



Background Paper Transforming the Education Workforce

Why We Need to Rethink the Education Workforce

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The Education Workforce Initiative (EWI) was established in response to a recommendation from the Education Commission's *Learning Generation* report to explore new ways of diversifying and strengthening the education workforce. The *Transforming the Education Workforce* report is one of EWI's key contributions to catalyzing this thinking. It draws on recent evidence and provides thought leadership on how to rethink the education workforce. For the full report and other supporting documents, please visit EducationWorkforce.org.

The *Transforming the Education Workforce* report was originally commissioned as a set of sequential background papers and thus each paper influenced and references the others. The background papers are written by different authors and cover the rationale for rethinking the education workforce, the design of the education workforce, how it can be strengthened, and political economy and financial considerations.

This background paper focuses on why we need to rethink the education workforce and outlines the critical challenges, the education workforce's role in addressing those challenges, global and education trends influencing the education workforce, and opportunities for education workforce reform.

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Executive Summary

Despite gains in education over the past decades, the opportunity for inclusive, quality education as set out by Sustainable Development Goal 4 (SDG 4) has yet to be realized for millions of children. Progress is still too slow or has stagnated as systems struggle to continuously improve and adapt to changing needs. According to *The Learning Generation* report projections, of the 1.4 billion school-age children in low- and middle-income countries in 2030, an estimated 420 million will not be on track to learn the most basic childhood skills, and 825 million will not be on track to acquire basic secondary-level skills. These low levels of learning are compounded by a growing demand for education to provide a wider set of skills beyond foundational literacy and numeracy.

While many factors contribute to the slow or stalled progress on global and national education goals, the core issue is that most education systems are not designed or resourced to continuously improve and align toward the goal of a quality education for all students. Education systems are complex and face varying obstacles to design, growth and governance depending on their stage of development and the context in which they are embedded, but common characteristics have been identified in top performing education systems—the key strategies they use to improve student outcomes center around developing a quality teacher workforce.¹

Teachers are at the heart of the learning process and developing a quality teacher workforce is crucial, but in order to take a systems perspective, we need to think of the education workforce more broadly than teachers alone, as other roles and relationships are involved. The education workforce is the largest expenditure in education budgets and therefore the greatest investment any government could make in its education system. It is also the most influential lever for change— those on the ground engaging with children and young people every day. Therefore, understanding how the entire education workforce supports education system goals is critical to achieving SDG 4.

Roles beyond the teacher support access and learning, such as school leaders and district support staff, and other complementary roles, such as specialist teachers and community volunteers, have been shown to assist teachers in ensuring equity and inclusion. What is clear is that roles at all levels of the education system are critical to align education systems toward teaching and learning.

There are challenges to leveraging the broader education workforce for change. Education systems simply do not have the right professionals in the right places performing effectively and this often reinforces existing inequality. Systems rarely design or adequately support the workforce to provide relevant, inclusive and quality education. Because of this and other factors, the education workforce cannot keep pace with change. Moreover, the global trends- demographic, environmental, technological and educational- driving this change not only impact education today but point to how it needs to evolve for the future. It is critical to consider the implications of these trends for education systems, and particularly for the education workforce.

Uneven progress towards Sustainable Development Goal 4

"Ultimately the value of education is increasing because it is education that will determine whether the defining trends of this century – technological, economic, and demographic – will create opportunity or entrench inequality, and because it is the common critical factor for successfully addressing the global challenges humanity is facing."

-Education Commission, The Learning Generation: Investing in education for a changing world (2016)

Everyone has the right to education. The world enshrined education as a fundamental human right in the 1948 Universal Declaration of Human Rights and in 2015 world leaders committed to the United Nations' Sustainable Development Goal 4 (SDG 4) to ensure **inclusive and equitable quality education and promote lifelong learning opportunities for all**. The subsequent Education 2030 Incheon Declaration and Framework for Action defines quality education as that which "necessitates, at a minimum, that learners develop foundational literacy and numeracy skills as building blocks for further learning, as well as higher-order skills" which include knowledge and skills to promote sustainable development.²

The case for investing in education is indisputable. Education is more than a fundamental human right- it is critical for long-term economic growth and essential for the achievement of all of the United Nations Sustainable Development Goals. A dollar invested in an additional year of schooling, particularly for girls, generates earnings and health benefits of \$10 in low-income countries and nearly \$4 in lower-middle income countries. Around one-third of the reductions in adult mortality since 1970 can be attributed to gains in educating girls and young women.³

The world has made significant progress in education over the past 15 years. The number of out-of-school children and youth has been cut almost in half, and today more than 90 percent of primary school-age students are enrolled in school.⁴ There has been progress on gender parity in access at the global level; out-of-school rates for boys and girls of lower and upper secondary school age are now nearly identical, while the gender gap among children of primary school age dropped from more than five percentage points in 2000 to two percentage points in 2016.⁵

Despite these gains, the opportunity for inclusive, quality education as set out by SDG 4 has yet to be realized for millions of children. Progress is still too slow or has stagnated as systems struggle to continuously improve and adapt to changing needs. Given the detailed coverage of developments towards SDG 4 in the *Global Education Monitoring* report, key points will be summarized briefly here as they relate to the core focus areas of access, learning, equity, and inclusion.

Access and learning

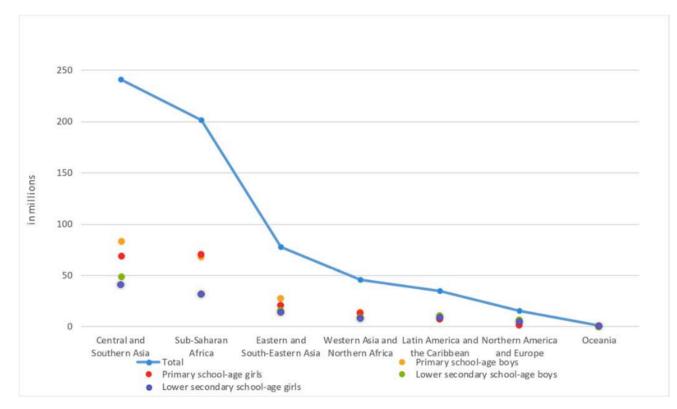
The world is failing to give every child access to a quality education. While the number of children in preschool, primary, and secondary school has increased globally in the last 15 years, progress has essentially stagnated⁶ as the primary out-of-school rate has barely moved in 10 years from around 9 percent due to demographics and high birth rates in some countries.⁷ Today there are still 263 million children out of school: 61 million

primary-school-aged children – 10 percent of all children in low- and lower-middle-income countries – and 202 million secondary-school-aged children.⁸

In 2016, the Education Commission estimated that around 67 percent of children are completing primary school in low-income countries, 88 percent in lower-middle-income countries and 99 percent in high-income countries. Just 24 percent of children are completing secondary school in low-income countries, 50 percent in lower-middle-income countries, compared to 76 percent in high-income countries.⁹ The Commission also estimated that based on current trends, it will take until the end of this century to get all children in low-income countries completing primary school.¹⁰ Progress would need to be almost three times faster for universal completion to be achieved.¹¹

Access and completion are not the only issues – we know that schooling is not the same as learning and evidence shows we are in the midst of a global learning crisis. More than 617 million children and adolescents – or six out of ten children and adolescents globally – are not achieving minimum proficiency levels (MPLs) in reading and mathematics (see Figure 1).¹²





Source: UIS. 2017. "More than One-Half of Children and Adolescents are Not Learning Worldwide." *Fact Sheet No. 46*. Montreal: UNESCO Institute for Statistics (UIS).

In low-income countries, the rates of children and adolescents not meeting minimum levels of literacy and numeracy are systematically higher than in lower-middle-income, upper-middle-income, and high-income countries.¹³ According to *The Learning Generation* report, only half of primary-school-aged children and little more than a quarter of secondary-school-aged children in low- and middle-income countries are on track to reach at least the low learning levels.¹⁴ This means that, of the 1.4 billion school-age children in low- and middle-income countries in 2030, an estimated 420 million will not be on track to learn the most basic childhood skills, and 825 million will not be on track to acquire basic secondary-level skills.¹⁵

These global figures mask very large regional differences. More than 85 percent of children in Sub-Saharan Africa are not learning the minimum, despite years of steady growth in enrollment rates. In Central and Southern Asia, 81 percent of children and adolescents will not meet minimum proficiency levels in reading by the time they complete basic education. And in Latin America and the Caribbean, the total rate of children and adolescents not reading proficiently is 36 percent.¹⁶

Recent PISA for Development results confirm poor learning outcomes. Only 12 percent of children tested across seven countries¹⁷ meet minimum proficiency for math and 23 percent for reading, compared with 77 and 80 percent in OECD countries (see Figure 2). For these seven countries, reaching the SDG reading target (minimum proficiency level for all by 2030) would require average proficiency levels among 15-year-olds in school to *quadruple*—and this does not account for children out of school in these countries.¹⁸

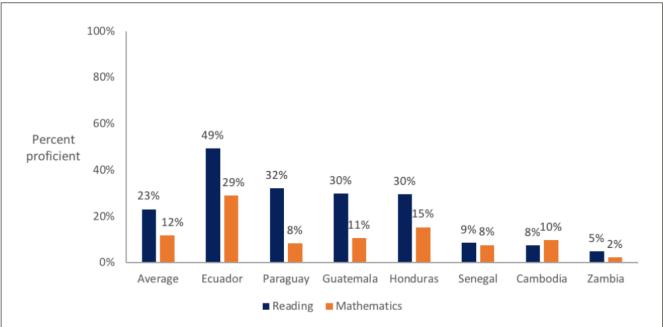


Figure 2: All PISA-D countries fall short of universal minimum proficiency in reading and mathematics

Source: Kaffenberger, Michelle. 2019. "PISA-D reveals exceptionally low learning." RISE blog. Research on Improving Systems of Education (RISE). Data from PISA for Development at: <u>https://doi.org/10.1787/c094b186-en</u>

"One in four primary-school-aged children who are not learning the basics are not in school. But three out of four children who are not learning are failing to achieve despite being in school." –Education Commission, *The Learning Generation: Investing in education for a changing world* (2016)

There is a growing demand for education to provide a wider set of skills beyond foundational literacy and numeracy, including soft skills, life skills, higher-order skills, and non-cognitive skills. These skills are complex and cross-disciplinary – ranging from creativity to critical thinking to social and emotional skills to global competences – and are increasingly recognized as valuable for individuals and societies to thrive and live sustainably in this century.¹⁹ The shift to include a wider breadth of skills is evident across a range of countries at different stages of economic development, education standards, and political stability.²⁰ Cognitive skills (such as reading, math and science) are intrinsically interconnected with this broader set of skills, with each reinforcing the other, though research on this is nascent.²¹ Although evidence is still limited, many education systems are expected to deliver a vast and highly complex curriculum with these skills to students already behind in foundational learning.

Equity and inclusion

Although it is agreed that successful education systems are those that reach everyone, the most marginalized are the furthest behind.²² Disadvantage manifests in various and interacting forms and in different contexts over which young people have little control but can significantly shape their education opportunities and trajectories. For example, we know that gender, ethnicity, disability and family and cultural backgrounds, together with other factors such as poverty and geographical location, interact to affect a child's education outcomes. This is illustrated in Sub-Saharan Africa where fewer than one in 20 poor, rural girls are on track to complete secondary education, seven times less likely than non-poor, urban boys.²³

Gender is still a major barrier to education with only 25 percent of the poorest girls in low-income countries completing primary school.²⁴ Even in regions where gender parity has been achieved at the primary level, such as North Africa and West Asia, gender disparities in enrollment exist at lower secondary school level and become more pronounced in upper secondary school.²⁵ For learning outcomes girls generally tend to outperform boys in reading, but they score lower in mathematics and science tests in many countries.²⁶

Poverty exerts great influence on education outcomes. Across low- and middle-income countries, there is on average a 32 percent gap between the chances of children in the poorest quintile and richest quintile completing primary education. For those children who are in school, 54 percent of the richest children learn the basics, while only 35 percent of the poorest do.²⁷ In some contexts, poverty is compounded by disruptions due to conflict, natural disasters, and other emergencies. As learning is cumulative, any gaps in learners' early preparation—poor developmental abilities and low preschool skills—tend to worsen over time. Children arrive at school unprepared and teachers are not sufficiently equipped to deal with the reality of these children's needs.²⁸

Disability is often a greater determining factor of exclusion from education than gender or location.²⁹ Children and adolescents with disabilities face varying degrees of exclusion based on the type of disability they have, their gender, location, and other compounding disadvantages.³⁰ In most low- and middle-income countries, children with disabilities are more likely to be out of school than any other group of children. And in some countries, having a disability can more than double the chance of a child not being in school compared to their non-disabled peers.³¹ The Education Commission estimated that as many as half of the 65 million children with disabilities of primary and lower secondary school age in developing countries are out of school.³²

At the system level, funding constraints and the additional cost of reaching the most marginalized mean spending is not always directed to the most disadvantaged. While progress has been made in recognizing that all children, from every population, are entitled to a quality education, the pace of progress on equity and inclusion in education is difficult to measure as many of the most marginalized are often invisible in statistics at national and global levels.³³

A systems perspective

While many factors contribute to the slow or stalled progress on global and national education goals, the core issue is that **most education systems are not designed or resourced to continuously improve and align toward the goal of a quality education for all students.** As a growing body of evidence reveals, the design and delivery of education policy will only succeed when it is understood as part of a larger system; reform considerations that are not predicated on a systems view risk undermining this impact.³⁴ *The Learning Generation* report shows that countries at any income level can improve results significantly by strengthening their education systems – and that a strong system³⁵ in a middle-income country can produce results which are as good as a weaker system in a high-income country.³⁶

Each education system is composed of a collection of elements and actors at all levels who are guided by dynamic, interrelated relationships, which are often nonlinear and multidirectional.³⁷ In strong systems, these actors and relationships align with a coherent, collective goal or set of goals. These are driven by a shared and inclusive vision to enhance the learning experiences and outcomes of all students which should be developed through a process involving all stakeholders.³⁸

There is no "one-size-fits-all" model when taking a systems approach – each system starts from a different point, faces different expectations, and operates in different social and political contexts³⁹. The strength of a system depends not only on the effectiveness of individual elements and actors within it but on the fundamental interplay among these elements⁴⁰ and the accountability relationships that exist between them. No matter the context, ensuring coherence between all elements and relationships so they work in concert toward a shared goal is vital. In many cases, systems are not aligned with the overall goal of learning and might have other goals that can detract from this effort.⁴¹

Systems change is not easy. Too often reform agendas focus on piecemeal changes, ignoring the implications of policy linkages or accountability relationships in a wider set of systems both within and beyond the education sector. For example, teacher training reforms designed to improve pedagogy

often fail to recognize that teachers are accountable to both their direct employer and their students and community. Conflict can arise if the reform is not based on a shared vision between those actors that teachers are accountable to and if there is incoherence in the way these relationships function.⁴² There will also be incoherence in a system if iterative cycles of feedback and adaptation do not exist to support continuous self-improvement.

While education systems are complex and face varying obstacles to design, growth and governance depending on their stage of development and the context in which they are embedded, common characteristics have been identified in top performing education systems—the key strategies they use to improve student outcomes center around developing a quality teacher workforce.⁴³

Effective teachers are at the heart of the learning process and developing a quality teacher workforce is crucial, but in order to take a systems perspective, we need to think of the education workforce more broadly than the teacher workforce alone, as other roles and relationships are involved.

The education workforce's role in achieving SDG 4

Given the learning crisis is situated in societies changing at a faster pace than ever before, there is a sense of urgency for real action from education.⁴⁴ The education workforce is the largest expenditure in education budgets⁴⁵ and therefore the greatest investment any government could make in its education system. The workforce is also the most influential lever for change— it is those on the ground engaging with children and young people every day. Therefore, understanding how the education workforce supports education system goals of access, learning, equity, and inclusion is critical for all countries, no matter the context.

Access and learning

Effective teachers and teaching are central to access and learning

Teacher quality is the single most important influence on learning outcomes at school level. A successful teacher can make a major difference to a student's learning trajectory - going from a low-performing to high-performing teacher increases student learning significantly.⁴⁶ Teachers can even impact long term student well-being, future academic achievement and economic outcomes.⁴⁷ When it comes to equity, several years of outstanding teaching may offset learning deficits of disadvantaged students.⁴⁸

However, the process by which teaching leads to learning is complex and inadequately researched,⁴ especially with regards to the distinction around teacher quality versus teaching quality. Linda Darling-Hammond emphasizes that both are necessary for learning and distinguishes *teacher quality* as the bundle of personal traits, dispositions, skills and understandings an individual brings to teaching, whereas *teaching quality* is in part a function of teacher quality but is also strongly

influenced by the context of instruction, including factors external to what the teacher brings, such as wider curriculum reform and assessment, that are part of the wider system.⁴⁹

While there are many different frameworks for effective teaching– that which leads to improved student outcomes – **the literature shows that effective teachers have the knowledge, skills and behaviors to ensure all students can learn**. They are able to support learners from diverse backgrounds and with special needs and are aware of standards of professional knowledge and practice and know how to effectively assess student learning.⁵⁰

Effective teaching strategies are multidimensional – the context in which they are applied determines how they will work. This means there is no single strategy that can guarantee better student outcomes, but research has highlighted a number of practices that improve learning among students.⁵¹ These include techniques such as strong classroom management, clear instructions, helping students engage meaningfully with the learning content, applying formative assessment and providing constructive, supportive feedback.⁵² There is some evidence that teacher management of the classroom and its climate – e.g. teachers' expectations around behavior and effort, and teachers' abilities to make efficient use of time, resources and space – has an impact on student outcomes. ⁵³ This includes time on task and student engagement.⁵⁴

The most effective interventions to improve student learning rely upon improving teaching. In a review of interventions across low- and middle-income countries, teaching-driven interventions, such as structured pedagogy programs, raised student language and math scores in what corresponds to approximately nine months and six months of learning respectively.⁵⁵ Mother-tongue-based bilingual education has been shown to significantly enhance the learning outcomes of students, especially from minority language communities.¹ Other highly impactful interventions include targeting foundational skills, remedial education, and assessment for learning, especially to support teaching at the right level.⁵⁶ In some cases, technology has been shown to support teachers in delivering these interventions.⁵⁷ In all cases, teacher subject and pedagogical knowledge is key⁵⁸ – in a review of developing country evidence on the effects of different educational inputs on outcomes, teachers' knowledge of their subjects is one of the few variables consistently correlated with student learning.⁵⁹

Roles beyond the teacher are shown to support access and learning

Studies of the best school systems consistently show that the quality of learning is reliant not just on teachers but on the quality of a broad range of actors, both inside and outside the education system. This includes other teaching and learning roles, such as teaching assistants, which the literature suggests may improve learning if adequate support for their training, induction, and deployment is in place.⁶⁰ Even in interventions in which the teacher is central, evidence suggests that other roles can provide effective support, for example volunteers or classroom assistants to focus on foundational learning needs or to provide mother tongue/ bilingual instruction. Several high-quality studies find strong impacts of remedial instruction programs on learning outcomes even when implemented by volunteers or informal teachers with little formal training, though these effects could

be attributed to the low capacity of teachers and low levels of learning in these contexts.⁶¹ A literature review of learning support staff in developed countries concluded that learning support staff can also be used in schools to reduce teachers' workload, freeing time for them to focus on teaching tasks.⁶² In areas with low coverage of qualified teachers, evidence suggests that alternative models of delivery based on sharing specialist teachers alongside less qualified teaching staff and often supported by technology can help reach the most marginalized who have limited access to quality education.⁶³

"Data on operations, targets, and human resource management practices in over 1,800 schools educating 15-year-olds in eight countries showed that leadership and management quality is strongly associated with better educational outcomes."

– Teach For All, Leadership Development Guidance Note (2016)

Strong school leadership and management focused on supporting teachers can lead to improved learning.⁶⁴ International evidence suggests that that improvement at school-level rarely occurs in the absence of effective leadership and that school leadership accounts for up to 27 per cent of variation in students' learning achievement, second only to classroom teaching.⁶⁵ More specifically, evidence shows that school leaders can improve teaching and learning when they have sufficient autonomy in decision making, dedicate time to instructional leadership, and create a culture of shared responsibility.⁶⁶ This includes teacher professional development, which can be fostered through mentoring and coaching— shown to have a significant effect on teacher quality— as well as facilitating peer learning amongst teachers.⁶⁷

Roles at all levels of the education system are critical to align education systems toward teaching and learning

Studies from high income contexts show that districts—the role that supports teachers— can play a transformational role in inclusion and improving school and teaching and learning quality,⁶⁸ especially if they are leveraged to facilitate collaboration, provide instructional leadership and specialist support, and promote better use of data, particularly for addressing inequalities. There is less systematic research on the role of the district in low- income countries, but there are examples of the importance of the district in supporting the implementation of effective programs in these contexts. For example, the district was identified as a key driver of the success behind a program in Bangladesh⁶⁹ which focused on facilitating collaboration between teachers and district staff for instructional support. Collaboration with district staff and other education officers not only strengthened learning outcomes at the classroom level but improved technical skills at the district level. Another program in India suggests that investment in the district can be very powerful. This program found giving officials the time and ability to conduct developmental classroom observations of teachers in between network meeting, led to the rate of teacher classroom practice change doubling and in some cases tripling across 70 districts.⁷⁰ Similarly, curriculum support officers in a Kenya literacy program make regular classroom visits to conduct structured observations and provide feedback to teachers. They use tablets to upload data on student reading progress and teacher practice, which allows district offices to generate an aggregate picture of their progress



compared with other districts, as well as comparative data on their own schools.⁷¹ This program has had large and meaningful impact on learning outcomes and most strikingly at the national level.⁷²

While evidence is limited, the literature around civil service reform suggests that the state level can support teaching and learning through building greater institutional capacity in change leadership and adaptive policymaking, use of evidence and partnership and coalition building.⁷³

Equity and inclusion

Effective teachers and teaching are key to ensuring all students - no matter their situation – are accessing education and learning

Creating inclusive learning where all students can succeed no matter their situation requires the strategic involvement of teachers.⁷⁴ The most effective interventions and practices proven to increase learning from low levels for those furthest behind include remedial education and structured pedagogy, especially to support teaching at the right level (see the impact of various TARL interventions in Figure 3).⁷⁵ An example from Ethiopia suggests that teacher's foundational classroom practice can successfully change to target inclusion with the use of structured pedagogy supported by technology.⁷⁶ It is important to note that these practices are key for targeting foundational skills at the lowest levels— moving to minimum standards and beyond most likely requires the types of effective teaching strategies mentioned in the previous section.

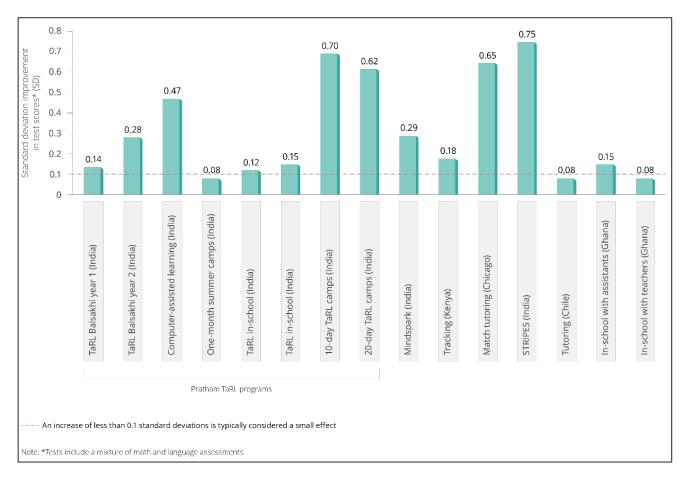


Figure 3: Learning effects from Teaching at the Right Level interventions across various contexts

Source: Teaching at the Right Level (TaRL). 2019. "Evidence." Available at: <u>https://www.teachingattherightlevel.org/evidence/</u>

Differentiated teaching roles, such as specially trained teachers, have a crucial role to play in supporting inclusion in mainstream classrooms. For example, specialist teachers can support students with special needs by offering individualized attention in the classroom and providing practical advice to classroom teachers on educational inclusion strategies. This could include different types of guidance ranging from sharing suggestions on the best position for a child in the classroom to transcribing tests from Braille into text to providing information on basic eye health.⁷⁷

Education support staff and other complementary roles can support teachers on equity and inclusion

Examples from around the world exist of education professionals and semi-professionals working alongside teachers in strategic interventions known to improve outcomes for those furthest behind, such as remedial education focusing on foundational skills, teaching at the right level

and mother tongue instruction. These include a range of roles from community assistants to volunteer tutors to various types of learning support staff. For example, where teachers do not speak the local language, language assistants in the form of community members, national service volunteers or teaching assistants can provide effective support. An initiative in Ghana utilized local high school graduates as teacher community assistants to lead in- and after-school remedial classes for small groups of students in primary school with significantly improved skills in literacy and numeracy on average.⁷⁸

Several examples from low- and middle- income countries suggest that complementary roles can improve inclusion and the overall health and welfare of students.⁷⁹ Evidence shows that health interventions – malaria prevention, school feeding, water and sanitation, deworming and comprehensive sexuality education – are highly effective to increase enrollment and participation, especially for girls and other vulnerable groups,⁸⁰ especially in developing countries where an estimated 500 million days of school per year are lost due to sickness. Students' relationships with their teachers in the school environment are consistently predictive of a broad range of health and well-being outcomes.⁸¹ However, teachers often have heavy workloads and diverse responsibilities and are usually incentivized to prioritize work directly related to core school functions.

Moreover, several research articles have highlighted incongruence between the power imbalance within a teacher–student relationship and the dynamics required to address health and well-being-related issues, with qualified non-teaching staff other than teachers, such as school nurses, potentially playing important roles in connecting students to their school and supporting well-being.⁸² In the Camfed program in Malawi, young women mentors from the community (Learner Guides) deliver specialized curricula, including a life skills and wellbeing program. Learner Guides help children (girls and boys) build their confidence, learn more effectively and set goals. In a context where HIV/AIDS has had a particularly devastating effect, and taboos often prevent girls from learning about their bodies, Learner Guides provide vital sexual reproductive health information, working to prevent HIV/AIDS and keep girls safe from exploitation.⁸³

Key challenges affecting the education workforce

Since the turn of the millennium there has been a dramatic growth in the education workforce in countries seeking to universalize access to schooling. Between 2005 and 2015, the number of primary teachers increased from 2.6 million to 4.0 million in Sub-Saharan Africa, and from 4.6 million to 6.1 million in South and East Asia. Over the same period, the number of secondary teachers in SSA more than doubled. Additionally, over the last two decades teacher standards and licensing have been put in place to define what is expected from teachers.⁸⁴ And some countries, like Chile, are undertaking large-scale, comprehensive reform to address the many inter-related issues surrounding the education workforce.

Despite some progress in workforce reform over the past generation, outcomes are not where they need to be. Education systems face a number of challenges to their education workforce but most fall

under three core issues: the recruitment, supply and retention of quality education professionals, the effectiveness of these professionals and other roles at all levels, and the ability of systems to support a workforce that can keep pace with change. All countries face challenges related to these categories; however, this section highlights those specific to in low- and middle- income contexts.

Education systems simply do not have the right professionals in the right places performing effectively and this often reinforces existing inequality

Education systems do not have enough effective teachers and often distribution exacerbates inequalities

As the youth dividend grows, so does the demand for education. Between 2012 and 2030, lower- and middle-income countries (LMICs) are predicted to see a 13 percent increase in the number of children, with the greatest increases expected in those countries lagging furthest behind in education outcomes.⁸⁵ This will lead to anywhere between a 25 to 50 percent rise in the demand for teachers, a dynamic further complicated in countries undergoing changing demographic transitions which may lead to quick increases in demand but also to decreases where populations are expected to move to cities or experiencing a decline in fertility rates.

It is estimated that almost 69 million additional teachers must be recruited by 2030 in order to meet SDG 4, with over 76 percent of them needed in Sub-Saharan Africa and South Asia.⁸⁶ In a number of the poorest countries, these increases are equal to half or more of the projected graduates of tertiary education (see Figure 4) – a proportion that is unprecedented in even the most successful and most industrialized nations.⁸⁷

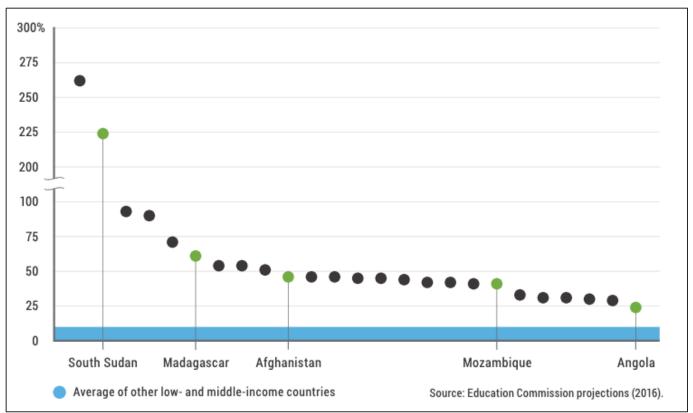


Figure 4: In some countries, half of all graduates are needed to meet teacher demand

Source: The Education Commission. 2016. *The Learning Generation: Investing in education for a changing world.* Washington, DC: The International Commission on Financing Global Education Opportunity.

Teacher shortages are not always generic. Insufficient teacher supply is often a localized problem, which can be driven by inequitable deployment and distribution (with oversupply in some locations and levels) both to remote and rural locations, but also within specific subjects such as STEM (science, technology, engineering and mathematics) – adding further complexity to the challenge. Many interrelated factors drive this: from a limited pool of potential recruits⁸⁸ to failure to attract top graduates into the workforce; from trained teachers who do not enter the profession or emigrate; to high attrition rates of qualified professionals leaving in the early years⁸⁹ due to lack of support compounded by difficult working conditions; and poor financial modelling in the workforce value chain.

There are often significant issues with inefficiencies in both centralized recruitment systems (rather than localized hiring from within the community itself) and ineffective teacher utilization and management. Often teachers are dis-incentivized from taking posts in hard-to-reach locations for reasons ranging from poor living conditions, to limited opportunities for professional advancement, diversified local languages and ethnicities that create barriers for immersion into the community. Governments have attempted multiple policy measures and practices to address these gaps – from incentives for teachers to relocate to rural areas, to mechanisms to recruit local community members as contract teachers – often with mixed results.⁹⁰

"In many countries, urban areas have qualified teachers who are unemployed, while rural areas have unfilled posts. This pattern of simultaneous surplus and shortage is strong evidence that the problem of finding teachers for rural schools will not be solved simply by producing more teachers." –World Bank, *Teachers for Rural Schools* (2008)

There is also growing international evidence that more qualified teachers disproportionately work with more advantaged schools and privileged students, take smaller class-sizes, and focus on later grades⁹¹ – an inequitable teacher deployment pattern that has clear and dangerous consequences for both educational equity and quality.⁹²

Historically, governments have relied on traditional routes into teaching and focused on solutions with limited evidence of effectiveness. Contract teachers, for example, often supply up to 50 percent of the workforce demand across African countries⁹³ with mixed evidence of effectiveness.⁹⁴ They do not provide a long-term, sustainable solution and challenge professionalism.⁹⁵ The conditions under which contract teachers are hired are often very poor –unstable, low wages with no security and benefits, and usually no clear path to becoming a qualified teacher.⁹⁶ Given the distinct characteristics of the education workforce labor market – where governments are typically the largest employer – the opportunity to innovate solutions to overcome the demand challenge is limited within the traditional delivery model. Even without any other drivers for change, the sheer numbers of additional teachers in the locations required pose a huge problem.

To consider: How can education systems develop a more targeted deployment model which matches demand with supply on a number of dimensions? How can education systems rapidly attract and retain the number of qualified teachers in the right locations with the right expertise in contexts where with low labor supply? What staffing models might have potential to leverage a more differentiated but still professional and qualified teaching and learning workforce and harness technology?

Education systems are not meeting the necessary conditions to attract the right people or to motivate and keep them in the workforce

Many systems struggle to bring the best people into the education workforce. This is not surprising: where the teaching profession is low status and low paid, teacher training candidates are often drawn from the pool of school graduates whose qualifications are too low for them to access alternative, more desirable forms of higher education so many individuals enter teacher training programs as a means of gaining access to higher education, rather than in order to become part of the education workforce.⁹⁷ Many developing countries also face a vicious circle, in which poorly educated students become poorly-educated teachers unable to improve their students' learning.

Moreover, what makes an effective prospective teacher has eluded researchers and policymakers alike. Academic competency is commonly used criteria to select teachers, yet there is growing evidence that academic rigor and qualifications may not sufficiently signal a good quality teacher.⁹⁸

Substantial international evidence indicates that, beyond a given threshold, there is no relationship between a teacher's academic qualification and pupil performance.⁹⁹ Direct measures of teacher capability (such as their knowledge of effective teaching practices) do, however, show very strong positive effects.¹⁰⁰

Qualified teachers are at the heart of any quality education system, yet what it means to be a trained and/ or qualified teacher varies by country. The limited data available suggests whilst many countries have increased the numbers of trained teachers – globally 86 percent of teachers are trained at the primary level – the proportion is far lower in Southern Asia (77 percent), the Caribbean (70 percent) and sub-Saharan Africa (62 percent). Moreover, in sub-Saharan Africa, even fewer teachers are trained at the pre-primary level (36 percent) and secondary level (45 percent), with many countries, including Eritrea, Ghana, and Niger, seeing decreasing percentages of teachers trained since 2000.¹⁰¹

If attracting the *right* people to the education workforce has proved difficult, keeping the strongest there is even harder. Across many countries, average teacher pay has fallen relative to other professions and the pay distribution has narrowed meaning few systems are actively rewarding strong performance.¹⁰² In many low- and middle- income countries, salaries are so low that basic needs cannot be met, with teachers earning between just \$2-\$4 a day.¹⁰³ Additionally, the latest UIS data on SDG Indicator 4.a.1 show that far too many teachers are facing some dire classroom conditions. For example, two out of three primary schools in least developed countries do not have electricity and only 43 percent have handwashing facilities. Less than half of primary schools in Sub-Saharan Africa have access to clean drinking water let alone access to Internet or computers.¹⁰⁴ Add to this problematic classroom management issues, double shifting, high pupil-teacher ratios, and an everexpanding list of responsibilities that can create unrealistic expectations when they are not met. Coupled with the overall de-professionalization of teaching,¹⁰⁵ a decline in the occupational prestige, esteem, and status of teaching, as well as insufficient career pathways, it is not surprising quality professionals are exiting the system: in general, attrition rates are reported higher for teachers with greater academic gualifications potentially reflecting the wider labor market opportunities open to them.¹⁰⁶

These factors are leading to a motivation crisis, with far reaching implications for the learning and development of students.¹⁰⁷ In a review of teacher motivation in low-income countries, the UNESCO Teacher Task Force concluded that "teacher motivation in low-income countries is low and/or decreasing in general" and while the evidence is severely limited and rates vary according to country, a large contingent of public school teachers are unsatisfied with their jobs and unmotivated to improve or stay in the profession.¹⁰⁸ If teachers are not motivated to teach there is little hope of moving beyond a system based on administrative accountability to one based on professional accountability.¹⁰⁹ Moreover, most systems will not be able to foster professional accountability if they still rely on a model where every teacher chooses their own approach as opposed to one where teachers choose from practices agreed by the profession as effective. Essentially, teachers, leaders, and other staff are expected to perform as professionals in a system that fails to give them the resources they need, a culture of recognition, relevant development opportunities, or serious opportunities to own and shape the profession. Most systems that do support teachers tend to focus on developing individuals' skills

rather than growing the collective capacity of the entire education workforce required for a team of professionals.

To consider: Drawing on lessons from other sectors, how can we raise the profile of the teaching profession, ensure qualifications are built on effective skills and competences, and create a diverse system of meaningful incentives that attract – and retain – the right people to the education workforce? Where are there efficiencies to be had, such as in eliminating corruption and patronage in teacher hiring, to ensure the right people are recruited?

Education systems rarely recognize that inclusion gaps exist in the workforce itself

As enrollment rises, the range of backgrounds and diverse needs of children will likely grow as well. Evidence shows that education outcomes improve when a student feels they are reflected in and represented by their teacher;¹¹⁰ designing the workforce must therefore pay particular attention to the attraction, recruitment, and training of a workforce that represents the students they serve. In practice this can be difficult, as significant barriers still exist for individuals facing multiple disadvantages to entering the education workforce itself. For example, teachers with disabilities are often siloed into posts at special needs institutions only¹¹¹— and many systems still rely on traditional routes into teaching.

Labor dynamics in the education workforce should be considered to help address demographic imbalances. Increasing government-led initiatives that focus on, for example, incentivizing women into education exist, yet the number of females in leadership and management positions remains disproportionately low.¹¹² This can even be true when there is a gender balance in the teacher population from which leadership positions are drawn.¹¹³ In some contexts female teachers are more inequitably distributed than male teachers, with female teachers more strongly concentrated in urban areas due to multiple cultural and social factors, which Mulkeen, Ratteree and Voss-Lengnik (2017) identify as including "(i) expectations that women will locate near their husbands' work, (ii) a belief that remote areas are unsuitable and even unsafe for educated single women, and (iii) general assumptions about teaching as a suitable profession for urban middle-class women. An insufficient number of female teachers in a country is often caused by a general low level of priority for female education, resulting in few female secondary schools and therefore few female secondary school leavers." ¹¹⁴

Beyond gender, it is important that governments attract a workforce with diverse backgrounds and strengths, to ensure all students feel represented by their teachers, and are able to access a fair learning process.¹¹⁵ The issue of representation can be one of ethnic, cultural, religious or language and in countries with a dominant group, distribution tends to favor that group as they are overrepresented in those with higher levels of education and those able to attend teacher education. These individuals might be reluctant to work in more with populations from minority groups which creates a vicious cycle where marginalized communities have more difficulty attracting effective teachers and thus continue to underperform in education.¹¹⁶ These dynamics are intersectional and

compounded by nuanced and often subtle discriminations within employment conditions, which can further perpetuate the cycle of inequitable and unrepresentative workers entering the profession.

"Accessing and completing training is not the end of the challenge for teachers with disabilities. They may face discrimination in finding a job...discrimination within the workplace...and lack of access to professional development opportunities."

–IDDC, Teachers for All: Inclusive Teaching for Students with Disabilities (2013)

To consider: How can governments attract a workforce with diverse backgrounds and strengths to meet all student needs? How can governments design a workforce that is more representative of the students it serves?

Education systems are not designing or adequately supporting the workforce to provide relevant, inclusive and quality education

Teachers are expected to undertake increasingly complex responsibilities with little clarity on their role and limited support

Education policy across countries from all contexts is moving toward a broader set of skills (often termed 21st century skills)¹¹⁷ and teachers are expected to fulfill increasingly diverse and complex instructional roles to address not only the wide range of learner needs (first generation learners, multiple languages, diverse backgrounds, special needs) but to facilitate these 21st century curriculums with an ever-expanding range of skills and competences.¹¹⁸ This means having advanced expertise in subject areas, pedagogy and instruction, ICT and socio-emotional and behavioral development among others. For many teachers, meeting the demands of each student with vastly different backgrounds is difficult and discouraging,¹¹⁹ especially with large class sizes and limited support staff. For a variety of reasons, there is often a mismatch between the classroom instruction and the learning level of the students. Personalized approaches to learning could help make progress¹²⁰ but these have never been delivered at scale across education systems in developing contexts. We know that technologies introduced to make things easier for teachers have had mixed results at best. But more sophisticated tools are constantly emerging. Evidence shows that the application of artificial intelligence (AI) enabling adaptive learning looks promising.¹²¹

These instructional roles are often undermined by broader system initiatives such as curriculum design that makes it difficult for teachers to enact their responsibilities professionally. Undertaking an increasingly complex instructional role is often on top of unrecognized non-instructional duties, including administrative tasks, health and psychosocial support, or extracurricular activities.¹²² These responsibilities are critical to student success as well, but teachers often have heavy workloads and any tasks related to health are additional responsibilities.

In developed contexts teachers spend half of their working time in non-teaching related activities as opposed to focusing on instruction proven to improve learning. And keeping order in the classroom, generally the biggest concern for new teachers, occupies an average of 13 percent of all teachers' time across OECD countries.¹²³ Research across several Sub-Saharan African countries estimates students receive as little as two and a half hours of teaching on an average day and evidence across seven different countries in Latin America¹²⁴ suggests that **20 percent of potential instructional time is being lost across Latin America compared with the Stallings benchmark of 15 percent.** This is the equivalent of one less school day per week. Most of the time being lost to instruction is used on **classroom management activities—which absorb between 24 and 39 percent of total time** and teacher time off task. This was attributed to handling basic administrative tasks (taking attendance, distributing materials, and cleaning the blackboard) in inefficient ways and spending time off-task, e.g. in social interaction with students or another teacher at the door.

As the frontline worker with the most direct responsibility for students' learning, the role of the teacher must be refocused and defined explicitly enough to allow for a high level of professionalization and mobilization of their expertise and experience and to ensure their interactions with students are as fruitful as possible (this does not exclude essential activities outside the classroom such as professional development).¹²⁵ Rethinking the role of the teacher and drawing on existing expertise in the workforce beyond teachers could allow teachers to focus on the most critical areas of need given what we know already about improving learning.

To consider: How can teachers be supported by other professionals with different qualifications to fulfil this complex role? How can education systems draw on existing skills and expertise beyond teachers? How can adaptive learning technologies support teachers to deliver a more personalized education?

Teachers do not have the right initial education and professional development to deliver a quality and inclusive education

A growing body of evidence exists on what works in teacher education – including collaborative observation, school-based mentors,¹²⁶ and peer learning experiences – yet across the developing world, models of professional development remain outdated. Issues in pre-service training range from misalignment of teacher education with the school curriculum, limited practice-based learning opportunities during training, and omission of newer skills. Weakness in the knowledge and expertise of teacher educators and institutional management of initial teacher education institutions compound these issues.¹²⁷ In Gambia, for example, 77 percent of instructors surveyed in 2015 had never taught in a primary school themselves.¹²⁸ Countries face trade-offs in quantity and quality when they introduce costly but needed expansions to existing training infrastructure to meet demand.¹²⁹

Whilst the quality of pre- and in-service training varies significantly across countries, many continue to rely on ineffective cascade trainings that are both dislocated from the context of the classroom and the follow-up required to tangibly change behaviors and practice.¹³⁰ Moreover, when those who have

attended the training then try to implement what they have learned within their school, they can receive resistance. Cascade training models are often seen as the only option for reaching scale at low cost. However, many countries are not utilizing technology for distance and open learning or coaching and mentoring at scale which could support quality training for existing teachers who may or may not be qualified but need additional education to bring them up to the required standard.

Too often government professional development does not align with best practices associated with improved performance. Professional development should be closely linked to the most effective interventions that have proven to change what happens *inside* the classroom: the 'black box' where the 'magic' of education traditionally takes place.¹³¹ School systems need to think strategically about training content and delivery and customize training to the particular needs of different teachers in their specific contexts.¹³² Teacher and school collaborations and networks have the potential both to support professional development through sharing of skills and promoting reflection on best practices, and to develop and sustain intrinsic motivation within the education workforce. Professional learning communities of teachers that reflect on students' work and data on students are linked to school improvement.¹³³Studies show that in-person, on-site coaching is the most effective way to deliver advice on classroom practice, and that coaching should be the core of any good professional development program.¹³⁴

Regular classroom teachers are often tasked with understanding and meeting the diverse needs of all their students, often with training that is highly generic, focused on socializing students with special needs and those with disabilities and integrating them into traditional learning environments, rather than based around clear plans for meeting the specific student needs. In many cases, the workforce does not include distinct specialist roles that could support teachers in providing a high-quality and personalized learning experience for all students, including those with special education needs and disabilities. This is due to multiple interrelated factors, including insufficient data and evidence on what roles are required, and resistance to redefining or introducing these new roles due to low prioritization in both policy and funding support. Systems too rarely invest what is needed to recruit or train a workforce with specialized skills or leverage the time of professionals who can play a coordinating role at district level to focus on issues of in-classroom learning, rather than just access, for all students.

Overall, governments lack information on how to design and distribute education workforce roles to address this and how to enact the roles in reality. And while we know that identification and intervention around special education needs early in a child's life creates immediate and long-term benefits,¹³⁵ there is little coordination between the early childhood education workforce and basic education workforce to support this. While international standards, such as Article 24 of the Convention on the Rights of Persons with Disabilities exist, translating this into practice remains problematic.¹³⁶

To consider: How can systems develop a more effective approach to initial training and preparation and effective professional development that changes practice in the classroom and consider the potential role of technology can play? How workforce design can ensure inclusive equitable education is available for all?

Leadership and management are not supported to focus on leading teaching and learning

An education workforce can only function effectively when clear lines of accountability, and quality leadership and management are in place, including clear definitions of roles and responsibilities. Evidence suggests these are all factors strongly associated with better educational outcomes.¹³⁷

Without strong accountability and leadership, the education workforces can be diverted with official non-teaching tasks (travel to receive pay or administrative duties), excused or authorized leave (illness or caring for relatives), as well as unexcused absences, resulting in high rates of absenteeism at a huge cost to the education system.

Research on 21 developing countries showed absenteeism rates for primary school teachers ranged from 11 to 30 percent with many countries seeing their school leadership and district officials absent more often than their subordinates.¹³⁸ A study using Service Delivery Indicator data from seven countries in Sub-Saharan Africa showed that averaging across the countries, 44 percent of teachers were absent from class, either because they were absent from school, or because they were in the school, but not in the classroom.¹³⁹ This not only hampers education development efforts but accounts for the loss of between 10 and 24 percent of recurrent primary education expenditures alone.¹⁴⁰ Even where teachers are present, many developing country systems suffer significant loss of instructional time in the classroom.

Studies, particularly in high- income contexts, consistently show the effect of 'instructional leadership' on teaching and learning outcomes.¹⁴¹ Effective school management can help tackle key issues with teacher effectiveness if they have the capacity and autonomy to make decisions at the school level.¹⁴² Policymakers increasingly view school principals as instructional leaders – particularly as systems move towards decentralization - but in practice principals' roles focus on traditional administrative and management duties with little time to provide instructional leadership.¹⁴³ In many education workforce models, school leaders receive no additional or specialist training or support, resulting in overburdened administrative leadership instead of instructional and pedagogy-led practice.¹⁴⁴ Data from the TALIS survey in primarily high-income countries also shows that school principals spend on average 40 percent of their time planning and managing resources and are often overburdened with administration. UNESCO's in-depth review of school leadership across six regions internationally suggests that principals struggle to implement instructional leadership due to factors such as a poor understanding and poor preparation for new responsibilities, as well as local cultural norms around leadership which see school leadership as a 'figurehead' rather than an instrumental activity.¹⁴⁵

While studies show that districts can play a transformational role in school improvement, evidence suggests that the critical functions needed at district level for supporting teaching and learning are currently underdeveloped. Studies by IIEP in a range of contexts, most recently across 10 countries in Sub-Saharan Africa and Asia, suggest that this is because of a significant gap between theory and practice in district workforce roles.¹⁴⁶ Although the district workforce often includes roles and job

descriptions with a remit to support teaching and learning, such as pedagogical coaches, in practice, core district functions have often remained unchanged for decades.

Leaders, especially at the district level, are often incentivized by poorly conceived career pathways where promotion is based on years of service rather than competency or performance. In many contexts, promotion is plagued by patronage politics and corruption.¹⁴⁷ These lines of accountability cannot simply exist within the school. Cluster, district, and national support structures have a key role to play in coordinating effective support and enhancing the collaborative approach across schools and regional teams of education professionals. However, they are often constrained by resources and weak lines of accountability, thus these decentralized mechanisms for monitoring and support often deliver in name only.

To consider: How can leadership and management at all levels be more effective and have a greater focus on leading learning and using data for decision-making? Can accountability be enhanced by envisioning the workforce as teams of professionals who build shared responsibility for student learning?

The expertise of the education workforce is not always used to inform workforce reform

Education workforce professionals themselves are often excluded from policy discussion and positioned as passive receivers of reform, with limited opportunities to voice concerns around the technicalities of changes that directly affect them. The Incheon Declaration calls for the creation and strengthening of mechanisms for institutionalized social dialogue with teachers and their representative organizations, ensuring their full participation in the development, implementation, monitoring, and evaluation of education policy. OECD research has shown that effective professional development indicates that teachers must be active agents in analyzing their own practice in relation to professional standards, and their students' outcomes in relation to student learning standards, suggesting that teachers must be a part of those processes for creating standards.¹⁴⁸ The best education systems demonstrate that when teachers are recognized as true partners in the design and implementation of education interventions, they will leverage their autonomy to innovate solutions and improve practice at the heart of the system: with students.

Many initiatives have attempted to address this mismatch between the demand from the workforce to have influence over policy design and the ability to act on this. In a recent survey, only 23 percent of teachers felt they had such influence,¹⁴⁹ whilst a recent study of the relationship between governments and unions representing teachers found that consultation rarely stretches beyond policy to pedagogical issues, with the relationship frequently described as changing and conflictual.¹⁵⁰ This is arguably even more important when looking at the need to include inputs from a diverse range of workforce stakeholders, in particular professionals with disabilities and lived experience of marginalization, to give a stronger sense of reality to the design and delivery of policy reform.

To consider: How can governments support the workforce and other key stakeholders to influence and lead in education workforce reform?

The education workforce is not supported to keep pace with change

Political economy dynamics incentivize the system to maintain the status quo

Developing the ownership required to drive results, and the capacity to sustain system change and improvements over time, requires unpacking the incentive structures that give actors in the education system interest in maintaining the status quo. These system conditions and the political economy dynamics entwined in the education workforce subsystem – from the technical capacity of its leadership to the conditions for success in place – can either drive the pace of progress or perpetuate inertia. The lack of information flow on what good change looks like and guidance on how to manage change effectively prevents systems from implementing the self-improvement measures required.

The political and economic climate around reform can significantly influence the motivations, incentives, financing, and actions of the education workforce and those managing it. For example, in many countries, corruption and patronage in the workforce can cause large inefficiencies in teacher hiring and in others, decentralized leaders in districts can be incentivized to focus on compliance to procedures, rather than encouraged to take actions that could support improvements and enable the education workforce to deliver outcomes.

The education workforce does not operate in isolation. The slow pace of change in workforce reform is not only affected by internal system dynamics, but also by macro systems both inside and outside of the educational sphere. Distinct stakeholders – including the ministries of health, ministries of finance, public service, local government and beyond; the country's top political leadership; unions; international think tanks and financing bodies – can strongly influence the actions of the education workforce, and by implication shape their ability to facilitate learning outcomes. Systems rarely encourage cross-sectoral collaborations and planning even though we know that there are linkages with health and social protection sectors that could help address inclusion and equity issues and connecting with the private sector could help secondary schools better prepare graduates for the workplace.

Ultimately, driving systems change is not only about the pace of progress, but the quality of change and an ability to disrupt the status quo with continuous feedback loops through self-improvement. This requires leaders to have a growth mindset in approaching reform.¹⁵¹ If we want to generate new solutions, instead of just optimizing within existing thought frameworks, we need to build a better understanding of how systems can self-improve across a variety of contexts and conditions.

The education workforce has limited capacity to harness innovation or utilize the information and data required to continuously improve

The education workforce often cannot take advantage of innovations because often they don't have access to the research on how innovations can be leveraged to improve teaching and learning, or the tools, materials, etc. needed to test them. Most systems today don't have the capacity or processes in place to spot and scale innovations or take advantage of leapfrogging opportunities— new or innovative practices that enable challenges to be addressed more quickly and don't necessarily follow traditional models of progress. Most governments adhere rigidly to a single educational model but scaling innovation to leapfrog requires that governments open to a diversity of possibilities and provide space for innovation to take root and spread.¹⁵²

The same applies to technology innovations which is increasingly relevant as new technologies become more ubiquitous, accessible, and affordable. Although simply providing devices is not sufficient - digital tools cannot replace the relationship between the teacher and students – opportunities to harness digital tools and processes have been shown to enhance the learning process. Technology-enabled assessments, for example, can be embedded to reduce interruptions to teaching and learning processes and provide near real-time feedback to teachers, school leaders, and most importantly students and their families.¹⁵³ However, teacher training and professional development must keep pace to allow the education workforce to harness these tools.

To consider: How can governments design an education workforce that is able to harness innovations and take those that work to scale, and continuously adapt to ever-changing needs?

There is not yet enough robust evidence to continuously inform education workforce design and strengthening

Too little is known about how the education workforce actually performs their professional responsibilities, and the implications this has on learning outcomes. Whilst research exists on teacher professional development in low- and middle- income countries, there is far less knowledge on the entry into – and progression within – the profession.

The 2016 mapping on the availability of monitoring information on progress being made towards SDG 4 found that 72 percent of the data required is currently unavailable. This is most acute in areas related to the education workforce: only half of the countries surveyed had any data available on teacher attrition rates or teacher training from the previous year.¹⁵⁴

Whilst most countries have established education management information systems (EMIS) that collect data on education inputs, gaps in basic data on many teacher indicators (from teacher

registration to education expenditure) remain. The quality and relevance of the data that does exist is often poor¹⁵⁵ and data on other roles within the workforce are rarely collected.

Where evidence is available, systems struggle to support interventions that drive workforce performance improvements at scale. This is due to multiple factors – from limited agreement on indicators of workforce quality standards, to limited leadership capacity at all levels of the system. The body of data and evidence of what works across the entire ecosystem needs to be built: identifying the true causal factors of challenges facing the education workforce, in order to better direct policy recommendations, and strengthen investment in relevant and targeted reform efforts.

Even where new solutions for the workforce have been introduced, our understanding of their potential impact is often limited. This highlights the challenge governments face: despite copious amounts of data being produced, large gaps remain due to the underfunding and variable quality of data management systems, and contradictory results have impeded their ability to make the right policy decisions¹⁵⁶. While investments can be made in improving data production, its true value lies in the efficiency of its use – translating this information into actionable insights that can inform decision-making at the highest level.¹⁵⁷

To consider: How can the education workforce effectively generate, analyze, and use data, and how can the design of the workforce reflect the skills needed to do this?

Box 1: Lessons from how the health sector has tackled workforce challenges

Looking to other sectors for inspiration can be helpful— for example, the health sector has responded to the increasing complexity and specialization of medical care, global workforce shortages, increases in disease, aging populations, as well as financing constraints, with a model of delivery based around teams of professionals with distinct roles and expertise. This multidisciplinary, collaborative team-based approach is generally believed to yield better health services, and researchers have found that teamwork in the health sector actually does reduce the number of medical errors and increases patient safety. Health supports a team-based approach with "skill mix analysis", a tool used to evaluate existing skills in a given health workforce. A method called horizon scanning is also used to determine which skills are increasingly required for future care. This allows for scoping and developing the most effective and efficient combination of roles in a health workforce team to meet specific needs within contextual constraints often through task shifting, or in some cases, creation of new roles where appropriate. Health provides an example of how a multidisciplinary team-based approach underpinned by skill analysis to enable task shifting and in some cases role creation can lead to more efficient use of available human resources in public service delivery.

References

D'Amour D., Ferrada-Videla M., San Martin Rodriguez L., Beaulieu, MD. 2005. "The conceptual basis for interprofessional collaboration: core concepts and theoretical frameworks. *Journal of Interprofessional Care,* May Supplement 1:116-31.

HRH Global Resource Center. "Why is teamwork in health care important?" Capacity*Plus*. Washington, DC: IntraHealth International.

WHO. 2010. *Framework for Action on Interprofessional Education and Collaborative Practice*. Geneva: World Health Organization (WHO).

WHO. 2013. Interprofessional collaborative practice in primary health care: nursing and midwifery perspectives: six case studies. Human Resources for Health Observer n. 13. Geneva: World Health Organization (WHO).

The education workforce in an ever-changing world

Most societies are changing at a faster pace than ever before. Education systems are struggling to keep up and progress has been uneven both between and within countries. The global trends driving this rapid change not only impact education today but also point to where it is headed and how it needs to evolve for the future. It is critical to consider the implications of these trends for education systems, and particularly for the education workforce, and to remember that the process is reciprocal— education has the power to influence global trends and shape the future as well.

Demographic shifts and evolving attitudes toward family structures and gender bring diversity and impact the growth of inequality

The global population will continue to rise for a few more generations, with growth especially high in least developed countries. More than half of this growth through 2050 will be in Sub-Saharan Africa alone, with children accounting for 33 percent of Sub-Saharan Africa's population, compared to 23 percent in the rest of the world. In the least developed countries, population growth and fertility remain high which will continue to challenge governments seeking to expand opportunity and reduce inequalities.¹⁵⁸ Although trends vary at the country level, global trends reveal that decreasing birth rates and increasing life spans contribute to aging at a global scale and will have ramifications for future labor markets, including the size of the working-age population which could cause more countries to enter the race for talent and skills.¹⁵⁹ Growing populations coupled with each generation being increasingly more educated, will increase demand for education, especially in regions where education is already struggling to meet demand.

To consider: This will require a rapidly expanding education workforce in many countries. In some countries¹⁶⁰ however, declining birth rates have implications for resizing the education workforce.¹⁶¹ Considerations for the development of a flexible workforce are therefore important.

In the most recent World Migration report, the International Organisation for Migration (IOM) highlights that more people are living in other countries and work is the major reason that people migrate internationally. Projections indicate continued large movements of migrants between regions, often from low- and middle-income countries to high-income countries.¹⁶² In addition to migrants, there has been an increase in refugees globally, with women and children making up a substantial portion of this population. Conflict, violence, and movement associated with environmental change have fueled the displacement of these peoples.¹⁶³

To consider: With a growing number of migrants and internally displaced peoples (IDPs), education workforces are already having to educate an increasingly diverse student populations with wideranging needs, including those from conflict and emergency contexts. Specialist forms of support to address language, psycho-social, and other needs may be required and coordination and collaboration among all stakeholders are critical.

Movement to urban areas is also increasing with more than half of people globally living in urban areas and 68 percent of the world's population projected to be urban by 2050.¹⁶⁴ This leads to specific challenges such as accommodating rapid population growth which can cause pressure on infrastructure and basic services; the expansion of slums and peri-urban settlements, and the lack of capacity to adequately plan for development.¹⁶⁵ It is important to note that projections indicate around 3.1 billion people will still live in rural areas in 2050.¹⁶⁶ In rural and urban areas the gap in living standards and life chances are widening with shifts in geopolitics often eroding trust and confidence in government.¹⁶⁷

To consider: This means planning for education will require more robust data to ensure resources are deployed where they are most needed. Targeted approaches to attracting, training, deploying, developing, and retaining the education workforce in both rural and urban areas will be more important than ever to ensure that inequality in education is not exacerbated. Ways of providing quality education effective teachers for those in hard-to-reach locations as well as overcrowded urban areas will need to be found.

In addition to demographic and geographic changes, shifts are occurring in familial arrangements and values, as well as traditional gender roles and stereotypes. In many countries, laws and attitudes have evolved to recognize household arrangements that do not fit the predominant model of the nuclear family and include more diverse family structures.¹⁶⁸ Moreover, attitudes toward gender have evolved in relation to roles within family structures and outside them as well. Economic changes—such as women increasingly participating in the labor market and more men taking paternity leave¹⁶⁹ — can lead to adjustments in the power balances within families.¹⁷⁰ Biases in the labor market about traditionally "masculine" and "feminine" vocations and roles are increasingly recognized.¹⁷¹ Political changes are also taking place with greater representation of women in government decision-making,¹⁷² which can lead to changes in policy and legislation supporting women's and girls' rights.

To consider: Education systems need to consider how these changes affect the composition and needs of the workforce, and schools will need to continuously revisit how they engage with students and parents or guardians of students and their own workforce.

Environmental change impacts the sustainability of and skills needed for our societies and economies

The movement of people is also impacted by climate change, one of the most pressing and largescale issues of this century. Higher temperatures, rising sea levels, and more frequent extreme weather events as well as the number and severity of natural disasters recorded per year has been steadily rising over the last century due to climate change impacts. Most predictions suggest that climate change will have unprecedented influence on where people can settle, grow food, build cities, and how they will provide functioning ecosystems for key services in the future.¹⁷³

To consider: Education has an increasingly important role to play in developing the responsible attitudes and sustainable behaviors needed to meet the mounting pressure of increasing environmental insecurity.¹⁷⁴ Frontline education workers can prepare students, encouraging them to consider the long-term consequences of actions impacting the environment and sustainable development by raising their awareness of these issues and promoting sustainable attitudes and skills. The 2018 PISA assessment measured global competence which encourages examination of local, global, and intercultural issues, understanding and appreciating different perspectives and worldviews, interacting successfully and respectfully with others, and taking responsible action toward

sustainability and collective well-being. These new skills and competences increasingly influence what the education workforce need to know and do.

Growth and technological innovation spark the need for a wider range of skills

"Technological change makes it harder to anticipate which job-specific skills will thrive and which will become obsolete in the near future. In the past, shifts in skill requirements prompted by technological progress took centuries to manifest themselves. In the digital era, advances in technology call for new skills seemingly overnight."

-World Bank, World Development Report: The Changing Nature of Work (2019)

Unprecedented growth and innovation in science and technology are raising fundamental questions about what it means to work and live in this century. This includes everything from advances in brain science to increased automation and big data to more sophisticated ICTs and artificial intelligence.

The internet and digitization have profoundly changed the ways people learn, including how we access, share, and create vast amounts of information. In 2020, over 4 billion people will be connected to the internet, rising from 3 billion in 2015. Despite the progress being made in global connectivity, in 2020 there will still be over 3.6 billion people not using the internet, the majority of whom will be lower income and/or in rural areas. Existing inequalities for the economically disadvantaged could be exacerbated by the lack of connectivity.¹⁷⁵ Progress is being made however—in Africa users are up by more than 20 percent each year with the number of internet users in Benin, Sierra Leone, Niger, and Mozambique more than doubled over 2017.¹⁷⁶

More sophisticated ICTs have followed the growth in connectivity. Growth is particularly pointed in the areas of big data analytics and knowledge management as well as in the development of robotics and machine learning which have led to greater automation technologies. Since 2000 the intensity of ICT employment has increased by almost 10 percent in low- and middle-income countries, almost twice as fast, on average, as in high-income economies.¹⁷⁷ But evidence suggests that there has been an increase in demand for skills that cannot be replaced by increasing technology and automation, including the non-routine skills of critical thinking, creativity, and socio-behavioral competencies, such as managing and recognizing emotions to enhance teamwork. In 12 of 16 mostly developing countries, wages in non-routine occupations increased significantly more than wages in routine occupations between 2005 and 2011.¹⁷⁸ Employability today is increasingly less about what you already know and more about your capacity to learn.

Nearly 45 percent of employers globally are finding it difficult to find people with the right skills, citing lack of soft skills as one of the reasons. Globally, more than half of employers say communication skills – written and verbal – are their most valued human strengths followed by collaboration and problem-solving.¹⁷⁹ Manpower Group notes in their *Skills Revolution 2.0* report that industry needs "people with learnability – the desire and ability to develop in-demand skills to be employable for the

long term". It is important to note that these surveys are not relevant to many in developing contexts where the world of work is overwhelmingly dominated by the informal sector. For example, on average, 7 in 10 non-farm workers in countries in Sub-Saharan Africa and Southern and Southeast Asia are in the informal economy, and the challenge is pervasive in in many regions. Individuals working in the informal economy are in a highly precarious economic situation, with women disproportionately facing the biggest challenges.¹⁸⁰

Given the complexity and range of skills required to succeed in the labor market, *education systems* and their workforce will have to ensure that students are learning the foundational and higher order skills required and support them to continuously learn and manage complex ways of thinking and working in an ever-changing world.¹⁸¹ While much is written about the global drivers transforming societies and economies, the future is rarely predictable. What we do know is that underlying all these shifts is a deepening complexity and increasing speed of change that require urgent action from education.¹⁸²

To consider: These shifts present a critical opportunity for education to evolve and influence the future direction of our world. However, the shifts are less relevant for some populations, especially where poverty is acute. It is in these contexts where education can really move the needle to ensure the most marginalized can take advantage of the changes taking place in the rest of the world.

Key trends in education are changing our understanding of what learning looks like

In the last few decades, advances in neuroscience have led to a greater understanding of how the brain works with implications for cognitive and behavioral development and the ways that people learn best. For example, evidence increasingly suggests that being bilingual can improve executive function and working memory, a skill critical to achievement in reading, writing, and math. We also know that stunting and other early childhood development deficiencies impact cognitive development and learning performance from the beginning of a child's life.¹⁸³

To consider: Advances in brain sciences, especially those connected with cognitive development and the science of learning have implications for the delivery of education; the design of learning spaces and experiences; teaching methodologies, curricula, and language of instruction; and for harnessing the motivation of both the education workforce and their students.

Our understanding of how children learn best must increasingly include an understanding of how they interface with digital tools. Greater connectivity and more sophisticated ICTs are already changing how education is delivered – from the use of teacher and student content downloaded on mobile phones, to educators interacting with students remotely via the internet, to the use of artificial intelligence to enable adaptive personalized learning.

To consider: The fast-paced growth and innovation in ICTs will continue to provide more diverse ways to facilitate student learning in formal and non-formal settings. Some digital tools are also enabling greater operational efficiency and productivity in some areas such as school management, data collection and analysis.

As connectivity and technology continue to spread and become more widely accessible, the digital and tech-related skills required from students and the education workforce are becoming more prominent as well. However, more evidence is required to understand the impact of these technologies on learning experiences and outcomes. And it is important to emphasize that these changes in skills are not homogeneous but need to account for the significant disparities arising out of the variable growth of connectivity and ICTs in a given context.

In response to the global drivers of change described above, education curriculum policy is moving toward a broader set of skills and greater pedagogical innovation. The policy shifts are underpinned by the recognition that greater learner agency is required to support lifelong learning in and beyond school, examples include teaching at the right level and more personalized learning.¹⁸⁴ Other approaches encourage students to be active agents in shaping their learning trajectories, with teachers moving into a facilitator role to make connections to opportunities and enable greater collaboration with students in designing their learning.¹⁸⁵ We know that students exhibit many learning styles in addition to differences in maturity, ability, and background, and more sophisticated tools are beginning to support teachers (and students) in understanding a student's learning requirements at a given time.¹⁸⁶ While pedagogical practice is difficult to articulate at a system level (lack of agreed definitions and the dynamism involved in the learning relationships), research has started to categorize types of innovative pedagogies that can support personalized learning – including embodied learning, experiential learning, computational thinking, gamification, blended learning, multiliteracies, and discussion-based teaching.¹⁸⁷

The contexts in which learning takes place are becoming more diversified. This includes any combination of changes in location, types of spaces, arrangements, resources, and tools utilized, thus creating a more multidimensional ecosystem of learning.¹⁸⁸ The OECD's research on innovative learning environments shows trends moving toward opening up classroom doors so that teaching can be shared, breaking down the close association between a particular learning space and a single teacher. Examples include mixed-aged learning groups and opening up the classroom to the wider community. Learning is also taking place in "digital spaces" and traditional educational institutions are starting to integrate these into formal learning systems.

Networking is becoming more complex and widespread in contemporary learning systems. Innovations in technology and management are facilitating organic networks of practitioners that are able to share proven practices and collaborate in ways that were unthinkable in previous generations. Digital platforms and ICTs take many different forms and have become a prominent part of deeper collaborative action. Isolation in learning systems is now seen to seriously limit potential. Partnerships not only within the learning environment but external to it – including families and communities, higher

education, cultural institutions, and businesses—are increasingly seen to support broader education goals.¹⁸⁹

To consider: The education sector will need to seriously rethink the organization of its systems and external partnerships when planning for how the education workforce will evolve for the future.

Summary: Rethinking the education workforce

Progress towards SDG 4 has been uneven and compounded by the rapid pace of societal change education systems are required to match. The education workforce is already the single biggest investment any government makes in education and the greatest lever for change. Teachers and the broader workforce— the frontline workers leading learning— are critical in determining whether all students receive a quality and inclusive education. However, the workforce faces significant challenges that hinder them from helping systems achieve education goals. These challenges provide an opportunity to question long-held assumptions about education workforce models and methods of delivery and reimagine an education workforce truly fit for now and the future.

Endnotes

¹ OECD. 2010. Strong Performers and Successful Reformers in Education: Lessons from PISA for the United States. Paris: OECD Publishing; Michael Barber and Mona Mourshed. 2007. How the world's best-performing school systems come out on top. Washington, DC: McKinsey & Company; Mona Mourshed, Michael Barber, and Chinezi Chijoke. 2010. How the world's most improved school systems keep getting better. Washington, DC: McKinsey & Company; Emiliana Vegas, Alejandro Ganimian, and Analia Jaimovich. 2012. Learning from the best: improving learning through effective teacher policies. Washington, DC: World Bank.

² UNESCO. 2015. "Education 2030 Incheon Declaration and Framework for Action for the Implementation of Sustainable Development Goal 4." Paris: UNESCO.

³ Jamison, Dean and Marco Schäferhoff. 2016. "Estimating the Economic Returns of Education from a Health Perspective." *Background Paper for the Education Commission*. SEEK Development (SEEK).

⁴ UNICEF. 2019. "UNICEF Data: Primary education- October 2019." Accessible at:

https://data.unicef.org/topic/education/primary-education/

⁵ UIS. 2017. "Reducing global poverty through universal primary and secondary education." *UIS Fact Sheet 44*. Montreal, Canada: UNESCO Institute for Statistics (UIS); UIS. 2018. "One in Five Children, Adolescents and Youth is Out of School." *UIS Fact Sheet 48*. Montreal: UNESCO Institute for Statistics (UIS).

⁶ UIS. 2017. "Reducing global poverty through universal primary and secondary education." *UIS Fact Sheet 44*. Montreal, Canada: UNESCO Institute for Statistics (UIS); UIS. 2018. "One in Five Children, Adolescents and Youth is Out of School." *UIS Fact Sheet 48*. Montreal: UNESCO Institute for Statistics (UIS).

⁷ UIS. 2018. "One in Five Children, Adolescents and Youth is Out of School." *UIS Fact Sheet 48*. Montreal: UNESCO Institute for Statistics (UIS).

⁸ Education Commission. 2016. *The Learning Generation: Investing in Education for a Changing World*. New York: International Commission on Financing Global Education Opportunity.

⁹ Education Commission. 2016. *The Learning Generation: Investing in Education for a Changing World*. New York: International Commission on Financing Global Education Opportunity.

¹⁰ Education Commission. 2016. *The Learning Generation: Investing in Education for a Changing World*. New York: International Commission on Financing Global Education Opportunity.

¹¹ Nicolai, Susan, Chris Hoy, Tom Berliner, and Thomas Aedy. 2015. *Projecting progress: reaching the SDGs by 2030*. London: Overseas Development Institute (ODI).

¹² UIS. 2017. "More than One-Half of Children and Adolescents are Not Learning Worldwide." *UIS Fact Sheet 46*. Montreal: UNESCO Institute for Statistics (UIS).

¹³ UIS. 2017. "More than One-Half of Children and Adolescents are Not Learning Worldwide." *UIS Fact Sheet 46*. Montreal: UNESCO Institute for Statistics (UIS).

¹⁴ Based on the international learning assessments that the Education Commission used as a standard for learning. ¹⁵ Education Commission. 2016. *The Learning Generation: Investing in Education for a Changing World*. New York: International Commission on Financing Global Education Opportunity.

¹⁶ UIS. 2017. "More than One-Half of Children and Adolescents are Not Learning Worldwide." *UIS Fact Sheet 46*. Montreal: UNESCO Institute for Statistics (UIS).

¹⁷ The seven PISA-D countries are: Cambodia, Ecuador, Guatemala, Honduras, Paraguay, Senegal, and Zambia. ¹⁸ Kaffenberger, Michelle. 2019. "PISA-D Reveals Exceptionally Low Learning." RISE blog. Available at: <u>https://www.riseprogramme.org/blog/PISA-D low learning</u>

¹⁹ OECD. 2018. "Future of Education and Skills: Education 2030." Paris: OECD Publishing; Anna Rosefsky Saavedra and V. Darleen Opfer. 2012. "Learning 21st-Century Skills Requires 21st-Century Teaching." *Phi Delta Kappan*, 94(2): 8-13.
 ²⁰ Care, Esther, Kate Anderson and Helyn Kim. 2016. *Visualizing the Breadth of Skills Movement Across Education*

Systems. Washington, DC: Brookings Institution. ²¹ Garcia, Emma. 2014. "The Need to Address Noncognitive Skills in the Education Policy Agenda." *Briefing Paper #386*. Washington, DC: Economic Policy Institute (EPI).

²² UIS. 2018. Handbook on Measuring Equity in Education. Montreal: UNESCO Institute for Statistics (UIS).

²³ Analysis by the Education Commission Secretariat (2016) of Demographic and Health Surveys (DHS) data using a meta-dataset with 39 countries, of which 28 are Sub-Saharan Africa countries. The analysis com-pared the percent of young adults aged 20-24 who had completed secondary among two groups - poor, rural females vs. non-poor, urban, males. The country-fixed average secondary completion for each group was 5 percent and 37 percent, respectively. ²⁴ UIS. 2016. "Leaving No One Behind: How Far on the Way to Universal Primary and Secondary Education?" *Policy* Paper 27/ Fact Sheet 37. Montreal: UNESCO Institute for Statistics (UIS).

²⁵ UIS. 2016. "Leaving No One Behind: How Far on the Way to Universal Primary and Secondary Education?" *Policy* Paper 27/ Fact Sheet 37. Montreal: UNESCO Institute for Statistics (UIS).

²⁶ King, Elizabeth M. and Rebecca Winthrop. 2015. "Today's challenges for girls' education." Washington, DC: Brookings Institution; UNESCO. 2018. Meeting our commitments to gender equity in education. Paris: UNESCO.

²⁷ Research for Equitable Access and Learning Centre (REAL), University of Cambridge. 2016. "Overcoming Inequalities within Countries to Achieve Global Convergence in Learning." Background Paper for the Education Commission.

²⁸ World Bank. 2018. World Development Report 2018: Learning to Realize Education's Promise. Washington, DC: World Bank.

²⁹ Lewis, Ingrid and Sunit Bagree. 2013. "Teachers for All: Inclusive Teaching for Children with Disabilities." Brussels: International Disability and Development Consortium (IDDC).

³⁰ UNICEF. 2013. The State of the World's Children 2013: Children with Disabilities. New York: UNICEF.

³¹ GCE and Handicap International. 2014. "Equal Right, Equal Opportunity: Education and Disability." Johannesburg: Global Campaign for Education (GCE).

³² Education Commission. 2016. The Learning Generation: Investing in Education for a Changing World. New York: International Commission on Financing Global Education Opportunity.

³³ UIS. 2018. Handbook on Measuring Equity in Education. Montreal: UNESCO Institute for Statistics (UIS).

³⁴ Pritchett, Lant. 2015. "Creating Education Systems Coherent for Learning Outcomes." *RISE Working Paper*.

Washington, DC: Center for Global Development (CGD); Education Commission analysis (2016).

³⁵ Education Commission analysis (2016) of effective education systems drawing in particular on Mourshed et al. (2010) and World Bank SABER program.

³⁶ Education Commission. 2016. *The Learning Generation: Investing in Education for a Changing World*. New York: International Commission on Financing Global Education Opportunity.

³⁷ Faul, Moira. 2016. "Scoping Study: Education systems diagnostics tools." Oxford: Health and Education Advice and Resource Team (HEART).

³⁸ OECD. 2016. "What makes a school a learning organisation? A guide for policy makers, school leaders and teachers." Paris: OECD Publishing,

³⁹ Barber, Michael and Mona Mourshed. 2007. How the world's best-performing school systems come out on top. New York: McKinsey & Company.

⁴⁰ Gillard, Julia. 2017. "Sharing the future by building better education systems," in *Meaningful Education in Times of* Uncertainty: Collection of Essays. Washington, DC: Brookings Institution.

⁴¹ World Bank. 2018. World Development Report 2018: Learning to Realize Education's Promise. Washington, DC: World Bank.

⁴² Pritchett, Lant. 2015. "Creating Education Systems Coherent for Learning Outcomes: Making the Transition from Schooling to Learning." RISE Working Paper. Oxford: RISE.

⁴³ OECD. 2010. Strong performers and successful reformers in education: lessons from PISA for the United States. Paris: OECD Publishing; Michael Barber and Mona Mourshed. 2007. How the world's best-performing school systems come out on top. Washington, DC: McKinsey & Company; Mona Mourshed, Michael Barber, and Chinezi Chijoke. 2010. "How the world's most improved school systems keep getting better." Washington, DC: McKinsey & Company; Emiliana Vegas, Alejandr Ganimian, and Analia Jaimovich. 2012. Learning from the best: improving learning through effective teacher policies. Washington, DC: World Bank.

⁴⁴ OECD. 2019. *Trends Shaping Education 2019*. Paris: OECD Publishing.

⁴⁵ Education Commission. 2016. The Learning Generation: Investing in Education for a Changing World. New York: International Commission on Financing Global Education Opportunity.

⁴⁶ Hanushek, Eric A. and Steven G. Rivkin. 2010. "Generalizations about Using Value-Added Measures of Teacher ⁴⁰ Hanushek, Eric A. and Steven G. mixkin. 2010. deneralizations about companying reactions about companying reactions about companying reactions and Steven G. Quality." *American Economic Review* 100(2): 267-71; Hanushek, Eric A., John F. Kain, Daniel M. O'Brien and Steven G. 34

Rivkin. 2005. "The Market for Teacher Quality." *NBER Working Paper 7082*. Cambridge, MA: National Bureau of Economic Research (NBER); Johah E. Rockoff. 2004. "The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data." *American Economic Review* 94(2): 247-252; David K. Evans and Fei Yuan 2018. "Working Conditions of Teachers in Low and Middle-income Countries." *Background paper for the World Bank's 2018 World Development Report: Realizing the Promise of Education for Development*. Unpublished.

⁴⁷ Béteille, Tara and David K. Evans. 2019. "Successful Teachers, Successful Students: Recruiting and Supporting Societies Most Critical Profession." Washington, DC: World Bank; Raj Chetty, John Friedman, Jonah Rockoff. 2014. "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood." *American Economic Review*, 104 (9): 2593–632; William L. Sanders and June C. Rivers. 1996. "Cumulative and Residual Effects of Teachers on Future Student Academic Achievement." *Research Progress Report*, Knoxville, TN: University of Tennessee Value-Added Research and Assessment Center.

⁴⁸ Béteille, Tara and David K. Evans. 2019. "Successful Teachers, Successful Students: Recruiting and Supporting Societies Most Critical Profession." Washington, DC: World Bank; Eric A. Hanushek and Steven G. Rivkin. 2010. "Generalizations about Using Value-Added Measures of Teacher Quality." *American Economic Review*, 100 (2): 267-71; Steven G. Rivkin, Eric A. Hanushek, and John F. Kain. 2005. "Teachers, Schools and Student Achievement." *Econometrica*, *73*(2), 417-458; Jonah E. Rockoff. 2004. "The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data." *American Economic Review*, *94*(2), 247-252; Albert Park and Emily Hannum. 2001."Do Teachers Affect Learning in Developing Countries? Evidence from Matched Student-Teacher Data from China." Paper prepared for the conference "Rethinking Social Science Research on the Developing World in the 21st Century Social Science Research Council," Park City, Utah.

⁴⁹ Darling-Hammond, Linda. 2010. *Recognizing and developing effective teaching: What policy makers should know and do. Policy Brief.* Washington, DC: Center for American Progress.

⁵⁰ Darling-Hammond, Linda. 2006. *Powerful teacher education: Lessons from exemplary programs*. San Francisco: John Wiley & Sons.

⁵¹ OECD. 2016. "Insights from the TALIS-PISA Link Data: Teaching Strategies for Instructional Quality." Paris: OECD Publishing.

⁵² Hattie, John. 2009. *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. Abingdon: Routledge; Robert J. Marzano, Debra Pickering, and Jane E. Pollock. 2001. Classroom Instruction that Works: Researchbased Strategies for Increasing Student Achievement. Alexandria, VA: ASCD. Wayne, A. and P. Youngs. 2003. "Teacher characteristics and student achievement gain: A review." *Review of Educational Research*, Vol. 73, 89-122.

⁵³ Dulay, Sabiha and Engin Karadağ. 2017. "The Effect of School Climate on Student Achievement." in *The Factors Effecting Student Achievement*, E. Karadağ (Ed.). Berlin: Springer International Publishing.

⁵⁴ Bruns, Barbara and Javier Luque. 2015. *Great Teachers: How to Raise Student Learning in Latin America and the Caribbean*. Washington, DC: World Bank; Dulay, Sabiha and Engin Karadağ. 2017. "The Effect of School Climate on Student Achievement." in *The Factors Effecting Student Achievement*, E. Karadağ (Ed.). Berlin: Springer International Publishing.

⁵⁵ Béteille, Tara and David K. Evans. 2019. "Successful Teachers, Successful Students: Recruiting and Supporting Societies Most Critical Profession." Washington, DC: World Bank.

⁵⁶ Evans, David and Anna Popova. 2015. "What Really Works to Improve Learning in Developing Countries? An Analysis of Divergent Findings in Systematic Reviews." *Policy Research Working Paper 7203*. Washington, DC: World Bank.
⁵⁷ Muralidharan, Karthik, Abhijeet Singh and Alejandro J. Ganimian. 2019. "Disrupting Education? Experimental Evidence on Technology-Aided Instruction in India." *American Economic Review*, 109(4): 1426-60.

⁵⁸ Glewwe, Paul and Karthik Muralidharan. 2015. "Improving school education outcomes in developing countries: evidence, knowledge gap and policy implications." RISE Working Paper. Oxford: Research on Improving Systems of Education (RISE).

⁵⁹ Glewwe, Paul, Eric Hanushek, Sarah D. Humpage, and Renato Ravina. 2011. "School Resources and Educational Outcomes in Developing Countries: A Review of the Literature from 1990 to 2010. NBER Working Papers 17554. Cambridge, MA: National Bureau of Economic Research (NBER).

⁶⁰ Barber, Michael and Mona Mourshed. 2007. How the world's best-performing school systems come out on top. New York: McKinsey & Company; Barber, Michael, Fenton Whelan, and Michael Clark. 2010. Capturing the Leadership Premium: How the world's top school systems are building leadership capacity for the future. New York: McKinsey &

Company; Laura Lewis. 2016. "Leadership Development Guidance Note." *Background paper for the report The Learning Generation: Investing in education for a changing world*. Teach for All (TFA).

⁶¹ IPA (Innovations for Poverty Action). 2015. "Evaluating the Teacher Community Assistant Initiative in Ghana." Available at: https://www.poverty-action.org/about/randomized-control-trials; Brendan Lehan. 2018. "Teacher Community Assistant Initiative: A national pilot for remedial education shows the value of proactive negotiation of evidence-based projects." New Haven: Evidence in Practice at Yale School of Management, Yale University; J-PAL. 2006. "Making Schools Work for Marginalized Children: Evidence from an inexpensive and effective program in India." Policy Briefcase No. 2. Cambridge: Department of Economics, Massachusetts Institute of Technology (MIT).

⁶² Navarro, F. Masdeu. 2015. "Learning support staff: A literature review." OECD Education Working Papers, No. 125. Paris: OECD Publishing.

⁶³ Jenny Perlman Robinson and Rebecca Winthrop with Eileen McGivney. 2016. *Millions Learning: Scaling Up Quality Education in Developing Countries*. Center for Universal Education. Washington, DC: Brookings Institution; Naylor, Ruth, Charlotte Jones, and Pearl Boateng (Education Development Trust). 2019. "Strengthening the Education Workforce." *Background Paper for Transforming the Education Workforce: Learning Teams for a Learning Generation*. New York: Education Commission.

⁶⁴ Christopher, Day and Pamela Sammons. 2013. "Successful leadership: a review of the international literature." Reading: Education Development Trust.

⁶⁵ Leithwood, Kenneth and D. Jantzi. 2006. "Linking leadership to student learning: the contribution of leader efficacy." *Educational Administration Quarterly* 44(4): 496-528; Viviane M.J. Robinson and Helen S. Timperley. 2007. "The Leadership of the Improvement Teaching and Learning: Lessons from Initiatives with Positive Outcomes for Students." *Australian Journal of Education*, 51(3).

⁶⁶ Pont, Beatriz, Deborah Nusche, and Hunter Moorman. 2008. Improving School Leadership, Volume 1: Policy and Practice. Paris: OECD Publishing.

⁶⁷ Conn, Katherine. 2014. "Identifying Effective Education Interventions in Sub-Saharan Africa: A Meta-Analysis of Rigorous Impact Evaluations." New York: Colombia University.

⁶⁸ Leithwood, Kenneth. 2013. "Strong Districts and Their Leadership." Toronto: The Institute for Education Leadership. ⁶⁹ Naylor, Ruth, Charlotte Jones, and Pearl Boateng (Education Development Trust). 2019. "Strengthening the Education Workforce." *Background Paper for Transforming the Education Workforce: Learning Teams for a Learning Generation*. New York: Education Commission.

⁷⁰ STIR and ID insight. 2018. "Impact of STIR's programming on teacher motivation and student learning: Endline report." IDinsight.

⁷¹ Bruns, Barbara. 2018. "In Bringing a Literacy Project to Scale, has Kenya Found a Holy Grail?" Washington, DC: Center for Global Development (CGD).

⁷² Piper, Benjamin, Joseph Destefano, Esther M. Kinyanjui, and Salome Ong'ele. 2018. "Scaling up successfully: Lessons from Kenya's Tusome national literacy program." *Journal of Educational Change* 19(3): 293–321.

⁷³ OECD. 2017. *Skills for a High-Performing Civil Service*. Paris: OECD Publishing; OECD. 2017. "Core Skills for Public Sector Innovation." Paris: OECD Publishing; Harry Jones. 2011. "Taking responsibility for complexity: When is a policy problem complex, why does it matter, and how can it be tackled?" *ODI Briefing Paper 68*. London: ODI (Overseas Development Institute).

⁷⁴ Pérez, Jesús Soldevila, Mila Naranjo Llanos, and Joan Jordi Muntaner Guasp. 2017. "Inclusive practices: the role of the support teacher." *Aula Abierta* 46(2), 49-56.

⁷⁴ Evans, David and Anna Popova. 2015. "What Really Works to Improve Learning in Developing Countries? An Analysis of Divergent Findings in Systematic Reviews." *Policy Research Working Paper 7203*. Washington, DC: World Bank.

⁷⁵ Evans, David and Anna Popova. 2015. "What Really Works to Improve Learning in Developing Countries? An Analysis of Divergent Findings in Systematic Reviews." *Policy Research Working Paper 7203*. Washington, DC: World Bank.

⁷⁶ Strigel, Carmen. "Mobile resources to promote teacher efficacy in teaching children with disabilities in Ethiopia." Presentation at CIES 2018. Mexico City: CIES (Comparative and International Education Society).

⁷⁷ Lewis, Ingrid and Sunit Bagree. 2013. "Teachers for All: Inclusive Teaching for Children with Disabilities." Brussels: International Disability and Development Consortium (IDDC).

⁷⁸ J-PAL. 2006. "Making Schools Work for Marginalized Children: Evidence from an inexpensive and effective program in India." Policy Briefcase No. 2. Cambridge, MA: MIT Poverty Action Lab; Lehan, Brendan. 2018. "Teacher Community

Assistant Initiative: A national pilot for remedial education shows the value of proactive negotiation of evidence-based projects." Evidence in Practice Research Project. New Haven, Connecticut: Yale School of Management.

⁷⁹ Camfed International. 2017. "Annual Review 2017." Cambridge, UK: Camfed International; Leonard Cheshire. "Inclusive education for persons with disabilities –Are we making progress?" *Background paper prepared for the International Forum on Inclusion and Equity in Education – Every Learner Matters, Cali, Colombia, 11–13 September* 2019. Paris: UNESCO.

⁸⁰ GPE. 2018. "Better Education Outcomes Through School Health Interventions." Washington, DC: Global Partnership for Education (GPE).

⁸¹ Bonell, C.J., Farah, A. Harden, H. Wells, W. Parry, A. Fletcher, et al. 2013. "Systematic review of the effects of schools and school environment interventions on health: Evidence mapping and synthesis." *Public Health Research* 1(1): 1–340; Moore, G. F., H.J. Littlecott, R. Evans, S. Murphy, G. Hewitt, and A. Fletcher. 2017. "School composition, school culture and socioeconomic inequalities in young people's health: Multi-level analysis of the health behaviour in school-aged children (HBSC) survey in wales." *British Educational Research Journal*, 43(2): 310–329; Suldo, S. M., A.A. Friedrich, T. White, J. Farmer, D. Minch, and J. Michalowski. (2009). "Teacher support and adolescents' subjective well-being: A mixed-methods investigation." *School Psychology Review* 38(1): 67.

⁸² Littlecott, H. J., G. F. Moore and S. M. Murphy. 2018. "Student health and well-being in secondary schools: the role of school support staff alongside teaching staff." *Pastoral Care in Education* 36(4): 297-312; Pound, P., R. Langford, and R. Campbell. 2016. "What do young people think about their school-based sex and relationship education? A qualitative synthesis of young people's views and experiences." *BMJ Open* 6(9).

⁸³ Camfed International. 2017. "Annual Review 2017." Cambridge, UK

⁸⁴ Centre of Studies for Policies and Practices in Education. 2013. "Learning Standards, Teaching Standards, and Standards for School Principals: A Comparative Study." *OECD Education Working Papers No. 99*. Paris: OECD Publishing.

⁸⁵ Education Commission. 2016. *The Learning Generation: Investing in Education for a Changing World*. New York: International Commission on Financing Global Education Opportunity.

⁸⁶UIS. 2016. "The world needs almost 69 million teachers to reach the 2030 education goals." *UIS Fact Sheet No. 39*. Montreal: UNESCO Institute of Statistics (UIS).

⁸⁷ Education Commission. 2016. *The Learning Generation: Investing in Education for a Changing World*. New York: International Commission on Financing Global Education Opportunity.

⁸⁸ Mulkeen, Aiden, William Ratteree, and Ilse Voss-Lengnik. 2017. *Teachers and teacher policy in primary and secondary education - Discussion Paper Education*. Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

⁸⁹ Mulkeen, Aiden and Nuala Crowe-Taft. 2010. *Teacher attrition in Sub-Saharan Africa: The neglected dimension of the teacher supply challenge, A literature review*. Paris: UNESCO IIEP.

⁹⁰ Mulkeen, Aiden and Dandan Chen (Eds). 2008. *Teachers for Rural Schools: Experiences in Lesotho, Malawi, Mozambique, Tanzania, and Uganda. Africa Human Development Series*. Washington, DC: World Bank.

⁹¹ OECD .2018. "In which countries do the most highly qualified and experienced teachers teach in the most difficult schools?" *PISA in Focus* #85. Paris: OECD Publishing.

⁹² Luschei, Thomas and Amita Chudgar. 2015. Evolution of Policies on Teacher Deployment to Disadvantaged Areas. Background Paper for the Education For All Global Monitoring Report. Paris: UNESCO.

⁹³ Bashir, Sajitha, Marlaine Lockheed, Elizabeth Nihan, and Jee-Peng Tan. 2018. *Facing Forward: Schooling for Learning in Africa*. Washington, DC: World Bank.

⁹⁴ Banerjee, Abhijit, Shawn Cole, Esther Duflo, and Leigh Linden. 2007. "Remedying Education: Evidence from Two Randomized Experiments in India." *Quarterly Journal of Economics* 122(3):1235–1264; Karthik Muralidharan and Venkatesh Sundararaman 2010. "The Impact of Diagnostic Feedback to Teachers on Student Learning: Experimental Evidence from India." *The Economic Journal* 120(546); Esther Duflo, Pascaline Dupas, and Michael Kremer. 2015. "School Governance, Teacher Incentives, and Pupil-Teacher Ratios: Experimental Evidence from Kenyan Primary Schools." *Journal of Public Economics* 123(C):92-11; Geeta Kingdon, Monazza Aslam, Shenila Rawal, Sushmita Das. 2012. "Are contract and para-teachers a cost effective intervention to address teacher shortages and improve learning outcomes?" London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
 ⁹⁵ Mulkeen, Aiden, William Ratteree, and Ilse Voss-Lengnik. 2017. *Teachers and teacher policy in primary and secondary education - Discussion Paper Education*. Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

⁹⁶ Mulkeen, Aiden, William Ratteree, and Ilse Voss-Lengnik. 2017. *Teachers and teacher policy in primary and secondary education - Discussion Paper Education*. Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). ⁹⁷ Naylor, Ruth, Charlotte Jones, and Pearl Boateng (Education Development Trust). 2019. "Strengthening the Education Workforce." *Background Paper for Transforming the Education Workforce: Learning Teams for a Learning Generation*. New York: Education Commission.

⁹⁸ Hattie, John. 2009. *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. Abingdon: Routledge.

⁹⁹ Best, Alice, Barbara Tournier, and Chloe Chimier. 2018. "Topical questions on teacher management." Paris: UNESCO IIEP; Glewwe, Paul, Eric Hanushek, Sarah D. Humpage, and Renato Ravina. 2011. "School Resources and Educational Outcomes in Developing Countries: A Review of the Literature from 1990 to 2010. NBER Working Papers 17554. Cambridge, MA: National Bureau of Economic Research (NBER).

¹⁰⁰ Glewwe, Paul, Eric Hanushek, Sarah D. Humpage, and Renato Ravina. 2011. "School Resources and Educational Outcomes in Developing Countries: A Review of the Literature from 1990 to 2010. NBER Working Papers 17554. Cambridge, MA: National Bureau of Economic Research (NBER).

¹⁰¹ UNESCO. 2017. *Accountability in education: meeting our commitments.* Global Education Monitoring Report, 2017/8. Paris: UNESCO.

¹⁰² World Bank. 2018. *World Development Report: Learning to Realize Education's Promise*. Washington DC: World Bank.

¹⁰³ Crehan, Lucy. 2016. Exploring the impact of career models on teacher motivation. Paris: UNESCO IIEP.

¹⁰⁴ Montoya, Silvia. 2019. "We Must Support Our Teachers." UIS Blog. Available at: <u>http://uis.unesco.org/en/blog/we-must-support-our-teachers</u>

¹⁰⁵ Symeonidis, Vasileios. 2015. *The Status of Teachers and the Teaching Profession: A study of education unions' perspectives*. Brussels: Education International.

¹⁰⁶ Mulkeen, Aiden and Nuala Crowe-Taft. 2010. *Teacher attrition in Sub-Saharan Africa: The neglected dimension of the teacher supply challenge, A literature review*. Paris: UNESCO.

¹⁰⁷ Dembélé, M., and Rogers, F. H. 2013. "More and better teachers: Making the slogan a reality," in J. Kirk, M. Dembélé and S. Baxter (Eds.), *More and better teachers for quality education for all: Identity and motivation, systems and support.* Collaborative Works. Crehan, Lucy. 2016. Exploring the impact of career models on teacher motivation. Paris: UNESCO IIEP.

¹⁰⁸ Richardson, Emily. 2014. "Teacher Motivation in Low-income Contexts: An Actionable Framework for Intervention." *Report prepared for the Teacher Motivation Working Group at CIES 2014*.

¹⁰⁹ Schleicher, Andreas. 2018. World Class: How to build a 21st century school system. Paris: OECD Publishing.

¹¹⁰ Gershenson, Seth, Cassandra Hart, Constance Lindsay, and Nicholas Papageorge. 2017. "The Long-Run Impacts of Same-Race Teachers." *IZA discussion paper 10630*. Bonn: IZA Institute of Labor Economics; Sperling, Gene B. and Rebecca Winthrop with Christina Kwauk. 2016. *What Works in Girls Education: Evidence for the World's Best Investment*. Washington, DC: Brookings Institution.

¹¹¹ GCE and Handicap International. 2014. "Equal Right, Equal Opportunity: Education and Disability." Johannesburg: Global Campaign for Education (GCE).

¹¹² Uwizeyimana, Dominique E. And Navela .S Mathevula. 2014. "Promotion of Female Educators into School Management Positions: A Gendered Perspective." *Mediterranean Journal of Social Sciences* 5(20); Shephard, Sue. 2017. "Why are there so few female leaders in higher education: a case of structure or agency?" *Management in Education* 31(2).

¹¹³ Hungi, Njora. 2011. "Characteristics of School Heads and their Schools." *SACMEQ Working Paper 3*. Gaborone: Southern and Eastern African Consortium for Monitoring Education Quality (SAQMEQ).

¹¹⁴ Mulkeen, Aiden, William Ratteree, and Ilse Voss-Lengnik. 2017. *Teachers and teacher policy in primary and secondary education - Discussion Paper Education*. Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

¹¹⁵ UNESCO IICBA. 2017. *Teacher Support and Motivation Framework for Africa: Emerging Trends*. Addis Ababa: UNESCO-IICBA.

¹¹⁶ Mulkeen, Aiden, William Ratteree, and Ilse Voss-Lengnik. 2017. *Teachers and teacher policy in primary and secondary education - Discussion Paper Education*. Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

¹¹⁹ OECD. 2014. *New Insights from TALIS 2013: Teaching and Learning in Primary and Upper Secondary Education*. Paris: OECD Publishing.

¹²⁰ Pane, John F., Elizabeth D. Steiner, Matthew D. Baird, Laura S. Hamilton, and Joseph D. Pane. 2017. *Informing Progress: Insights on Personalized Learning Implementation and Effects*. Santa Monica: RAND Corporation; Benjamin Herold. 2016. "Personalizad Learning? What Does the Research Say?" *Education Week* 36(09): 14-15.

¹²¹ Pane, John F., Beth Ann Griffin, Daniel F. McCaffrey, Rita Karam, Lindsay Daughtery, and Andrea Phillips. 2013. "Does an Algebra Course with Tutoring Software Improve Student Learning?" *Research Brief*. Santa Monica: RAND Corporation; Wang, Haiwen and Katrina Woodworth. 2011. "Evaluation of Rocketship Education's Use of DreamBox Learning's Online Mathematics Program." Santa Monica: Center for Education Policy, SRI International.

¹²² UNESCO. 2017. Accountability in education: meeting our commitments. Global Education Monitoring Report, 2017/8. Paris: UNESCO; Jelmer Elvers and René Kneyber, Eds. 2016. *Flip the System: Changing Education from the Ground Up*. New York: Routledge.

¹²³ OECD. 2015. "Education Indicators in Focus: How Much Time do Teachers Spend on Teaching and Non-teaching Activities?" Paris: OECD Publishing.

¹²⁴ Bruns, Barbara and Javier Luque. 2015. *Great Teachers: How to Raise Student Learning in Latin America and the Caribbean*. Washington, DC: World Bank.

¹²⁵ Schleicher, Andreas. 2018. Valuing our Teachers and Raising their Status: How Communities Can Help. International Summit on the Teaching Profession. Paris: OECD Publishing.

¹²⁶ Naylor, Ruth and Yusuf Sayed. 2014. "Teacher quality: evidence review." Canberra: Department of Foreign Affairs and Trade (DFAT).

¹²⁷ Lewin, Keith and Stuart, J. S. 2003. "Researching teacher education: new perspectives on practice, performance and policy, Multi-S ite Teacher Education Research Project (MUSTER)." *Synthesis Report*. London: Department for International Development; Sayed, Yusuf. 2011. "Initial and Further Teacher Education and Training" in Ratteree, B. *Handbook on human resource toolkit of good practices for the teaching profession*. Geneva: International Labor Organization (ILO); Mulkeen, Aiden, William Ratteree, and Ilse Voss-Lengnik. 2017. *Teachers and teacher policy in primary and secondary education - Discussion Paper Education*. Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

¹²⁸ Mulkeen, Aiden and Nuala Crowe-Taft. 2010. *Teacher attrition in Sub-Saharan Africa: The neglected dimension of the teacher supply challenge, A literature review*. Paris: UNESCO IIEP.

¹²⁹ Mulkeen, Aiden and Nuala Crowe-Taft. 2010. *Teacher attrition in Sub-Saharan Africa: The neglected dimension of the teacher supply challenge, A literature review*. Paris: UNESCO IIEP.

¹³⁰ Popova, Anna, David Evans, Mary E. Breeding, and Violeta Arancibia. 2019. "Teacher Professional Development around the World: The Gap between Evidence and Practice." *Working Paper 517*. Washington, DC: Center for Global Development (CGD); Orr, D., Westbrook, J., Pryor, J., Durrani, N., Sebba, J., and Adu-Yeboah, C. (2013). What are the impacts and cost-effectiveness of strategies to improve performance of untrained and under-trained teachers in the classroom in developing countries? Systematic review. London: EPPI-Centre, Social Science Research Centre, Institute of Education, University of London.

¹³¹ Bruns, Barbara, Soledad De Gregorio, and Sandy Taut. 2016. "Measures of Effective Teaching in Developing Countries." *RISE Working Paper 16/009*. Oxford: Research on Improving Systems of Education (RISE).

¹³² Schwille, J., M. Dembélé, M., and J. Schubert. 2007. "Global perspectives on teacher learning: improving policy and practice. Paris: UNESCO IIEP; Yusuf Sayed. 2009. "Teacher Professional development: Lessons and Experiences" in proceedings of the 2nd National Continuing Professional Development Education Conference. Namibia: NIED.
 ¹³³ Darling-Hammond, Linda, Maria E. Hyler, Madelyn Gardner. 2017. *Effective Teacher Professional Development*. Palo Alto. CA: Learning Policy Institute.

¹³⁴ Jayaram, Kartik, Andy Moffit, and Doug Scott. 2012. *Breaking the habit of ineffective professional development for teachers*. Washington, DC: McKinsey&Company.

¹³⁵ UNICEF. 2013. The State of the World's Children 2013: Children with disabilities. New York: UNICEF.

¹¹⁷ Care, Esther, Helyn Kim, Kate Anderson, and Emily Gustafsson-Wright. 2017. "Skills for a Chaning World: National Perspectives and the Global Movement." Washington, DC: Brookings Institution.

¹¹⁸ Schleicher, Andreas. 2011. *Building a High-Quality Teaching Profession: Lessons from around the World*. Paris: OECD Publishing.

¹³⁶ GCE and Handicap International. 2014. "Equal Right, Equal Opportunity: Education and Disability." Johannesburg: Global Campaign for Education (GCE).

¹³⁷ Bloom, Nicholas, Renata Lemos, Raffaella Sadun, and John Van Reenen. 2014. "Does Management Matter in Schools?" *NBER Working Paper 20667*. Cambridge, MA: National Bureau of Economic Research (NBER).

¹³⁸ Transparency International. 2013. "Global Corruption Report: Education." New York: Routledge.

¹³⁹ Tessa, Deon Filmer, Gayle Martin, Ezequiel Molina, Brian Stacy, Christophe Rockmore, Jakob Svensson, and Waly Wane. 2016. "What Do Teachers Know and Do in Primary Schools in Sub-Saharan Africa?" Washington, DC: World Bank.

¹⁴⁰ Transparency International. 2013. "Global Corruption Report: Education." New York: Routledge.

¹⁴¹ Robinson, Viviane. 2007. The impact of leadership on student outcomes: Making sense of the evidence." *Conference paper for The Leadership Challenge*. Australian Council for Education Research (ACER).

¹⁴² World Bank. 2018. *World Development Report: Learning to Realize Education's Promise*. Washington DC: World Bank.

¹⁴³ Vaillant, Denise. 2015. "School leadership, Trends in Policies and Practices, and Improvement in the Quality of Education." Paris: UNESCO; UNESCO. 2017. *Global Education Monitoring Report 2017/18: Accountability in education: meeting our commitments*. Paris: UNESCO; UNESCO. 2016. "Leading better learning: School leadership and quality in the Education 2030 agenda." Paris: UNESCO

¹⁴⁴ OECD. 2014. *New Insights from TALIS 2013: Teaching and Learning in Primary and Upper Secondary Education*. Paris: OECD Publishing.

¹⁴⁵ UNESCO. 2016. "Leading Better Learning: School leadership and quality in the Education 2030 agenda: Regional reviews of policies and practices." Paris: UNESCO.

¹⁴⁶ IIEP Research Brief. 2017. "Decentralization in education: Examining the role of the district education office." Paris: UNESCO IIEP.

¹⁴⁷ IIEP Research Brief. 2017. "Decentralization in education: Examining the role of the district education office." Paris: UNESCO IIEP.

¹⁴⁸ Schleicher, Andreas. 2011. *Building a High-Quality Teaching Profession: Lessons from around the World*. Paris: OECD Publishing.

¹⁴⁹ UNESCO. 2017. *Global Education Monitoring Report 2017/18: Accountability in education: Meeting our commitments.* Paris: UNESCO.

¹⁵⁰ Symeonidis, Vasileios. 2015. *The Status of Teachers and the Teaching Profession: A study of education unions' perspectives*. Brussels: Education International.

¹⁵¹ Fullan, Michael. 1993. Change Forces: Probing the Depths of Educational Reform. Burgess Science Press.

¹⁵² Winthrop, Rebecca with Adam Barton and Eileen McGivney. 2018. *Leapfrogging Inequality: Remaking Education to Help Young People Thrive*. Center for Universal Education. Washington, DC: Brookings Institution.

¹⁵³ Wolfenden, Freda, Alison Buckler, Cristina Santos, and Jenna Mittelmeier. 2018. "Re-envisioning and Strengthening the Education Workforce: Initial Literature Review." Milton Keynes: The Open University.

¹⁵⁴ UIS. 2016. "The world needs almost 69 million teachers to reach the 2030 education goals." *UIS Fact Sheet No. 39*. Montreal: UNESCO Institute of Statistics (UIS).

¹⁵⁵ Bashir, Sajitha, Marlaine Lockheed, Elizabeth Nihan, and Jee-Peng Tan. 2018. *Facing Forward: Schooling for Learning in Africa*. Washington, DC: World Bank.

¹⁵⁶ Custer, Samantha, Elizabeth King, Tamar Manuelyan Atinc, Lindsay Read and Tanya Sethi. 2018. *Toward Data-Driven Education Systems: Insights into using information to measure results and manage change*. Washington, DC: Center for Universal Education at the Brookings Institution.

¹⁵⁷ Custer, Samantha, Elizabeth King, Tamar Manuelyan Atinc, Lindsay Read and Tanya Sethi. 2018. *Toward Data-Driven Education Systems: Insights into using information to measure results and manage change*. Washington, DC: Center for Universal Education at the Brookings Institution.

¹⁵⁸ World Bank and International Monetary Fund. 2016. *Global Monitoring Report 2015/16: Development in an Era of Demographic Change.* Washington, DC: World Bank; United Nations, Department of Economic and Social Affairs, Population Division. 2017. *World Population Prospects: The 2017 Revision, Key findings and advance tables.* Working Paper No. ESA/P/WP/248. New York: United Nations.

¹⁵⁹ World Bank and International Monetary Fund. 2016. *Global Monitoring Report 2015/16: Development in an Era of Demographic Change.* Washington, DC: World Bank; Münz, Rainer. 2013. "Demography and Migration: An Outlook for the 21st Century." *Policy Brief.* Washington, DC: Migration Policy Institute.

¹⁶⁰ Europe, North America, 19 countries in Asia and 15 in Latin America and the Caribbean.

 ¹⁶¹ United Nations, Department of Economic and Social Affairs, Population Division. 2017. World Population Prospects: The 2017 Revision, Key findings and advance tables. Working Paper No. ESA/P/WP/248. New York: United Nations.
 ¹⁶² United Nations, Department of Economic and Social Affairs, Population Division. 2017. World Population Prospects: The 2017 Revision, Key findings and advance tables. Working Paper No. ESA/P/WP/248. New York: United Nations.

¹⁶³ IOM. 2018. World Migration Report 2018. Geneva: International Organisation for Migration (IOM).

¹⁶⁴ United Nations, Department of Economic and Social Affairs, Population Division. 2019. World Urbanization Prospects: *The 2018 Revision (ST/ESA/SER.A/420).* New York: United Nations.

¹⁶⁵ IOM. 2018. World Migration Report 2018. Geneva: International Organisation for Migration (IOM).

¹⁶⁶ United Nations, Department of Economic and Social Affairs, Population Division. 2019. World Urbanization Prospects: The 2018 Revision (ST/ESA/SER.A/420). New York: United Nations.

¹⁶⁷ OECD. 2018. "Future of Education and Skills: Education 2030." Paris: OECD Publishing.

¹⁶⁸ OECD. 2019. *Trends Shaping Education 2019*. Paris: OECD Publishing.

¹⁶⁹ OECD. 2019. *Trends Shaping Education 2019*. Paris: OECD Publishing.

¹⁷⁰ World Bank. 2011. World Development Report 2012: Globalization's Impact on Gender Equality: What's Happened and What's Needed. Washington, DC: World Bank.

¹⁷¹ World Bank. 2011. World Development Report 2012: Globalization's Impact on Gender Equality: What's Happened and What's Needed. Washington, DC: World Bank.

¹⁷² OECD. 2015. Trends Shaping Education 2015. Paris: OECD Publishing.

¹⁷³ United Nations Environment Programme. 2018. "Climate Change Annual Report 2018: Putting the environment at the heart of people's lives." Nairobi: United Nations Environment Programme.

¹⁷⁴ OECD. 2019. *Trends Shaping Education 2019*. Paris: OECD Publishing.

¹⁷⁵ Cisco. 2019. Visual Networking Index: Forecast and Trends, 2017-2022. *White Paper*. Available at:

https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-741490.html

¹⁷⁶ We Are Social and Hootsuite. 2018. "Digital in 2018: Essential Insights in Internet, Social Media, Mobile and Ecommerce Use Around the World." Available at: <u>https://digitalreport.wearesocial.com/download</u>

¹⁷⁷ World Bank. 2016. World Development Report 2016: Digital Dividends. Washington, DC: World Bank.

¹⁷⁸ World Bank. 2019. World Development Report 2019: The Changing Nature of Work. Washington, DC: World Bank.

¹⁷⁹ Manpower Group. 2018. "Talent Shortage Survey." Manpower Group.

¹⁸⁰ Stuart, Elizabeth, Emma Samman and Abigail Hunt. 2018. "Informal is the new normal: Improving the lives of workers at risk of being left behind." *Working Paper 530*. London, Overseas Development Institute (ODI).

¹⁸¹ Schleicher, Andreas. 2011. *Building a High-Quality Teaching Profession: Lessons from around the World*. Paris: OECD Publishing.

¹⁸² OECD. 2019. *Trends Shaping Education 2019*. Paris: OECD Publishing.

¹⁸³ UNICEF. 2013. Improving Child Nutrition: The achievable imperative for global progress. New York: UNICEF.

¹⁸⁴ OECD. 2018. "Future of Education and Skills: Education 2030." Paris: OECD Publishing.

¹⁸⁵ OECD. 2018. "Future of Education and Skills: Education 2030." Paris: OECD Publishing.

¹⁸⁶ OECD. 2001. "Schooling for Tomorrow: What Schools for the Future?" Paris: OECD Publishing.

¹⁸⁷ Paniagua, Alejandro and David Istance. 2018. *Teachers as Designers of Learning Environments: The Importance of Innovative Pedagogies*. Paris: OECD Publishing; David Istance. 2019. "Approaches to pedagogical innovation and why they matter." Washington, DC: Brookings Institution.

¹⁸⁸ Schleicher, Andreas. 2018. "Valuing Our Teachers and Raising their Status: How Communities Can Help." International Summit on the Teaching Profession. Paris: OECD Publishing.

¹⁸⁹ OECD. 2015. *Schooling Redesigned: Towards Innovative Learning Systems.* Paris: Educational Research and Innovation, OECD.

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