K4D | Knowledge, evidence and learning for development

Approaches to managing public sector basic education systems for delivery of school and classroom-focused results

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Question

Global evidence of effective approaches to improving and reforming public sector basic education systems for delivery of school and classroom-focused results.

Under this topic, the report will seek to explore the following thematic issues:

1. *Financial management*
2. *HR Management, including structures for teacher professional development*
3. *Evidence of approaches to the use of data-gathering and evidence to inform decision-making*

Contents

1. Overview

This report provides a summary of global evidence on effective approaches to improving and reforming public sector basic education systems with a particular focus on delivery of school and classroom-focused results. In keeping with the request, the scope of the report focusses primarily on emerging practices associated with financial management, HR Management, and the use of data-gathering and evidence to inform decision-making at all levels of the system.

The discussion on educational reform approaches includes critiques of programme-based reform processes and the presentation of alternatives that focus on solving locally nominated and defined problems through decision-making that encourages positive experimentation through multiple small-scale localised initiatives combined with frequent cycles of data analysis.

The section on financial management includes an overview of issues associated with the equitable distribution of education budgets and approaches that can help overcome such issues through targeted and decentralised approaches to budgeting.

Regarding HR management, a broad range of interventions for addressing issues in teacher recruitment, deployment and professional support are highlighted, with a particular focus on initiatives to improve professional commitment and school-level performance. Of high relevance to the context of this study, it is worth noting that Steenbergen (2016) proposes a range of policy options for deployment and recruitment within the Nigerian state context.

Finally, the discussion on data-gathering to support evidence-based decision-making draws on a range of examples of the value of such approaches in enabling system-wide performance improvement.

Key findings from this study include:

- The importance of data use to manage the effective deployment and targeting of human and financial resources according to equitable and needs-based criteria
- The value of enabling localised and/or decentralised approaches to recruitment, deployment, budgeting and data analysis in order to solve localised contextual challenges
- The provision of a broad range of contractual and support initiatives to ensure the engagement, motivation and professional development of teachers and head teachers
- The need for committed, problem-focussed and outcomes-orientated leadership at all levels of the education system, especially at school level.

The evidence provided is drawn from a broad range of international contexts, and is based on substantial system-level analysis. However, due to limitations in time and space allocated to this study, there are some limitations to the level of detail with which specific cases and implementation practices are discussed. The study contains no specific focus on gender in terms of scope or the evidence gathered and presented here.

2. Emerging approaches to management of educational reform

In general terms, it is increasingly recognised that there is a need to strengthen the performance of education systems by designing investment with a focus on results at every level. Despite increases in investment, efforts to improve education are leading to huge variability in results, with similar investments and reforms producing widely different outcomes in different places. For example, Vietnam spends about the same amount per pupil on education as Tunisia, as a percentage of GDP per capita. Yet, in Tunisia only 64% of students passed the secondary international learning assessment, while in Vietnam it was 96% (Education Commission 2016). Analysis finds that improvements in the design and delivery of education will succeed *only* if they are underpinned by a system that is built to deliver results.

2.1 Critiques of programme-based reform approaches

A growing school of thought identifies standardised programme-based reform initiatives, such as those currently favoured by donors, as reinforcing the reduced capability of education systems in developing countries. This is in part because they create and reinforce processes through which global players constrain local experimentation and tying their funds to pre-conditions in structural adjustment and other budget financing initiatives (Andrews, Pritchett & Woolcock 2012). However, in addition, the combination of policies, procedures, and implementation acumen needed to improve outcomes across an entire education system places extraordinary demands on systems that frequently do not have the basic capacity to succeed (Crouch & DeStefano 2017).

For example, Crouch & DeStefano (2017) cite as evidence the case of the World Bank's own Systems Approach for Better Education Results (SABER), which requires the education systems in participating countries to produce comparative data and knowledge on over 500 indicators covering everything from early childhood development, to assessment, to higher education, to school health and feeding. These requirements are in place despite the broad range of institutional challenges the relevant systems face, both in term of technical and resource capacity.

Pritchett (2013, in Crouch & DeStefano 2017) defines these programme-based approaches to systemic reform as 'isomorphic mimicry': a process that creates institutions in developing countries which look like those in states with functional public sectors. By acting to recreate the mechanisms to implement the reforms tried in successful countries, but without putting in place the underlying functionality that actually makes the reforms work, education systems can acquire the broad range of education ministries, offices, agencies and institutions, but still lack the operational ability to actually deliver high-quality services. Instead, the adoption of 'best-practice' policies and infrastructures only ends up masking a government's poor functional performance to the outside world (Steenbergen 2016).

Therefore, in this context, the challenge of getting an education system to produce reliably better learning outcomes is more about operational capacity than it is about policy and systemic institutional structures (Moore 2015). This involves making a distinction here between *getting the policies right* and *managing implementation* (Crouch & DeStefano 2017), an understanding that is reflected in the increasing evidence of sector strategies that explicitly claim improved learning outcomes as an objective. This is a process that involves identifying the core things a

management system needs to do to ensure that teaching and learning improve in all schools. Crouch & Stefano (2017) see this in terms of three core functions: setting expectations for the outcomes of education; monitoring and holding schools accountable for meeting those expectations; intervening to support the students and schools that are struggling to meet expectations, and holding the system accountable for delivering that support.

2.2 Alternative approaches: PDIA and DDD

Alternative approaches to the management of educational reform that are seen to address this need often focus on efforts that require community action and advocacy, critical to challenging norms and supporting local change (Education Commission 2016). Examples include Problem-Driven Iterative Adaptation (PDIA) and the practices emerging from the Doing Development Differently (DDD) manifesto. Firstly, these models focus on solving locally nominated and defined problems in systemic performance (in contrast to transplanting preconceived “best practice” solutions). Secondly, they seek to create an environment for decision-making that encourages positive experimentation through multiple small-scale localised initiatives (in contrast to designing projects and programmes with rigid implementation criteria). Thirdly, they advocate for tight feedback loops that facilitate flexible experiential learning that feed rapid cycles of planning, action, reflection, and revision (in contrast to enduring long lag times in learning from standard monitoring and evaluation procedures). Fourth, they seek to actively engage broad sets of stakeholders at all systemic levels to ensure that reforms are viable, legitimate, relevant, and supportable by all stakeholders (in contrast to technical expertise promoting a top-down diffusion of innovation) (Andrews, Pritchett & Woolcock 2012; Crouch & DeStefano 2017).

In general terms, such approaches relate to ideas that are already being acted upon in the local context, and are thus often administratively and politically feasible, while also yielding the necessary positive results in addressing the policy issue. However, these ideas are only exhibited in a small part of the system and thus deviate from the norm (Steenbergen 2016). It is argued that enabling such processes of innovation and experimentation is only possible when novelty is both encouraged and rewarded within the authorizing environment within which key decisions are made, and when broad sets of stakeholders are authorised to engage together in designing and implementing locally relevant solutions to locally perceived problems (Andrews, Pritchett & Woolcock 2012).

For example, in terms of systemic reform, field-level education officers and school principals are often ignored in systemic capability interventions or seen as passive targets of change. However, their roles are also seen as essential to the effective implementation and embedding of reform outcomes (Whittle, Suhomlinova & Mueller 2011, in Andrews, Pritchett & Woolcock 2012) and an overly centralized approach to change will find that many stakeholders at the field level will not implement the adopted changes where they do not share the understanding that change is needed or that the prescribed solutions are appropriate. (Andrews, Pritchett & Woolcock 2012).

In response, emerging approaches to educational reform such as PDIA advocate for strong mechanisms for convening connections between practitioners and decision-makers that allow broader engagement in designing, experimenting and implementing reforms. This typically involves bringing groups of leaders together with key implementers to craft local experiments and solutions (Dorado 2005, in Andrews, Pritchett & Woolcock 2012), and ensuring interactions with frontline workers who will ultimately have to implement final changes (Andrews, McConnell & Wescott 2008, in Andrews, Pritchett & Woolcock 2012).

In addition, in design terms, these approaches advocate for a project approach described informally as 'muddling through', associated with an experientially-based model of encountering and solving localised contextual situations. This often takes place on a flexible and short-term basis, in contrast to the long-term planning and goal-setting associated with standard programme-based reform activities (Andrews, Pritchett & Woolcock 2012).

Based on evidence in a broad range of systemic reviews, Crouch & DeStefano (2017) contend that whole-system reform can benefit from an approach that tries many different things at a smaller scale. Narrowing the focus and scale of interventions within education reform to a localised framework of reference can, counterintuitively, contribute to meaningful system-level change. Tackling specific, key elements of the system that impact the quality of service provision can stimulate rapid cycles of learning and, in fact, can lead to 'doing systems change differently'.

2.3 Alternative approaches: Deliverology

McKinsey's deliverology approach is increasingly influential in system reform contests, and bases its approach on three key factors:

1. **Leadership:** for any programme to operate with a leadership that will start strong and maintain a focus on the achievement of learning outcomes (need champions to support reform)

2. **Data:** the efficient use of reliable, regular and timely data to provide evidence of progress and inform decision-making

3. **Accountability:** ensuring that all contributors take responsibility for and management of the delivery of key actions according to deadlines (delivery chain and traffic lights on a delivery plan).

(Barber et al. 2010)

This approach is based, in theoretical terms, around the establishment of small teams that are focused on performance in the delivery of specific systemic outcomes, that measure performance through the gathering of data to set targets and priorities, and around routines to drive and ensure that focus on performance.

A key factor in this is the working relationships between the leaders and decision-makers and the staff responsible for implementation. It is seen as crucial that project leaders take public accountability for the delivery of outcomes. In addition, the small team size is seen to ensure flexibility and efficiency in delivery, and selectivity based on skills and capacity. As far as possible, while leadership is crucial, the team should operate on a non-hierarchical basis in order to enable innovation and clear communications on performance to be shared openly.

In terms of data use, deliverology focuses its model on the setting and meeting of targets according to schedule. These should be ambitious and time-bound, but also realistic and achievable. These targets are accompanied by 'trajectories': key milestones and performance indicators that help measure systemic progress towards meeting those targets. It is in this context that the role of data-gathering becomes important. This can include drawing on historical data (i.e. previous performance), domestic peer group data (i.e. parallel performance in similar contexts) and international peer group comparison (i.e. parallel performance in other contexts).

Finally, the system uses regular and frequent routines of performance assessment reporting to maintain focus on the key tasks associated with the project. Additionally, deliverology emphasises the importance of transparency and information-sharing in project implementation as a further mechanism for ensuring accountability (Barber et al. 2010).

As an approach for educational reform in the public sector, deliverology has been used in a number of high-profile settings, including Pakistan, Ethiopia and Sierra Leone (Donnely 2018).

3. Approaches to financial management

There are five main reasons why spending does not always lead to better and more equal student learning outcomes:

- Spending is not allocated equitably
- Funds do not reach schools or are not used for their intended purposes
- Public spending can substitute for private spending
- Decisions on the use of public funding are not coherently aligned with learning
- Government agencies lack the capacity to use funding effectively.

(World Bank 2018; Education Commission 2016)

3.1 Spending on education as a proportion of national budget

In addressing issues of financial management within education reform, one of the priorities at the systemic level is to look at the overall education budget, including by sector, as a share of the national budget or GDP, and make an assessment as to whether the figures are in keeping with international benchmarks. The Incheon Declaration recommends that national governments allocate 4% to 6% of their gross domestic product (GDP) and/or at least 15% to 20% of their total public expenditure to education, with a particular focus on basic education (Global Partnership on Education 2016). The global benchmarks are essential for bringing attention to domestic financing by increasing national budget allocations and creating momentum for necessary improvements in efficiency, effectiveness and equity in domestic spending (Global Partnership on Education 2016).

There are some notable examples of commitment to educational funding among low and middle-income countries. In 2015, where data is available, 47% of GPE partner developing countries, including 43% of countries affected by fragility and conflict, spent at least 20% of total government expenditure on education (Global Partnership on Education 2016). This is a significant achievement in terms of budget commitment and should be acknowledged as such.

However, it remains the case that the majority of countries in a development context do not meet these targets (World Bank 2018). Going forward, it is estimated that low- and middle-income countries will be required to more than double their spending on education by 2030 to meet the anticipated educational needs at pre-primary, primary, secondary and post-secondary education levels (Education Commission 2016).

As part of its funding model to incentivize governments to increase budget allocations for education in keeping with the Incheon Declaration, GPE currently promotes an approach that, it argues, strengthens the entire education system and supports developing country partners. These include the following interrelated mechanisms:

- Strengthening education sector planning that includes financially sound sector plans informed by reliable data and accounts for external and domestic resources available for both recurrent and capital expenditures.
- Mobilizing more and better financing to maximize impact and build stronger education systems.
- Supporting mutual accountability through effective and inclusive policy dialogue and monitoring.

(Global Partnership for Education 2016)

This emphasis on both data and accountability at the macro level echoes the similar selection of interventions seen to underpin current approaches to education reform throughout national educational and schooling systems.

3.2 Public spending within education

Under equitable spending within education in general terms, government spending on non-salary educational costs, such as teacher training, instructional support, school infrastructure and appropriate materials for children, remains a low priority in many of countries. For example, in Zambia in 2013, 88.8% of total spending on basic and secondary education was for salaries, 8.5% was for infrastructure (mainly in secondary schools), 2.5% was for school grants, and 0.2% for textbooks (World Bank 2016, in Bashir et al. 2018). Similarly, in Ghana, salaries average around 97% of government expenditures on basic education (Darvas & Balwanz 2014, in Bashir et al. 2018).

While there is an identified need to better mobilise domestic funds for education (Education Commission 2016), in this context, many developing countries rely heavily on donors to finance resources such as textbooks and teacher training, although continued reliance on foreign funding for recurrent expenditures that are essential for the functioning of the education system creates problems of sustainability and poor resilience (Bashir et al. 2018).

In addition, many countries continue to rely on household contributions (such as for the purchase of textbooks and materials, and the upkeep of local schools) to compensate for low public spending on non-salary educational inputs.

However, the dependence on households tends to reinforce inequality in the quality of school provision, based on both household income and socio-economic status. For example, in rural and/or agricultural areas, where household incomes fluctuate according to the season, the education of children is vulnerable to local conditions (Bashir et al. 2018). Communities can also react to increases in public education spending by lowering their own contributions. For example, the introduction of school grants in India and Zambia had no effect on learning because parents reduced their own financial support in anticipation of increased government funding (World Bank 2018).

Inequality in public spending on basic education stems from four underlying factors: firstly, public spending is often allocated in ways that exclude poor and marginalized children, reducing its overall impact on learning. Overall, public education expenditure tends to favour wealthier, more powerful groups (World Bank 2018; Education Commission 2016). Public spending on education in developing countries frequently accrues largely to richer income groups, primarily because the overwhelming majority of poor children do not go beyond primary education, and the inequality in spending on primary and lower-secondary education further reinforces this bias (Bashir et al. 2018). In Zambia, 39% of secondary education spending was allocated to the richest fifth of households, compared with only 8 percent for the poorest (World Bank 2018).

The three further factors influencing budgetary inequality relate to teacher allocations, the quality of school infrastructure, and the frequency and quality of teaching-learning inputs. Schools in poorer communities tend to have higher student-teacher ratios, smaller shares of well-qualified and experienced teachers and fewer books, learning materials, and educational equipment. Such schools also have fewer of the amenities that enhance conditions in the workplace and drive teachers' preference for working in a specific school. Many systems have not been able to ensure that teachers who are assigned to rural schools continue to teach there beyond the stipulated period, meaning that the more experienced teachers move on elsewhere. Finally, the distance of schools from children's and teachers' homes is likely to be greater in poorer rural communities, impacting directly on the amount of time spent in class, particularly at the end and beginning of the school day (Bashir et al. 2018).

There are many cases where public funds have failed to reach schools and/or be used as intended. For example, in 2013–14, almost a third of school capitation grants failed to reach Zambian primary schools: funds were diverted for other uses, including to fund district-level operating costs. In the Philippines, in 2013 about a quarter of similar funds did not reach primary and lower secondary schools: while district education offices reported using some of the funds to pay school expenses, this use was not recorded and schools had no way of monitoring the spending. Schools that served poorer students also received a smaller share of their intended allocation than schools serving wealthier students. Even when resources are delivered to schools, they are sometimes not used: in Sierra Leone, a 2008 programme successfully increased the delivery of textbooks to schools, but the textbooks had no impact on learning because they were stored as a hedge against future shortfalls rather than distributed to students (World Bank 2018).

In addressing these issues, there are a number of approaches that effective financial management can seek to prioritise.

3.3 Targetted educational spending

Policies to spend incremental resources for improving learning and to reduce disparities in standards of provision can include the following:

- Increasing and protecting the budget for quality-enhancing, non-teacher related inputs, as well as strengthening the public financial management processes related to the execution of these budget lines
- Defining and implementing standards for minimum school facilities and instructional materials, and budgeting for them accordingly

- Targeting budgetary investment to prioritise poor regions and poor households for additional support to offset existing inequities
- Implementing equitable teacher allocation and deployment policies, thereby ensuring a more equitable spend on salary costs.

(Bashir et al. 2018; Moore 2015)

The Education Commission (2016) recommends applying the concept of progressive universalism as a way to close the gaps in equity and learning. This means expanding provision of quality education for all while prioritizing the needs of the poor and disadvantaged. It provides a guiding principle to inform spending decisions, recognizing the scarcity of public funding.

In supporting this, decision-makers should have the knowledge to invest in the education interventions and approaches that deliver the best results. Funding should be shifted to the best-proven systemic changes and specific practices that improve learning, selected and adapted according to different country contexts. To keep investment focused on the reforms and practices that work best requires building education systems that continuously seek out and act upon the best new information on what delivers results, including by increasing the share of funding that goes toward research, development and evaluation. Increasing funding in education R&D and evaluation can benefit all countries and will be particularly critical as decision-makers innovate and respond to the new challenges and opportunities facing education in the coming decades (Education Commission 2016).

3.4 Decentralised budgeting

In large countries, inequality in education financing across regions or subnational units – whether for political or logistical reasons - is a major issue. Decentralizing educational decision-making and financial management to subnational and local governments has been extensively promoted by international organisations such as the World Bank (UNESCO, 2017: 6). However, decentralisation is not a ready-made solution to achieving educational equity or improving learning at school level (Hanushek, Link & Woessmann 2013; Snilstveit et al. 2015 in Bashir et al. 2018), and can be associated with corruption in contexts where democratic institutions are weak (UNESCO, 2017: 58).

4. Approaches to HR management

In general terms, there are a number of key interventions and approaches to HR management at systemic level that can contribute significantly to improvements in the overall management of the teaching workforce. In the first instance, the key cornerstones that are seen to contribute to stronger management systems, better HR decision-making and clearer roles and responsibilities for the educational workforce include:

- For systems to develop and use effective Education Management Information Systems (EMIS) at central, local and school levels to enable better planning and management in the training, recruitment, deployment and CPD of teachers

- For systems to encourage the active participation and involvement of teachers and headteachers in systemic decision-making, including through clearly defined roles and responsibilities in this regard
- To strengthen systems for the training, recruitment and deployment of teachers including, for example, the provision of appropriate incentives for teachers working in hardship posts.

(Mpokosa et al. 2008)

Further to this, emerging practices seen over the last 5 years are increasingly presenting evidence of the benefits of:

- Ensuring that basic standards and mechanisms for teacher management, professional support and working conditions are in place at school-level
- Strengthening mechanisms for school-level accountability and teacher professionalism including, for example, through increased community engagement

(World Bank 2018; Bashir et al. 2018)

Drawing on this, within the field of HR management, there are a selection of specific challenges that education systems in LMICs are required to address. They include the following.

4.1 Teacher Recruitment

Following the pressures placed on education systems in developing countries after the expansion of universal primary education (UPE) in association with the Millennium Development Goals, addressing needs associated with the scale and capacity of the teaching workforce has become recognised as a systemic priority. In Sub-Saharan Africa overall, the teacher workforce has expanded rapidly over the past 15 years, growing by an average of 4.1% a year in primary education and by 6.6% a year at the secondary level (Bashir et al. 2018).

However, in order to continue to grow to meet future demand, teacher recruitment strategies must acknowledge that while most teachers at present are drawn from the more educated pool of the national labour force, primary teachers earn about 9% less than other tertiary-educated workers (Bashir et al. 2018). Teachers need to be treated as professionals, and good professionals receive support and respect, but are also held to high expectations (Education Commission 2016). Yet education systems in many countries neither reward teachers for performing well nor penalize them for performing poorly (World Bank 2018; UNESCO 2015; Mpokosa et al. 2008). Already, teachers are more likely than other professionals to hold a second job, a factor which impacts on schooling outcomes (UNESCO 2015). However, as economies in developing countries diversify, there will be greater competition for the relatively few tertiary-educated workers, and unless terms and conditions are improved, the education sector may not be able to recruit or retain trained teachers. Many countries already face serious challenges in these areas (Bashir et al. 2018). In respect of teachers' salaries ILO/UNESCO (2006) points to a situation where 'in a significant number of countries, teacher salaries are simply not comparable with those paid in other skilled occupations of equivalent professional or even lower occupational level.'

In response, HR management systems should seek to oversee strategies to improve incentives for developing a more effective teacher workforce, including through:

- Establishing in sustained dialogue with teachers through their unions and other key stakeholders to take joint ownership of the learning agenda and its challenges
- Developing a results-oriented action plan to identify and remove key impediments to better recruitment, retention and professional commitment, including:
    - working conditions;
    - pay and career progression;
    - standards for professional conduct;
    - criteria and processes for teacher certification, recruitment, and professional advancement.

(Bashir et al. 2018; UNESCO-IICBA 2017)

Recruitment criteria

In order to ensure recruitment of the best teachers, a review of literature from Steenbergen (2016) concludes that it often helps to centralise the recruitment system and adopt a structured, formal recruitment process. Such an approach is seen to have a clear impact on learning outcomes. In the context of Mexico between 2008-2009, Estrada (2013, cited in Steenbergen 2016) demonstrates that introducing a teacher recruited on the basis of a test into a school can have very large effects on student learning.

Estrada further notes that the difference in performance cannot be explained only in terms of the teacher's test scores. Even those test-based teachers with similar scores to traditionally hired teachers outperform them in schools, thus emphasising the importance of teacher contracts and accountability identified by De Ree et al. (2015) and Pritchett (2015) below: if a teacher knows they are appointed by policy rather than on the basis of competence, they are less accountable to the school, and may thus have lower attendance and less motivation to perform (Estrade 2013, in Steenbergen 2016).

The key is to offer clear and transparent minimum teacher competencies – rather than criteria based primarily on qualifications and/or length of service, avoid having an informal system to dominate, and ensure the centralised system is robust enough against external influences (Steenbergen 2016). Such factors help avoid systemic elements that undermine the quality of teacher selection and lower teacher effectiveness by reducing their accountability to schools.

However, prior to recruitment, there is also evidence that establishing strong national training intake standards, as well as standards for teacher training institutions themselves, has a strong effect the overall quality and professional capacity of teaching graduates entering the system. However, such measures can impact heavily on the levels of teacher training enrolments. On the introduction of such standards, enrolment in Peru's teacher education programmes dropped from 38,000 in 2006 to about 12,000 in 2008 (Bruns et al., 2015). Fortunately, such figures were much closer to Peru's actual recruitment needs: in the context of the teaching workforce crisis identified in sub-Saharan Africa, the practical viability of such a drop in teacher numbers would need to be carefully assessed. Other incentives for attracting high quality recruits include offering high-scoring applicants scholarships to study teacher education (e.g. Columbia in Bruns et al. 2015).

Teacher salaries and teacher contracting

With regard to salaries in particular, teacher pay is directly linked with expanding access to schooling. While it may not have a direct impact on specific learning outcomes, a system's ability

to pay its teachers well and on time is closely linked with positive results such as teacher recruitment, retention, satisfaction and morale, as well as class size, factors that have themselves been connected with education quality (Dolan et al. 2012). Education systems that do not have the financial resources to recruit additional teachers typically accommodate expanding student enrolment rates by increasing the number of students in the classroom (UIS, 2011).

In discussing these issues further, in a study of teachers in Pakistan, Bau & Das (2017) state that, while they found no direct link between teacher quality (in terms of learning outcomes) and teacher wages in the public sector, there was an impact of contract status on teacher quality; contracted teachers had a greater impact on learning outcomes than permanent teachers. Similarly, in India, Atherton & Kingdon (2010, cited in Pritchett 2015) compared the results of teachers being hired either into regular civil service positions or as contract teachers. Contract teachers in Uttar Pradesh made less than a third the salary of civil service teachers, yet children learned twice as much than if in a permanent class with a civil service teacher as with a contract teacher. A parallel study in India found contract teachers were at least as effective as regular teachers; because these teachers are more accountable to the school, they are also much less likely to be absent (18% for contract teachers versus 27% for traditional teachers). Hence, 'contract teachers were able to more than make up for their lower levels education, training, and experience with higher levels of effort' (Muralidharan & Sundararaman, 2013). Similar findings were made about contract teachers in Kenya (Duflo, Kremer, & Dupas 2009, in Pritchett 2015). Recent work in Indonesia shows that a doubling of teachers' salaries has no effect on student learning (De Ree et al. 2015).

This suggests that, from an HR management perspective, whereas attractive or realistic pay scales are more associated with encouraging teacher recruitment and retention (De Ree et al. 2015; Pritchett 2015), an effective relationship of accountability for teachers (such as through contracted recruitment) is more closely associated with outcomes student learning (Pritchett 2015). 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 (UNESCO 2015).

4.2 Teacher Deployment

A key function of HR management within education systems is ensuring the effective deployment of teachers at a state and national level. Student-teacher ratios should be more or less consistent across schools to provide all students with equitable learning opportunities, but in some countries this does not occur (UNESCO 2015).

In Ghana, for example, the same number of teachers is allocated to schools having 500 students as to schools having half as many students; by comparison, in Côte d'Ivoire, the number of teachers in a school relates more consistently to the number of students in that school. In addition, the need for specialized teachers in secondary education is seen to greatly complicate the task of teacher allocation to schools (Bashir et al. 2018).

At the primary level, countries in sub-Saharan Africa including Lesotho, Mauritius, South Africa, Swaziland, and Zimbabwe have been more successful at deploying teachers. However, these systems share a number of common features: small or mature systems; modest fluctuations in the size of incoming teacher cadres; and few initial contextual challenges. Conversely, countries such as Cameroon, the Democratic Republic of Congo, Togo, Benin, the Republic of Congo,

Côte d'Ivoire, Tanzania, Burkina Faso, Chad, and Senegal have recruited large numbers of teachers but have been unable to deploy them to schools in need (Bashir et al. 2018).

In particular, poor teacher deployment systems result in disparities in teacher distribution between rural and urban schools (Steenbergen 2016; UNESCO 2015). In Lesotho, Sierra Leone and Malawi, a DFID study found that there was an acute shortage of qualified teachers in rural areas and it was very difficult to recruit staff for rural postings (Mpokosa et al. 2008).

The common effect of poor deployment management and inequitable deployment is that excessively high pupil-teacher ratios make classes overcrowded and unmanageable, and the move towards participative teaching and learning methodologies becomes impractical. Large numbers of children drop out after their first or second year at school, and large numbers of repeaters contribute to wastage. Teachers become exhausted and demoralised by the increased workload caused by increasing class sizes (Mpokosa et al. 2008).

In response, HR management systems should seek to oversee strategies to improve both teachers' deployment and attendance, including through:

- Developing systems for gathering data on and responding to school-based teacher workforce needs at district, state and national levels
- Engaging key stakeholders in developing teacher allocation and deployment norms, informed by reliable data consolidated from all relevant sources
- Rationalizing teacher leave policies to reduce authorized teacher absences when schools are in session, with possible provision of substitute teachers
- Strengthening incentives for school heads and the local community to reduce teacher absences
- Planning for the use of substitute teachers to reduce loss of instructional time from authorized teacher absenteeism.

(Bashir et al. 2018).

Decentralised deployment mechanisms

In delivering such models, Steenbergen (2016) concludes that the more centralised the deployment system is, the more pronounced the disparities will be between urban and rural schools. Centralised initiatives for deployment such as forced transfers rarely work, and can be damaging to teacher morale. However, while localising the deployment system often leads to the most equitable deployment system, it also comes at the price of teacher effectiveness: evidence suggests that more qualified teachers will apply for positions in urban areas, while, out of necessity, rural schools will frequently recruit from a reduced pool of largely underqualified individuals. Decentralised systems are also more vulnerable to external pressures and political interference, especially for districts with weak administrative capacity.

Arguably, models of school-based recruitment can help overcome the potential weaknesses and challenges of a teacher deployment system. Teachers directly apply for a specific school, and schools will only select teachers who will accept the position. It also gives each school's head teacher the best ability to select those candidates that match the school's broader teaching requirements. In terms of equitable teacher deployment, this system often ensures that most schools across the nation can fill their teaching posts. However, this system also leads to the

best qualified teachers to get the most desirable (i.e. urban) jobs. Again, more rural schools have to rely on local teachers, who often have lower or no qualifications (Mulkeen 2009).

Additionally, decentralization measures have often complicated the work of school leaders and teachers in situations where little parallel work has been carried out to boost their management capacities (related to organizational management, budgeting, planning and resource management), or to reduce the practical constraints to working effectively in challenging contexts (UNESCO-IICBA 2017).

Incentives for teacher deployment

Addressing the range of deployment issues associated with rural-urban inequities can work, but require significant financial investments in terms of ensuring strong sub-national budget lines for recruitment, incentive initiatives such as rural hardship salary or allowance schemes, and the provision of teacher housing in community localities that otherwise lack such amenities.

Firstly, financial incentives are widely used in sub-Saharan Africa to attract and retain teachers in rural schools, but in most cases have limited impact. For instance, Zambia provides a 20% bonus, and Uganda has a 30% bonus for primary teachers in hard to reach areas. Yet, both times these were unsuccessful to attract many teachers into rural areas as the amount offered was generally considered to be loo low (Mulkeen & Chen, 2008). The Gambia introduced a special allowance in 2006 for anyone teaching in a school more than 3 km from the main road. This hardship allowance equated to an additional 30% of a teacher' salary, but went up to 35% and 40% for schools were further removed from the main road. As a result, by 2007, 24% of qualified teachers had *requested* to be transferred to the most remote locations. However, such a system was also very expensive, and thus reduced the overall number of teachers The Gambia could recruit (Mulkeen 2009; UNESCO 2015).

Secondly, as an example of teacher housing provision in hardship settings, in Malawi, this was often considered to be an absolute prerequisite for a teacher to accept the post. Many rural areas are largely dependent on subsistence farming and thus lack any private market for housing. Absence of housing was particularly important to female teachers who were worried about safety concerns without adequate residence. However, while Malawi's public provision of housing served as an important mechanism to attract teachers to rural areas, it is also very expensive, both in initial building and in maintenance cost. For that reason, very few countries are able to provide housing for all teachers (Steenbergen 2016).

4.3 Teacher professional development and career pathways

In general terms, it is acknowledged that the training provided to teachers in developing countries can be poor, resulting in a teaching workforce with weak subject-matter knowledge and poor pedagogical knowledge and skills (Mpokosa et al. 2008). Looking at this issue in HR terms, in the first instance this situation is creating a vicious cycle of low quality: low cognitive attainment among current and prospective teachers hampers future student learning, which in turn makes it more difficult to improve the quality of the pool from which future cohorts of new teachers will be recruited (Bashir et al. 2018). In the second instance, the lack of investment in teacher professionalism and the 'valuing' of teachers through systemic and effective in-service training and support contributes to the low levels of motivation and the high levels of absenteeism and attrition among serving teachers (UNESCO 2015; UNESCO-IICBA 2017).

Addressing this requires a reform of pre-service and in-service teacher training, as well as the development of clear and effective pathways for professional and career development (Bashir et al. 2018). This will require the systematic professionalization of both teaching and non-teaching roles within education, by improving teacher training and support for teachers, alongside distinct training and support for non-teaching roles (Education Commission 2016). From a pedagogic perspective, the trend in reduction of pre-service training based on a shift towards increased teacher practicum and work-based learning is to be commended. School-based models of pre-service and in-service training raise teacher motivation and the quality of teaching when they include 'practice-by-doing', coaching and mentoring and expose teachers to competence pedagogies to a greater extent than traditional college-based courses. In particularly challenging and adverse environments, teacher professional development (TPD) can be harnessed to help teachers feel emotionally well, supported and equipped for the double roles of teacher and nurturer. Certain types of TPD are also needed to create a supportive atmosphere for female teachers (UNESCO-IICBA 2017).

However, in many cases such policies have only been partially implemented. The provision of mentoring schemes, in-service training or distance support from local tutors or facilitators in such cases is often underfunded and poorly co-ordinated (Mpokosa et al. 2008). In this context, appraisal systems for teachers are frequently undertaken by school inspectors, and are primarily concerned with assessing teacher performance against external and largely administrative performance criteria, rather than on an individual or needs-based footing. Increasing motivation to improve performance among teachers through incentives can increase learning if the incentivized actions are within teachers' capacity. However, it remains the case that any teacher training needs to be individually targeted, context-specific, and repeated with follow-up coaching often around a specific pedagogical technique (World Bank 2018).

In response, HR management systems should seek to oversee strategies to improve teachers' professional knowledge and competence, including through:

- Aligning initial teacher education programmes, in content and design, with the school curriculum and with systemwide priorities for student learning in schools
- Enhancing pre- and in-service teacher practicums through better supervision of trainee teachers by school leaders, guided reflection on trainees' teaching practice experience, increased opportunity for peer-to-peer exchange and support, and increased access to videos and other digital resources that exemplify good teaching
- Enabling continuous professional development aimed at increasing subject-matter knowledge and pedagogical skills according to need, including induction of novice teachers, regular school-based professional support, on-going in-service training adapted to assessed needs, and peer support
- Establishing criteria for assessing professional improvement based on teacher competence and effectiveness in raising student learning and contributing to school improvement.

(Bashir et al. 2018; World Bank 2018)

In linking interventions for teacher professional development with teacher recruitment (see above), there is strong evidence for the value of including a system of probationary periods for newly-recruited and/or deployed teachers. There are a number of reasons for this. Teachers are more accurately evaluated once they are teaching. Classroom observation, student surveys and

principals' perceptions all perform much better in predicting and supporting a teacher's capacity to improve student learning than traditional measures such as graduate degrees or teaching certificates (Grossman et al, 2013; Kane & Staiger, 2011; Jacob & Lefgren, 2008, in Steenbergen 2016). This also better allows the assessment of non-observable teacher characteristics such as career focus, leadership, perseverance and critical thinking (Muralidharan, 2015).

On this basis, Muralidharan (2015) advocates for a recruitment and professional development system where each teacher is directly employed by the school on a contract-basis for up to three years, giving priority to local candidates. The local government will then conduct annual in-school assessments of their teaching skills, and verify the teacher's effectiveness through classroom observations and principal surveys. Once a year, teachers can get promoted to the regular teacher service if they are found to meet the minimum teaching requirements. If, after three years they still do not meet the minimum teaching requirements, the teacher is let go, and a replacement contract teacher is recruited instead.

Additional interventions that are seen as particularly effective for professional development at a whole-school level are the introduction of programmes of peer review based on creating better internal teaching rules and identifying school-led best practices. Such interventions can also reduce the time burden on the principal and help ensure observers have relevant pedagogical expertise (White, 2014, in UNESCO 2017). By fostering teacher well-being and higher job satisfaction and motivation, they can be an element of professional accountability. They can also support professionalism by strengthening teacher collaboration and improving the knowledge base within the profession. Teacher collaboration and peer networks, although significant in all schools, have the greatest positive impact on teacher satisfaction in schools in areas with high poverty (OECD, 2016d, in UNESCO 2017).

4.4 School leadership for professional support

As indicated by the practicum models of teacher development presented above, the role of school leadership and head teachers should be seen as key to supporting professional development and quality educational delivery among teachers. Effective leadership and management, as vested in the senior school staff and especially the head teacher or principal, are increasingly considered priorities for enabling school improvement. Effective leadership means having school principals who are actively involved in helping teachers solve problems, including by providing instructional advice. It also means having principals who set goals with teachers to prioritize and achieve high levels of learning. These factors are associated with the highest levels of student learning, and they confirm that effective school leadership improves the quality of teacher-learner interactions (World Bank 2018). Education institutions that showed significant improvement in student achievement on international tests had strong leadership (Mourshed et al. 2010).

In terms of workforce performance in an educational context, what teachers achieve is a result of their motivations, abilities, and the situations in which they work (Leithwood et al 2006b, in Mpokosa et al. 2008). These factors are interdependent and all three need to be successfully taking place for quality educational provision to occur. The implications for school leadership practice are that school leaders need to work at school level towards improving all elements: teachers' and other staff members' motivations, abilities, and the settings in which they work. To be successful, therefore, requires the school leader to be in possession of a range of cognitive and effective qualities, strategies and skills. Appropriately, many countries increasingly view principals more as instructional leaders, supporting teachers to improve learning, than as

traditional school administrators (Vaillant, 2015). In poorer countries, emphasis on instructional leadership is less evident, though the principals' role in influencing school improvement has grown. In Ghana, school leaders regard themselves as no more than keepers of school possessions and implementers of government policies. In Kenya and Cameroon, school leaders have wide-ranging responsibilities, operating as leaders of learning rather than exclusively as school-level managers, budget holders and high-level administrators.

However, school leaders in such contexts are often not well-prepared to deal with these challenges. As a result, school leaders are increasingly overburdened and underprepared to fulfil these multiple roles effectively (UNESCO 2017). In response, HR management systems should seek to contribute to strategies to improve school leadership and school-based support to teachers, including through:

- Dedicated training for school heads and academic advisers to deepen their capacity to provide sustained, on-site coaching and guidance to teachers
- Building school leadership capacity to monitor and evaluate activities and outcomes associated with improving teachers' professional competence and effectiveness
- Providing school leaders with school management tools to track teacher and pupil presence, ensure availability of school materials, and maintain a school climate free of abuse
- Provide school leaders with peer-to-peer exchange and support mechanisms.

(Bashir et al. 2018)

To be effective, school leadership support associated with enhancing the abilities and motivations of the teaching workforce needs to be individually targeted and repeated, with follow-up coaching, often around a specific pedagogical technique. In Africa, a range of programmes with long-term teacher mentoring and coaching has shown sizable learning effects (Conn, 2017). In India, a programme that provided little initial training to teachers but then provided support throughout the year significantly increased both math and language ability, with the largest gains for those students who were performing poorly at the outset. In Shanghai, teachers participate in ongoing Teaching-Research Groups, which provide development, mentoring, and peer evaluation based on classroom observation (World Bank 2018).

In terms of the type of support school leaders can provide to teachers in improving their abilities, there are a range of domains where evidence shows that monitoring and guidance from leaders can be effective in providing improvements to learning outcomes. Firstly, in the classroom, key mentoring inputs can help enhance the emotional connection and relationships among teachers and students, and improve responsiveness to the academic and social/emotional needs and developmental levels of students. Further inputs can support teachers' instructional approaches to maximising student engagement, improving students' understanding of content and encouraging problem-solving, and providing effective feedback (Bruns et al. 2016).

In Jamaica, the government invested in a school principal training programme with key characteristics that likely led to better management and teacher support. The programme was based on analysis of principals' weaknesses. Principals were trained to provide feedback to teachers on their performance, as well as to use data to evaluate the learning needs of students. The programme also provided practical experience: after initial training, principals spent three months implementing the programme, with mentoring and coaching from experienced school

leaders. The training modules subsequently received high ratings for relevance from participants. Both the principals themselves and the teachers in their schools report major gains in management quality. Teachers say they are twice as likely to be observed in their classrooms and to have the principal work with them to develop short-term goals (Nannyonjo 2017).

In Kenya, test scores improved in schools whose leaders received an additional teacher performance monitoring training (Duflo et al., 2008, in UNESCO 2017), and studies have attributed increased test scores in Indonesia and lower levels of grade repetition, failure and dropout in Mexico (Pradhan et al., 2014; Bando, 2010, in UNESCO 2017) to strengthened school leadership. However, such interventions are more likely to succeed in and benefit schools in advantaged communities (UNESCO 2017).

4.5 School Conditions

Because of the rapid expansion in access to education, teachers in developing countries often lead to oversized, multi-grade classes. The teacher shortage increases workloads and requires long working hours, sometimes including double shifts. Moreover, teachers often have professional duties outside classrooms, such as coordinating the activities of parent-teacher associations, running extracurricular activities, and performing administrative tasks. Teachers in developing countries also face difficult working and living conditions, and a lack of school infrastructure and equipment often handicaps their efforts (World Bank 2018; Mpokosa et al. 2008). In this context, school conditions impact directly on teacher motivation and the quality of teaching, and contribute to teacher absenteeism. For example, in studies undertaken in a number of sub-Saharan countries, a lack of teaching and learning materials was the second most de-motivating factor reported by teachers and that better management of these resources through setting up of regional networks would enhance teachers' confidence (Mpokosa et al. 2008).

A nuanced approach to HR management includes enabling the work of teachers through management of their workplace conditions. While a qualified teacher with content and pedagogical knowledge and skills is essential to effective schooling, there are a selection of conducive conditions that are seen to support effective teaching and learning, and which in their turn contribute to improvements in the motivation and professional commitment of the teaching workforce as well as the attainment of pupils (Bashir et al. 2018). As such, it is appropriate to regard the status of school working conditions as one aspect of HR management.

Across the school, these conditions include:

- A manageable student-teacher ratio (no more than 50 students per teacher)
- Basic services, such as toilets for girls and electricity
- Access to textbooks for reading and mathematics
- Regular attendance in class by both teachers and students
- A school climate free from abuse and violence.

(Bashir et al. 2018; UNESCO-IICBA 2017)

In countries where most schools possess the six essential conditions that describe minimally conducive learning environments, the education system is able to place a greater focus on teacher effectiveness (whether through investment in HR mechanisms associated with teacher

preparation, continuing training, or professional incentives). In other settings, where constraints are severe, addressing these limitations can still be prioritized to good effect. Burundi provides an example of where, even without the resources to provide a full package of essential conditions, it is possible to foster student learning by focusing on, firstly, teacher preparation, training and support, and, secondly, on ensuring manageable class sizes for teachers to do their work (Bashir et al. 2018).

In response, HR management systems should seek to contribute to strategies to improve teachers' working conditions, including through mechanisms that gather data on and prioritizing additional support for schools with inadequacies in terms of:

- The physical environment (e.g. few or inadequate classrooms; a lack of toilets)
- Access to instructional resources (e.g. textbooks and materials; school-based teaching staff)
- Access to professional support (e.g. trained peers and mentors; effective school leadership).

(Bashir et al. 2018; UNESCO-IICBA 2017).

In particular, key resources for professional support might include administrative and pastoral support staff to cover administrative and other support functions, thereby enabling teachers to focus on core tasks associated with teaching and learning.

5. Data-gathering and evidence-based decision making

The capacity of a ministry of education to establish and use data systems that help to monitor and improve the education sector's performance is an indirect indicator of its implementation capacity, as well as a willingness to support evidence-based policy and decision making that are customized to local needs and opportunities (Bashir et al. 2018). Decision-makers invest in the education interventions and approaches that deliver the best results. Funding should be shifted to the best-proven systemic changes and specific practices that improve learning, selected and adapted according to different country contexts. To keep investment focused on the reforms and practices that work best requires building education systems that continuously seek out and act upon the best new information on what delivers results: assessing learning enables teachers to tailor teaching and helps leaders to target efforts and resources where they are most needed (Education Commission 2016).

Evidence from a range of sources suggests that the effective use of good quality performance data appears to be an essential precondition for system reform. In a study of high-performing education systems in cities around the world, Elwick & McAleavy (2015) identified a common systemic preoccupation with management information about student outcomes. Benchmarking the performance of schools allowed the authorities to identify both positive and negative outliers: high-performing schools and weaker schools serving similar communities. This made possible the identification of the best practice and the targeting of support at school-level. In Rio, data-based initiatives introduced key tests for students at the end of each two-month curriculum block, providing a rapid feedback loop and a school management tool for school principals and city officials. The new testing framework allowed to identify students who were functionally illiterate,

leading to the inception of remedial classes to help them catch up. As a result of this emphasis on data, targets for ensuring 95% functional literacy among 6th Grade students were comfortably exceeded three years ahead of the deadline.

5.1 EMIS systems

Several Sub-Saharan African countries have improved their data collection and analysis over the past two decades, with the UNESCO Institute for Statistics (UIS) and development partners supporting training and providing computing support. Many of the region's countries have established education management information systems (EMIS) that collect data on students, inputs to schools, and finance.

However, in terms of relevant data, critical weaknesses can remain within these systems: basic data on enrolments, teachers, and expenditures are often not readily available in many countries; many national or state EMIS do not cover the entire education sector (that is, both public and private providers as well as all levels, from preschool through higher education); and the quality and relevance of existing data is often poor (Bashir et al. 2018). In terms of specific gaps, an informal survey carried out by Bashir et al. (2018) found that only a few countries compiled timely and reliable data on student school participation, physical and financial inputs, and learning outcomes; and data on teachers often lacked information on qualifications, compensation, and deployment. In addition, available data on public spending on education is surprisingly uneven.

A distinguishing feature of data initiatives in most sub-Saharan African countries, including EMIS and some learning assessment systems, is that most have been set up and operated with funding from donors, often spurred by the need to monitor achievement of the Education for All (EFA) goals and targets. The multiplicity of donor-financed projects—each with its own scope, technical design, and rationale—often results in mismatches of software and hardware, complicated and overlapping questionnaires, irregular implementation, and a lack of overall system coherence and internal compatibility. Donor-funded initiatives are also hard to sustain because of the lack of resources for routine system maintenance and updates, including the critical human resources required for this purpose (Bashir et al. 2018).

A further limitation of reliance on EMIS systems for decision making is that EMIS, like much management data, primarily provide data on inputs rather than outcomes and school and system performance. Using learning outcomes data can provide additional information on performance but test results, especially end of cycle test results, are lagging rather than leading indicators, providing information only after teaching has been completed. Crouch and DeStefano (2017) argue that leading indicators such as measures of teacher attendance and use of class time could be included into monitoring frameworks to signal whether schools are providing sufficient opportunity to learn.

In addition, data from learning assessments, whilst informing education debates at the national level and contributing to monitoring of the Sustainable Development Goals at the international level, are not always as effective as they could be at directing education policy making or improving teaching practices. A review of a range of learning assessments administered in Uganda, including national examinations (primary school leaving examinations), a national sample assessment (the National Assessment for Progress in Education), a citizen-led assessment (UWEZO), donor-led assessments (EGRA and EGMA) and a regional learning assessment (SACMEQ), found that weak school accountability systems and lack of political engagement limited the potential of these assessments to impact on policy (Elks, 2016).

5.2 Alternatives to system-wide EMIS

Partially in response to such issues, Andrews, Pritchett & Woolcock (2012) advocate for a problem-driven, stepwise reform process that involves active learning through real-world experimentation. In terms of using evidence to inform decision-making, this approach allows reformers to learn about contextual constraints to change in general, how specific interventions work (or not) in a given context, and how these interventions interact with other potential solutions. This facilitates a process where evidence and outcomes immediately feed into the landscape of knowledge and capacities at hand, from which new arrangements emerge in resource-constrained settings. The lessons learned in such experimentation are dynamic and make the biggest difference when immediately incorporated into the design discussions about change. In this respect, the learning mechanism differs significantly from traditional monitoring and evaluation mechanisms that focus on compliance with a linear process of reform and allow 'lessons' only at the end of a project (Andrews, Pritchett & Woolcock 2012).

It is extremely difficult to evaluate an education system reform approach that uses this basic model of localised initiatives because there would be no single intervention to measure and assess (Crouch & DeStefano 2017). However, in support of this highly localised 'quick-feedback' approach within the context of formal education-systems, there is evidence of standardized approaches to localised data-gathering being developed for sampling and defining indicators, and training school directors and district administrators to collect the necessary data (RTI International 2016, in Crouch & DeStefano 2017).

For example, in Zambia, an SMS-based messaging gateway is being employed to transmit data (Bostock and Rakusin 2014, in Crouch & DeStefano 2017) from schools to the district level, where school report cards are then automatically produced, showing how a school compares to itself over time, as well as how it compares to district, regional, and national averages on key indicators. Systems for electronic monitoring of classroom practice are also growing in application; projects in Kenya (see Piper et al. 2015, in Crouch & DeStefano 2017) and Malawi are supporting school monitoring personnel using tablet-based software to record observations of instructional practice and to monitor their own provision of support to teachers.

However, once mechanisms are in place to allow such monitoring data to be collected and compiled on a regular basis, the system then needs to respond to what those data show. This requires decision-making authority, control of resources, and managerial capacity to direct resources based on need. It also requires that those who support schools—be they on site or at a sub-district or district level—know what to do to help a school be more successful (Moore 2015). Crouch & DeStefano (2017) argue that, in this context, centralised and informed decision-making can guide the selection of options to pursue, and that the local input, adaptation, and ownership advocated for by Andrews, Pritchett & Woolcock (2012) can then come into play when schools and communities are determining how best to support and effectively manage the introduction of research-based approaches to instruction. However, supporting this process requires both strong central-to-local communications mechanisms, as well as ensuring that district-level administrators and inspectors are aware of locally relevant evidence and are prepared to become accountable for helping schools succeed. In many cases, this may require a dramatic redefinition of their roles (Crouch & DeStefano 2017). National legislation and international action can be key to underpinning and embedding these efforts (Education Commission 2016).

In order for performance monitoring data to inform the targeting of differentiated support, Crouch & DeStefano (2017: 10-11) call for a cultural shift at both the system and the school levels. At the system level there needs to be a shift form allocating resources on a per-capita basis to a targeting of resources on the basis of local conditions and needs. At the school level, the shift involves teachers and other school community members going from an assumption that intelligence is fixed, and poor performance inevitable for certain students to a recognition that all children can and should succeed.

A number of systems are drawing on the methodologies for educational reform outlined under the deliverology approach. For example, in Punjab, Pakistan, the Chief Minister has demonstrated a clear commitment to reform through an identified set of education priorities and exhibits strong leadership through an established chain of accountability. Current mechanisms for data collection ensure rapid, accurate evidence from the front line. Mechanisms include data collection on teacher attendance through both a teacher register, and the physical checking of teachers in class and teaching; on teacher quality through the use of lesson plans; and on learning outcomes, through 3 students per class randomly chosen to answer a few basic literacy and numeracy questions. Ethiopia's leader has similarly indicated commitment to education reform, and in the higher education sector, both the MOE and universities have set deadlines and report progress weekly (Donnely 2018).

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About this report

This report is based on five days of desk-based research. The K4D research helpdesk provides rapid syntheses of a selection of recent relevant literature and international expert thinking in response to specific questions relating to international development. For any enquiries, contact helpdesk@k4d.info.

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