

Policy Paper 19

April 2015

This paper is being jointly released by the Education for All Global Monitoring Report (GMR) and the UNESCO Education Sector at the 12th Session of the Joint ILO/UNESCO Committee of Experts on the Application of the Recommendations concerning Teaching Personnel (CEART) in Paris (April 2015). It addresses the challenge of recruiting and training quality teachers, using country administrative data collected by the UNESCO Institute for Statistics (UIS) since 1999 and information from a variety of other sources.

The challenge of teacher shortage and quality: Have we succeeded in getting enough quality teachers into classrooms?

In 1990, the World Declaration on Education for All (EFA) was adopted in Jomtien, Thailand, committing countries to improve the quality of education. It recognized that ensuring universal access to primary education would only be a first step in enabling education to contribute fully to the development of individuals and society. A decade later in 2000, the Dakar Framework for Action, adopted at the World Education Forum in Senegal, declared that access to an education of good quality was the right of every child. It affirmed that quality was the heart of education, a fundamental determinant of enrolment, retention and achievement.

Although good quality education became a core aspect of the EFA goals, international attention continued to focus until recently on access to basic education. A shift in emphasis is now discernible towards quality issues--particularly in reference to learning--which are central to the proposed post-2015 education targets. Such a shift is vital to improve education for millions of children who have not acquired basic literacy and numeracy skills, even after at least four years in school.

Teachers are a critical education resource in every country. From early childhood

programmes through primary and secondary school, the presence of qualified, well-motivated and supported teachers is vital for student learning. Effective teaching strongly influences what and how much students achieve in school.

This policy paper examines international progress in addressing teacher shortages and teacher quality. It explores the global need for more teachers, not just enough teachers where they are most needed, but also good quality teachers who are well-trained and effective.

Despite progress, teacher shortages remain a serious concern

Worldwide, primary education systems employed more than 29 million teachers in 2012, 82% of them in developing countries. The total primary teaching staff increased by 17% between 1999 and 2012, or by about 4 million teachers. The largest increase occurred in sub-Saharan Africa and the Arab States. The number of secondary school teachers increased, from 24 to 32 million over the same period, double the increase in primary education teachers.



Since the EFA goals were set at Dakar, the pupil/teacher ratio (PTR)¹ has been an important measure for assessing progress towards good quality education. Globally, between 1999 and 2012, average PTRs have barely changed at the primary and secondary education levels. In primary education, the PTR improved slightly, from 26:1 to 24:1, and in secondary education, from 18:1 to 17:1. PTRs in sub-Saharan Africa hardly changed at either level of education. In primary education, teacher recruitment grew by 75%, at a pace similar to enrolment growth. At 42 pupils per teacher, this is the region with the highest PTR at the primary level.

In the absence of a global target on PTR in primary education, the most widely used international benchmark is 40:1. As of 2012, 29 out of 161 countries with data had a PTR in primary education exceeding 40:1. Of these, 24 were in sub-Saharan Africa, three in South and West Asia (Afghanistan, Bangladesh and Pakistan), one in East Asia (Cambodia) and one in the Arab States (Mauritania).

Several trends since 1999 can be highlighted. Of the 30 countries that had a PTR above 40:1 in 1999, 8 managed to bring the ratio below 40:1 by 2012; in Equatorial Guinea it more than halved, from 57:1 in 1999 to 26:1 in 2012. But in five of these 30 countries, the ratio increased, often because teacher recruitment did not keep pace with increases in enrolment following policies to expand education, such as fee abolition. In Malawi, for example, the ratio increased by 17% from an already high level of 63:1 in 1999 to 74:1 in 2012. In Guinea-Bissau, the ratio was at 44:1 in 2001, but rose to 52:1 in 2010.

PTRs in primary education rose by at least 20% in seven countries between 1999 and 2012, including Afghanistan, the Democratic Republic of Congo, Pakistan and Yemen. In Afghanistan, it increased from 33:1 in 1999 to 44:1 in 2011 – an almost fivefold rise in the teaching force was not enough to meet the almost sevenfold rise in primary enrolment. By contrast, the PTR fell by at least 20% in 63 countries, including Bhutan, Gabon, Timor Leste and Viet Nam. The Democratic Republic of Congo and Mali more than doubled their primary school enrolment while reducing their PTRs by about 14 pupils per teacher or more.

In the absence of a global PTR target in secondary education, a ratio of 30:1 is often employed. At the lower secondary level, of the 105 countries with data for 2012, 18 had ratios above 30:1, including Afghanistan, Mauritania, South Sudan and Zambia. Over the decade, the ratios grew by more than six pupils per teacher in Ethiopia, the Gambia, Guinea, Mali and Myanmar. In these countries a significant rise in enrolment outstripped more modest increases in teacher numbers, raising serious concerns for the quality of education. Yet, some countries with growing lower secondary enrolment improved their PTR significantly. In Togo, the gross enrolment ratio rose from 39% in 1999 to 68% in 2011 while the PTR fell from 44:1 to 34:1.

At the upper secondary level, out of 97 countries with data for 2012, only five countries, including Bangladesh, the Dominican Republic, Eritrea, Nigeria and Yemen had ratios above 30:1. The upper secondary pupil/teacher ratios stayed constant or decreased in most countries, markedly so in Eritrea (from 45:1 to 31:1). However, there was data for only 13% of sub-Saharan African countries: these countries suffer from the most significant teacher shortages at higher levels of education.

How many primary teachers will be needed in classrooms by 2030?

The future needs for teacher recruitment are determined by current teacher deficits, demographics, enrolment trends and the number of children who are out of school. Analysis by the UIS in 2014 shows that 27.3 million primary school teachers are needed to be recruited by 2030 (UIS, 2014).

Of the teachers required between 2012 and 2030, 23.9 million are needed to replace teachers who retire, change occupations, or leave due to illness and death. The remaining 3.4 million make up the shortfall, address expanding enrolment,

1. The PTR is calculated by dividing the total number of students enrolled by the total number of teachers. It is based on the teacher headcounts and does not reflect part-time teaching or double-shifting.

and underwrite quality by ensuring there are no more than 40 students for every teacher. Thus, around 190,000 additional teachers need to be recruited each year for a sufficient teaching supply in order to assure universal primary education by 2030 (such projections are currently not possible for secondary education).

Some regions and countries need many more additional teachers in primary schools than others. By far the biggest challenge is in sub-Saharan Africa, which accounts for 67% of the additional primary school teachers needed between 2012 and 2030. The Arab States account for around 15% of the additional teachers required. An assessment of teacher needs by country shows that the biggest challenge remains in Nigeria with nearly 400,000 additional primary school teachers required between 2012 and 2030, 12% of the global total. Of the developing countries needing the most additional primary teachers, seven are in sub-Saharan Africa.

Can countries recruit enough teachers by 2030? It is unlikely, particularly for those with the widest gaps. Analysis by UIS, based on trends in recruiting teachers over the past 10 years and population projections, shows that 28 countries, mainly in sub-Saharan Africa, will not be able to fill the gap until after 2030 if earlier trends continue (UIS, 2014).

Trained teachers are in short supply in many countries

To improve the provision of good quality education, an adequate pool of teachers and reasonable pupil/teacher ratios are not sufficient conditions. Equally important is ensuring that teachers are well trained, motivated and supported. While differences within and across regions are apparent, cross-country comparisons are often problematic due to different types of pre-service or in-service teacher education frameworks.²

Many countries have rapidly expanded their numbers of teachers by hiring applicants

who lack proper qualifications, as discussed below. Some countries, often out of necessity, have even lowered entry requirements to the profession. In Ghana, while there has been a 60% increase in the number of primary school teachers which has kept the PTR below 40:1 over the past decade, the proportion of trained teachers fell gradually from 72% in 1999 to 53% in 2013. Hiring untrained teachers may well serve to get more children into school and keep the PTR lower, but it can also jeopardize education quality. In Rwanda, by contrast, the PTR remained high, at 59:1 in 2012, and the share of qualified teachers increased from 49% of the teaching force in 1999 to 96% in 2012.

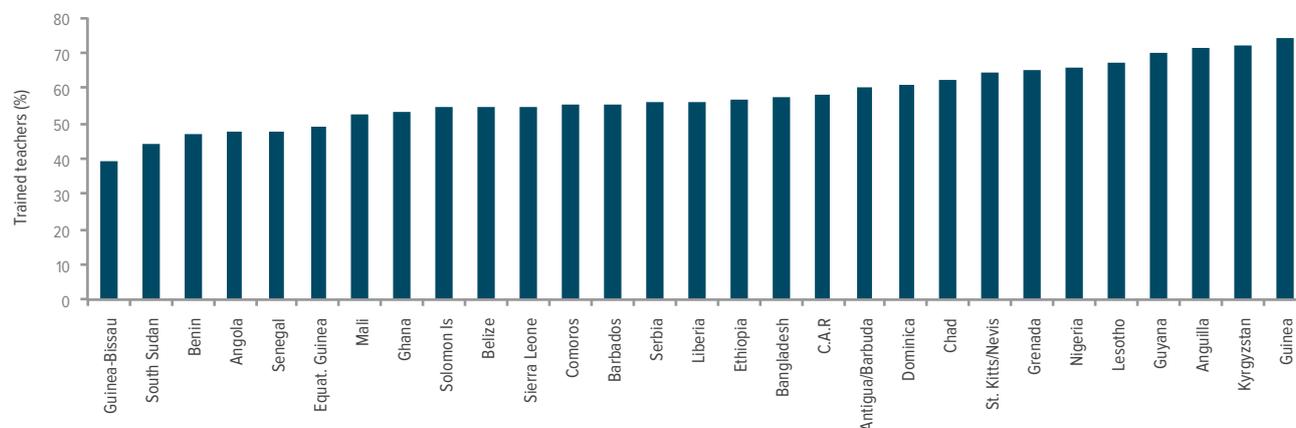
Figure 1 shows that in 30 of the 91 countries with data on trained teachers in 2012, less than 75% of teachers were trained to national standards, with figures below 50% in Benin, Guinea-Bissau and Senegal. In Guinea-Bissau, only 39% of primary school teachers were trained according to national standards, and the PTR increased from 44:1 to 52:1 between 2000 and 2010.

Figure 2 shows that the ratio of pupils to trained teachers exceeded the pupil/teacher ratio by 10 pupils in 28 of these 91 countries, including 20 in sub-Saharan Africa. In Central African Republic, the PTR was 80:1, and the pupil to trained teacher ratio was 138:1 in 2012. Countries with no severe shortage of total teachers may have shortages of trained teachers. While Bangladesh met the PTR target of 40:1, there was a wide gap in 2011 between the number of pupils and per trained teacher (70:1).

Between 1999 and 2012, pupil to trained teacher ratios declined in 44 out of 50 countries with data. In Nepal, the decrease was so large that it moved the country from a 260:1 ratio in 1999 to 28:1 in 2013. This significant improvement was due to a policy of upgrading teacher qualifications to require additional training (Dundar et al., 2014).

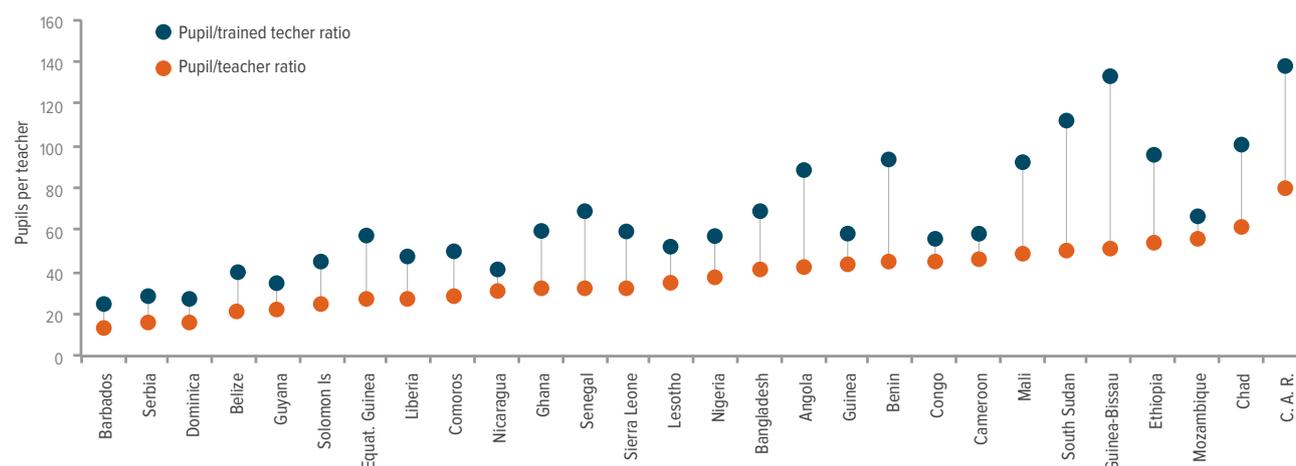
2. Wide variations exist in the programme selection, professional development opportunities and requirements, and the institutional quality of pre-service education.

Figure 1. Percentage of trained teachers in primary education, 2012



Sources: UIS database, EFA Global Monitoring Report team calculations (2015).

Figure 2. Comparisons of PTRs with ratios of pupils to trained teachers in primary education, 2012



Sources: UIS database, EFA Global Monitoring Report team calculations (2015).

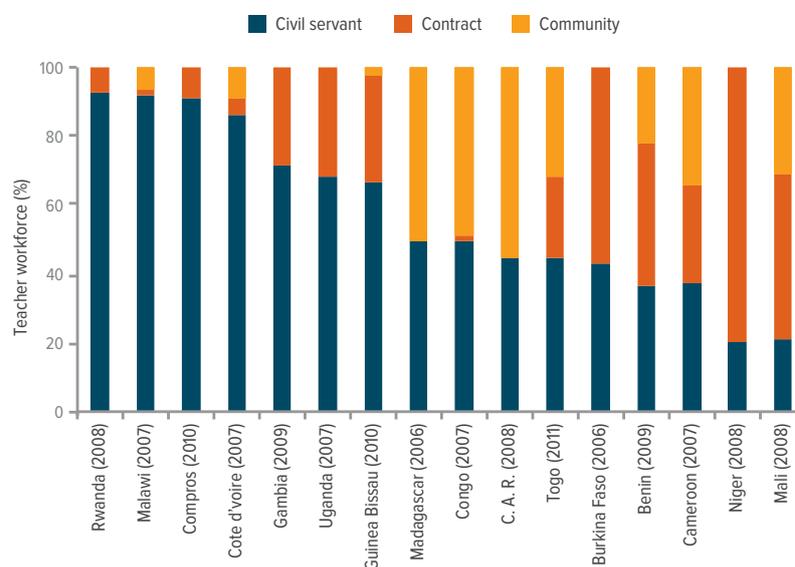
Contract teachers: increasing recruitment at the expense of quality?

In an attempt to respond to the urgent need for more teachers arising from increased enrolments, governments in developing countries, particularly those in sub-Saharan Africa and South and West Asia, launched large-scale teacher recruitment programmes that involved the widespread appointment of contract teachers. This approach partially overlapped with structural adjustment loans from international financial institutions that required the reduction of public sector spending (De Koning, 2013).

Figure 3 shows that by the late 2000s, there were far more teachers on temporary rather than civil service contracts in some countries. In Mali, the percentage of contract teachers reached almost 80%. The increase in the supply of contract teachers has enabled countries with the largest teacher shortages to reduce significantly their PTRs.

In South and West Asia too, expansion in enrolment has led to the recruitment of a large number of contract teachers. In several states in India, contract teachers have been a part of the education system since the 1990s. However, rapid expansion has taken place since 2002, when states were permitted to recruit such teachers through central government grants.

Figure 3. Teacher workforce by contract type, selected countries in sub-Saharan Africa, late 2000s



Note: Community teachers are contract teachers recruited by communities. Other contract teachers are recruited directly by the government.

Source: IIEP-Pôle de Dakar database.

However, there is variation between states. In 2013/14 in the state of Jharkhand, close to 47% of teachers were on a contract compared with less than 2% in the state of Karnataka (Chudgar and Luschei, 2015).

Contract teachers raise concerns about quality and equity, as they receive little or no professional pre-service training as well as considerably lower salaries than permanent teachers, and face poor working conditions and job insecurity (Kingdon et al., 2013). In Niger, for instance, contract teachers earn only half of the salary of a civil service teacher (Pôle de Dakar database). On the other hand, contract teachers may include teachers who do have the required minimum levels of formal education and professional qualifications but are still working on short-term contracts (UNESCO, 2015). In this case, professional development for them to improve qualifications and their professional status is redundant.

In some countries, the effectiveness of contract teachers is similar to that of civil service teachers. In India, for example, employing a contract teacher instead of a civil service teacher has not worsened learning outcomes.

However, achievement remains undesirably low, regardless of the type of teacher teaching in the classroom (Kingdon et al., 2013). By contrast, in Niger contract teachers tended to have a negative impact on learning levels in French and mathematics (Bourdon et al., 2010).

The management and implementation of a contract teaching system play a role in this area. Evidence from Guinea shows that good management makes a difference: under a policy developed by the government and teacher unions whereby contract teachers received 18 months of training, their students generally outperformed those of regular teachers,

and the teachers were significantly more qualified (Chudgar, forthcoming).

Contract teachers tend to be more effective where parental or community involvement is strong. In Kenya, for example, positive effects from hiring contract teachers were observed only in communities where parents were trained to monitor teacher absenteeism and time on task, and relatives of local civil service teachers were prevented from being hired as contract teachers (Duflo et al., 2012). In Mali, language and mathematics scores of grade 2 and 5 students were consistently higher under contract teachers closely monitored by the local community (Bourdon et al., 2010).

The key policy challenge for governments is to keep the flexibility and local responsiveness that contract teaching may offer, while ensuring that quality is not compromised. A single professional development career path for contract and regular teachers may be useful for improving teachers' efforts and motivation while simultaneously removing the existing dual system that may be detrimental to teacher morale (Kingdon et al., 2013).

Imbalances in teacher deployment within countries

At the national level, the total number of teachers and the pupil/teacher ratio can shed light on the state of a given education system. Yet, they can conceal large within-country imbalances in the distribution of teachers associated with location and school type. There is generally a marked and sustained gap between government and non-government school providers. Data analysis by the GMR team based on the UIS database showed that in several countries, including Congo, Rwanda and Uganda, the pupil/teacher ratio in public primary schools exceeds that in private schools by nearly 30 pupils or more.

The shortage of more trained and experienced teachers is likely to affect disadvantaged areas. In Mexico, experienced teachers were more likely to choose to teach in urban and richer municipalities, leaving positions in remote and rural areas for new and inexperienced teachers. The percentage of teachers with greater than 20 years of experience is 38% in large cities, compared to 26% in villages (Luschei et al., 2013). In South Africa, teachers with better subject knowledge in mathematics and reading were more commonly deployed to urban and better-resourced schools (Altinok, 2013).

In Nigeria, only two-thirds of teachers have minimum qualifications. In 2009/10, in the northern state of Kano, one of the poorer states in the country, the pupil to trained teacher ratio exceeded 100. **Figure 4** shows that in more than half of local government authorities, the situation was even worse, with at least 150 pupils per trained teacher in the most disadvantaged 25% of schools.

Inequality in trained teacher deployment is not confined to developing countries. In the United States, high attrition is

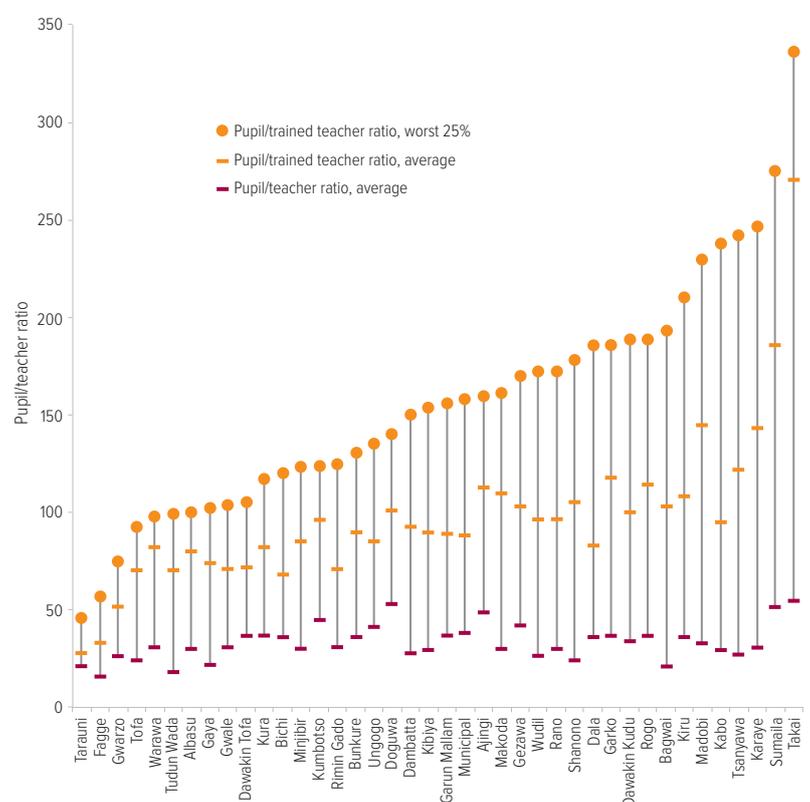
a key problem for schools when staffing their classrooms with qualified teachers. Increased attrition rates, especially among ethnic minority teachers, undermine efforts to recruit new teachers to disadvantaged schools and to diversify the teaching force (**Box 1**).

Deploying teachers to underserved areas

Over the last decade, governments have attempted to address teacher deployment challenges in different ways, including deploying through a centralized system, providing incentives (housing, financial benefits and accelerated promotion), and recruiting teachers locally (Chudgar and Luschei, 2015). Some governments post teachers, usually newly qualified ones, to disadvantaged areas.

Eritrea, Malawi and Oman have adopted planned deployment systems, but with varying results

Figure 4. Pupil/teacher and pupil/trained teacher ratio, mean and bottom 25% of government schools, by local government authority, Kano state, Nigeria, 2009/10



Source: EFA Global Monitoring Report team calculations (2014) based on 2009/10 Kano state annual school census data.

Box 1. In the United States, teacher shortages arise because the teaching force has steadily become less stable

In the United States, elementary and secondary teaching is marked by high and increasing rates of annual departures of teachers from schools and teaching altogether. Annual teacher turnover is estimated to be close to 14% at the national level and peaks at 20% for high-need schools. Analysis of the Schools and Staffing Survey and the Teacher Follow-Up Survey shows that while attrition in teaching is lower than in child care and secretarial work, it is much higher than in nursing and some traditionally highly respected professions such as law, engineering, architecture, and academia.

Ethnic minority teachers have significantly higher rates of attrition than non-ethnic minority teachers, and the gap has widened in recent years. The same difficult-to-staff schools that are more likely to employ minority teachers are also more likely to offer poor working conditions; these conditions account for higher attrition rates among minority teachers. Novice teachers, regardless of their ethnicity and race, register the highest rates of attrition. Within 5 years of entry, 41% of new teachers leave teaching. Attrition rates have been going up since the 1990s. Of first-year teachers who left after the end of the 2007/08 school year, 45% cited reasons related to dissatisfaction with school and working conditions, including salaries, classroom resources, student misbehaviour, accountability, opportunities for development, input into decision-making, and school leadership.

Sources: Auguste et al., (2010); Ingersoll et al., (2014).

according to their management. In Eritrea, the government assigns teachers to one of six regions and to specific schools, strictly depending on student numbers. As a result, by 2004/05, the association between teacher and student numbers was strong in all six regions. On the contrary, in Malawi, planned deployment led to a more uneven teacher distribution due to weak management capacity (Mulkeen, 2010), and in Oman, such a strategy has left disadvantaged areas with the least experienced teachers (Oman Ministry of Education and World Bank 2012).

In the Republic of Korea, teachers working in disadvantaged schools benefit from incentives such as an additional stipend, smaller class sizes, less teaching time, the chance to choose their next school after teaching in a difficult area, and greater promotion opportunities (Kang and Hong 2008). Consequently, disadvantaged groups have better access to more qualified and experienced teachers (Luschei et al., 2013).

In 2006, through resources from the Global Partnership for Education, the Gambia introduced a hardship allowance of 30% to 40% of the base salary for positions in remote regions at schools more than 3 kilometres from a main road. The incentive was large enough to change teachers' attitudes: by 2007, 24% of teachers in the regions where the incentive was offered had requested transfer to hardship schools (Mulkeen, 2010). An alternative approach adopted by Rwanda is to provide subsidized loans to trained teachers working in hard-to-reach areas. The vast majority of teachers in such areas have participated in the programme, making a minimum monthly contribution of 5% of their salary, with members allowed to borrow up to five times their savings (Bennell and Ntagaramba, 2008).

Another approach for benefiting underserved areas has been to recruit teachers from within and by their own communities. This is also driven by a desire to increase accountability, particularly in countries with evidence of and concerns about teacher absenteeism. Locally recruited teachers are also more likely to be socially and culturally akin to the students and parents in the schools where they teach. This closer social distance between teacher and student has been argued as having a positive impact on student learning (Rawal and Kingdon, 2010). In Lesotho, a local recruitment policy allows school management committees to hire teachers who apply directly to the schools for vacant posts. This had led a relatively smaller gap in pupil/teacher ratios between rural and urban areas (Mulkeen, 2006).

An effective presentation of data and transparent management practices can be important for the implementation of a teacher deployment policy. The Rainbow Spectrum initiative has been undertaken in the Philippines since 2003 to make disparities more visible. Districts were colour-coded according to their pupil/teacher ratios, with blue indicating a ratio below 24:1, red a ratio over 50:1, and black a complete teacher shortage. This simple device raised awareness of teacher deployment issues by making information readily available and easily understandable. Between 2009 and 2011, over 60% of new teacher allocation went to black and red areas (Albert, 2012).

Improving teacher status

Challenges in teacher recruitment and retention can result from the low status of the teaching profession, as measured by various markers such as salary, and the respect and value placed on teaching by society. Improving the status of teaching is associated with teachers' better motivation and job satisfaction, which increases their retention and performance, as well as student learning.

The 2013 Global Teacher Status Index illustrates stark differences across 21 countries. Teachers in China, the Republic of Korea, Egypt, Singapore and Turkey had higher status than those in countries of North America and Western Europe (except Greece). Less than 20% of people in Germany would encourage their child to become a teacher, compared with almost 40% in Turkey and 50% in China. Cultural issues explain some cross-country differences: teaching seems to be treated with more reverence in some Asian societies (Dolton et al., 2013).

The status of teaching as a profession has declined (Keuren et al., 2014). Across 15 countries that participated in the Teaching and Learning International Survey, less than 33% of lower secondary teachers believed teaching to be a valued profession in society in 2013, a substantial decrease from 60% in 2008 (OECD, 2014a).

Salaries have a direct impact on the attractiveness and prestige of teaching. In several sub-Saharan African countries, including Central African Republic, Guinea-Bissau and Liberia, teachers do not earn enough to lift their families above the poverty line (IIEP-Pôle de Dakar database). Over the past three decades, already low teacher pay declined across sub-Saharan Africa, with the sharpest declines in Francophone Africa (Pôle de Dakar 2009). When salaries are too low, teachers often need to take on additional work, including private tutoring, which can reduce their commitment to their regular teaching jobs and lead to absenteeism.

Teachers are paid less than people in professions requiring similar qualifications. In 2012, primary school teachers in OECD

countries earned 85% of the average for other full-time workers aged 25 to 64 with tertiary education, and lower secondary school teachers earned 88% (OECD, 2014a). In Peru, other professionals of similar qualifications and background earned 50% more than pre-school and primary school teachers (Mizala and Ñopo, 2012). Teacher salaries were adversely affected by the global economic downturn in late 2008 – their average across OECD countries dropped by around 5% at all levels of education between 2009 and 2012 (OECD, 2014b).

Some countries have taken steps to offer professional incentives to raise the status of the teaching profession. In Indonesia, under the 2005 Teacher Law, teachers are required to acquire a four year degree and be certified. Teachers who obtain certification then receive a professional allowance that doubles their salaries. Between 2006 and 2011, the percentage of primary teachers with a four year degree increased by 176%. The fivefold increase in enrolment in university education programmes, from 200,000 in 2005 to 1 million in 2010, suggests that certification and higher income may have increased the attractiveness of the profession (Chang et al., 2014).

Recommendations

The following recommendations are highlighted for governments to take action to assure the equitable deployment of qualified, motivated and well-supported teachers for all children:

- **Attract the best teachers from a wide range of backgrounds:** Policies and strategies should be implemented to ensure that teaching is attractive to highly qualified candidates from diverse backgrounds, with good subject knowledge, who are ready to live and work in remote areas, and teach disadvantaged children. This implies recruiting teachers from within local communities, which can increase accountability, particularly in countries with evidence on and concern about teacher absenteeism. Locally recruited teachers are also more likely to be socially and culturally akin to the students and parents in the schools where they teach.

- **Get teachers to where they are most needed and retain them:** Trained teachers should be encouraged to accept positions in areas where they are most needed through appropriate working conditions, and a combination of incentives, such as good housing and extra allowances or bonuses. Improving pay and working conditions and providing an attractive career path are the best ways to retain good teachers, and encourage and maintain their commitment to teaching. The effective management of teacher deployment is crucial. If guided by an effective and transparent use and presentation of data, it will contribute to the equitable distribution of teachers. Management of deployment and recruitment will be particularly important when enrolment rates have increased following educational expansion policies.
- **Improve teacher education both before and during teachers' careers:** Policies should be implemented to ensure teachers have sufficient qualification and training. Countries without severe shortages of total teachers may still have shortages of trained teachers.

Education quality can be jeopardized by hiring untrained teachers if they lack qualifications, preparation, motivation, appropriate working conditions and ongoing professional development. Acute teacher shortages may prompt governments to recruit contract teachers, especially when pressed to reduce public sector spending. But quality should not be compromised, even when recognizing the benefits that contract teaching offers, such as flexibility and local responsiveness. Professional development should be provided to contract teachers to benefit from the same career path, professional programmes, promotion opportunities and professional status as other teachers.

All teachers should receive adequate training with a good balance between theory and practice. Teachers should also be prepared to help learners with diverse learning needs and backgrounds, to impart reading skills to children in early grades, and to teach in a language that children understand. Continuous professional development is essential for all teachers to adapt to new learning challenges and new skills.

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