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Background Paper
Transforming the Education Workforce

Redesigning the Education
Workforce: A Design Thinking
Approach

Yeukai Mlambo, Ann Nielsen, and Iveta Silova, Arizona State University

with input from

Freda Wolfenden, Open University

Tal Rafaeli and Charlotte Jones, Education Development Trust

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 redesigning the education workforce using a design thinking approach to propose design options for the workforce needed now and in the future.

For questions or more information about this paper, please contact: info@educationcommission.org

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Executive summary

Education systems face the challenge of attracting and retaining an effective education workforce, while meeting the needs of an increasingly diverse student population and keeping up with global trends including rapidly advancing technological innovations. Unfortunately, the design of the education workforce in many countries stems from the industrial age of mass production and has been hard-wired for delivering basic services and infrastructure to promote economic growth. Now systems are charged with delivering quality education which is committed to inclusion and strives for constant improvement. This requires different core capabilities and changes to workforce practices and behaviors.

Reimagining the education workforce to meet Sustainable Development Goal 4 requires a clear focus on enabling access, learning, equity, and inclusion. An education workforce for this century will succeed when all children are learning, when teachers and other members of the workforce are respected by society and given the support they need, and when the teaching and learning environment becomes a focus of the community and not the sole responsibility of one teacher serving many students in one classroom. This workforce should be underpinned by core capabilities and strong partnerships driven by the kind of resilient trust that allows people and institutions to share collaborative opportunities as well as take risks that contribute to advancing effective teaching and learning. Achieving this requires a collaborative commitment to developing new habits of mind and dispositions among the education workforce, policymakers, and communities, as well as changes in institutional structures and culture.

This paper approaches the redesign of the education workforce by drawing on existing evidence of different roles in the education workforce, a review of effective approaches to teaching and learning, and in-country fieldwork we conducted in Ghana and Vietnam. Based on these findings, design principles were created to inform the process of redesigning the education workforce. These were then applied to create illustrations of **NEXT** and **FUTURE** models of the workforce. Of course, each context is different so the models will vary according to each context's specific needs. This paper offers considerations for policymakers and stakeholders that can assist in moving toward a desired education workforce model.

While few examples exist of large-scale redesign of the education workforce, some examples of recent innovations and initiatives point to new ways of thinking about the roles in the education workforce. While we acknowledge that more research is needed, existing evidence shows that:

- The role of the teacher has shifted allowing for greater student agency and personalized learning.
- Utilizing different types of teaching and learning roles at the classroom or school level can support improved learning, most importantly for the most marginalized.
- School leaders are most effective when they provide instructional leadership for teachers, create a culture of shared responsibility and professional collaboration among teachers; and understand how the broader community can support learning.
- Multidisciplinary teaching and learning teams that include a mix of skills and expertise can allow teams of teachers and other school professionals to be flexible and maximize their efforts in responding to student needs.
- Technology can expand learning opportunities and experiences for diverse students, allowing greater differentiation of the teacher role and/or learning environments.

- Effective educational systems include a middle tier that provides strategic and instructional leadership for schools, facilitates peer collaboration between schools and teachers; and ensures smart accountability based on data. (See background paper *Redesigning the Education Workforce*)

To further inform our thinking, we also draw on what we know about what works to improve learning. Recent reports, including *Transforming the Education Workforce* report, *The Learning Generation* report, and the *2019 World Development Report*, identify several effective practices associated with the workforce to increase access and learning outcomes. These include mother tongue/bilingual instruction, better teaching methods, remedial education, providing more teaching time, and providing teachers with more information on student progress. We have oriented the design toward these proven practices where appropriate.

What could the **FUTURE** of the education workforce look like?

Building on the existing evidence on workforce design and proven practices to enhance learning, and taking into account the global trends, **we recommend a set of design principles that can help guide policymakers who seek to redesign their education workforce. An effective process of redesign will:**

- **Start with the needs of learners** to determine the kinds of adult and technological expertise needed to be present, when, and in what ways.
- Move from a one-teacher, one-classroom model of education delivery to a **team-based and communal responsibility model** in which teachers, as the key agents for delivering teaching and learning, are able to focus on the teaching and learning needs of students and are supported by adults both in and outside of the school learning space to provide holistic learning experiences.
- **Recognize the diversity of both students and the education workforce** and ensure that issues of equity and inclusion and contextual and cultural relevance are considered in assembling the team of teaching and learning professionals needed to deliver learning effectively.
- **Be defined by the capabilities of the team, not just individuals**, and consider how those capabilities align with the changing needs of learners and learning environments.
- **Acknowledge the skills and knowledge that the education workforce already possesses** and provide opportunities to cultivate these skills and develop new skills that contribute positively to teaching and learning, and building professionalism.
- **Cultivate a culture of trust and shared responsibility** that allows for creativity and flexibility as well as some autonomy in decision-making across the various tiers of the ecosystem (e.g., classroom, school, middle-tier, and ministerial levels).
- **Encourage use of evidence, innovation, reflection, and adaption** — undertaking reflexive practices aimed at improving learning; engaging in critical data-driven practices, encouraging a culture of innovation (e.g., leveraging technology where appropriate) and therefore the potential to leapfrog traditional trajectories when appropriate. These innovative practices are then incorporated into the cycle of reflexivity. These workforce processes (feedback loops, cycles of continuous improvement, cultures of learning, etc.) are as important as the structures.

Applying these guiding principles, we propose an incremental and progressive model of the education workforce redesign, which moves the current education workforce ecosystem into **NEXT** and **FUTURE** phases of redesign. The **NEXT** phase is focused on addressing immediate challenges and needs and involves leveraging existing resources, strengthening existing roles as well as introducing new roles where necessary to

ensure teachers are supported in delivering education to marginalized populations (e.g., children with disabilities). In the **FUTURE**, emphasis is on bolder redesign initiatives that aim to propel the education workforce toward a team-based and communal responsibility model of educational delivery, one which centers the learners and their needs as the basis for determining which adults need to be in the room, with which skills, and for what purpose. The future education workforce model proposed requires us to break free from business as usual, including breaking from the traditional understanding of the structure of the current education system. If we are to reimagine and redesign the education workforce, it requires us to acknowledge that the learning spaces themselves would shift, as would the roles required to deliver education in a changing world.

This paper suggests that in addition to the design principles, the redesign of the education workforce must pay attention to the following key considerations:

- Changes to educational ecosystems need to be **attentive to local cultural and contextual needs** including those that address inclusion.
- Interventions need to be **respectful of the maturity of the system**. The movement from one revolution to the next may be swift for some education systems and slower paced for others.
- It is imperative that **strategic thinking and design across education systems** is embedded in the redesign of the education workforce.
- In thinking about redesigning the education workforce in specific contexts, it is essential that there are **systematic dialogues** that ensure that the principles and goals of the ecosystem discussed are infused in the functions of the different units as well as the roles and activities of each educator in the ecosystem.

Introduction

While advances in curriculum, assessment and pedagogical practices, and teacher training have begun to reform educational systems, a critical analysis of who is (and who is not) included in the education workforce has had less consideration. Teachers who are integral for student learning still largely operate in isolation from each other, rarely receiving effective feedback on their teaching from peers or school leaders. In addition, the role of the teacher has expanded, often requiring teachers to be experts in pedagogy and instruction, to teach more diverse curricula, informally and formally assess student learning, foster child welfare, and undertake other administrative tasks while simultaneously managing overcrowded and under-resourced classrooms comprising an increasingly diverse student body. Expansion of teacher roles and responsibilities coupled with significant teacher shortages exacerbate these challenges, as do limited accountability structures and support systems. As a result, many teachers in educational systems become overburdened and unmotivated, with negative impacts on teaching and learning (Winthrop et al, 2016; Wolfendon et al, 2018). This paper directs our attention to reconsider the education workforce that surrounds students and classrooms, repositioning the challenges of the 21st century that educational systems face as an opportunity to revisit the entire education workforce.

In framing this paper, we build on the work conducted by 2Revolutions (Sester & Morris, 2015; Kern & Rubin, 2012). 2Revolutions presents a framework to guide engagement with innovative practices at both basic and secondary school levels in the U.S. 2Revolutions argues that the rapid changes happening in the world, including growth in technology, shifts in policy environments, economic and other pressures on the traditional delivery of education, as well as growing dissatisfaction with the status quo, creates an opportunity to not just reform but to transform the education workforce (Sester & Morris, 2015). The framework provides a structure for considering and responding to both the incremental and transformational redesign of the education workforce for this century by considering three phases that demand an understanding of the current education

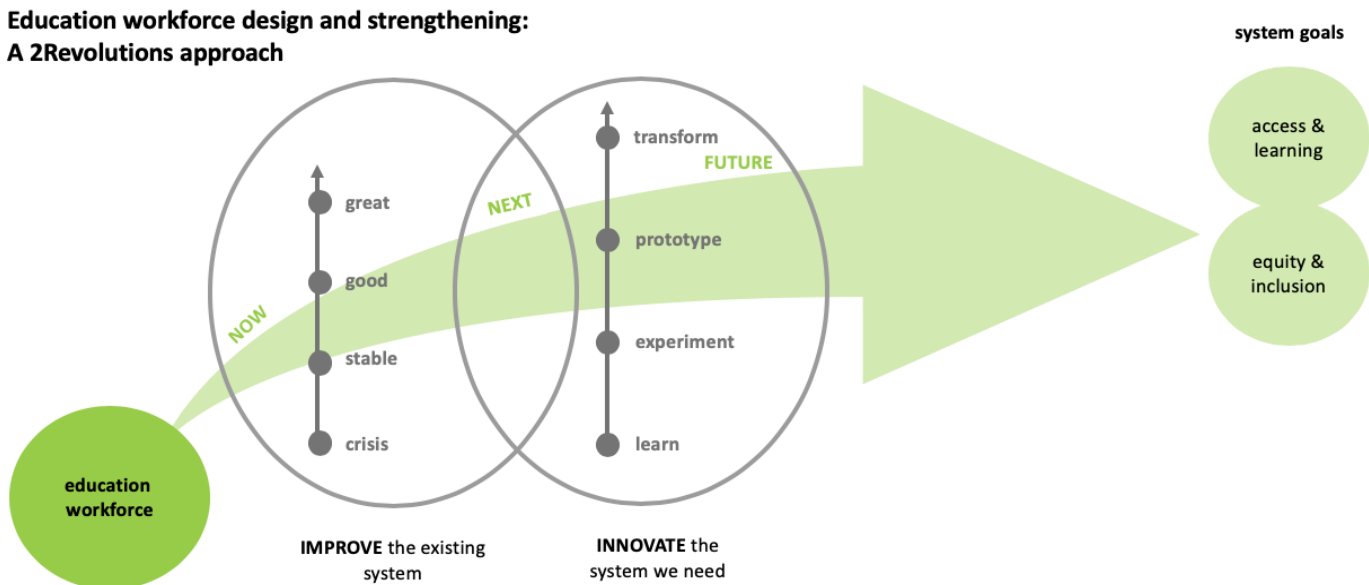
the Education Commission

workforce and the system in which it operates as a starting point for any movement toward a desired future. Through identified principles, the current education workforce can be guided toward more incremental changes in the immediate **NEXT** phase, and ultimately toward a **FUTURE** long-term phase of transformational, bolder thinking (Figure 1).

- Understanding the **NOW** allows us to identify the strengths, weaknesses, opportunities, and threats of the current education workforce system that demand immediate attention and action. Understanding the **NOW** requires engaging with teachers, school leaders, middle-tier staff, and other education delivery stakeholders from all levels of the ecosystem in order to have a holistic perspective of the current education workforce and to determine how to address immediate needs while simultaneously planning for the future.
- **NEXT** are the necessary immediate steps that address critical challenges identified in the now and help education workforce ecosystems to move closer to a future vision in phases or steps, working with key stakeholders and moving in incremental ways that are measured and evaluated for improvement. There may be multiple **NEXT** phases until the end goal is achieved.
- The **FUTURE** represents the desired future model of the education workforce, the functions of each individual within each level or unit of the education system (e.g., school, district, ministry), the roles as well as the activities that could exist to support the delivery of education in this century.
- Finally and most critical for education workforce redesign, each evolution of moving from **NOW** to **NEXT** and **FUTURE** needs to draw upon guiding principles that are collectively identified as necessary in propelling an education workforce toward a desired future.

In the following sections we begin with a review of existing research, introduce our fieldwork research that and conclude with considerations for various stakeholders including policy makers in order for this model to be successful.

Figure 1: 2Revolutions approach



Adapted from Todd Kern and Adam Rubin (2012) *Designing the Future of Learning: Unthink school to rethink learning*

Existing evidence and case study examples of redesigning the education workforce

Innovations in teacher roles

There is a scarcity of large-scale, policy-driven examples of and robust data on workforce design or redesign at scale (Wolfenden et al, 2018). However, literature from the Organisation for Economic Co-operation and Development (Paniagua & Istance, 2018; OECD 2018; Schleicher 2015). and other experts on the future of education points to the changing role of the teacher, which is evolving to be more multifaceted and adaptive depending on the context and students, and reveals several emerging characteristics of how teaching and learning is already changing.

For example, Innova Schools (low-cost private schools) in Peru combine **teacher-led, project-based learning** in small groups with student self-directed time using digital learning tools. Here, teachers monitor students' online work and offer personalized guidance. Such models are of course highly dependent on the availability of infrastructure, power, and access to the web and may not yet be feasible in more rural areas or urban areas with limited energy access (PERU – OECD).

At the Lumiar Institute in Brazil, there are no “traditional teachers”; instead, one half of the **“pedagogical staff” work as advisors, mentors, and coaches**, monitoring the students' progress and supporting them to select three or four projects that they work on every term. The other half of the staff are “masters” of a particular set of skills, such as engineering or piano playing, and work part time to design and facilitate projects that equip students with these skills.

The African School for Excellence, serving low-income families in South Africa, operates a **“rotational” model** in their classrooms. Students rotate between teacher-facilitated lessons, small-group peer learning activities, and individual work on computers. This model places the teacher in the role of the facilitator (Winthrop et al, 2016).

The Escuela Nueva model for multigrade classrooms in which students of different ages learn together through group discussions and projects also has the **teacher taking on a facilitator role**. Students work at their own pace, showing that they can have agency over their learning and can be at the center of the learning process. The use of demonstration schools in the Escuela Nueva model enables teachers to see and experience innovations complemented by peer coaching from the demonstration schools (n.d.).

In low and middle income countries there have been a number of initiatives that have explored how additional, differentiated roles working alongside the teacher can be complementary in providing targeted support within their classroom or supporting students in classrooms when specialist teachers are delivering instruction remotely. In some cases, in which there is a shortage of appropriately qualified teachers in a remote area, **specialist teachers** working with students across large geographical areas **facilitated by a variety of technology** have demonstrated improved learning outcomes. Examples include the Amazon Media Center in Brazil, the JAAGO program in Bangladesh (see Case Study 1) and MGCubed in Ghana (Case Study 2). The JAAGO program is an example of an education system that mobilizes a wider range of adult stakeholders to support the delivery of education for children and young people as a communal activity. **Local moderators**, psychologists, recent graduates, and internet companies, as well as corporate entities, all work together to support and deliver education.

Case Study 1: Example of innovation in education delivery to support access and learning for remote learners and to address shortages of qualified teachers in remote locations

Program: JAAGO

Country: Bangladesh

Focus: Technology-enabled use of qualified teachers to remote areas

JAAGO, a Bangladesh-based NGO, provides quality teaching to a group of 12 remote online schools (3,000 pupils) in 12 districts out of the Dhaka teacher center. The aim is to improve access to quality teaching for the poorest children in the most remote districts at free, JAAGO-funded schools.

Video lessons are led by English speaking graduates with teaching experience in collaboration with local class moderators. Learners with multiple deprivations receive lessons in purpose-built, technology-equipped classrooms. Families receive community officer support, and central expertise includes a psychologist to support learning difficulties and poverty-related issues of violence and early marriage.

Local support moderators are educated to 12th grade. They facilitate group work and class management and are ready to take over if there is a connectivity problem. An initial challenge was teacher quality, and this has developed. The professional development package for moderators covers training, induction, and preparation time to go through the syllabus. English phonics was a new topic covered in training. Quality monitoring is through supervision, visits, and software to observe classes.

This technology-based interactive pedagogy represents a major change for communities and contrasts with government schools in terms of ratio and resources. Classes are a mix of English and Bangla and resources include a full curriculum. Evaluations show that from a low base, 100% of those attending JAAGO primary schools passed, and at junior high, 93% passed.

Funding includes child sponsorship and multiple corporate partnerships. This includes an internet company investing in the IT infrastructure where there was previously no internet. A local project officer provides operational IT support. The technical challenges of bandwidth are ongoing.

In Ghana, the Making Ghana Girls Great initiative — “MGCubed” — leverages the skills of **expert teachers** who broadcast literacy and numeracy lessons to rural schools where class teachers or facilitators facilitate the remedial lesson, together with a life skills program. This helps the local teachers improve their teaching, provides a way of addressing the challenges of expert teacher shortages and teacher absenteeism, while promoting girls’ education in remote districts.

Case Study 2: Example of innovation in education delivery using technology

Program: Making Ghana Girls Great (part of the Department for International Development's Girls' Education Challenge)

Country: Ghana

Focus: Technology-enabled use of expert teachers across multiple school sites

From a studio in Accra, the Making Ghana Girls Great program delivers quality distance-learning video lessons to marginalized girls in 88 rural schools in the most deprived communities. Using satellite digital technology, literacy and numeracy lessons are delivered by expert teachers in Accra and supported in the rural classrooms by trained local female facilitators, often the class teachers. Local technical officers support connectivity challenges.

In response to problems of teacher supply shortages, the aim of the intervention is to give students most at risk of dropout greater quality learning time and to raise achievement and aspirations. The program takes account of the multiple community pressures on the most vulnerable girls.

The facilitators lead remedial instruction in numeracy and literacy either in or after school according to local teacher shortages and needs. In addition, the program runs after-school Wonder Woman clubs with life skills such as financial literacy, gender norms, and interviews with local role models. By request, some sessions are open to boys.

Harnessing the expertise of master teachers and combining that with the training of high school graduates as facilitators in a context of high unemployment and early marriage provides new status and a professional pathway. The facilitators reinforce positive attitudes and are closely involved with the school committees. An unintended consequence of the training and lesson observations has been the impact on the professional development of teachers in the schools and wider area; for example, teachers leading training for other colleagues and developing reading resources for whole-school literacy. Districts have also used the materials for wider in-service training and shared sessions on monitoring data and child safety. Plans include addressing the sustainability of this model.

The School-Based Mentor role implemented in Rwanda involves specialist teachers acting as **pedagogic advisers** working within or across schools to mentor teachers, with the aim of improving teachers' knowledge of English and pedagogical classroom practices. Despite some challenges around stakeholder buy-in, such as school administrators not providing time in the daily schedule for mentors to meet with teachers, the mentors were viewed positively by teachers. In addition to improving the English proficiency of teachers, the learner-based approaches that these mentors introduced also contributed to the improvement of students' literacy and proficiency levels with parents noting the changes in literacy skills they observed in their children (Buhungiro, 2015).

The use of **teaching assistants** can improve teaching and learning if adequate support for their training, indication, and deployment is in place. In Ghana, the Teacher Community Assistant Initiative utilized local high school graduates to support teaching small groups of students in primary school with learning gains shown by children participating in the program. **Volunteer support staff** have also been shown to support learning. The CAMFED learner guide program in Tanzania, Zimbabwe, Zambia, and Malawi (Case Study 3) offers alumni the

opportunity to volunteer as mentors and role models at local secondary schools. This program has shown considerable impact on retention and learning for the most marginalized girls and provides a route into teaching for CAMFED alumni. Other initiatives using community volunteers include the UNICEF/EQUIP program in Tanzania. In this community, volunteers have demonstrated improved outcomes for children through a 15-week school readiness program (Pettersson, et al., 2015).

Case Study 3: Example of community collaborators in supporting the delivery of education in schools

Program: CAMFED

Countries: Tanzania, Zimbabwe, Malawi, Ghana, Zambia

Focus: Use of female volunteer learning support staff from the local community

Campaign for Female Education — CAMFED — is an NGO supporting girls' access to, and retention in, education. CAMFED learner guides are female peer mentors providing pastoral support to marginalized girls in rural secondary schools in Africa.

Unlike teachers posted from outside the area, learner guides are local volunteers with experience of poverty challenges. They act as a missing link between school and community, especially concerning health and welfare issues. As insiders, they can build trust and offer psychosocial support.

In return for 18 months' support in school, learner guides receive a package of social benefits: classroom experience and training, a mobile phone for data monitoring, and an interest-free microloan from Kiva.org. Using the loan to start local businesses, learner guides report increased earnings above poverty thresholds. They have a second chance to learn through learning resources linked to a vocational BTEC certificate, potentially a route to teacher training.

In schools, learner guides lead in-school sessions in an innovative pastoral curriculum with materials based on the My Better World books. Sessions cover self-esteem and financial literacy relationships, and acknowledge barriers beyond school. Boys are involved in some sessions. Evaluation shows increased confidence and questioning of gender norms for boys and girls and retention and engagement for marginalized girls. Pupils in participating schools demonstrated increases in their math and English scores.

Funded by the Department for International Development since 2014, this program was piloted in Tanzania and Zimbabwe and extended to Malawi, Ghana, and Zambia. It has now involved nearly 6,000 learner guides. Sustainability is built in through strengthening of parent-teacher associations and capacity building of formal management structures. Learner guides act as female role models, demonstrating the value of education and qualifications and employment possibilities.

The Sistema de Aprendizaje Tutorial model in Central and South America offers an alternative secondary school experience for students in remote regions who are economically disadvantaged. Students are able to stay in their communities and continue with their livelihood activities while studying a specific curriculum that is flexible and relevant to their needs and is supported by tutors who stay with the same students for six years. **Tutors** are positioned as co-learners with their students in a climate of mutual trust.

Evidence from Glewwe and Malhadiran’s (2015) review of **supplemental remedial instruction and teaching** at the right level found “... several high-quality studies finding strong impacts of remedial instruction programs on learning outcomes, even when implemented by volunteers or informal teachers with little formal training” (p. 49). These include Pratham’s use of Balsakhis (informal “teachers” from the community) who took children in third and fourth grade who had not achieved basic competencies in reading and arithmetic out of the regular classroom for two hours per day and provided them with remedial instruction targeted at their current level of learning (Dutt, Kwauk, & Robinson, 2016). This program improved students’ test scores (average of math and English scores) by 0.14σ after one year of the program, and by 0.28σ after two years. Lakshminarayana, Eble, Bhakta et al. (2013) studied the impact of a program run by the Naandi Foundation which recruited community volunteers to provide remedial education to children in a randomly selected set of villages in Andhra Pradesh. The volunteers provided two hours of remedial instruction per day. After two years of this intervention, student test scores in program villages were 0.74σ higher than those in the comparison group. These indicate the benefits of additional roles supporting the learning of those most behind.

Glewwe and Malhadiran’s (2015) review also stated that “... overall, the evidence on pedagogy suggests that the quality of classroom pedagogy may be a key determinant of the extent to which increases in school inputs are translated into improvements in learning. In particular, **there may be very large returns from focusing on foundational learning for all children in school systems with a large number of first-generation learners**” (p. 47). See Figure 2 for a typology of the kinds of education workforce modifications exemplified by these initiatives.

Figure 2: Typology of current education workforce modifications

<p>Student access to specialist teaching (non co-located)</p>	<p>Student access to specialist teaching (non co-located)</p>	<p>Student engage in independent learning using online resources (perhaps OER)</p>	<p>Student supported in foundational/ vocational learning by other learning professionals</p>	<p>External expert support for those in “teaching” roles in school settings</p>	<p>Students studying independently (not in school)</p>
<p>Master teacher delivers lessons to dispensed students (interactive or broadcast)</p>	<p>Differentiation of teaching staff in the school (by expertise and responsibility)</p>	<p>Oversight by class teacher: Specialist teaching embedded in the materials: materials may generate learning analytics and pathways</p>	<p>Oversight by the class teacher: focus may be remedial or vocational/citizenship</p>	<p>Regular classroom visits or online discussion with senior teachers</p>	<p>Teacher roles often resembles that of tutor: can be flexible learning pathways for students</p>
<p>Students supported by co-located facilitator</p>	<p>Specialist staff for Humanities/ STEM, for example: learning facilitators for other subjects</p>	<p>Students monitored and sometimes supported by ‘teaching assistant’/facilitator</p>	<p>Individual students/ small groups guided by teaching assistants/community volunteers</p>	<p>Teacher support takes different forms: joint planning/scripted lessons etc.</p>	<p>Possibly provide models for learning platform hubs, e.g. Coursera?</p>

Adapted from Open University, Initial Research: Literature Review, 2018

In many countries, there is a lack of clarity about the core tasks school leaders should dedicate their time to (OECD, 2008), and there are considerable variations in the degree of autonomy in decision-making granted to school leaders. This is generally high across Organisation for Economic Co-operation and Development countries, and analysis of PISA results indicates some correlation between school autonomy and student achievement in high-income countries (OECD, 2008). But beyond OECD countries, there is a paucity of evidence on the practices of school leaders and managers. In low-income settings, anecdotal evidence suggests that school leaders are often too overburdened with administrative tasks to dedicate sufficient time for instructional leadership. One example of an alternative model is in the PEAS schools in Uganda (Promoting Equality in African Schools) which have a school director and a head teacher. The head teacher oversees teaching and learning, which includes CPD, monitoring learning progress, managing learning resources, timetabling, student discipline, and child protection. The head teacher reports to the school director who has responsibility for the school improvement plan and mediates between the school and the community, managing both the parent-teacher association and the governors. Relative to other private and public schools, management in PEAS schools is good, with resulting improved student outcomes. A strong performance management framework for head teachers is argued to be important (Crawford, 2017).

Innovations in school leadership

School leaders are most effective when they can provide instructional leadership to teachers, create a culture of shared responsibility through establishing professional learning communities among teachers, and leverage the broader community.

Evidence shows that while it is important for school leaders to be engaged with instructional leadership, it is less effective when the principal lacks sufficient expertise in the subject content to be able to provide valuable guidance beyond classroom management and teaching strategies. Therefore, it is equally important that principals are able to draw on the right individuals within and around the school community to assist with the tasks required to support teaching and learning. In addition, principals ought to foster collaboration and peer-learning among teachers within the school space through creating professional communities of learning and working on strategic system improvement in the delivery of teaching and learning within their designated learning environment (Kruse & Louis 2010).

The Lesson Study program in Zambia is an example of collaboration among primary and secondary school teachers who are encouraged to work together to "... plan, observe, and give feedback to each other in learner-centered teaching methodologies" (Wolfenden et al, 2018, p. 39) The peer-feedback model recognizes the assets teachers bring to their profession and work and allows them to build on these strengths with each other, thus reducing their dependence on district or middle-tier directives for how to manage their day-to-day delivery of education. This indicates the potential of collaboration in workforce design. School leaders can play an active role in **facilitating these peer-learning spaces** to impact teaching and learning.

The need to organize the workforce differently is not unique to the education sector. Other sectors, including manufacturing, technology, health care, and agriculture have all had to respond to changing conditions and have seen a drastic reshaping of their workforce. The health sector, for example, has a much stronger tradition of working in teams. The increasing complexity and specialization of medical care, coupled with global workforce shortages, increases in disease, aging populations, and financing constraints, means that medical staff have taken a multidisciplinary approach to health care.

Lessons from other sectors

Working in multidisciplinary teams that include the optimal mix of skills can allow teams of teachers and other school professionals to be flexible and maximize their expertise in responding to specific challenges.

Multidisciplinary teams ensure the most efficient and effective delivery of health care to patients by using collaboration and enhanced communication to expand the traditional roles of health workers and to make decisions as a cadre that work toward a common goal. Today, an entire team of health workers comes together to coordinate a patient's well-being (HRH Global Resource Center). Researchers have found that teamwork in the health sector actually reduces the number of medical errors and increases patient safety (HRH Global Resource Center). Teamwork also reduces issues that lead to burnout as one single person is no longer solely responsible for the patient's health, and health teams help break down hierarchy and centralized power of health organizations, giving more leverage to health workers (HRH Global Resource Center).

To find the optimal configuration of a health workforce team, the health sector uses a method called **skill mix analysis** to inform the design of its teams. This approach identifies the most appropriate combination of skills and activities (rather than the staff category) required to address a particular challenge under the constraints of a specific context.

Through skill mix analysis, **task shifting** can occur. Task shifting refers to the rational redistribution of tasks among workforce teams for a more efficient use of the available human resources. In cases in which additional human resources are needed, task shifting calls for newly created cadres of health workers who receive specific training to cover the identified gaps in skills (Buchan & Calman, 2005). Through skill mix and task shifting, for example, countries like Australia, Canada, England, and South Korea have been able to extend the functions of nurses who, through additional training, are able to perform advanced roles both to improve efficiency and in response to the shortage of physicians in rural and remote areas. We also see a longer continuum of roles, all of which have differentiated expertise, and roles that support patients in a variety of ways.

While the health sector should not be equated with the education sector as the services offered are notably different, the health sector's proactive engagement with resource planning and workforce redesign in ensuring existing expertise is optimized to meet critical needs and outcomes and can serve as an inspiration for education workforce consideration.

In education, multidisciplinary categories of professionals already exist at various levels in developing country education systems. These include professionals and other staff in finance and administration, student welfare, leadership and management, and of course, teaching and learning. **There is little literature around how these groups of professionals work together toward the shared goal of providing quality education.** There is evidence from high-income contexts showing impact of in-school collaboration on improved learning outcomes. Educators who are in a school with high social capital — that is, around others who are collaborating

effectively — are able to support better student outcomes. Andy Hargreaves and Michael Fullan (2012) argue that education should focus on growing a skilled system in which the collective capacity of people to create and pursue overall vision is enhanced as opposed to the traditional approach of developing the skills of individuals to do their work better.

In Arizona (Case Study 4), Arizona State University has been piloting a new model which builds a team of educators, each with specific roles, who, as a team possess the full set of knowledge, skills, and dispositions we expect of single teachers today. Through this new model, professional teachers can play a role in managing the team of other educators supporting student learning. The model ensures that, despite more children in a learning environment, children have multiple adults to lean on for their learning. This reduces the burden on the single teacher to be the sole provider of knowledge and support for the diverse needs of children.

In order to future-proof the design of the workforce, technology needs to be considered, even though to date it has had mixed results. As highlighted in the presented examples, technology serves as a tool that fosters and enables collaboration, knowledge-sharing, data collection, and analysis. Within the learning space, “... when systematically implemented, educational technology can support a wide range of educational innovations including flipped classrooms, peer-to-peer teaching, and customized learning” (Pierce & Cleary, 2016, para 2).

One of the most promising breakthroughs toward making education available for all in a personalized way could be through the application of artificial intelligence. AI is able to cater to the different abilities and backgrounds of every student, something that earlier and more standardized technological applications were not able to do. Teachers can use AI algorithms to provide different learning paths for each student because AI can analyze learning progress of each individual student. Promising examples are emerging, such as Mindspark in India, and the use of artificial intelligence in university courses. The availability of such “high-tech” platforms could potentially free up time for teachers to focus on nurturing higher order skills like complex problem-solving and sociobehavioral skills such as teamwork, to combine “high-tech and high-touch learning.”

The examples begin to provide insight into how the current education workforce could be redesigned, with the caveat that these few examples have operated mainly at a small scale; therefore, questions of sustainability, replicability, cost, etc. still need to be explored. Building on these existing innovative practices, we used a grassroots and participatory design thinking approach to understand how teaching and learning is taking place in Ghana and Vietnam to build an example of how education workforce redesign could occur. The next section provides an overview of our research approach as well as the initial findings that informed our proposed model and principles for redesign.

Leveraging technology for teaching and learning

Technology can expand learning opportunities and experiences for diverse students allowing greater differentiation of the teacher role and/or enabling changes to the teacher role.

Case Study 4: Example of team teaching in public schools

Program: Arizona State University and Avondale School District

Country: USA

Focus: Co-teaching team models driven by the districts in collaboration with higher education teacher preparation entities

ASU is partnering with school districts to prototype systems that provide more relevant and team-based apprenticeship experiences for teacher candidates, develop more professionally rewarding leadership and collaborative experiences for in-service teachers, and deliver better experiences and outcomes for learners.

In an attempt to redesign the educator workforce, this new senior year teacher candidate residency model has been piloted at ASU's Mary Lou Fulton Teachers College. This reform emerged in response to a four-decade national decline in undergraduate enrollment in U.S. teacher preparation programs, as well as low academic performance scores across the state of Arizona. The success of this program is dependent on the close working relationships between university faculty and superintendents across the Phoenix Valley.

Rather than the typical model in which a single preservice teacher is partnered with an in-service mentor, two or three teacher candidates work alongside one lead teacher, creating a team. The inaugural year has been piloted in Avondale Elementary School District. As classified teachers, the senior-year teacher candidates are experiencing a unique, progressive, impactful, and powerful senior teaching experience. The team of teacher candidates and a lead teacher are responsible for two learning environments and two class rosters. This encourages more collaboration between the lead teacher and teacher candidates as they co-plan, co-teach, co-assess, and co-reflect. Lead teachers are supported by an MLFTC faculty member as site lead. As employees of the school district, teacher candidates receive different levels of support from site administration and instructional coaches.

In addition to improving the experience of teacher candidates, this program also addresses needs in the Avondale district. With 3–4 teachers in the classroom, elementary students have opportunities to get support from multiple teachers in different ways. The academic needs of students can be more easily and readily met, as well as their social and emotional needs. As this program expands to several districts in the coming school years, modifications will be made to the support provided for the lead teacher.

Teacher candidates are fully employed by the Avondale district, earning a stipend. Lead teachers also receive a stipend as compensation for the extra duties of mentoring three teacher candidates, attending extra training meetings, and managing the activities of another classroom of students and parents. After the reallocation of funds in the district, these stipends came to be cost neutral for the district, as no benefits package is offered or attached to the total salary amount.

Workforce redesign (design-thinking centered) approach in practice

Design thinking is a participatory and collaborative brainstorming exercise which engages all stakeholders in the educational ecosystem to identify future goals and needs and begin to creatively reimagine the education workforce required to achieve those goals. Design thinking is “a human-centered approach to innovation,” (Carlgren, Rauth & Elmquist, 2016, p. 38) that takes into account stakeholder perspectives in order to understand and solve problems occurring within particular contexts. The design thinking process is guided by six steps aimed at understanding the problem, exploring plausible solutions, and materializing (implementing or testing) those solutions. The six steps as applicable to this study include

1. Empathizing to understand the context and needs of students and educators at district, cluster, and school levels
2. Defining the problem based on data collected
3. Engaging stakeholders in workshops to ideate and brainstorm creative solutions to the problems identified
4. Building prototypes of potential educator workforce models to address identified problem
5. Testing
6. Implementing the different models (This is beyond the scope of the redesigning chapter but could be carried forward through future work)

Six principles of design thinking

Six principles guide design thinking and consequently our work: 1) problem-driven, 2) stakeholders-focused, 3) diversity-pursuit, 4) experimentation, 5) visualization, and 6) abductive reasoning (Zheng, 2018). The field study for this approach utilized a participatory qualitative methodology within a social constructivist approach to generate a deeply co-constructed, evidence-based understanding of education workforce roles that are enacted and experienced (by students and educators) in the context. This approach generated three levels of analysis: the specified, the enacted, and the experience of different roles. The specified roles are those which are articulated in policy and in role descriptors (where available). Consideration of enacted roles moves the analysis to the arena of the district (or other middle-tier structures) and the school, while consideration of how roles are experienced foregrounds the student, positioning them not as a passive recipient of teaching but as an active agentive participant in the learning process. Working in two districts in both Ghana and Vietnam, the research team undertook the following activities:

- **Stakeholder in-depth interviews** (district officials, heads of school, school management committees representing caregivers, education support personnel and other educators including community educators, NGOs, community health providers, etc.)
- **Interviews** with district (middle-tier) officials
- **Student and school-level photovoice data collection** and focus group discussions (teachers, other educators)
- **Daily diaries** distributed to teachers and other educators (including education support personnel) to facilitate an understanding of the hourly roles they engage in throughout a school day

The focus of each activity was to generate understandings of existing roles and their core tasks, motivations, needs, values, challenges, understandings, and enactment of accountability. Involvement of students in the photo voice activity provided a complementary perspective and allowed for students’ experiences and needs to be centered in the research. To achieve this, students were asked to focus on who supports different aspects of their learning. Through a guided discussion, they were asked to identify their needs as well as other ways

they wish they could be supported in their learning. Conversations with all participants also focused on the role of technology as well as considerations around gender and special needs.

Following initial analysis, design workshops were held in three of the four districts in both Ghana and Vietnam. These involved education stakeholders from across levels within the system to identify future goals and needs which assisted in creatively redesigning the education workforce required to deliver the articulated goals of access and learning, inclusion and equity and a self-improving system. This design process was informed by the principles of design thinking as well as the five dialogues of design as guided by the foundational principles of a desired education workforce (Carlgren, Rauth & Elmquist, 2016; Scragg, Warr, Mishra, 2018). Participants were from two primary and two senior secondary schools (upper secondary in Vietnam) located in two districts in each country (total = 4 schools per country).

Figure 3. Summary of research approach

Summary of research approach

Data collection

<p>Stage 1: Understanding and evaluating</p>	<p>Understanding the current education landscape in consultation with local leadership (articulated roles)</p> <ul style="list-style-type: none"> • Exploring the literature and evidence on where new or significantly changed education workforce roles have been introduced and their impact 	<ul style="list-style-type: none"> • Desktop research • Case study interviews
<p>Stage 2: Engaging</p>	<p>Engage with stakeholders to identify needs, challenges and constraints in the current system (enacted roles)</p> <ul style="list-style-type: none"> • Primary data collection and analysis on <i>current roles, levels of effectiveness, needs and constraints,</i> • Data analyzed to <i>understand the current landscape, its opportunities and challenges.</i> 	<ul style="list-style-type: none"> • Interviews • Focus groups • Photovoice
<h2>Analysis of Primary Data Collection</h2>		
<p>Stage 3: Re-imagining</p>	<p>Engage with key stakeholders to reimagine new roles in the current context and for the future (necessary/desired roles)</p> <ul style="list-style-type: none"> • Considerations of marginalized groups (i.e. girls, students with disabilities) • Considerations of technology to enhance educational opportunities 	<ul style="list-style-type: none"> • Re-design workshops

The following questions guided our research:

1. What do students and educators value in their teaching and learning experiences?
2. What changes would students and educators want to see in education going forward?

Overview of findings

For more comprehensive findings refer to our fieldwork reports (*Primary Research on the Design of the Education Workforce in Ghana* and *Primary Research on the Design of the Education Workforce in Vietnam*).

Our findings in brief highlighted the following:

What do students and educators value in their teaching and learning experiences?

Overall, students in both Ghana and Vietnam value:

- **Peer collaboration** and opportunities through which they are able to learn from each other
- **Specialist teachers** who are enthusiastic about their subjects (primarily at the secondary level)
- **Experiential learning opportunities** through which students can learn through practice. In both countries students noted their value for being able to use multiple spaces to study, both within the school setting and in other locations such as their homes or in the community.
- **Holistic educational support**, which includes attention to their social-emotional needs. In both countries, access to health and welfare-related services (e.g., guidance counselors, school-based nurses, counseling services) were noted as integral for students' success.

For educators who included teachers and head-teachers, value was derived from being able to support students in holistic ways and not just in delivering learning content; the ability to support and facilitate student-led learning and strong school leadership that provides feedback to improve their own teaching.

What changes would students like to see in their teaching and learning experiences?

Students in both countries emphasized a desire for:

- **Improved learning spaces** — Suggestions included updating of brick and mortar infrastructure including classrooms and ablution areas especially for girls.
- **More opportunities for peer learning** — In Vietnam, students emphasized wanting more opportunities to engage in the arts and other student-driven activities in addition to their academic learning.
- **More personalized learning** — Choice and flexibility in educational pathways that are aligned with their personal interests
- **Greater harnessing digital technologies** for learning

Educators noted similar desires to leverage technology in delivering content, providing more personalized learning for increasingly diverse student needs, and emphasized the need to expand the role of the educator beyond academics. In both countries, educators called for greater autonomy at the school level that would allow them not only to determine the education activities, but also personnel composition informed by the needs of their students and contexts. In both countries the importance of providing inclusive learning environments was noted as being imperative for the future of education delivery. More importantly, educators in both countries voiced their desire for more support staff to allow teachers to provide increased attention to students who require more support, as well as to allow more time to collaborate with other teachers to plan and review curriculum on an ongoing basis.

The next section provides the design principles we derived from these fieldwork findings and other evidence already discussed.

Design principles

The following design principles guided our perspective on ways to move the education workforce system from a single-teacher, single-classroom model to a model of education delivery that reflects a team-based and communal approach that addresses student and educator needs. Such an approach appreciates that individuals both within and outside of formal learning spaces can and should support the education of children and young people. Beyond the implications of creating a positive impact on achievement, learning from a network of adults, can positively affect student engagement, grades, and college and career aspirations (Sun, Loeb & Grissom, 2017).

An effective process of redesign will:

- **Take the needs of students as learners** as the starting point for considering and determining which members of the education workforce need to be present, when, and in what ways.
- Move from a one-teacher, one-classroom model of education delivery to a **team-based and communal responsibility model** in which teachers, as the key agents for delivering teaching and learning, are able to focus on the teaching and learning needs of students and are supported by adults both in and outside the school learning space.
- **Recognize the diversity of both students and the education workforce** and ensure that issues of equity and inclusion, contextual and cultural relevance are considered in assembling the team of teaching and learning professionals needed to deliver learning effectively.
- Be **defined by the capabilities of the team, not just individuals**, and consider how those capabilities align with the changing needs of learners and learning environments.
- **Acknowledge the skills and knowledge that the education workforce already possesses** and provide opportunities to cultivate these skills and develop new skills that contribute positively to teaching and learning and building professionalism.
- **Cultivate a culture of trust and shared responsibility** that allows for creativity and flexibility as well as some autonomy in decision-making across the various tiers of the ecosystem (e.g., classroom, school, middle-tier, ministerial levels)
- **Encourage use of evidence, innovation, reflection, and adaption**, undertaking reflexive practices aimed at improving learning; engaging in critical data-driven practices, encouraging a culture of innovation (e.g., leveraging technology where appropriate) and therefore the potential to leapfrog traditional trajectories when appropriate. These innovative practices are then incorporated into the cycle of reflexivity. These workforce processes (feedback loops, cycles of continuous improvement, cultures of learning, etc.) are as important as the structures.

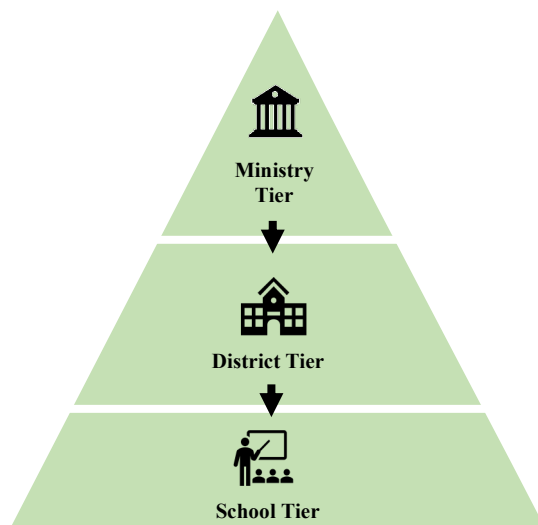
Using these principles, we analyze the existing system and provide initial ideas for moving the education workforce toward the **NEXT** and **FUTURE** models.

The education workforce: What is happening NOW?

The **NOW** education workforce model is generally organized under three tiers: the ministry tier, the middle tier (e.g., region, district, cluster), and the school tier. Although these layers vary across countries and education systems that may be significantly more complex, they serve as adequate generalizations to frame our discussion. The current system operates primarily hierarchically with decisions emanating from the top of the pyramid and being disseminated down to schools (see Figure 4). Subsequently, the middle (or district level) tier and ministry level tier have not unburdened the school level tier from the aforementioned, exhaustive list of duties. Furthermore, there remains a distance between the ministry tier, where policies are decided; and the school tier, where implementation takes place and, we argue, where most knowledge about what is needed to provide quality education lies.

As noted previously, our current global education workforce model is built around a static student learning environment: a one-teacher, one-classroom model. We postulate that, given advancements in educational technology, development in modern pedagogical practices, contemporary curriculum programs, and diverse and growing student populations, new perspectives of what educational systems can and should be are desperately needed. In (most) educational systems, a teacher in the 21st century is expected to have expertise in the following skills related to teaching and professionalism: content knowledge, pedagogical knowledge, knowledge and expertise in student social emotional well-being, physical well-being, inclusive teaching methodologies, ability to proactively engage families and communities and to maintain minimum professional reporting such as lesson plan development, participation in professional organizations and training, completion of administrative tasks.

Figure 4. NOW education workforce structure



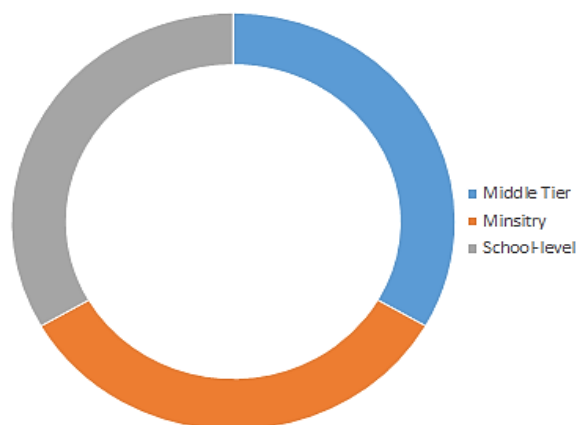
In most contexts, the aforementioned teacher level duties are typically correlated with minimal or base level salaries associated with civil servant status. On average, teachers are expected to master these duties while managing and teaching student class sizes that have teacher-to-student ranges from 1:30 to 1:70 students per class. In short, the teaching profession is complex, overwhelming, and untenable in the current structure.

Educational systems will be only as good as their design, including the workforce that drives it. Therefore, in conceptualizing a model of a redesign of the broad education workforce, a proactive and iterative approach is proposed that results in an education workforce that has a more effective and engaged approach to prioritizing and supporting teaching and learning for children and young people. Guided by 2Revolutions, we have framed a model of a **FUTURE** education workforce, re-imagined in an educational system that is self-improving and flexible to the needs of the students it serves, breaking from many of the outdated structures it has inherited.

What might an education workforce (and its system) look like when it can self-improve?

We start the **NEXT** model with the same three-tier system that reflects most current education workforces, yet we demonstrate how these tiers may be different in a new education workforce model predicated upon seven design principles of an education workforce. In this proposed model, the traditional three tiers of ministry, district, and school level units become redistributed in an arrangement that promotes deeper collaboration, shared responsibility, and trust while moving away from the hierarchical system of operation (see Figure 5). In our proposed model, individual tiers have levels of defined autonomy where each tier is aware of the non-negotiable goals for teaching and learning as well as the target outcomes, but each tier, particularly the school and districts, have flexibility in how to arrive at those goals. More importantly, in this model the distance between policy makers and implementers is reduced to ensure that policies are directly informed by the everyday needs of the teaching and learning professionals at the school tier.

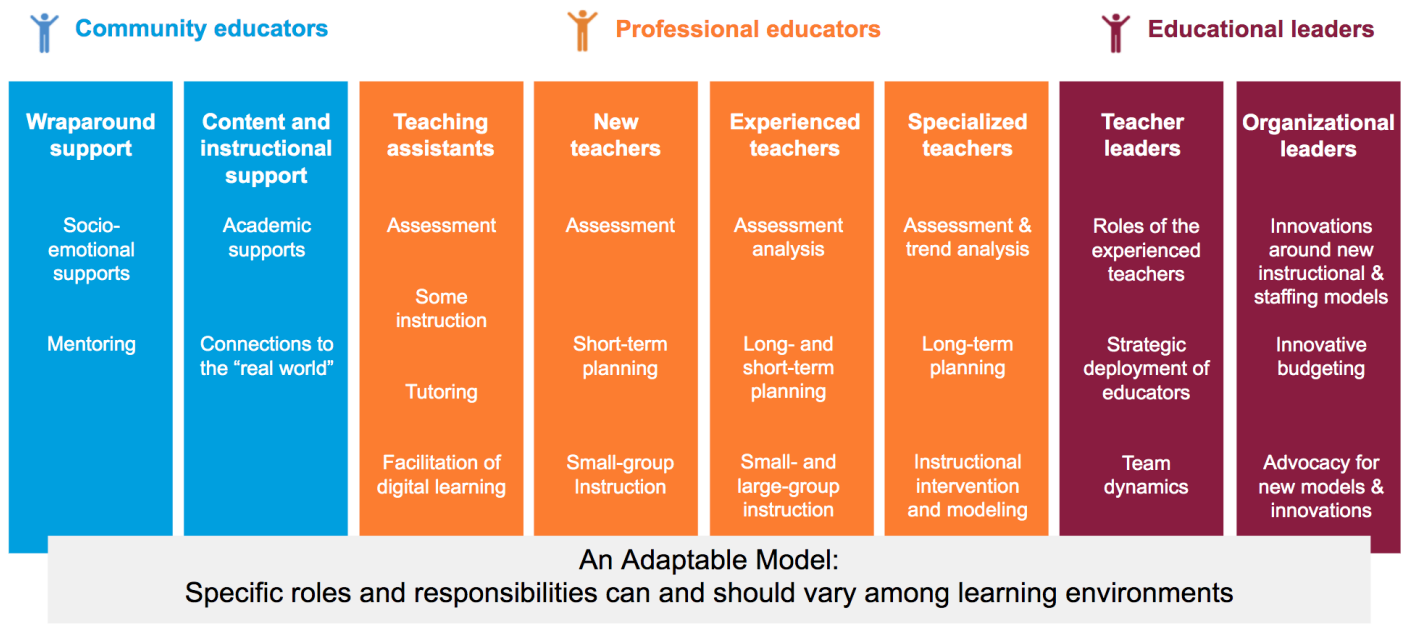
Figure 5. Redistributed tiers of an educational system



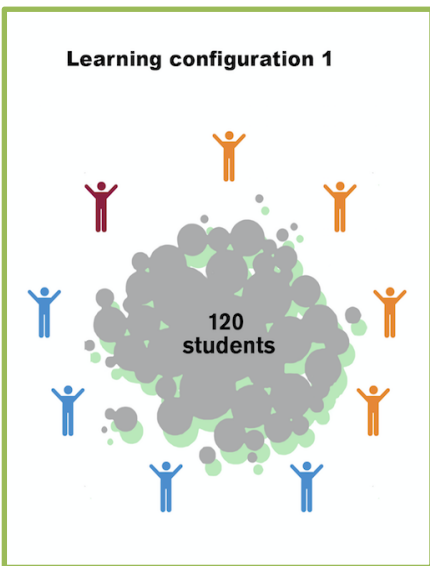
We begin by reframing the fundamental job of a teacher by redistributing many of the tasks to additional professionals and community educators who may support professional educators more strategically. In Figure 6, we propose an illustrative example of an education workforce that aims to respond to the learning needs of students in this century and seeks to address many of the challenges teachers face. The education workforce we envision aims to improve the efficiency and effectiveness of educational systems while allowing members of the education workforce more opportunities to grow professionally, to support educational ecosystems to leverage existing resources for change and, most importantly, to develop an educational ecosystem that is able to positively impact student learning.

A broader educator workforce, educators operating as a team — and focused on supporting students — could provide better opportunities to meet the learning needs of all students. The coordination of a broader educator workforce allows an educational system to deploy its human capital from both the school and middle tiers into different learning configurations based on student learning needs. In addition, professional educators (i.e., teachers) will be able to engage with a broader support team that can address many of the challenges educators face in classrooms today.

Figure 6. Continuum of potential roles for educator teams



The following learning configurations provide examples of how a more diverse educator workforce can be leveraged to support student learning.



In Learning Configuration 1 we demonstrate how a broader education workforce may team around students in learning arrangements that are supportive to **whole group instruction**. In this configuration, community educators, professional educators, and professional managing educators might collaborate under the direction of the professional managing educator to deliver content, demonstrate learning, etc. Professional managing educators and professional educators reflect individuals from both the school and middle tiers.

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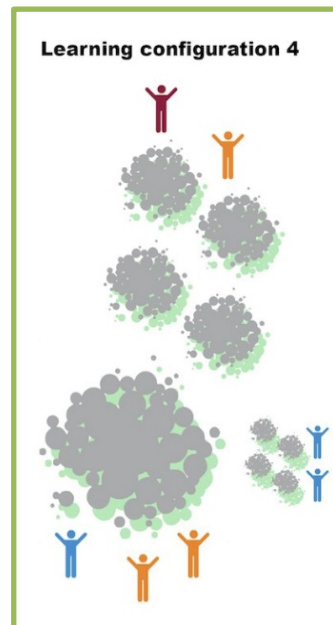
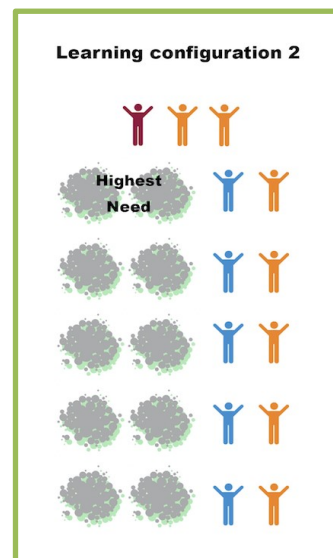
In Learning Configuration 2 we demonstrate how an educator workforce organizes itself around students to provide **smaller group instruction** tailored to the learning needs of students. In this example, the professional managing teacher along with two specialists (perhaps specialized teachers or experienced content area teachers) lead other professional educators (i.e., experienced teachers, beginning teachers, teaching assistants) and community educators to oversee smaller groups of students. In particular to this configuration, professional educators and community educators with specialized expertise (i.e., inclusive education, mental health, special education) may be coordinated around high-need students to provide more strategic academic or inclusive educational practices support while other educators might be grouped around the remaining students to ensure mastery learning is achieved and supported.



Learning Configuration 3 demonstrates how an education workforce team would have embedded opportunities for **professional collaboration** and learning (see professional educators and managing professional educators) while a smaller component of the educational team (i.e., community educators and teaching assistants) might oversee students who would be engaged and supported in independent learning activities. In this arrangement, professional educators would receive just-in-time training from school level and/or middle-tier level specialists in areas such as pedagogy and content knowledge, or to engage in collaborative planning based on student assessment and performance data.

environments allowing large group instruction, small group instruction, and individualized instruction to occur. In this configuration, professional managing educators, along with experienced or specialized teachers, would lead and plan the coordination of multiple learning configurations to occur simultaneously.

These roles and models are not prescriptive but could be considered a starting point to show how new roles could be imagined to strengthen existing roles and personnel. In determining the context-appropriate roles for the education workforce, each education system level needs to consider the guiding principles and how each role will contribute to the collective education workforce to advance the aforementioned goals.



Self-improving teams

In essence, educator teams, however configured for context and cultural considerations, become what we might refer to as “self-improving” teams. These models curtail the isolation of teachers and, simply by the nature of creating an organizational structure that mirrors most other professional organizations, can begin to professionalize the profession of teaching. Professional learning and support becomes embedded and novice teachers placed on teams experience a new kind of induction support from more-experienced teachers and community members with various expertise. The model increases the ability for teachers to create more robust social networks and linkages across disciplines. Teams are able to improve the learning environment for greater equity, higher expectations, active learning, progress monitoring, and feedback. The ability to use technology as a tool and a teacher then becomes more likely in a team-based model as there are adults who can monitor and manage the digital processes of individual learning.

These models also beg for a new kind of leadership at both the school and middle tiers. The principal or head of school will need to begin to think of themselves as a systems leader and would need to emphasize their skills related to systems management, data for human service design, team-building, and managing a new organizational structure of internal and external relationships. The managing teacher role might be new to some schools and to teachers. This role will also develop as teachers placed in these positions will need to understand new ideas such as:

- Examining data for “instructional delegation” and scheduling
- Building a team that distributes expertise and how to determine what content and pedagogical expertise team members bring to the learning environment
- How to think about space and use of space
- Providing feedback to teammates
- How to be flexible in serving the needs of students

The use of specialists also needs to be examined as the use of these experts will be critical to the entire school. Teachers who choose to attain advanced degrees or specialized certificates need to be recognized for their expertise and utilized accordingly.

Research tells us that collaboration and teaming can create educational environments with distributed expertise and support, key to keeping and retaining high-quality educators (teachers and leaders). Research also tells us that educators who work in collaborative teams remain in their field longer, feel less isolated, and experience less absenteeism (Minarik, Thornton, & Perreault, 2003). Proposed here are teams embedded in the entire operation of teaching and learning, not before- or after-school professional learning communities but experts who can work together throughout the day to create the kinds of learning environments every student needs to be successful. In the process, the individuals and the team as a whole improve as well.

The Middle Tier: From NOW to NEXT to FUTURE – flipping the role of the middle level

One cannot engage with education workforce design in a piecemeal manner. An ecosystem approach is imperative for the future of the education workforce to succeed. Refer to background paper *Redesigning the Education Workforce* for an in-depth engagement with future redesign of the middle tier. Here we provide brief considerations for the entire education ecosystem which includes the middle tier.

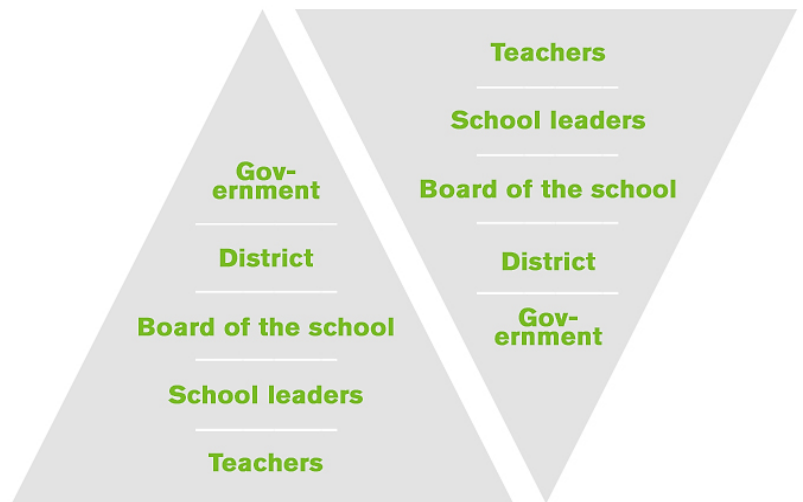
In the **FUTURE**, the middle tier would continue to support school leaders and teachers to be effective. It would also promote opportunities for schools and the education workforce to be more learner-centered, flexible, and reflexive in its support of student learning. In the **FUTURE** model, the middle tier transitions from being compliance-focused to being a support base

and facilitator for school leaders and teachers, driven by learners needs, to lead the change. It is hoped that the district could become lighter as more educational decision-making is led at school level. The idea of a middle tier serving as a support base is aligned with Evers and Kneyber’s (2018) idea of a flipped system. (See Figure 7 for a visual representation of a flipped system.) Some compliance activities will of course need to be undertaken, but it is hoped they could be made more efficient using technology. Support alone, however, will not suffice. The district can then provide additional processes and structures to allow for inspection, and systematic monitoring, for example through peer review.

In this flipped system that reflects a team-based and communal approach to education delivery, the middle tier serves these functions:

- **Leading** evidence-informed school improvement focused on system learning: identifying and scaling “what works” locally, based on a dialogue about international, national, and local evidence
- **Enabling** schools to connect and share practice, nurturing teacher professional communities and system leadership
- **Building** capacity of schools to own data and use it to take improvement action
- **Partnering** with wider actors to drive outcomes and foster innovation (e.g., health, business, NGOs)
- **Identifying** and addressing systemic barriers to education outcomes; translating, contextualizing, and aligning education policy for schools
- **Coordinating** human resource management systems for all employees with direct input from school level educators

Figure 7. Flipped systems model adapted from Evers & Kneybers (2018)



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- **Coordinating and governing** education building operations, educational supplies, and materials of brick and mortar learning spaces as well as other learning spaces
- **Coordinating** overall welfare and education of each student being educated within their jurisdiction (including local and transient students) in conjunction with other social welfare services (e.g., working with district health officials, girls' education officers)

From NOW to NEXT to FUTURE:

The school and middle tiers presented in the **FUTURE** phase reflect a continuum of potential roles and reconfiguring that need to be collectively built and planned over time. (See progression illustration in Figure 8.) To achieve this progressive and incremental redesign of the workforce, educational systems might leverage the 2Revolutions (Sester & Morris, 2015) framework in proactive planning.

“...it is important to focus on the interdependence between models and conditions. For example, we need more and better examples of learning models as “proof points” that experiment with, and continually edge closer to, implementing the future we envision. But if these models exist in environments that lack appropriate conditions to thrive, then they may not succeed and likely will not reach scale even if they do. On the other hand, even the most progressive policy conditions in the country will have only limited impact if they fail to catalyze and sustain the growth of successful new learning models within a new ecosystem. The Future of Learning requires that we engage at both levels of the system simultaneously.”

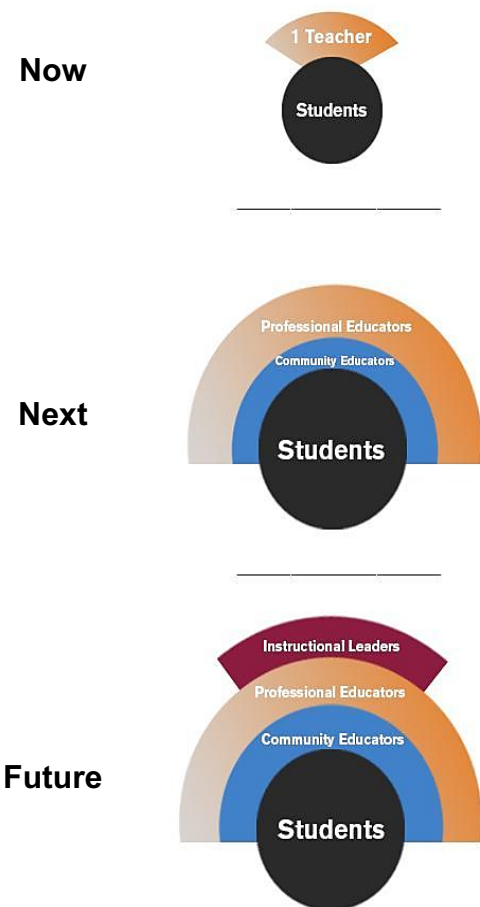
— *The Future of Learning: Unthink School to Rethink Learning*

What steps should educational systems take in a redesign of the education workforce?

For any educational system to move forward in a redesign of its education workforce, a critical analysis of current systems and readiness for change is a crucial first step. In this section, we provide a brief overview of key considerations that can support educational systems to contextualize what their **NEXT** and **FUTURE** education workforces might consist of in order to strategically plan forward.

- Readiness for educator workforce change:** A foundational component to understanding the need and development of broad support for change must come from multiple data points. Educational systems must gain insight and perspective from stakeholders who not only work within the educational system but also stakeholders that coordinate with the educational system. A broad range of readiness data including both qualitative and quantitative data sources are recommended to provide a well-rounded and holistic data set from which to glean readiness for change.
- Analysis of student data:** A critical analysis of student data should include both descriptive statistics (i.e., data disaggregated by gender, age, grade level, graduation rates, special education services, attendance rates, disadvantaged populations, language) and student assessment data (i.e., national assessment results, global learning metrics).
- Identifying the education workforce necessary to meet the needs of all students:** Consideration and ideation of current systems based upon the readiness and student data analyzed inform exactly whom the education workforce needs to serve, how it will be served and the types of instructional groupings and strategies needed to personalize learning for students. Thus, the system can coordinate and build the right teams of experts dependent on the specific data-driven needs of learners. This also helps to identify the level of service that the middle and school tiers can provide with existing resources and the need for external resources and expertise when necessary.
- Deliberate preparations for the NEXT and FUTURE education workforce:** Using a forward planning framework (such as 2Revolutions; Setser & Morris, 2015) to guide next steps, educational systems must begin to strategically plan for their **FUTURE** workforce *building from their current workforce*. In looking toward the **NEXT**, educational systems need to consider how the current educator must be trained,

Figure 8: Now, Next, Future progression



supported, and prepared at the school, middle, and ministry level tiers; and what additional members of the educator workforce will be needed, including how some roles may be repurposed from existing roles or resources (i.e., NGOs, community organizations, etc.). Coordination and alignment with educator preparation programs must also be considered.

- **Assessing the education workforce:** Evaluation and accountability processes will need to be adapted to focus on the learner and learning environment and the overall functioning of the team instead of individuals. Traditional assessments of educational systems (i.e., large-scale data sets, teacher evaluation) need to be reconsidered as elements within a system, not proxies for how an education workforce operates.
- **Addressing educational systems infrastructure and organization:** The reshaping of the education workforce will also demand thinking about how to reallocate funding and human resources to layer and organize professionals and others in the educational system. In many cases, educational spaces will need to be reconsidered as most schools are built for traditional one-teacher, one-classroom models. Consideration should be made as to how current structures can be utilized in their existing formations as well as plans for how future structures might be designed.

The role of the Ministry

Although a redesign of the state-level, or “Ministry,” workforce and operational system is beyond the scope of this paper, it is important to note what the function of a ministry of education would need to be in the illustrative **FUTURE** models. We provide these ideas as possible starting points but acknowledge that more targeted research around this tier of the education workforce is needed. The ministry would continue to provide systemwide leadership for the broader education workforce within national borders. In the **FUTURE**, the Ministry becomes a more visible contributor to the activities of the school and district tiers while maintaining its functions of establishing educational policy and coordination of the educational system within the broader governmental system. Ultimately, education workforce redesign is not likely to succeed or be effective if ministry-level policymakers do not spearhead and influence the process. In the next section, we provide a few considerations for stakeholders and policymakers in particular for engaging with this work of redesigning the education workforce.

Conclusion and key considerations for policymakers and stakeholders

To achieve the SDG4 goal of supporting quality and inclusive education for all, the education workforce and the education system in which it operates need to rapidly evolve. Innovation in education is needed not only in terms of curriculum content but also in the workforce and artifacts (e.g., technology) used to deliver education. As demand for quality education and student enrollment increases, traditional models of education that rely solely on a single-teacher, single-classroom system of operation have become ineffective and difficult to sustain. To account for the diversity of students’ learning styles, to meet different students where they are in their learning, and especially to attend to the learning of special needs students, different teaching models are imperative.

“We need to disrupt the idea of having only one teacher in front of a group of students at once.”

— Rita Pin Ahrens, director of education policy, Southeast Asia Resource Action Center

As highlighted in this chapter, the 2Revolutions (Setser & Morris, 2015) approach provides a pathway to enact the necessary changes. As discussed in this chapter, the **NOW** and **NEXT** phases call first for understanding, then attending to more immediate needs through actions that facilitate incremental changes to the current status quo. The movement from the **NEXT** to the **FUTURE** transformational revolution challenges education stakeholders to be bolder in reimagining and implementing an education workforce and system of operating. It is important to note that any meaningful transformation in the delivery of education requires the education workforce to shift in terms of culture and behaviors. The introduction of new roles and functions will not be effective if such fundamental changes to ways of being, knowing, and doing do not also evolve. In order to do so effectively there are a few considerations worth noting.

- First, as has been noted previously, changes to educational ecosystems need to be **attentive to local cultural and contextual needs**. In thinking about individuals to be involved in improving education, engagement with local leadership is paramount. Prescriptive, one-size-fits-all approaches that do not acknowledge the local context will result in generic and unsustainable interventions that may exacerbate existing challenges.
- In addition, interventions need to be **respectful of the maturity of the system**. The movement from one revolution to the next may be swift for some education systems and slower paced for others. The pace of change will be contextual to many mitigating factors. For example, proposing new roles at the school level that rely on a particular student ratio may not be feasible if the educational infrastructure is not made available to allow for smaller class sizes. Therefore, emphasis should instead be placed on fostering a culture that values self-improvement and ensures that all stakeholders remain committed to making the necessary changes to move the education workforce and the education system forward at the level that is radical but feasible for the particular context.
- It is also imperative that **strategic thinking and design across education systems** is embedded in the redesign of the education workforce. To ensure that the system is self-improving, key individuals at all levels of the system need to be able to think strategically about the ways in which national policies are implemented in alignment with the guiding principles. Clearly defined education goals provide a starting point for systematic thinking and planning about how these goals can be achieved as well as the human resources that may be needed to achieve those goals. Accordingly, systems thinking is a necessary component of addressing education workforce challenges because the workforce operates within a larger ecosystem comprising various entities which all influence the delivery of education, directly or indirectly.
- Finally, and most important, in thinking about redesigning the education workforce in specific contexts it is essential that there are **systematic dialogues** that ensure that the principles and goals of the ecosystem discussed are infused in the functions of the different units as well as the roles and activities of each educator in the ecosystem. Policymakers need guided ways to think through every facet of the education ecosystem and how they interact with each other to facilitate change.

Ultimately, the broader impact of reimagining the education workforce will contribute to the long-term development of a fundamentally new education workforce model for education professionals and allied educators in communities, simultaneously renewing both. The new model will need to be agile and flexible for adoption across all grade levels, content areas, and contexts to meet the needs of students in 21st-century

learning environments. Developing this new model attends to the effectiveness of the education system to ensure: 1) students are learning and building larger adult networks, which includes understanding the tools and resources required to do so; 2) equity, access, and inclusion are fostered in the delivery of education for all students; 3) efficiency within the workforce so that scarce resources are used effectively; and 4) understanding of the political and economic implications of education, including labor market needs, costs of providing education, and the link between education and national and international workforce development.

As schools and districts (middle tier) are given the latitude to develop self-improving teams in ways that fit their context, new areas of educational research will need to begin to examine the viability and outcomes of these new models on the entire system. Initially, they will need to begin documenting and providing an in-depth description of the teams — the formation of the team, how the teams function, agreements made by team members, the relationships and roles that are established in each team, etc. Examining the growth of the team and the professional learnings that are taking place through social network analyses, measures of power and influence, and group discourse will provide insight on how the team is functioning, growing, and developing. Growth of individuals in relation to a self-improving, team-based model will be imperative to understanding not only the strength of the individuals on the team but how the team-based model has impacted individual learning and growth. Focus groups, interviews, and surveys will assess how individuals view their own growth and development in both content and pedagogical expertise. And finally, research should assess high-functioning teams in relation to student learning to better understand the influence on the learning environment.

Appendix: Additional notes on in-country primary research study findings

Workforce design findings related to student access and learning, equity, and inclusion

Student welfare

- Concern for pupil welfare is often central to the identity of teachers, school leaders, and other members of the education workforce at basic schools in Ghana and Vietnam. In Ghana, teachers derive much job satisfaction in solving problems relating to pastoral or community issues and were observed undertaking a range of related activities such as dealing with hygiene issues around the school, administering folic acid to female pupils weekly, and attending to pupils experiencing food security issues and those at risk of various forms of abuse.
- Concern for student mental health — Educators in Vietnam (teachers, principals, ministry officials) expressed that pressure to succeed academically was often very difficult for students. Educators in the design workshops indicated more support with these issues would be welcome but there was some reluctance to involve additional personnel who might disrupt their carefully nurtured relationships with parents and the local community.
- Limited access to school-based health and welfare professionals in both Ghana and Vietnam — In Vietnam, students expressed a need for otherwise absent psychological support, while in Ghana, school nurses are highly valued by students but were only found in secondary schools. In the absence of such professionals and with weak links to school health education programs¹ children from disadvantaged communities and homes are particularly susceptible to school absence due to poor health and poverty.

Pedagogy and quality of education

- Raising and maintaining standards of learning are a priority for head teachers and district staff in Ghana and Vietnam but their working days are currently dominated by administration and management focused on process compliance — monitoring and supervising teacher punctuality, attendance, and submission of lesson plans. Such tasks are undertaken carefully and with fidelity. But this leaves little time to dedicate to activities linked to improvements in the quality of teaching, in-depth monitoring of student learning, to foster collaboration, or to lead professional learning.
- In Ghana, there was little discourse about pedagogy, and staff members in leadership positions are less confident about their skills and competencies in management and pedagogy. In Vietnam, educators shared that they receive regular training, but educational systems and/or their educational facilities do not always allow them to implement training techniques. For example, teachers in Vietnam showed great interest in implementing high-tech, high-touch learning platforms but did not have access to 1:1 technology in their classrooms that could accommodate such systems. In addition, teachers who did have the opportunity to engage in pilot testing of high-tech, high-touch learning environments lacked awareness and structures to collaborate professionally around these initiatives. This leads to weak feedback loops to inform priority areas for improvement in teaching and learning and consequently relatively low impact on the quality of teachers' practice and student attainment. Moreover, feedback is not systematically fed into overall systems to inform planning at district level.

¹ Fieldwork, Ghana 2018

Support staff

- The Ghana secondary schools benefited from teams of support staff, but there was no staff support for administration, pupil welfare, or maintenance of the premises in any of the basic schools. This impacted the activities of senior teaching staff. Basic school head teachers undertake activities as diverse as the hiring of night watchmen, supervising student cleaning of the school compound, and the minutiae of resource distribution (chalk, pen, notebooks, etc.) to teachers. Secondary school senior teaching staff undertake daily supervision of non-teaching staff throughout the school — in the carpentry store, dormitories, pantry, etc. — as well as resource distribution to individual teachers. This might occupy up to 75 percent of their day, but undertaking these activities is currently seen by some as an outward representation of their authority in the school and they found it difficult to imagine delegating these tasks.

Teacher allocation and retention for rural areas

- Teachers are often reluctant to work in rural schools, generating high levels of teacher “churn.” The majority are newly trained teachers with no other options open to them and they often want to move to a more urban school after a year. The district director contrasted this with teachers in urban areas who would be happy to stay for up to 10 years. The school attendance book at a rural school illustrated this: In September 2015, three teachers were sent to the school but none stayed more than a few days, citing lack of suitable accommodation in the village and lack of transportation to commute as reasons for their departure. Field work noted other basic schools finding it difficult to retain subject specialists.

Class sizes

- Class sizes in basic schools in Ghana are generally within international norms, but the recent rapid expansion of access to secondary school in Ghana has led to large classes at this level, causing teachers to feel dispirited and ineffective. “You can’t manage 70, you can’t observe those losing concentration or falling sleep. [Also], the marking takes so long.” (Secondary school teacher, Ghana, November 2018). In urban areas of Vietnam, large class sizes were noted to be a challenge. Vietnamese parents and teachers lamented the difficulties of having meaningful interactions with students given large class sizes and limited space: “We have limited space while the number of students is many. It also makes it difficult for interaction between teachers and students during teaching.” (Vietnam, December 2018).

Pedagogy and curriculum

- Students in Ghana noted that while they are usually taught in a lecture style, they appreciate moments for peer collaboration and peer teaching, “Some of us, if a teacher teaches, you don’t get everything. But when your colleague [fellow student] explains to you, you get it much.” (Secondary school student, Ghana, November 2018). Students also highly valued school trips, practical sessions, and spaces for them to engage in individual quiet reading and study. In Vietnam, stakeholders in the design workshop noted that although there is some flexibility in the curriculum for teachers to instruct in different ways, “the key lies in the capacity of the teachers.” (Vietnam, Design Workshop, 2018).

Role of technology

- Field researchers noted several examples of teachers in Ghana and Vietnam using their own digital devices for lesson preparation and communication. Moving forward, there was a strong appetite from educators and students to draw more extensively on digital resources; digital technologies were seen as central to future ways of teaching and learning, facilitating data collection and analysis to inform

decision-making, and using social media platforms to connect teachers with each other and with experts. However, educators recognized the need for support to develop their skills in leveraging information and communications technology across the curriculum and the current absence of any expertise in this area at district level. Provision of education for parents on the use of technology for learning together with common “rules of use” for students and teachers were also deemed essential moving forward.

School-level staff recruitment

- School leaders and district staff in Ghana have limited input to education staff recruitment; this makes it difficult to ensure that staff skills and competencies match the learning needs of their students and to make maximum use of the available teacher capacity. Staff timetables indicated inefficiencies in teacher deployment. In both countries, head teachers have little authority to reward or discipline teacher performance, thereby reducing the incentive to undertake supervision with rigor and purpose. Educators in design workshops called for more autonomy at the school level and more opportunities to input their experiences into policy discussions at the local level or to be part of communities of practice, in particular around pedagogy and equity issues.

Role of middle-tier officials²

- In Ghana, the current extensive expansion of secondary schooling is placing considerable strain on the capacity of districts to effectively support secondary schools; frequently one coordinator is expected to cover all secondary schools in a district. Staff currently in these positions had limited professional experience of secondary school teaching or leadership. In addition, district reporting lines were fragmented and there were low levels of coordination across staff around support for each school.

Inclusion and equity

- In Ghana, district staff are highly committed to inclusion despite the low prioritization given to this issue by district assemblies, limited capacity, and a lack of resources (specialist teachers and physical aids). In this situation they focus on *overcoming barriers to school access* for children with physical disabilities. Their days are dominated by screening children, advocacy, and securing funding for appropriate access conditions (e.g., ramps) and aids. Currently these rarely include assistive technology.
- Although there is a recognized need to enhance teacher competencies and skills to plan and facilitate differentiated learning activities to meet the learning needs of all pupils, the very small number of specialist middle-tier staff have limited capacity and capabilities to advise teachers on how to adapt their teaching. This need for specialist coaching and other forms of CPD focused on inclusion is growing in both countries, particularly in secondary schools as they expand enrollment and their student intake becomes diverse.
- In Ghana, the focus of gender-orientated activity is almost exclusively on access to school, not on learning. A district girls’ education coordinator described how she visited the local market each week to identify girls who were not in school and speak with their parents — an underutilization of her skills. She had little time to advise on girls’ participation in learning within school. Educators at the design workshops recognized the importance of increasing the number of staff working on special needs and gender issues. In Vietnam, the field work indicated there was much less emphasis on gender as an area that needed intervention.

² District level data was collected in both countries; however, the engagement with the district level in Ghana was more in-depth compared to Vietnam, and this is reflected in the findings shared.

- In both countries, there is little formal dedicated support to help students with disabilities access the school environment. In Ghana, fellow students were observed assisting students, and in Vietnam, parents provide the necessary support to their children within school. This situation can cause some teachers to question the appropriateness of inclusion policies.
- National Service Volunteers were found at some of the schools visited in Ghana, and they are highly appreciated. These new graduates choose to spend their compulsory year of service in a school, often in their home community. They provide additional support for students, and educators were keen to expand their numbers: "... one in each class, it will help. ... When the teacher is doing the teaching, the service personnel will also be going round to help those children who are slow." (Head teacher, Ghana, November 2018). In South Ghana, district staff estimated that 80% of the serving teachers in that district did not speak the local language. This is particularly critical for teachers of lower primary classes where the language of instruction is intended to be the language of the community. In these classrooms, National Service Volunteers are provide a valuable support: "The volunteers normally come from the local community so they can speak the language and mediate with the children, helping them to understand the teacher." (District Staff, Ghana, November 2018).
- "Girls Education" and "Guidance and Counseling" teachers at basic schools (teachers nominated by the head teacher for these unpaid additional responsibilities) work hard to support pupils, often with strong backing from the head teacher, but external support and guidance for these roles is limited — district staff are severely stretched with one adviser working across the whole district of 50–60 schools.
- In Ghana, the field work indicated relatively low numbers of women in more senior positions and very few professional staff members with known disabilities in the education service. Educators demonstrated appetite to move to a system in which progression is based on merit and more support is provided for female teachers with young children (on-site child care for example).

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