable distribution of teachers to schools while also meeting teachers' needs.

EFFECTIVE PERSONNEL POLICIES: **KEY MESSAGES**



- Meritocratic selection of teachers yields better learning outcomes, even when the system cannot predict teacher effectiveness perfectly.
- Probationary periods are crucial to allow teachers to learn and prove themselves.
- Fair, efficient, and transparent teacher deployment policies are essential to ensure all schools have adequate numbers of effective teachers.
- Education systems must be able to dismiss ineffective teachers who do not improve despite receiving effective support.

WHAT POLICIES CAN HELP SUPPORT AND MOTIVATE TEACHERS THROUGH THEIR CAREERS?

MANY TEACHERS CAN IMPROVE IF PROVIDED WITH ONGOING TRAINING AND SUPPORT.

Although it is true that on average, teachers tend not to dramatically improve after their first few years of experience, a number of teacher professional development programs have helped teachers to improve student learning. In South Africa, a program that provided teachers with regular coaching improved the teachers' practices in the classroom and raised student test scores significantly.⁸⁶ This is consistent with evidence from many programs in the United States that coaching teachers can translate into significantly improved student test scores.⁸⁷ A program that provided teachers with literacy training in Uganda — along with materials for students — dramatically improved students' reading and writing.⁸⁸ A program that trained teachers to evaluate their students' level of performance and adapt their teaching accordingly led to strong literacy gains in Liberia.⁸⁷ All these examples — and many more — demonstrate that teachers have the capacity to improve.

EFFECTIVE TEACHER PROFESSIONAL DEVELOPMENT PROGRAMS HAVE CERTAIN CHARACTERISTICS IN COMMON.

They tend to include a face-to-face component, they are subject-specific, they are linked to some sort of professional incentives (such as opportunity for promotion), they include practice with other teachers, and they include follow-up visits in the teachers own classroom. These principles are derived from comparing 33 teacher professional development programs in low- and middle-income countries that were evaluated closely, all with student learning outcomes, and comparing those programs with the largest student learning gains and those with the smallest gains.⁸⁹

MOST LARGE-SCALE TEACHER PROFESSIONAL DEVELOPMENT PROGRAMS IN PLACE TODAY DO NOT HAVE THE CHARACTERISTICS OF SUCCESSFUL PROGRAMS.

Many teacher professional development programs have disappointing impacts on student learning. A large-scale teacher training program in China yielded no results on student learning, likely due to being too theoretical and passive.⁹⁰ Some are even counterproductive. A training program designed to help teachers of high school math students to implement active learning techniques in Costa Rica resulted in significantly lower learning than in classrooms where teachers were not trained.⁹¹ Even the promising teacher coaching results from the United

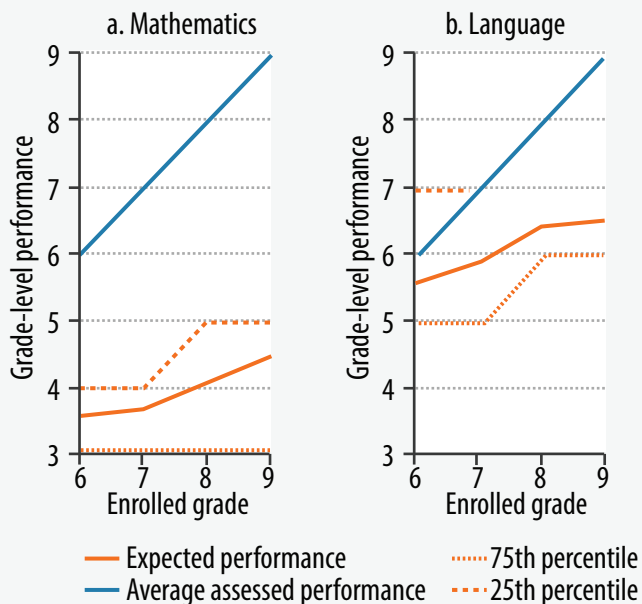
States tended to be much smaller when implemented at scale relative to the results of small, pilot programs.⁵⁸ In fact, the majority of large-scale programs to support teachers are not evaluated in any formal way, so their effectiveness in helping teachers to improve student learning is unknown. However, examining the key elements of large-scale teacher support programs and comparing them to programs that we know are effective provides suggestive evidence for whether these programs are likely to be effective. Researchers recently gathered information on the key components of the teacher professional development programs covering the most teachers in 14 countries around the world. Relative to those that have been evaluated and found to be effective, national programs are far less likely to have any link to career opportunities, such as salary or promotion. National programs are less likely to include any follow-up visits with teachers in their classrooms, and they are less likely to include practice with other teachers as part of the training. In short, many of the characteristics that mark the most effective programs are missing in national programs.⁵⁸ This lack of effectiveness is not just a phenomenon of low- and middle-income countries: A recent study in three large public school systems within the United States found that many resources go into teacher professional development, but to little effect.⁹² Improving teacher skills on the job is crucial, but not all teacher professional development is created equal.

A PROVEN WAY TO HELP TEACHERS EFFECTIVELY REACH STUDENTS IS TO MAKE SURE THAT THEY REACH STUDENTS AT THE LEVEL THAT STUDENTS ARE CURRENTLY AT, USING A CLASS OF INTERVENTIONS KNOWN AS “TEACHING AT THE RIGHT LEVEL.”

Teachers often do not teach students at their current level of learning for at least two reasons. First, many countries have extremely ambitious curricula, such that the majority of students quickly fall behind in school. Yet teachers are pressured to teach the curricula, such that few students are actually following the grade-level material in some schools. As Figure 3 shows — using data from students in India (New Delhi) — in Grade 6, the students in the top 25 percent in mathematics are only at Grade 4 level. So a teacher teaching Grade 6 content will leave behind even the best students. By Grade 9, the top students are only at Grade 5 level, four years behind the curriculum. Second, a single classroom will

FIGURE 3: MANY STUDENTS ARE BEHIND GRADE-LEVEL, AND A SINGLE CLASSROOM MAY INCLUDE CHILDREN AT VARYING LEVELS OF LEARNING.

Assessed grade-level performance of students relative to enrolled grade. New Delhi, India (2015)



Source: World Development Report 2018, using data from Muralidharan, Singh, and Ganimian (2017).^{63,97}

include students at widely varying levels of knowledge. In that same Grade 9 classroom, the bottom 25 percent of students are at Grade 3 level. So even a teacher who departs from the curriculum in order to reach students at their level of knowledge must contend with teaching students at the Grade 5, Grade 4, and Grade 3 levels of knowledge, all at the same time, no easy feat. Teaching at the right level may include reading camps carried out during school holidays, the provision of remedial teaching and learning materials, or grouping students by ability instead of age, whether for an hour a day or some other portion of the day or year.^{93,94,95}

Given the uncertainty on school openings and closures due to COVID-19, teachers will need even more support to identify at-risk students based on assessments, mitigate factors that encourage student exit, and bring

them to grade level. Strategies such as streamlining the curriculum and separating students into small ability groups will be especially important in recovering learning loss.

PROVIDING TEACHERS WITH HIGHLY STRUCTURED LESSON PLANS CAN IMPROVE LEARNING.

In environments where many teachers lack sufficient content knowledge and pedagogical ability, providing such plans can be an effective way to help students achieve basic literacy and numeracy skills. These can range from guides that teachers can rely on but also have the freedom to deviate from according to circumstances to strictly scripted lessons that teachers read off tablets. Experience across 13 low- and middle-income countries shows that providing these guides — along with training to use them — leads to significant learning gains equivalent to an additional half year of learning.⁹⁶ Evidence from similar interventions — often classed under the heading of “direct instruction” — in high-income countries confirms those positive learning impacts.⁹⁸

IT IS POSSIBLE TO IMPLEMENT EFFECTIVE TEACHER SUPPORT AT SCALE.

Implementing effective teacher programs at scale is a challenge. Programs that work well at the pilot stage often do not translate to effective nationwide programs for a variety of reasons — maintaining the same quality of implementers and of supervision at scale can be a challenge, as can the ability to make course corrections when the program is not working as planned.⁹⁹ In Kenya, the program of providing teachers with structured lesson plans — a loose script — together with training and materials to help them implement those plans, led to significant gains both at the pilot stage and scaled to the national level.¹⁰⁰ In the Kenya experience, the program used existing school inspectors as coaches, providing additional structure to responsibilities that were already part of their job description. Helping professionals to do their existing jobs more effectively may work better at scale than creating brand-new structures, when possible.

TECHNOLOGY CAN COMPLEMENT TEACHER PERFORMANCE, BUT IT SELDOM IS EFFECTIVE AT REPLACING IT.

In recent decades, some efforts to circumvent teachers, for example, by simply providing laptops directly to students, have not resulted in significant learning gains.

However, technology does have a role to play in helping teachers to be their best. In Brazil, low-cost coaching delivered to the teacher coordinators in schools — helping them to support teachers more effectively — led to modest but low-cost improvements in student learning.¹⁰¹ An effective but costly pilot in providing on-site coaching to teachers in South Africa led to an experiment with virtual coaching via tablet, which had similarly sized effects on teacher effectiveness to on-site coaching.^{86,102}

SCHOOL PRINCIPALS ARE CRUCIAL TO SUPPORTING TEACHERS.

Professionals of all types work most effectively when under the supervision of good managers. Across countries, better management in schools is associated with better student learning outcomes.¹⁰³ Within education systems, schools in Uganda and in India back up this relationship: schools with better management deliver better student learning.^{104,105} In effective schools, principals play a role in pedagogical leadership in addition to their administrative role. They help teachers to set goals and expectations based on student assessments, assist in evaluating teaching, and ensure an organized, supportive environment.¹⁰⁶ Merit-based principal hiring — as the high-performing city of Sobral in northern Brazil has done and as Peru has implemented — can have positive impacts on teacher performance and subsequent teacher performance.¹⁰⁷ Furthermore, efforts to train existing principals — in Jamaica, Madagascar, and the United States — show that it is possible to improve the performance of the existing stock of principals, at least to some degree.^{108,109,110} Relatively small learning gains from improving the skills of principals can add up to large impacts across many students.

The uncertainty on school openings and closures due to COVID-19 has put added mental stress on teachers. As schools reopen, teachers might feel stressed by the prospect of getting infected, the loss of their own skills — given that many may not have participated in routine refresher trainings — as well as the skills of their students. Furthermore, reintegration into schools may be characterized by periods of intermittent closures or multiple shifts to maintain social distancing norms. To cope with stress, teacher and management team culture — especially at the school level — may need to be strengthened as teams can plan addressing challenges together. Regular communication while schools are

closed and when they open can help teachers come together. Structured peer-support groups are low-cost and can help teachers deal with drastic changes. Social media can play a key role in building collegial support, as with Facebook/WhatsApp teacher/school groups in Kenya, South Africa and Pakistan (in process), as would engaging teacher unions/professional groups to discuss strategies for teacher recovery. Interventions, such as HealthyMinds@Work in Mexico, can help teachers cultivate important aspects of well-being using simple exercises drawing upon the latest findings in neuroscience, psychology and traditional contemplative perspectives.¹¹¹

TEACHERS SHOULD BE ACCOUNTABLE FOR THEIR PART IN STUDENT LEARNING, BUT TEACHER ACCOUNTABILITY MECHANISMS INCLUDE A WIDE ARRAY OF INSTRUMENTS.

Teachers are a crucial part of the learning process, and it is reasonable that they should be accountable for their role in that process. But teachers work within systems, and accountability needs to flow throughout the system, including from administrators, school principals, and teachers.¹¹² Furthermore, teacher accountability includes a wide array of instruments. Like most professionals, teachers place value on the respect of their supervisors and colleagues. Teacher accountability can include outcome-based programs — such as pay-for-performance — but it can also include rule-based accountability, wherein teachers are required to fulfill certain duties, and professional accountability, where teachers receive support and are evaluated by their peers and supervisors.¹¹³

Effective systems that do institutionalize pay-for-performance, such as the municipality of Sobral in Brazil, do so in the context of many other supports for teachers. In the case of Sobral, rewards go not only to teachers but also to principals, pedagogical coordinators, and to the school as a whole.¹¹⁴ Regardless, pay-for-performance is just one tool in a much wider teacher accountability and support toolkit.

SUPPORTING TEACHERS: **KEY MESSAGES**



- Many teachers can improve if provided with ongoing training and support, potentially leveraging technology to do so.
- Providing teachers with highly structured lesson plans can be an effective way to help students achieve basic literacy and numeracy skills.
- Hiring school principals based on merit and giving them both the skills to provide leadership and the tools to better manage their administrative duties enhances the effectiveness of teachers.

HOW CAN EDUCATION TECHNOLOGY HELP TEACHERS TO TEACH EVERY STUDENT EFFECTIVELY?

EDUCATION TECHNOLOGY WORKS BEST WHEN IT COMPLEMENTS TEACHERS RATHER THAN SEEKS TO SUBSTITUTE FOR THEM.

Efforts to simply provide students directly with technology—such as the One Laptop per Child program—have largely been ineffective.¹¹⁵ But employing technology in conjunction with the efforts of teachers can be an essential tool to help students learn in the twenty-first century: the COVID-19 crisis has brought this fact into sharp relief.¹¹⁶ When education systems stop seeing education technology as a cure-all for their learning crises but rather deploy it strategically to address specific challenges in each aspect of the teaching-learning process discussed above, then ed-tech can achieve its full potential. But to work effectively, this deployment requires partnership with and buy-in from teachers.

COMPLEMENT TEACHER CONTENT KNOWLEDGE AND PEDAGOGICAL SKILLS WITH TECHNOLOGY.

One challenge that many education systems face is that teachers lack full mastery of content they need to teach and of the pedagogical skills needed to teach it.⁷⁰ Technology can provide easy and quick access to both content and pedagogical resources at any time, anywhere, relative to traditional brick and mortar structures. For example, the Teacher Education in Sub-Saharan Africa initiative provides open-source courses and materials on pedagogical approaches teachers can use to improve their instruction in literacy, numeracy, science, art, and other subjects. Science educators in Ghana, Zambia, Kenya, Tanzania, and Uganda developed the science resources, adapted to the relevant curricula.¹¹⁷ Alternatively, tools initially developed in high-income countries, like Khan Academy, Coursera or Wikiversity may be incorporated into professional development curricula to help teachers upgrade their content knowledge, with the additional benefit of modeling how to teach challenging topics. In the United States, some school systems have implemented programs of “micro-credentialing,” which help teachers master sub-topics within their field and receive professional recognition for it.¹¹⁸

Detailed lesson guides can also help teachers with less pedagogical knowledge and content mastery, especially for early grade skills such as literacy and numeracy.⁹⁶ The guides can nudge teachers who might otherwise rely on pure lecture to engage students, as well as provide step-by-step guidance in implementing literacy and numeracy instruction. In some countries, such as Paki-

stan and South Africa, teachers receive these guides on tablets. This can allow active updates and even analysis of the teaching process.¹¹⁹

TECHNOLOGY CAN HELP BUILD EFFECTIVE COMMUNITIES OF TEACHING PRACTICE, ESPECIALLY IN TIMES OF CRISIS.

Most professionals benefit from the opportunity for collaboration with others in their field. Teaching can feel like a solitary profession, and this was heightened in 2020 when many countries closed schools for extended periods of time due to COVID-19, even as some teachers engaged students by phone or other means. Technology enables virtual collaboration. Even in lower income environments, teachers often have access to smartphones and apps like WhatsApp: a survey of secondary school teachers in Tanzania found that most had smartphones and most used WhatsApp.¹²⁰ Teachers in many countries—from Kenya to Turkey to Hong Kong—have established Facebook or WhatsApp groups where they share pedagogical tips or ask each other for clarification on content issues.¹¹⁶ Education systems can encourage these groups and use pedagogical coordinators to boost the quality of content when appropriate.

TECHNOLOGY CAN HELP WITH TEACHER DEPLOYMENT AND MANAGEMENT.

Education systems can use technology to improve the consistency and transparency of teacher management systems. For example, the government of Malawi launched an initiative to use geospatial coordinates of schools across the country combined with teacher data to establish a rule-based teacher allocation system, so that the number of teachers more consistently lines up with the needs of students.¹⁹ The state of Karnataka (in India) also uses a technology-enabled system for teacher deployment, as do other systems.¹²¹ Effective technology systems can help monitor how long teachers have been in different postings, where the greatest needs are, and more.

Likewise, technology can play a crucial role in both monitoring and supporting teachers. For example, simple regular phone calls to teachers, along with students and village leaders, boosted student learning outcomes in Niger.¹²² Technology can also facilitate the establishment of mechanisms so that teachers can highlight challenges (such as delayed pay or missing benefits) and seek solutions in the education system – i.e., grievance redressal mechanisms. One effective example of that, in

a high-income country, involved call centers in the New York City (in the U.S.) where operators were empowered to help teachers find the answers they needed.¹²³

WHEN SCHOOLS CLOSE IN A CRISIS, EDUCATION TECHNOLOGY CAN HELP TEACHERS CONTINUE TO SUPPORT STUDENTS.

During the COVID-19 pandemic, school systems around the world closed their doors for months at a time. In higher income environments, teachers conducted virtual school using programs like Zoom or Google Classroom to hold classes while students participated from home. Despite virtual learning options, learning losses have been concentrated among lower income students, likely those with less stable internet access (among other factors), highlighting that technology can only be effective if teachers and students can access it in a supportive learning environment.¹²⁴ Thus, while technology has been crucial to help teachers connect with students during the pandemic, extra attention is required to ensure that crises don't exacerbate learning gaps.

In countries with less widespread internet access, teachers sometimes reached out to students to provide tutoring calls. These efforts had mixed success, with benefits to student learning in Botswana and Bangladesh but not in Kenya or Sierra Leone.¹²⁵ In Sierra Leone, public school teachers were less likely to make the tutoring calls than their private school counterparts.¹²⁶ These results signal that while there is promise in using technology to help teachers connect with students in a crisis, there is much left to learn in how to effectively implement and manage these initiatives.

THESE STRATEGIES WILL ONLY WORK IF SYSTEMS INVEST NOT ONLY IN THE TECHNOLOGY, BUT ALSO IN THE TRAINING, SUPPORT, MONITORING, AND MAINTENANCE TO MAKE TECHNOLOGY WORK.

Storage rooms in schools around the world are littered with broken tablets and non-functioning computers. Even more striking, at times education systems have functioning technology that is barely used because it is not integrated into the curriculum against which teachers and students are judged or because teachers have not received sufficient, effective training to incorporate the technology into their daily practice. A one-day training seminar will likely not be enough; routine use of technology and regular updating of skills will be import-

ant. Likewise, if teachers lack internet connectivity, then online resources will not help them: science teachers in Ghana highlighted that online materials seemed useful but that the cost of internet access proved prohibitive.¹¹⁷

Teachers also need to buy into the value of the technology, seeing its potential to benefit them in their teaching. A program implemented in NGO schools in India used cameras to monitor teacher attendance and boosted student learning, but when a related program was implemented in government-run health centers, workers rejected and even damaged the monitoring technology.^{127,128} No education technology will be effective if teachers reject it.

THE ONLY WAY TO KNOW IF THE TECHNOLOGY IS WORKING IS TO TEST IT.

Educational innovations are successes or failures based on the results they deliver. As systems innovate with using technology to help teachers and students to reach their potential, rigorous systems of evaluation must be in place over time. In South Africa, the government tested virtual coaching, where a teacher coach would communicate with teachers via tablet rather than in-person, as compared to traditional, in-person coaching. After one year, the two programs performed similarly.¹⁰² But two years later, as students had graduated to more advanced skills, the effectiveness of in-person coaching far outstripped virtual coaching. Over time, teachers accessed the tablets less and less frequently, again underscoring that technology can only work if teachers see its value and use it regularly.¹²⁹ Only careful evaluation revealed this pattern. Many education technology interventions—especially hardware interventions, focused on distributing technology—have failed, leading to costly waste in education systems with no resources to spare.⁹⁷ Testing for effectiveness is essential to help teachers to reach students more effectively with technology.

CONCLUSION

EFFECTIVE TEACHERS ARE CRUCIAL TO STUDENT PERFORMANCE, AND EDUCATION SYSTEMS CAN AND MUST HELP TEACHERS TO REACH THEIR POTENTIAL.

While there is certainly more to learn, extensive evidence both from high-income countries and from low- and middle-income countries demonstrates key principles that apply in a wide array of environments. Fundamentally, good education systems ensure that teaching is an attractive profession, use effective personnel policies,

provide practical pre-service training, and continuously support their teachers to help them reach their full potential. Exactly how these principles are applied will vary from context to context. In Table 2, we outline certain principles that may vary between low-income, middle-income, and countries affected by fragile, conflict, and violence affected countries. Ultimately, no policies have greater potential to improve the quality of education than policies that make teachers more effective.

TABLE 2: PRINCIPLES FOR GOOD PRACTICE ACROSS CONTEXTS

OBJECTIVE	PRINCIPLES FOR GOOD PRACTICE	ADDITIONAL CONSIDERATIONS FOR LOW-INCOME COUNTRIES AND COUNTRIES AFFECTED BY CONFLICT
Make teaching attractive	<ul style="list-style-type: none"> ○ Improve occupational prestige using communications strategies ○ Peg salaries to competing professions ○ Use career progression structures effectively 	<ul style="list-style-type: none"> ○ Ensure salaries reach teachers on time ○ Provide job security to reliable, effective teachers
Improve personnel policies	<ul style="list-style-type: none"> ○ Incorporate tests of subject knowledge and pedagogical ability into the hiring process ○ Use probationary periods to identify and retain the most effective teachers ○ Recognize, promote, and reward effective teachers ○ Use a fair and transparent process to allocate teachers where they are needed most ○ Adopt meritocratic hiring system for teachers and school leaders 	<ul style="list-style-type: none"> ○ Where data systems do not allow for extensive testing, still include meritocratic elements in the hiring process ○ Recognize good teachers even when test-based value added is not possible ○ In refugee settings, allow teachers who have migrated to update their credentials and teach
Prepare teachers for school	<ul style="list-style-type: none"> ○ Ensure that teachers have content mastery ○ Provide teachers with practical pedagogical skills ○ Train teachers to manage classrooms effectively, including classrooms with students at varied learning levels ○ Train teachers to become proficient with distance education and ensure students learn remotely 	<ul style="list-style-type: none"> ○ Ensure that teachers at least have knowledge of the content they are supposed to teach ○ Focus teacher preparation on practical skills ○ Ensure teachers are fluent with basic technologies for distance learning
Support teachers in school	<ul style="list-style-type: none"> ○ Introduce high-quality teacher professional development that is tailored, practical, focused and ongoing. ○ Provide teachers with structured lesson guides ○ Introduce regular teacher coaching, potentially leveraging technology to do so ○ Provide teachers with continuous support to reduce stress, especially during emergencies. Possible mechanisms include regular communication with school leadership teams, structured peer-support groups, and well-being interventions 	<ul style="list-style-type: none"> ○ Provide intensive teacher professional development in that is tailored, practical, focused and ongoing. ○ Highly structured lesson guides can be particularly valuable in environments where teachers have limited educational background themselves ○ Set up structured peer-support groups to reduce mental stress and provide professional support during emergencies

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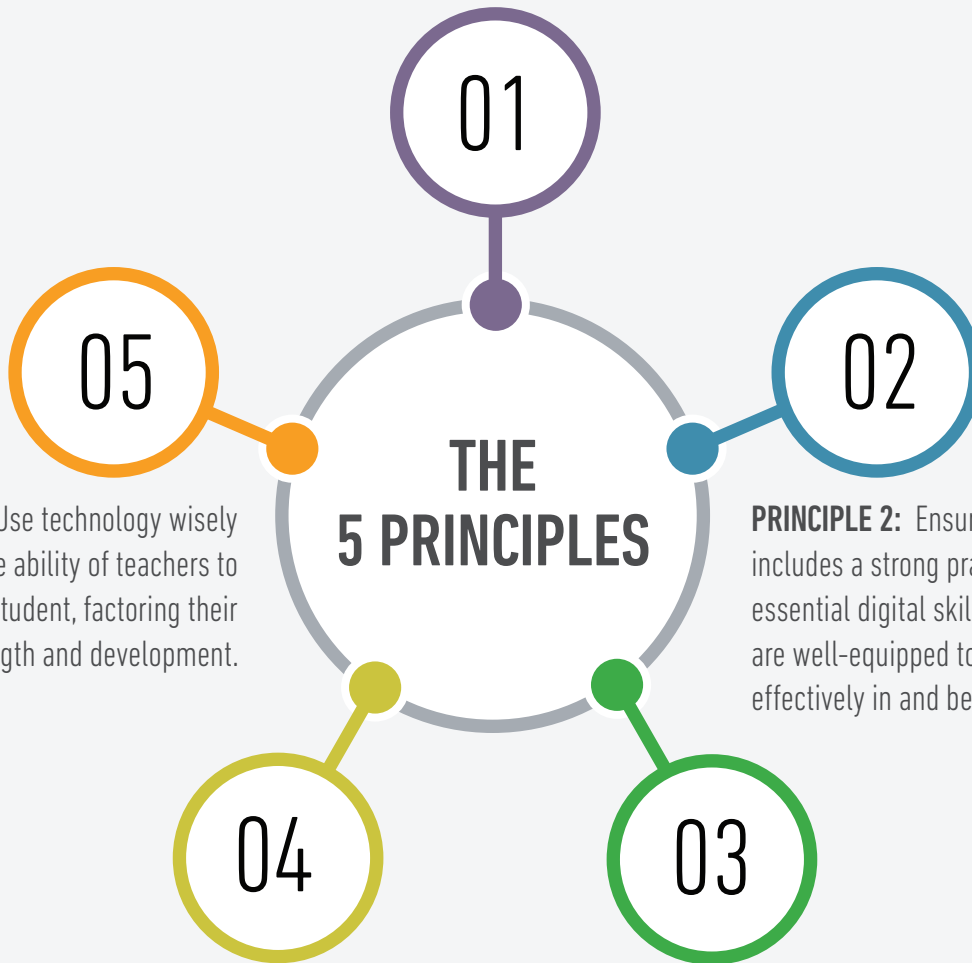
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THE WORLD BANK WILL USE THE FOLLOWING PRINCIPLES TO BUILD CADRES OF EFFECTIVE TEACHERS IN MIDDLE AND LOW-INCOME COUNTRIES:

PRINCIPLE 1: Make teaching an attractive profession by improving its status, compensation policies and career progression structures



PRINCIPLE 5: Use technology wisely to enhance the ability of teachers to reach every student, factoring their areas of strength and development.

PRINCIPLE 2: Ensure pre-service education includes a strong practicum component and essential digital skills to ensure teachers are well-equipped to transition and perform effectively in and beyond the classroom.

PRINCIPLE 4: Provide continuous support and motivation, in the form of high-quality in-service professional development and strong school leadership, to allow teachers to continually improve.

PRINCIPLE 3: Promote meritocratic selection and effective deployment of teachers to ensure that all students have access to good teaching.

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