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# The Educational Challenges of Transition: Key Issues for Low- and Lower-Middle-Income Countries and GPE Toward 2030

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### Abbreviations and Acronyms

ASA	Advocacy and Social Accountability					
CAR	Central African Republic					
DAC	Development Assistance Committee					
DCP	Developing Country Partner					
DHS	Demographic and Health Surveys					
ECD	Early Childhood Development					
EMIS	Education Management and Information Systems					
ENA	Europe and North American					
ESD	Education for Sustainable Development					
ESP	Education Sector Plan					
ESPDG	Education Sector Plan Development Grant					
ESPIG	Education Sector Program Implementation Grant					
GDP	Gross Domestic Product					
GER	Gross Enrollment Rate					
GNI	Gross National Income					
GPI	Gender Parity Index					
GSER	Grade-Specific Enrollment Rate					
ICFGEO	International Commission on Financing Global Education Opportunity					
KIX	Knowledge and Innovation Exchange					
LIC	Low-Income Country					
LMIC	Lower-Middle-Income Country					
LSCR	Lower Secondary Completion Rate					
MCA	Maximum Country Allocation					
MICS	Multiple Indicator Cluster Surveys					
NIR	Net Intake Rate					
OOSC	Out-of-School Children					
PASEC	Programme d'Analyse des Systèmes Educatifs de la CONFEMEN (The Analysis Programme of the CONFEMEN Education Systems)					
PCCR	Primary Cohort Completion Rate					
PCR	Primary Completion Rate					
PISA	Programme for International Student Assessment					
PPP	Purchasing Power Parity					
RBF	Results-Based Financing					
SACMEQ	The Southern and Eastern Africa Consortium for Monitoring Education Quality					
SDG	Sustainable Development Goal					
SED	Sustainable Education Development					
SILDS	Small Island and Landlocked Developing States					
STEM	Science, Technology, Engineering and Math					
STP	Sao Tome and Principe					
TIMSS	Trends in International Mathematics and Science Study					
TVET	Technical and Vocational Education and Training					
UIS	UNESCO Institute for Statistics					
UMIC	Upper-Middle-Income Country					
VAT	Value-Added Tax					

### **1.0 Introduction**

This review maps dimensions of educational development in countries affiliated to the Global Partnership for Education (GPE).<sup>1</sup> It profiles educational participation to create an understanding of how access has changed and where the priorities are for future investment and external assistance. Its focus is on GPE's developing country partners (DCPs), especially those in transition from low- to lowermiddle-income status and those where primary school participation is nearing universal levels.<sup>2</sup>

Massive educational development needs remain unmet across the DCPs and invite new commitments and bold reforms. The biggest challenges are managing the universalization of secondary school, providing access for all children to preschool, and controlling the public costs of growth in higher and further education. At the same time, additional investment is needed to enhance quality and raise levels of achievement. Public finances will be stretched to capacity. Governments can increase allocations to education as a proportion of GDP and of the public budget, and make gains from increased efficiency. Private contributions from households should grow, but will not be sufficient to fill the funding gaps because of steeply unequal income distribution that leaves many families below the poverty line. The domestic private sector in most DCPs is too small and only weakly motivated to invest in educational services for the poor. Innovative financing mechanisms could make useful contributions to the resources available, but most proposals are unlikely to generate the volume of recurrent expenditure needed to achieve and sustain GPE goals. Inequalities will grow unless public financing promotes equitable participation. The poorest, living on less than US\$1.25 a day, cannot afford fees and other charges. Charging those below the poverty line for public services increases the number of households in poverty. Pro-poor public financing will necessarily remain at the core of the education policy agenda in DCPs.

External assistance is essential to catalyze reforms that lead to sustainable educational development in DCPs. Strategically focused GPE grants can contribute to increased resource mobilization by governments, greater access for all children, more efficient delivery systems and enhanced learning outcomes. Eligibility for education sector program implementation grants (ESPIGs) depends on DCPs having gross national income per capita below US\$1,045 and primary completion rates (PCRs) below 85 percent. Recently, adjustments have been made to the income thresholds, countries affected by fragility and conflict have been given enhanced eligibility, and lower secondary completion rates have been added into the eligibility process (GPE, 2017a). Some low-income countries (LICs) and many lower-middle-income countries (LMICs) may lose eligibility for GPE support as incomes rise and PCRs and lower secondary completion rates (LSCRs) improve.

### 1.1 Statement of the Problem

Changing conditions, especially in those DCPs becoming richer and more educationally developed, are resulting in new needs for GPE support. The GPE Fund will be replenished and will seek to address the full range of changing priorities across member states.

Patterns of participation in education systems since 2000 demonstrate clearly that progress has been uneven (UNESCO, 2015). There are several characteristic types of education system evolution

<sup>1</sup> A full version of this review with more detailed technical analysis of data is available on request.

<sup>2 &</sup>quot;DCPs" refers to the 67 countries listed as developing country partners on the GPE website when this analysis was set up. More countries have since joined the partnership.

in low- and middle-income countries that have different implications for future investment (Lewin, 2015a). As more children enroll and complete primary school, there are major challenges emerging to manage the expansion of secondary schooling. Dropout is a much more serious problem at secondary level than at primary. In addition, many DCPs have promised to provide preschool to all children but have yet to develop delivery methods on scale. More generally, curricula, assessment and teacher education all have to change to reflect 21st century demands on education systems and the priorities of the Sustainable Development Goals (SDGs). At the same time, there is a need to complete the task set by the Millennium Development Goals to universalize primary completion where entry rates to school remain below universal levels and dropout remains high. There are risks of prematurely shift-ing the focus of support to secondary, while many still fail to complete primary school.

Ten key issues emerge from this analysis and various recent reports (e.g., GPE, 2015a; GPE, 2017b; ICFGEO, 2016; Rose and Steer, 2013; UNESCO, 2016; UNICEF, 2015; IBP and UNICEF, 2017). First, patterns of enrollment by grade in LICs and LMICs described in this analysis indicate that substantial numbers of children continue to drop out of primary school, learn little and are silently excluded. Dropout rates vary widely by level and by country. Though entry rates have improved, completion rates still lag behind. Developing country partners have education systems with at least five different dynamics patterns that shape development and illustrate different patterns of dropout (Lewin, 2015a). Second, gendered inequalities in access to school have greatly diminished but remain a serious issue in about half of the developing country partners, especially at the secondary level (UNESCO, 2016). Four clusters of DCPs are identified in the analysis presented below, each with different challenges. Third, universal rights to education now extend to the age of 15 years. This is the legal age of work and falls well into the secondary school cycle. Universal access needs to be financed up to at least the end of lower secondary, and this is problematic in many developing country partners (IBP and UNICEF, 2017). Fourth, preschool remains inaccessible to a majority of children in developing country partners, is often privately financed and is rationed by price. It is nevertheless critical to subsequent participation and learning (Woodhead, 2016). Fifth, there may be at least as many outof-school children (OOSC) living in LMICs as live in LICs. Many are in school but not learning, and in some intellectual sense are little different from those physically out of school. Their needs should continue to be addressed even though they live in wealthier countries (UNICEF, 2014).

Sixth, large inequalities in access and achievement related to wealth, location and gender are endemic across DCPs and have to be reduced if educational development that is sustainable is to become a reality. On average, 35 percent of households in LMICs are below the poverty line and may be as disadvantaged educationally as the 48 percent below the poverty line in the LICs (UNDP, 2015). Participation through secondary school is strongly correlated with household wealth, as is evident from the World Inequality Database (WIDE, 2016). Seventh, educational infrastructure remains underfunded and unevenly available, with many schools lacking adequate services as recognized in Goal 4 of the Sustainable Development Goals (UN, 2016). Eighth, teacher education has been neglected and is failing to provide the skilled and professional workforce needed for quality education that raises achievement (UNESCO, 2014). Ninth, development depends on the proportion of the population with abstract thinking skills and analytic capability above the level of reading and numeracy (OECD, 2017). A new emphasis on curriculum development and higher-order skills is needed, along with new investments in science and technology and living skills related to social cohesion. Tenth, assessment systems overemphasize high-stakes selection examinations and provide very little insight to improve learning and teaching, unlike formative assessment designed to incrementally enhance learning outcomes (Greaney and Kellaghan, 2008).

If the educational aspirations of the SDGs are to be met, DCPs will need to increase spending on education to as much as 6 percent of GDP. This is about 50 percent more than is currently available, including the contributions from aid, according to the analysis in this report. More efficient collection of domestic revenue has to be accompanied by strategic and efficient use of funds to accelerate development. Many DCPs already receive considerable external support. Additional financing has to be conceived in ways that do not increase aid dependency and are informed by sustainable development values and practices applied to education.

GPE education sector program support will need to evolve in light of uneven economic development within and between DCPs, transitions to higher levels of participation, greater concerns for efficiency and more emphasis on learning outcomes. Eligibility criteria are changing to reflect changing diagnoses of need and progress toward goals. This report identifies the factors that will still need to be taken into account.

### **1.2 Structure of the Review**

Specifically, this review:

- Develops a conceptual map of educational exclusion and inclusion related to the education systems of DCPs.
- Maps participation, OOSC, school-age population growth and education system structures of DCPs.
- Analyses large-scale data to develop a new typology of DCPs that locates countries within five different enrollment patterns and four different profiles of gendered enrollment, and identifies characteristically different patterns of progress over the last decade in LICs and LMICs.
- Identifies five key issues that will affect the evolution of education systems in DCPs: equity, infrastructure, teacher education, curriculum and assessment.
- Discusses criteria for eligibility for GPE support in terms of national income, completion rates, fragility and vulnerability, grant distribution, aid dependence, and results-based finance.
- Computes financing needs for DCPs to achieve the goals set by GPE and SDGs, comments on opportunities and risks, and identifies ways forward.
- Provides insights into the best use of external funding to promote educational reform in LMICs and LICs, especially those likely to graduate to intermediate levels of national income and educational development.

### 1.3 Goals of the Global Partnership for Education

The Global Partnership for Education is committed to three goals for education and development in member countries:

- 1. Improved and more equitable learning outcomes.
- 2. Increased equity, gender equality and inclusion.
- 3. Education systems that are more effective and efficient.

Most recently, GPE confirmed that it will "continue to focus primarily on low-income and lowermiddle-income countries, especially those countries with high numbers of out-of-school children and significant gender disparities, as well as those countries affected by crisis and fragility" (GPE, 2017a). The understanding is now that "financing continues to focus on basic education, defined as preprimary, primary and lower secondary education and second-chance learning opportunities." This extends GPE's concerns to include lower secondary education.

The core strategy to achieve these goals is to support universal access to basic education, expand participation in postprimary education and preschool, enhance learning outcomes, promote equity, and catalyze reforms that improve efficiency, effectiveness and the ability to finance education from domestic revenue. The goals are shared by DCPs, which are distributed between low-income and lower-middle-income countries (LICs and LMICs) in approximately equal numbers. The aspiration is that all children should:

- Enroll in preschool, enter primary ready to learn at the appropriate age, and progress through school to at least grade 9 without repetition.
- Regularly attend schools that have qualified teachers, adequate infrastructure for learning and a safe and healthy environment for children to develop.
- Demonstrate learning achievement linked to national curricula for literacy and numeracy and to higher-level cognitive, affective and psychomotor outcomes.
- Enjoy equitable access to schools of quality and achieve outcomes that make full use of their capabilities.
- Experience provision that is financially sustainable and professionally challenged to be efficient and effective as measured by indicators of development.
- Engage with circles of support that ensure adequate health and nutrition before and after entering school.

The main support the GPE provides to DCPs is through its education sector program implementation grants. From 2003 to 2014, the allocations have totaled about US\$3.9 billion. The grants allocated represent over 95 percent of all GPE expenditure, but only about 45 percent of the number of grants approved, indicating there are many small grants. About 24 percent of DCPs have received 60 percent of the ESPIGs by value since 2003. Conversely, 38 percent of all DCP grant recipients have received about 5 percent of the total. Some of the imbalance is related to the differing sizes of DCP education systems and their particular needs. The historic distribution indicates that there is some scope for considering the coverage of grants across DCPs, and the new eligibility criteria are designed to address some of the concerns. The question now is how the pattern of allocation should change in relation to new needs. It should be noted that GPE is the largest source of funding for education sector analyses, which, though much smaller in monetary value, enhance the quality of ESPIGs.

This analysis provides new insights into achievements and challenges in enhancing participation in education, and it profiles policy options for different groups of DCPs. External financing meshed with increased domestic revenue generation and strategic reforms that increase efficiency and effectiveness will be essential to catalyze sustainable development.

### 1.4 Conceptualizing Educational Inclusion and Exclusion

There are many reasons why children in developing country partners fail to complete basic education successfully and why learning is often compromised. A simple model identifies five clusters of factors that influence different forms of exclusion and determine whether access to education is equitable and results in meaningful learning. Each cluster needs to be considered in developing education sector plans (ESPs).



#### FIGURE 1 FACTORS AFFECTING EDUCATIONAL INCLUSION AND EXCLUSION

Source: Author's elaboration.

The five factors that affect participation and outcomes encapsulate effects at the level of the individual, household, community, education district, and the schools and classrooms children attend. Thus, children have different *individual* capabilities and changing motivations and aspirations. These influence the extent to which they attend formal schooling and the things that they learn. The *households* in which children live shape educational participation and experience. Families have different levels of cultural capital and varying abilities to support the costs of schooling. Both individuals and the households are influenced by *community*-level social, political and economic aspirations and expectations around schooling.

These factors are complemented by the *management and resources* provided by authorities above the level of the school. This supports the infrastructure on which learning depends and employs teachers, provides school buildings and ensures the availability of learning materials. The fifth factor is the organization of learning at the *school and classroom* level through the curriculum and pedagogic practice that determines worthwhile educational outcomes. Government programming and external assistance, including GPE grants, can accelerate development through direct and indirect inputs to each of the five factors that shape meaningful and equitable learning of value to development. Some of this investment is in buildings and infrastructure, and some is in people, pedagogy, curriculum and learning support. Most costs lie in recurrent expenditure and are continuous year-on-year, and therefore need to be financed in a sustainable way. Other support is in capital investment in fixed assets with long-term benefits, and in catalytic inputs that provide inputs for specific purposes that can accelerate educational development with large gains at low costs—for example, reforms to systems of assessment, curricula and school management. Governments and development agencies can have more influence over some of these factors than others. Revising curricula has a different quality from changing child-rearing practices; some individual characteristics are present from birth and others are a result of nurturing; and reforming local governance of education may be more difficult than running in-service courses for teachers.

Flows of students through education systems and learning outcomes are influenced by factors on both the supply and the demand sides. Planning influences the supply side, e.g., mapping and building schools where they are needed and providing an adequate supply of teachers and learning materials. The demand side is shaped by the motivation of children and parents, perceived relevance, and opportunities to learn and progress. Low achievement and inequalities of access and learning experiences can also contribute to demand-side failures. Development agencies have historically placed more emphasis on the supply side than on the demand side for educational services; it may be time to reconsider the balance of advantages.

### **1.5 Flows of Children and Zones of Inclusion and Exclusion in Developing Country Partners**

The development of education systems is characterized by who participates at different levels, the curriculum they experience and the learning outcomes they achieve. This paper is focused on what we know about the flows of students through systems in developing country partners, what analysis reveals about the opportunities and risks that exist in various groups of DCPs, and how these can help DCPs and the Global Partnership for Education prioritize the investment needed to accelerate educational development.

Children flow through education systems more or less smoothly at every level, from preschool to higher education. In LICs, most children do not experience well-organized preschool and most have left the system by the end of lower secondary school. Many of those who are enrolled at each level may be silently excluded. If they are over-age by more than a year and more than a year behind the learning level for their grade, their chances of completing primary and secondary school diminish.

As systems develop, the level at which children leave the school system and enter the labor market increases. In most developing country partners, the minimum age of work is 15, below which the presumption must be that children have access to full-time education. This means a full program of primary and lower secondary school.

Access and learning within education systems fall into different zones of inclusion and exclusion. The zones implicitly include a recognition that physical access without learning is not meaningful access. In particular, the idea of "silent exclusion" is that there are many children who are enrolled but learning little and who are not visible to enrollment rate statistics. Under the SDG indicators, it



### FIGURE 2 ZONES OF EDUCATIONAL INCLUSION AND EXCLUSION

Zones of Educational Inclusion and Exclusion

Source: Author's elaboration.

should become possible to couple participation with achievement data—but this task is at an early stage and the data is not available on scale cross-nationally.

A simple model of Zones of Inclusion and Exclusion draws attention to some of the major characteristics of flows of children, and also indicates possible bottlenecks and issues that inhibit participation and learning.

Flows of children through education systems in developing country partners are age-related. Many children may be over-age for the grade in which they are enrolled, unlike in high-income countries. In LICs and some countries affected by fragility and conflict, 30 percent of children may be over-age by two years or more. Over-age entry and progression is strongly associated with lower achievement, increased dropout and failure to participate in secondary school. In most developing country partners, those who are not enrolled by the age of 8 are unlikely to ever enroll. Over-age children always remain over-age for their grade. This issue can be represented by a chart that illustrates age grade progression and probability of enrollment for primary and lower secondary cycles in lowincome, low-enrollment developing country partners.<sup>3</sup>

<sup>3</sup> This chart simulates data patterns found in many developing country partners and other LICs in DHS and MICS data, e.g., for Ghana, India and Indonesia. It is not possible to aggregate such data meaningfully across countries with different patterns. The infographic is the simplest way of illustrating these underlying patterns.



FIGURE 3 AGE AND ZONES OF EDUCATIONAL INCLUSION AND EXCLUSION

The model of inclusion and exclusion can be formalized to show participation by grade and to locate different populations of children who experience more or less meaningful access to education at primary and secondary school levels. It can be extended to cover other levels and can be used to illustrate differences between groups—e.g., boys and girls, rural and urban, rich and poor. This is shown in Figure 4.

The nominal grade level is shown along the X axis for a system with six years of primary school and four years of lower secondary. It can be adapted to model various lengths of primary and secondary school. The Y axis uses an indicator of participation defined by the age-specific enrollment rate, i.e., the number enrolled divided by the number in the relevant age group.<sup>4</sup> In countries where the quality of the data is adequate, the numbers at risk of leaving can be estimated from historic records of those who actually left. Other indices of participation could be used.<sup>5</sup> In this example, about 20 percent of children fail to enter grade 1, 45 percent reach grade 6, and about 20 percent complete lower secondary. This is similar to some low enrollment DCPs that are LICs and a few LMICs.

Source: Lewin 2011, 22.

<sup>4</sup> This is technically a grade-specific enrollment rate available from administrative data and school census returns.

<sup>5</sup> This indicator of participation could be actual enrollment—the grade-specific gross enrollment rate or the grade-specific net enrollment rate. It can be separated for girls and boys, rural and urban, rich and poor, etc.



#### FIGURE 4 SEVEN ZONES OF INCLUSION AND EXCLUSION BY GRADE<sup>6</sup>

Source: Lewin 2011, 12.

The profile can be adapted to use data from different countries and can be applied in larger countries using data from provinces and districts.<sup>7</sup> LMICs include countries where there are still significant numbers of out-of-school children and where primary completion rates are well below 85 percent, indicating substantial dropout. In many, lower secondary completion rates are below 50 percent.

As education systems in developing country partners evolve, and as the countries graduate from LICs to LMICs, demand for external assistance will change. Most DCPs will seek to universalize secondary education to grade 9 or 10 (and many to grade 12 by 2030), and to expand preschool. This will create demand for many new school places, the majority of which are at lower and upper secondary level and in preschool. There are many implications for teacher supply, teacher salaries and infrastructure. These can be discussed under different zones.

**Zone 0.** Over the next decade, most DCPs will include at least one year of preschool in publicly funded provision. This could add 0.2 percent to 0.4 percent of GDP to the education budget if the cost per child is comparable to that at the primary level.<sup>8</sup> Critical issues include location of preschools,

7 Over- and under-age enrollment affect the apparent attrition, as does repetition within grades that slows the flow of children through the system.

8 Preschool costs may be more or less than those at the primary level, depending on whether teachers are trained and formally employed like primary teachers, or are community members contributing time and being paid low wages. Preschool classes vary from less than 10 to more than 50 children. There is a wide variation in cost per student, so a useful initial proxy is to assume a similarity with cost at the primary level.

<sup>6</sup> Consortium for Research on Educational Access, Transitions and Equity (CREATE), funded by the U.K. Department for International Development (DFID); www.create-rpc.org.

### ZONES OF INCLUSION AND EXCLUSION

**Zone 0** *Children excluded from preschool.* A minority of children attend preschool in many developing countries. Access is often rationed by price. Effective preschools increase age-appropriate entry to primary school, and are associated with lower subsequent dropout.

**Zone 1** *Children who are not enrolled and may never attend school.* This includes those who could attend existing schools but do not, those who will enroll over-age, and those who are excluded by livelihoods, location, civil status, disability, social stigma or other vulnerabilities.

**Zone 2** *Children who are excluded and drop out after initial enrollment.* This includes those who drop out of school and fail to complete a full cycle of basic education. These children make up the largest numbers of out-of-school children and young adults who have not achieved the basic learning outcomes necessary for well-being and sustainable livelihoods in most countries.

**Zone 3** *Children included in school but at risk of dropout.* This includes those whose attendance is low, who are over-age on entry and as they progress, and whose achievement levels are so low that they are at risk of failure to complete basic education successfully. These children can be described as "silently excluded" since they are enrolled but may achieve little before exiting the system without core skills and competencies.

**Zone 4** *Children who fail to transition to secondary education.* This may be the result of failing to be selected, being unable to afford costs, being located far from a secondary school, or experiencing other barriers to participation.

**Zone 5** *Children who have dropped out of secondary grades.* This includes older children who may be influenced to exit schooling for reasons on both the supply side (poor-quality teaching, under-resourced schools, uninspiring curricula) and the demand side (direct costs of schooling, opportunity costs of fore-going employment, household production commitments).

**Zone 6** Children included in school but at risk of dropping out from secondary school. Silent exclusion is a problem at the secondary level when age, attendance, achievement levels and other factors interact to compromise learning outcomes that are valued in the labor market and necessary for progression to higher levels of education.

and the content and pedagogic orientation of better practice. If needs for infrastructure, preschool teacher training and learning material can be identified, these could absorb substantial amounts of resources with a potentially high rate of return. LMICs will see demand for preschool grow rapidly. Two-year preschool could create demand for as many as 50 million new places (35 million in LICs and 25 million in LMICs). Much of the growth will have to be publicly financed if it is to provide access at costs that do not exclude poor students. It will need to be at or below the cost of primary school if it is to be universally available.

**Zone 1.** The number of children who never attend school is declining in most developing country partners and should be at very low levels by 2030. As preschool provision expands on schedule, enrollment in primary grade 1 will become nearly universal. The exclusion of marginal groups has to be addressed, but for most DCPs it will become a problem on the margins by 2030. Marginalization will affect smaller and smaller groups with unusual circumstances. There will be exceptions where illegal and cross-border migrants without civil rights increase in number, disadvantaged social groups are systematically discriminated against and some types of disability remain unacknowledged.

Marginalized groups will become urban and peri-urban as a result of urban migration. Systematic solutions are needed that diminish the need for unusual and expensive solutions in the future.

**Zone 2.** The number of children in developing country partners who enroll but fail to complete primary school with appropriate learning levels in school subjects is large and could total more than 100 million, depending on the definitions used.<sup>9</sup> For some DCPs, the number may be increasing as enrollment growth in lower grades accelerates but completion rates fail to keep up, especially at lower secondary levels. Though the majority of 6- to 11-year-olds are in school, they are often not in the right grade for their age; in some DCP school systems, 30 percent are two or more years overage, with consequences for achievement and dropout. In most LICs and many LMICs, those enrolled in grade 6 are a smaller number than those in the relevant age group. There will be plenty of scope to invest in inputs that can reduce dropout, the cause of which will vary across DCPs. Much greater physical capacity will be needed to enroll the unenrolled, accommodate those who currently drop out, and extend universal access to the secondary level. LICs will need to provide 40 million additional school places at the primary level, and LMICs about 20 million.

**Zone 3.** Silent exclusions, where children attend but are not learning, are common in developing country partners. The signifiers are clear and include irregular and low attendance, over-age progression and multiple repetition of grades, low levels of achievement, lack of motivation and high risk of dropout. The form and causes of silent exclusion will differ by educational level. Existing data suggest that in some systems, half or more of children attend less than 80 percent of the time, 30 percent are seriously over-age, and achievement levels are two or more grades below national curriculum expectations. Every year a child is older, the probability is that their performance on primary school examinations falls by about 4 percent (Lewin et al., 2011). Low-performing countries on Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) reach levels of achievement equivalent to four or more years behind OECD norms for mathematics competencies (OECD, 2016). Data from the Southern and Eastern Africa Consortium for Monitoring Education Quality (SACMEQ), the Analysis Programme of the CONFEMEN Education Systems (PASEC) and other cross-national testing programs show similar results in LICs and LMICs. In some developing country partners, the performance of the best students is comparable with OECD norms, but the performance of the average and the bottom quintile are at least a standard deviation less. It is a core challenge to find ways of closing the cognitive chasm that exists in performance between and within countries. If OECD levels of achievement are chosen as a criterion, then more than half of the children in LICs and LMICs are unlikely to be learning at comparable levels of achievement.

**Zone 4.** By 2030, most DCPs will have adopted automatic promotion through to lower secondary school. Transition rates from primary to lower secondary may exceed 90 percent, especially in the LMICs. Failure to attend secondary school will persist where the main excluders—costs, distance, safety, relevance—are not addressed. External assistance has a role to play in promoting reforms that reduce direct costs to households, ease physical access to secondary schools, improve infrastructure and ensure security. A growing problem will be that selection into secondary school is inequitable, often rationed by price, and may be linked to membership in social groups. The need to invest in ways that are pro-poor will become more sharply defined as enrollments expand, school quality becomes more differentiated, and private provision grows and has an impact on equitable access.

<sup>9</sup> If PISA data is indicative, and if a broad definition of basic skills linked to OECD levels of competence of 15-year-olds is used, it is likely that much larger numbers of children are failing to acquire basic skills.

**Zone 5** and **Zone 6**. Dropout and silent exclusion at the lower secondary level are analogues of similar inclusions and exclusions at the primary level. For most DCPs, the proportion of 12- to 15-year-olds not in school increases rapidly with age, such that a majority of 15-year-olds have left school prematurely. Those at risk of dropout, and those who leave and enter labor markets prematurely, will be a persistent concern and an invitation to diagnose cause and effect. Action will be needed by DCPs on both the supply and the demand sides of the problem.

On the *supply side*, issues at the secondary level include needs for specialist teachers and highcost facilities, such as science laboratories and sports venues. At the primary level, many developing countries have been hiring unqualified contract teachers at low wage rates in both public and private schools. Unqualified contract teachers are much more difficult to deploy successfully at the secondary level because of the need to have subject expertise at a higher level. In addition, expensive information technologies are often requested but may not deliver learning gains consistent with their costs, not the least because of uneven and unreliable connectivity and the costs of system maintenance and renewal. On the *demand side*, young adults have agency, which means their preferences must be respected and relevance demonstrated. Opportunity costs may be quite significant for older children, and real and perceived rates of return must be positive for high completion rates. Early marriage may also be a significant reason for dropout.

The zones of inclusion and exclusion can be mapped for different DCPs. This can be done in many different ways to profile challenges of access, progression and completion, using the best data available. Disaggregation is also possible that can highlight particular dimensions of exclusion and inequalities between groups.

### 2.0 Profiling Educational Participation in DCPs

There are currently 67 developing countries in the Global Partnership for Education that qualify for education sector program implementation grants. A further 22 countries qualify for leverage fund grants allocated to some lower-middle-income countries. Overall, there are similar numbers of LICs and LMICs among the DCPs, and roughly equivalent numbers of primary-school-age children (about 108,000 in the LMICs and 106,000 in the LICs for those countries on which there is data held by the UNESCO Institute for Statistics [UIS]).<sup>10</sup>

DCPs have an average rate of economic growth projected at about 4 percent a year using World Bank data, and GDP growth projections from 2012–2018.<sup>11</sup> This will lead to about half of the LICs becoming LMICs by 2030. The number of primary-school-age children in LICs and LMICs is similar at around 100 million in each group.

The rate of growth in the primary-age child population (6–11 years) averages about 1.7 percent in LICs and 1.0 percent in LMICs. It is falling as demographic transitions occur. Gross enrollment rates (GER) at primary average over 100 percent in both LICS and LMICs. Net intake rates (NIR) are less in LICs (60 percent) than in LMICs (67 percent) and indicate that a third or more of children do not enter school at the correct age even in most LMICs (UIS, 2016).

<sup>10</sup> The data used on LICs and LMICs are derived from UN sources and are the most recent available. Only LICs and LMICs eligible for GPE support at the time of the analysis and that provided relevant data to UN agencies were considered.

<sup>11</sup> Growth rates are projected by averaging actual growth 2012–2015 and projected growth 2015–2018 by country.

	GER, Pre- primary	Net Intake Rate, Primary	Net Enrollment Rate, Primary	GER, Primary	Percentage of 00SC	Grade 5 Completion Rate	Primary Completion Rate <sup>12</sup>	GER, Lower Secondary	GER, Upper Secondary
LICs	36.8	60.2	78.3	107	20.4	62.5	38.2	57.6	29.4
LMICs	48.3	67.3	86.2	105	12.2	79.4	74.5	71.0	51.5

### TABLE 1 COMPARISON OF PARTICIPATION IN LICS AND LMICS

*Source:* UIS online database, 2016.

Grouping the DCPs that are, or are likely to become, LMICs over the next decade produces a comparison table (Table 1).<sup>13</sup>

The differences between LICs and LMICs are mostly in the direction that would be expected. However, many low-performing DCPs are missing data points. If data were available, more differences might emerge.

### 2.1 Participation in LICs and LMICs

Pre-primary attendance is greater in LMICs (48 percent) than LICs (37 percent) according to existing UIS data, which is not very reliable. There is great scope for expansion in access at this level. However, most preschool is privately financed and fee-paying. Free public provision is needed to reach children from the poorest quintiles of household income. There appear to be more OOSC in LICs (20 percent) than in LMICs (12 percent), but this does not account for large numbers who are over primary school age and still enrolled as a result of late entry and repetition. Grade 5 completion rates indicate lower retention in LICs (63 percent) than in LMICs (79 percent). There are large differences between LICs and LMICs in primary completion rates that average 38 percent (LICs) and 75 percent (LMICs). According to the *Global Education Monitoring Report* (UNESCO, 2015), primary completion rates will improve over the next decade and the differences in participation rates between LICs and LMICs and LMICs will shift to the secondary level.

The scope for growth in participation in lower secondary is considerable (Lewin 2008, 170). Gross enrollment rates averaging 57 percent in LICs and 70 percent in LMICs imply that less than 40 percent (LICs) and 50 percent (LMICs) complete grade 9 successfully. Grade 9 is now the end of basic education and the entry point into the labor market in most partner developing countries. GERs at upper secondary are low despite growing ambitions to universalize the whole secondary cycle.

The LICs and LMICs are heterogeneous groups with much overlap between them. Many LICs and LMICs have primary completion rates between 40 percent and 80 percent. All developing country partners with a PCR above 80 percent are LMICs. Completion rates for lower secondary are not generally available. GERs for lower secondary show a similar overlap between LICs and LMICs to that found with PCRs.

<sup>12</sup> Some DCPs have seven- or eight-year primary systems, so primary completion rates are much lower than grade 5 completion rates, especially if these are on-schedule primary completion rates.

<sup>13</sup> Figure 20 shows the countries in an infographic and explains the method used.

The PCR will remain an important indicator for the Global Partnership for Education, but it may become less useful as a criterion for eligibility as more and more countries achieve high rates. The lower secondary completion rate will become a better guide to overall levels of participation and persistence in school. PCRs and LSCRs can be measured in different ways with different results. GPE now uses 37 indicators (GPE, 2016), which will continue to evolve as the characteristics of DCPs change.

### 2.2 Out-of-School Children

Estimating the number of out-of-school children in developing country partners is technically difficult and suffers from poor data quality from some of the largest countries. Note that several large countries have no reliable estimates for OOSC. These include Afghanistan, Bangladesh, the Democratic Republic of Congo, Ethiopia, Madagascar, Malawi and Nigeria.

The profile of DCPs looks different depending on whether the concern is for the proportion of OOSC in the child population or with the absolute number of OOSC. Across the DCPs, about 10 percent of primary school children on average are out of school. The proportion is more than 20 percent in about one-third of DCPs. Half the total number of OOSC are in only five developing country partners. These are Kenya, Niger, Pakistan, Sudan and Tanzania. However, some large countries (e.g., the Democratic Republic of Congo, Ethiopia and Nigeria) do not list OOSC though the numbers are likely to be large.



FIGURE 5 PERCENTAGE OF OOSC IN PRIMARY-AGE CHILD POPULATION

Source: UIS online database, 2016.



#### FIGURE 6 ABSOLUTE NUMBER OF OOSC

Source: UIS online database, 2016.

### 2.3 Demography

DCP population growth rates average about 2.1 percent for the population as a whole (1.7 percent in LMICs and 2.6 percent in LICs). The age group of 1- to 4-year-olds is growing much more slowly at about 1.3 percent (1 percent in LMICs and 1.7 percent in LICs) on average, according to current UN population projections reported to UIS. There are wide variations between DCPs, from below 1 percent to well over 3 percent per annum. In about half of the developing country partners, the school-age population is growing at less than 50 percent of the rate of the population as a whole. The reasons differ and include increased longevity, declining fertility and differential migration. About half of all LMICs have growth of less than 1 percent compared to less than 20 percent of LICs.

Six DCPs have declining populations of school-age children (6–11 years old). These are Afghanistan, Georgia, Micronesia, Moldova, Nepal and Vietnam. Some DCPs have high rates of growth above 3 percent annually—for example, Burundi, Côte d'Ivoire, Eritrea, The Gambia, Kyrgyzstan, Mali, Niger, South Sudan, Tajikistan, Tanzania, Uganda and Zambia. In these countries, GDP per capita will be reduced by high rates of population growth. Growth toward LMIC status will be enhanced if demographic transition begins to take place. Fertility is related to educational attainment. Increased participation, especially of girls, may increase the rate at which GDP per capita increases.



FIGURE 7 PROPORTION OF PRIMARY CHILDREN OF SCHOOL AGE IN THE POPULATION

In developing country partners, children who are of primary school age make up about 14 percent of the population. By strong contrast, in Western Europe and North America, demographic transition to low growth means that the proportion of the population of primary school age is only about 6 percent. All things being equal, this means that more than twice as much needs to be spent relative to GDP in developing country partners to achieve universal participation. Low child-population growth creates opportunities to invest in quality. For DCPs with child population growth of 1 percent, the number of school places needed increases by 50 percent in 40 years; with growth above 3 percent, numbers will increase by 50 percent in about 15 years.

### 2.4 Structures

LICs and LMICs organize their school systems in different ways, with implications for patterns of development. This can be illustrated by systems in Sub-Saharan Africa.

The most common systems have a 6:3:3 pattern, with the age of entry being 6. However, nearly 20 percent have longer primary cycles, and about a third have four years of lower secondary rather than three years. Most systems have 12 grades, but a third have 13 grades from the beginning of primary school to the end of lower secondary.

Source: UIS online database, 2016.



#### FIGURE 8 STRUCTURE OF DCP EDUCATIONAL SYSTEMS



Structures are important because they influence flows of children through systems. Dropout is much more likely at transition *between* cycles than *within* cycles. Long primary and lower secondary cycles have lower completion rates than shorter cycles. Different ways of grouping grades in schools—e.g., 1–6; 1–6 and 7–9; 7–9 and 7–12—have different implications for school size, curriculum, teacher training and deployment, as well as for costs. Managing expansion of access efficiently and effectively depends on matching structures to patterns of demand and resources available.

## 3.0 Planning Flows of Children—A New Typology for LICs and LMICs

Achieving goals to universalize access and enhance quality depends on how students enter and flow through education systems. Most indicators currently used are cross-sectional and fail to capture how flows shape future achievement. Sustainable results are generated, however, by seeing the problem longitudinally as a flow, not cross-sectionally at a point in time, and seeing education systems as dynamic systems in which each part interrelates to other parts. Hence, increasing primary completion rates depends on how many children entered school six years ago and how many drop out or repeat in each grade. Before DCPs can reduce the numbers of out-of-school children, they must address the reasons why children are pushed or pulled out of school while they are still *in* school, not after they have dropped out.

The *grade-specific enrollment rate* (GSER) can be used to assess flows in a simple way. It indicates the number of children enrolled in school as a ratio of the number of children in the school age group for that grade. If all children of primary school age are enrolled in grade 1 at the correct age, the value of the index will be 1 if there are no repeaters. If the value is greater than 1, that means there are more children enrolled than there are in the age group—a result of over-age entry and repetition. If the index is below 1, that means there are more children in the relevant age group than are enrolled in school, indicating that some are out of school. In every education system, there is a *tipping point* at which the number of children enrolled in a grade becomes less than the number in the age group for the relevant grade and the GSER is less than 1. The GSER is the best simple indicator of flow that is readily available.<sup>14</sup>

The *shape of the curve of enrollments* by grade is a clear indicator of the evolution of the education system. A concave shape<sup>15</sup> suggests high initial dropout and low completion rates. Where the curve is strongly concave and initial enrollment very high, there are many over-age children and resources are likely to be distributed inefficiently. A convex curve indicates that dropout is likely to be low until higher grades. Peaks and troughs in the enrollment curve, especially those at the end of a cycle where there are high-stakes examinations, are often related to queuing and repetition. Changes in the shape of the curve over the last decade provide indications of progress or stasis, and these are discussed in the main report. Those countries that have steep enrollment curves with much dropout should see the enrollment curve flatten over time. All the systems may have quality and achievement issues.

### 3.1 Patterns of Enrollment using Cross-Sectional Data

There are five different profiles of participation in developing country partners. These condition new investment and strategies to manage progress toward universal participation and more effective learning in both LICs and LMICs. The patterns of enrollment by grade are (1) *convex*, (2) *highly convex*, (3) *linear decline*, (4) *concave*, and (5) *linear full enrollment*. Figure 10 charts these patterns using an index of

<sup>14</sup> There are many ways of refining this indicator, many of which require technical understanding of statistics. This simple definition can be understood with simple arithmetic.

<sup>15</sup> Concave is used here to mean that the curve has a decreasing slope, and convex an increasing slope.



FIGURE 9 TYPES OF ENROLLMENT BY GRADE

Source: Author's chart based on aggregated enrollment data.

participation that shows the grade-specific enrollment over the grade-specific age group.<sup>16</sup> It is based on aggregation of data patterns across DCPs.

- Type 1 DCPs have concave enrollment curves through to grade 12. Intake levels into grade 1 are similar to the number of children in the entry age group indicated by a participation index of 1. The tipping point, where there are as many children in the age group as are enrolled in school, is in grade 1 or grade 2. Dropout starts in grade 1 and results in fewer than 50 percent completing grade 6. Completion rates may be below 40 percent for primary, and are less than 20 percent for lower secondary. Development at the secondary level is strongly constrained by output from the primary level. The priority is to increase correct age entry and progression rates and reduce dropout.
- Type 2 DCPs have very high rates of over-enrollment in the early grades of primary. Enrollment curves are very concave and tipping points are typically around grades 3. Enrollment in grade 1 may exceed 200 percent of the number of children in the age group and include over- and

<sup>16</sup> This does not account for over- and under-age enrollment. However, there is no reliable system-level data that would allow any necessary corrections to be made. The overall patterns are indicative rather than specific to any system, and create a basis for grouping education systems that has consider-able policy relevance.

under-age entry and repetition. High dropout means that less than 70 percent of the age group complete grade 6 and less than 50 percent reach grade 9. For some DCPs this pattern has persisted for a decade, and one equilibrium with low enrollment, low dropout and low completion has been replaced by another with a very high intake, high enrollments and a higher rate of dropout, leading to low completion rates. The priority is to regularize on-schedule entry and reduce high dropout in lower grades.

- Type 3 DCPs include countries where the intake rate to grade 1 is high, but is less than 50 percent greater than the number of 6-year-olds, and is therefore less than Type 2. Enrollments decline linearly with increasing grades, and the tipping point is around grade 4. No more than 75 percent of children in an age group reach the end of primary. There may be serious issues with over-age children and repetition, and with persistent dropout that accumulates from grade to grade such that fewer than 50 percent complete lower secondary. Primary completion rates constrain expansion of secondary school. Priorities are to reduce repetition and dropout from higher grades.
- Type 4 DCPs include countries that are close to achieving universal completion of grade 6 and have more than half of children in lower secondary. Enrollment curves are concave and tipping points are around grade 6 or higher. Most children enroll and finish primary grades at the right age. The biggest attrition occurs in lower secondary, and less than half of all children succeed in entering upper secondary. These systems are likely to need support at the postprimary level for cost reduction, curriculum development, quality improvement and enhanced equity as well as investment in infrastructure.
- Type 5 DCPs have full enrollment. Enrollment curves are linear and track child population growth. There is no tipping point. Where there is demographic transition, the number of children in the single age population declines each year. These systems have achieved universal enrollment up to the end of lower secondary. They are likely to have needs for investment in quality, achievement and equity.

LICs are concentrated in Type 1, 2 and 3 systems. LMICs are predominantly Type 4 and Type 5 systems (Table 2); thus, LIC and LMICs are not distributed evenly among the enrollment types, and their rates of progress through the typology vary. This is evident from detailed charts showing changes in enrollments over the last 10 years (Appendix 1). It is probable that Type 1 LICs will become Type 2 systems and Type 2 will become Type 3. There is a large distance to travel for most DCPs to become Type 4 and, finally, Type 5 full enrollment systems. It is likely that Type 1 LMICs will graduate to become Type 2 or Type 3 systems within the next decade, and most will graduate to Type 4 and some to Type 5.

Pattern	LICs	LMICs	Comment
Type 1 Low Enrollment, High Dropout Concave Curve	Burkina Faso, Eritrea, The Gambia, Guinea, Haiti, Liberia, Mali, Niger, South Sudan, Sierra Leone	Côte d'Ivoire, Mauritania, Pakistan, Senegal	Intake rate and enrollment to grade 1 low and likely to include over-age children; low primary completion rates and very low lower secondary completion; progression to higher grades strongly associated with household wealth.
Type 2 Over-Enrollment in Grade 1 and High Dropout Strongly Concave Curve	Benin, Burundi, Chad, CAR, Comoros, Congo, Congo Dem.Rep., Ethiopia, Madagascar, Malawi, Mozambique, Rwanda, Timor-Leste, Togo, Uganda,	Cameroon	Intake rates and enrollment to grade 1 very high, with double the number of children in lower grades than in the age group; high dropout with less than 75 percent successfully completing primary and less than 50 percent completing lower secondary; progression to higher grades strongly associated with household wealth.
Type 3 Middle-Level Enrollment and Dropout Linear Attrition Curve	Afghanistan, Bangladesh, Cambodia, Lao PDR, Myanmar, Nepal,	Lao PDR, Yemen, Nigeria	Intake rates and enrollment to grade 1 up to 40 percent more than in the age group; most but not all complete primary, but substantial dropout such that less than 50 percent reach the end of lower secondary; children from richer households survive longer.
Type 4 Middle-Level Enrollment and Low Dropout Convex Curve	Tanzania	Bhutan, Ghana, Kenya, Honduras, Lesotho, Nicaragua, STP, Tanzania, Vietnam, Zambia, Zimbabwe	Intake and enrollment rates in grade 1 up to 10 percent more than in the age group; low dropout through primary with high completion rates; dropout accelerates through lower to upper secondary; children from richer households survive longer.
Type 5 Full Enrollment and Low Dropout Linear Curve	Tajikistan	Albania, Georgia, Kyrgyzstan, Moldova, Mongolia, Uzbekistan,	Full intake and enrollment in primary grades through to grade 9 with little dropout.

### TABLE 2 DCPS CLASSIFIED BY ENROLLMENT TYPE FOR LICS AND LMICS



FIGURE 10 ENROLLMENT BY GRADE

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FIGURE 11 PERCENTAGE OF GIRLS BY GRADE IN COUNTRIES WITH ILLUSTRATIVE CASES

Source: UIS online database, 2016.

### 3.2 Gendered Enrollment Patterns

Patterns of enrollment of girls and boys can also be charted by grade to illustrate how gender equity differs through education systems. This highlights the need for a variety of strategies to accelerate progress toward gender-equitable enrollments. There are four different patterns of gendered exclusion; these can be described as (1) strong exclusion of girls in all grades; (2) weak exclusion of girls in primary, strong exclusion at secondary; (3) near equity in primary and weak exclusion of girls at secondary; and (4) gender equity in all grades.

A fifth pattern may emerge where some DCPs have more boys than girls enrolled, especially in the higher grades. This is beginning to be true, more so in LMICs than LICs, and is often true in middle- and high-income countries.

- Countries with Pattern 1 have differential enrollment by gender throughout their education systems. They have a low level of overall participation for both boys and girls. It must be a priority to invest in interventions that increase participation of both girls and boys to much higher levels.
- Countries with Pattern 2 have fewer than 45 percent girls enrolled through primary. This kind of exclusion is often concentrated among particular subpopulations, e.g., the poorest households, specific social groups and geographic areas.
- Pattern 3 countries have equal enrollments of girls and boys up to the end of primary if equity is defined as 50 percent plus or minus 2 percent. The problem in these countries is that girls' participation falls off at the secondary level. The common reasons are over-age progression, early marriage, underachievement, low returns for household investment, and social prejudices against the education of girls. Which of these factors is most important is specific to the country.

Pattern	LICs	LMICs	Comment
Pattern 1 Very Low Percentage of Girls in All Grades	Afghanistan, CAR, Chad		30%–40% girls in grade 1 falling to less than 35% by grade 9.
Pattern 2 Low Percentage of Girls in All Grades	Benin, Congo Dem. Rep., Eritrea, Guinea, Mali, Niger, Togo	Côte d'Ivoire, Pakistan, Yemen	40%–46% girls in grade 1 falling to below 45% by grade 6 and below 40% by grade 9.
Pattern 3 Near Equity in Primary but not Secondary	Burkina Faso, Burundi, Congo, Guinea-Bissau, Ethiopia, Liberia, Mozambique, Sierra Leone, Tanzania	Cameroon Lao PDR, Nigeria	46%–50% of girls in grade 1, with at least 45% up to grade 6. Grade 9 averages about 45%, but some DCPs have fewer girls at grade 9 level.
Pattern 4 Equitable Enrollment of Girls and Boys	Bangladesh, Bhutan, Cambodia, The Gambia, Myanmar, Madagascar, Malawi, Nepal, Rwanda, STP, Timor-Leste, Uganda, Vietnam	Ghana, Guyana, Honduras, Kenya, Lesotho, Nicaragua, Senegal, Vietnam, Zambia	Average of 48% of girls in grade 1 and 50% in grade 6 and grade 9; higher-enrollment DCPs have more girls than boys, with a tendency for the proportion of girls to increase with grade level.

### TABLE 3 PATTERNS OF PARTICIPATION BY GENDER FOR LICS AND LMICS

• Pattern 4 exists where there is full enrollment. There is a tendency for girls to out-enroll boys in some higher-enrollment countries, especially in higher grades. In Pattern 4 countries, there are no strong and systematic gender differences in enrollment at an aggregate national level. This may or may not conceal differences within particular groups and regions that are country specific.

In Pattern 1 countries, 80 percent of girls and boys have similar enrollment status. In Pattern 2 and 3, 90 percent of girls and boys have the same participation rates. In most countries boys outenroll girls, but more girls are enrolled—especially in the higher grades—in several Type 4 countries, e.g., Bangladesh, Lesotho, Myanmar, Nicaragua, Rwanda, and Vietnam (Figure 15).

The problem of achieving more equitable enrollment is concentrated among those out of school or at risk of dropout. This does not mean that problems of equity are resolved when almost all girls and boys have a similar enrollment status. It does mean that indicators other than enrollment and completion rates may be needed to identify, monitor and reduce forms of gendered preference and exclusion of girls and boys. Strongly targeted interventions are likely to be needed.

There is an association between LIC and LMIC status and patterns of enrollment by gender. Patterns 1 and 2 are more common in LICs and patterns 3 and 4 in LMICs. The association is blurred at the boundaries, and some DCPs do not fit the pattern. The most obvious explanation is that cultural preferences related to gender and education are largely unrelated to national wealth. More generally, in many developing country partners girls who are enrolled tend to be younger than boys. This is true for 17 African countries in the SACMEQ assessment system. The problems may be more about keeping older girls in school and on schedule than about entry into school.







### 3.3 Time Series Data on Enrollments

The *direction of travel* of the development of education systems varies in complex ways across the clusters of LICs and LMICs. This is important, since development in the recent past of DCPs that qualifies for GPE support—and that has benefited from large-scale programs associated with Education for All<sup>17</sup> since 2000—is a signifier of what may be feasible in the near future. Tracking enrollment by grade since 2000 illustrates the dynamic changes that have taken place. Some systems show little change; some show increased levels of enrollment in grade 1, with increased dropout in higher grades; some show increased enrollment and reduced dropout; and some show sustained increases in participation to grade 9 and beyond.

Some illustrative cases are shown in Figure 13. In these charts, enrollments by grade are shown for each year since 2000 where data is available. Enrollments are in absolute numbers from school census sources and UIS. Those enrolled therefore include those who are over-age and under-age for their grade. The dotted line shows the size of the relevant age group for each grade. Where this slopes down to the right, the child population is growing; where it shapes up to the right, it is falling. Four illustrative cases have been selected. Appendix 1 collates time series data from other DCPs for which there is data.

In Pakistan, the number of entrants to grade 1 exceeds the number of 6-year-olds by a small margin, as the gross intake rate has increased since 2000. However, enrollments by grade have continued to fall at about the same rate since 2000, to the extent that no more than about 60 percent complete grade 6. Other DCPs with similar profiles include the Central African Republic (CAR), The Gambia, Guinea and Yemen.

A different pattern is seen in Burkina Faso, where there have been very large increases in enrollment from a small base in grade 1. Gross intake rates now exceed 100 percent, but more than half appear to be over-age entrants. Large increases have taken place in enrollment up to grade 6, beyond which there is steep attrition through the secondary grades with very few surviving to upper secondary. Other DCPs with similar profiles include Côte d'Ivoire, Eritrea, Mali, Mauritania and Niger.

Malawi has seen enrollments in grade 1 reach more than twice the numbers in the 6-year-old age group. Grade 1 enrollment persistently exceeds grade 2 by 20 percent or more. Not all of this is a result of dropout, as there is much repetition and over-age enrollment and some under-age entry to grade 1. Dropout has remained high over the eight-year primary cycle, with enrollments in grade 8 about 30 percent of those in grade 1 and with a primary completion rate of about 60 percent. Other DCPs with similar profiles include Benin, Cambodia, Cameroon, Chad, Lao PDR, Madagascar, Mozambique and Uganda.

Vietnam has seen a transformation in patterns of enrollment by grade. Entry into grade 1 has decreased from its high levels in 2000; this over-enrollment in grade 1 of 20 percent or more included over-age children. By 2014, entry into grade 1 was about the same as the number of 6-year-olds. Dropout was always relatively low. The numbers in each age group have been falling as a result of demographic transition, and the numbers completing primary education now reach 95 percent. Here, the system has been effective at retaining those who enter in grade 1 through to secondary level. It has also benefitted from falling numbers of school-age children. Vietnam has an unusual pattern of rapid development of participation, some elements of which can be seen in time sequence data from Ethiopia, Ghana, Lesotho, Tanzania and Zambia, all of which have seen increased intake persist to higher grades.

<sup>17</sup> Dakar Framework for Action, http://unesdoc.unesco.org/images/0012/001211/121147e.pdf.







Grade

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The tradeoffs that are necessary with limits on investment in education by DCPs and bilateral and multilateral donors need to be profiled for systems that are at various levels of development with different directions and rates of travel. The outcome will depend on how each country prioritizes which need to meet first—access, attainment, achievement, equity—and which issues would gain the most comparative advantage and value added with resources from GPE, as indicated by planning.

### 3.4 Patterns and Progress

It is clear from the enrollment chart patterns that rates of progress toward full enrollment through to the end of lower secondary have varied greatly. In some countries, grade-specific participation has remained quite static, while in others, there has been rapid improvements. For some, the most rapid growth has been in the early grades of primary, whereas others have seen growth spread across the grades. In many countries, secondary enrollments have remained low despite large increases in primary completion rates. When developing plans in developing country partners, it is crucial to understand current patterns and recent profiles of growth.

It is tempting to see the five education system types—(1) convex, (2) highly convex, (3) linear decline, (4) concave and (5) linear full enrollment—as a developmental sequence through which education systems transition as they develop. Thus, education systems might evolve from Type 1 (low enrollment rates), through Type 2 and Type 3 (very high initial enrollment with high dropout, with gradually reducing over-age entry and repetition) to Type 4 (full primary enrollment and a majority completing lower secondary) and Type 5 (full enrollment to grade 9 and beyond). In terms of gender parity, the sequence could be from Pattern 1 to Pattern 4. Differences between LICs and LMICs are consistent with this model of progression, though many DCPs diverge from the simple model as a result of intercountry heterogeneity in the length of school cycles and selection practices.

If education systems did evolve through stages, then transitions from one to another could be managed by replicating the actions of the countries that succeeded in achieving high enrollments through to the end of the basic education cycle, in spite of low starting points. This is the default position of much policy dialogue at the international level: it assumes that high-performing countries offer lessons that can be translated into advocacy for reforms and interventions in countries that lag behind in educational development. This only works, however, if there is sufficient homogeneity between countries for causal assumptions about educational development and policy implementation to hold across countries. If, after a decade or more of advocacy, results in terms of universal levels of participation and learning remain elusive, then such a simple-stage theory of change looks as if it falls short of what is needed.

It can be seen from the data that if the evolution of enrollments were sequential through the types, it would almost certainly be inefficient. Type 2 systems are wasteful because they over-enroll by a factor of two or more in grade 1, followed by extremely high dropout rates and high costs per successful graduate. If no more than half the children who enter grade 1 reach the end of the primary cycle, many additional years of primary school are needed to produce one graduate.

Front loading educational expansion with a focus on entry to grade 1 under Education for All programs has inflated lower grade enrollments, leading to overly large class sizes and to high pupil-to-teacher ratios in many DCPs. Higher grades may have much lower class sizes and benefit those who survive the lower grades. Pupil-to-teacher ratios and other inputs often end up privileging those who survive and are promoted, and who are disproportionately from higher income households.
Resources that are currently used to support over-enrollment in lower grades could be used to expand access to higher grades within the same budget totals if the flow of students were managed more efficiently.

If the patterns established in Type 2 systems remain in place for a decade or more, as is the case in some developing country partners, then these systems have transitioned from one kind of equilibrium—low enrollments and high dropout—to another: very high initial enrollment and very high dropout. The primary completion rate may thus fail to improve much despite great increases in grade 1 enrollment. The time sequence charts draw attention to where progress has been fast or slow, and across the system or concentrated in some parts.

It may be possible to move directly from a Type 1 pattern directly to a Type 4 pattern and then Type 5, especially for those LMICs that are Type 1. Current theories of change do not dwell on what would be necessary to manage enrollment growth in order to leapfrog from Type 1 to Type 4. Nor do they address the implications of gendered differences that are associated with ascending grade levels as systems develop and inverting to favor girls at higher levels in some high enrollment systems.

Current theories of change are not based on time series data on the evolution of systems that flag what has been achievable in the past. What is more, current strategies seem largely undifferentiated by system type. However, the system type determines starting positions and distance to travel to goals, and is mediated by varying capacity and political will to allocate resources. Some patterns of expansion are likely to be unsustainable financially, and some may exacerbate increased inequality. Lessons need to be learned from past patterns of development to inform realistic planning.

The most likely patterns of educational development are those that replicate the past (Lewin, 2015a). The profile of growth over the last decade is the best indicator of the profile of growth over the next decade; trend analysis can suggest what is most likely to happen in the future, all things being equal. This is the point of departure for programs and projects. Evolutionary change of systems can persist indefinitely, while radical shifts in policy depend on events that change the direction and momentum of development but then revert to evolutionary change. The former needs nurturing and nudging to consistently improve system level outcomes; the latter generally requires large investments in infrastructure, persistent political will and sustained consensus about goals.

The implications of this new analysis are considerable for future GPE grant support. The patterns of enrollment indicate different starting points for strategic planning, with varying pathways toward system-level goals that may not be the same across countries. Each education system will have its own preferences and priorities, and the grant development process should recognize these differences. There is now a need for eligibility criteria and balanced investment programs that reflect the dynamic aspects of system growth proven to determine sustainable progress in participation and learning.

The challenge is to depart from infusing national systems with piecemeal, short-term external inputs that are designed to produce "quick wins" in the participation of some groups. These wins tend to come at the expense of evolutionary gains in valued outcomes that are sustainable over the medium term across systems. A core dilemma is finding a balance between investing in the margins (thus reaching the most marginalized) and investing in the core of education systems so that they expand to be inclusive of the margins. Problems associated with uneven patterns of participation between social groups, and with low levels of learning achievement across broad swaths of learners,

are better understood as problems with the core of the system rather than problems of the most marginalized.

Theories of change need to be based on empirical insights from the past about how systems actually behave, rather than how they should or could behave in an ideal world. The basis for generating these theories is provided by this analysis of existing patterns of participation growth.

# 4.0 Emerging Issues for LICs and LMICs in Transition

Five issues of general concern merit consideration as new programs are developed to meet the challenges of the next generation of educational development. These highlight (1) equity, (2) infrastructure, (3) teachers and teacher education, (4) curriculum and (5) assessment.

# 4.1 Equity

Equity is essential for educational development. Growth in participation and improvements in quality and learning are often unevenly distributed; without policies and plans that are deliberately propoor, increased public investment may most benefit those who are already advantaged. Indicators of participation and attainment show wide differences within developing country partners in the extent to which wealth, location and gender influences outcomes. Generally, LICs have greater levels of educational inequality than LMICs in terms of initial enrollment, primary and secondary completion rates, and average years of schooling.

A classification of LICs and LMICs shows how they differ in inequities related to wealth, location and gender.<sup>18</sup> This uses a weighted index for inequalities in primary completion rates with weighting of wealth ( $\times$ 3), location ( $\times$ 2) and gender ( $\times$ 1).<sup>19</sup> The greater the score and ranking, the less the effect of wealth, location and gender on educational outcomes. Other weightings would produce results that are different in detail. This method identifies general patterns that replicate across the data set when different weighting and dependent variables are used to explore educational inequity. Appendix 2 lists DCPs by level of equity in primary completion rates.

Inequity is greater on average among LICs than LMICs, and the average ranking on the index is lower. The CAR, Guinea, Mozambique and Niger appear to be the most unequal LICs, and Côte d'Ivoire, Cameroon, Mauritania and Nigeria the most unequal LMICs, where differences in participation are strongly associated with wealth, location and gender. The average rank of LICs on this particular indicator is 19 (less equity); for LMICs, it is 31 (more equity). There is a considerable overlap between the two data sets.

DHS/MICS data are available on 49 DCPs. Of these, 25 are LICs, 22 are LMICs and two are uppermiddle-income countries (UMICs). It is possible to compare inequality across time by using data sets from around 2000 (Wave 1) and from around 2010 (Wave 2). This gives some sense of the direction of travel of inequalities, though robust comparisons across time are limited by the timing of the relevant survey data.

<sup>18</sup> With thanks to Marcos Delprato, who provided data for the analysis of equity from DHS and MICS.

<sup>19</sup> Analysis of household data sets typically shows that most of the variance in participation is attributable to household wealth, somewhat less to location, and less to gender. It is therefore justified to weight household wealth most.



FIGURE 14 EDUCATIONAL INEQUITY IN LICS AND LMICS

Source: Author's analysis from DHS database, 2016.

The indicators consider equity in terms of gender (female/male), location (rural/urban) and wealth (Quintile 1 [poorest 20%]/Quintile 5 [richest 20%]). The variables used are the parity indices for ever0 (ever been to school) and enrolled in school (in1, in2 and in3 for primary, lower secondary and upper secondary, respectively). The following picture emerges of inequity when indicators are averaged across the DCPs using population-weighted data.

Access to school (ever0), enrollment in primary (in1), enrollment in lower secondary (in2) and enrollment in upper secondary (in3) have generally become more equitable across the DCPs in relation to gender and location. The average gender parity index (GPI) for ever-enrolled improved from 0.89 to 0.94 between the two time periods, the average rural-urban index improved from 0.82 to 0.87, and the average wealth index from 0.65 to 0.70. Similar patterns can be seen in relation to primary enrollment rates (in1).

At lower and upper secondary levels, gender and location effects have also resulted in great equity, but wealth effects have remained the same or become more unequal. Upper secondary enrollment in developing country partners is selective. Those who survive are likely to be much richer than those who leave school. It appears that wealth effects have increased, with the parity index falling in the latest period from 0.49 to 0.46 at upper secondary. This could arise from faster growth



#### FIGURE 15 EQUITY 2000-2010 EVER-ENROLLED AND ENROLLMENT RATES

Source: Author's database downloaded from DHS, 2016.

in participation of those from the richest quintile of households, with growth in participation of the poorest children stalled by unaffordable direct and indirect costs.

Further analysis using completion rates shows improvements in equity related to gender and location. Equity in relation to household income appears to fall with higher levels of schooling. The number of years of schooling completed has also improved in relation to gender parity and locational equity, but not in terms of household wealth. This may indicate that enrollment rates above primary are peaking among the poor especially. The gains in equity have arisen mostly from improvements in the LICs rather than in the LMICs. In LMICs, poor households have benefited less than richer households from the expansion of upper secondary school.

Concentration curves illustrate which groups receive a disproportionate share of educational access and progression. The curve is a 45 degree line when each child benefits equally. Parity would be when every person received an equal share of educational benefit.

In LICs, it is clear that primary completion rates have become more equitable over the two time periods of the data. This is shown by the curve moving toward the diagonal line that represents equity as the data is drawn from Wave 1 (2000) to Wave 2 (2010). LMICs have a generally more equitable distribution of primary completion rates but have not improved over the two time periods.

Similar curves for the completion of lower secondary illustrate that LICs have seen increases in equity, but these are concentrated among the wealthiest 60 percent. The poorest 40 percent have seen little change and the poorest a reduction in equity. In the LMICs, the picture is similar, with little apparent improvement.

Using the DHS data sets for two different time periods allows a classification of LICs and LMICs into those countries that have seen rapid improvements in equity and those where progress has been slow or not happened at all. The analysis is indicative rather than definitive since the DHS data sets

# FIGURE 16 CONCENTRATION CURVE FOR PRIMARY COMPLETION—LICS



# FIGURE 17 CONCENTRATION CURVE FOR PRIMARY COMPLETION—LMICS

# FIGURE 18 CONCENTRATION CURVE FOR LOWER SECONDARY COMPLETION—LICS



# FIGURE 19 CONCENTRATION CURVE FOR LOWER SECONDARY COMPLETION—LMICS



Source: Author's database downloaded from DHS, 2016.

cover a range of dates. In this analysis, the DCPs are divided into groups depending on their initial level of enrollment and the rate of progress toward equity. The rate of change in the equity indicator is classified as slow or no progress, some progress and strong progress. Detailed results are presented in Appendix 3.

There are low enrollment countries that have seen strong improvement in equity related to wealth in the chances of entering school. These are Burkina Faso, Ethiopia, Mali and Sierra Leone. Guinea and Niger have also improved from a low base. Many of the DCPs with high rates of children

who ever attend school—Congo, Guyana, Honduras, Kenya, Kyrgyzstan, Malawi, Moldova, Sao Tome and Principe, Uganda and Zimbabwe—have seen small improvements because most children already enter school.

Enrollment in primary school has remained strongly associated with household wealth in Chad, Nigeria, Pakistan, Rwanda, Sao Tome and Principe (STP) and Senegal, which have relatively low levels of initial enrollment. In contrast, CAR, Ethiopia, Liberia, Niger and Sierra Leone, which also have very low levels of enrollment, and Benin, Côte d'Ivoire, the Democratic Republic of Congo, Haiti, Madagascar, Mozambique, Nepal, Togo, Tanzania and Zambia, which have low levels of enrollment, have seen strong increases in equity as their systems have expanded.

Primary completion rates have remained strongly associated with household wealth in many low- and intermediate-level DCPs, e.g., Albania, Cameroon, Congo, Côte d'Ivoire, Guinea, Guyana, Kyrgyzstan, Lao PDR, Moldova, Niger, Nigeria, Rwanda, Pakistan, STP, Uganda and Yemen. Over a similar period, there has been strong improvement in Benin, Cambodia, the Democratic Republic of Congo, Ethiopia, The Gambia, Lesotho, Mali, Mongolia, Nepal, Nicaragua, Senegal, Sierra Leone, Togo, Tanzania, Vietnam and Zambia.

Secondary enrollment and completion rates are also related to household wealth. There has been little change in equity in enrollment rates in Bangladesh, Chad, Haiti, Lesotho, Malawi, Mauritania, Mozambique, Nigeria, Pakistan, Tanzania and Yemen. The same is true for completion rates for lower secondary in Burundi, Cameroon, CAR, Comoros, Côte d'Ivoire, Lao PDR, Lesotho, Malawi, Mozambique, STP and Uganda

Gender equity is clustered differently. Burundi, Côte d'Ivoire, Madagascar and Pakistan have made little improvement in ever0 differences between boys and girls. Burundi, CAR, Haiti, Madagascar, Mauritania, STP and Tanzania also appear to have made limited progress in gender equity in primary school enrollments and in completion rates. Among the DCPs with low enrollment and completion rates at secondary, Burkina Faso, Burundi, Chad, Côte d'Ivoire Madagascar, Malawi Mauritania, Niger, Nigeria, Tanzania and Togo have remained relatively inequitable.

The most inequitable DCPs are also those with the lowest enrollment and greatest dropout rates. High levels of inequality are not possible with high levels of participation. Raising enrollment rates leads to greater gender equity, smaller urban/rural differences, and less impact of wealth participation. Inequality related to household wealth is generally much greater among DCPs than is exclusion related to location and gender. DCPs that have the highest levels of inequality would benefit most from pro-poor interventions that reduce costs to households and increase access to preschool and secondary. Prima facie, some interventions are pro-poor and some are not. Subsidies for uniforms and school feeding are pro-poor if properly targeted. Anything that results in charging fees or requiring contributions to households that are at or near the poverty line makes those households poorer and increases the number of children in poverty. It cannot be pro-poor. The recent growth of private fee-paying schooling and paid private tuition in many developing country partners, especially at the secondary level, has to be appraised in relation to its impact on equity.

# 4.2 Infrastructure

Infrastructure investment is needed on a massive scale in DCPs. In LICs, the number of additional places needed between now and 2030 is about 40 million at primary, 35 million at lower secondary

and 35 million at upper secondary, as indicated by the modeling in Section 6.2. In LMICs, the numbers needed are lower because more infrastructure exists; the additional places needed are about 25 million, 25 million and 35 million, respectively. If two-year preschool is universalized, this adds another 35 million places in LICs and 25 million in LMICs. The implications are that LICs would have to double current capacity at the secondary level, and LMICs increase capacity by about 50 percent, over the next 15 years.

This will create a large demand for school buildings. If average primary schools enroll 200 and secondary schools 400, this translates into about 220,000 primary schools and 170,000 secondary schools in LICs, and 100,000 primary schools and 120,000 secondary schools in LMICs. If the average cost of a simple primary school is US\$100,000 in an LIC and US\$300,000 in an LMIC, and secondary schools cost twice as much per school place to build as primary schools, the total additional cost can be estimated.<sup>20</sup> This comes to about US\$60 billion in LICs and US\$100 billion in LMICs. This capital spending would have to be found over the period of 15 years to 2030. It does not include preschool, which could add US\$17 billion for LICs and US\$12 billion for LMICs.<sup>21</sup> Nor does it account for rehabilitation, refurbishment, upgrading or maintenance costs.

As access is expanded, especially at the secondary level, DCPs will have to devise ways of delivering educational services at affordable costs to the public. Small secondary schools can be very expensive and may be four or more times the cost of primary schools to operate (Lewin et al., 2016). If they are boarding schools, as is common in Sub-Saharan Africa, the costs will be higher still. New designs are needed that can deliver a full curriculum at costs that can be financed, especially at the secondary level. Minimum school sizes should be agreed upon, efficient methods of deploying specialist teachers who can teach across the curriculum are needed, and upper and lower secondary schools should be co-located where possible. Preschool facilities should be linked to primary school sites and share facilities where feasible.

Large numbers of schools in LICs and LMICs do not have a full range of reliable services, such as electricity, clean water, sanitation and transportation. This situation has persisted for a long time (World Bank, 2004). Investment in infrastructure has lasting benefits, and its risks differ from those of supporting recurrent expenditure on salaries. Investment in infrastructure has comparative advantages for external assistance since it has long-term benefits and tangible short-term outcomes. Innovative finance mechanisms and philanthropy are better suited to support investments in infrastructure than to support recurrent costs.

Internet connectivity is problematic across most DCPs, but it is essential if competitive levels of achievement in the 21st century global economy are to be reached. The reality, however, is often far from the possibility. Many teacher education institutions and most schools do not have reliable connectivity. IT services and internet access may be charged at global prices that are unaffordable. New strategies are needed that make internet services available to all learners in schools—without proprietary ownership and usage charges. Telecoms and IT companies could offer free internet access to educational institutions as a condition of licensing. Development partners could invest in copyright-free learning materials related to national curricula and make them freely available online to all learners.

<sup>20</sup> A single classroom per grade school, with six grades and with each classroom costing US\$10,000, would cost US\$60,000 plus the cost of services, staff room, assembly space, etc. US\$100,000 for a six-classroom school is a plausible amount for well-founded structures in LICs; the private sector often builds for less to lower standards.

<sup>21</sup> Costing preschool is very uncertain as the method of delivery is unknown.

# 4.3 Teachers and Teacher Education

Teacher education systems in many DCPs have a history of low-volume output, static curriculum development, examination-oriented teaching and weak links to the school systems they serve. The number of primary teachers needed in LICs and LMICs will need to increase by 50 percent or more by 2030 to account for population growth and reductions in pupil-to-teacher ratios. The number of lower secondary teachers will have to more than double if lower secondary is to be universalized.

In LICs, most of the growth in demand will be at the primary level unless demographic transition is more widespread. In LMICs, most of the growth in demand for new teachers will be at secondary level. Overall, DCPs will need to recruit and train about 17 million new teachers by 2030. More than two-thirds of these will be secondary teachers if access is provided to all children to the end of secondary school by 2030.<sup>22</sup> Most of those teaching in 2030 will not have been teaching in 2015.

Raising quality and achievement depends on professionalizing teachers. The next wave of expansion at the secondary level requires trained teachers who have degree-level subject knowledge and

		GER 2015	GER 2030	School-Age Population	Teacher Attrition	Pupil-to- Teacher Ratio	Pupil-to- Teacher Ratio	Total Demand New Teachers
		%	%	Growth %	Rate in %	2015	2030	
LICs	Primary	100	105	2.00	3	40	30	4,280,526
	Lower	60	105	2.00	5	30	25	2,969,922
	Secondary Upper Secondary	30	105	2.00	5	20	20	2,910,563
	Total							10,161,011
LMICs								
	Primary	100	105	1.00	3	40	30	1,568,855
	Lower Secondary	70	105	1.00	5	30	25	2,555,876
	Upper	50	105	1.00	5	20	20	2,638,125
	Total							6,762,855
	GRAND TOTAL							16,923,866

#### TABLE 4 PROJECTED DEMAND FOR NEW TEACHERS

Source: Author's calculations, 2016.

<sup>22</sup> The number of teachers needed is dependent on the change in the population of school-age children, the change in enrollment rates, the pupil-to-teacher ratio and the rate of teacher attrition. This yields the results shown in Table 4 using aggregated data from across the LICs and LMICs.

understanding and are not employed casually. Arguably, the same is true of preschool and primary school teaching when teaching is configured as a profession rather than a job to be undertaken by unqualified teachers who are paid by the lesson.

There is an opportunity to invest in diverse pathways into teaching and establish which are most cost-effective and suited to circumstance. Teaching assistantships offer opportunities to work while training on the job. College-based systems can be complemented by school-based training and mentorship. New modalities of training, with managed continuing professional development over a career lifetime, should replace single-shot pre-career certification. Teaching may not be a lifetime career for all those who enter the profession. In some developing country partners and in some school subjects, the half-life of a trained teacher (i.e., the time it takes for half those trained to leave the profession) may be less than five years. If so, methods are needed to manage both those who may leave early and those who remain for their entire career.

Teacher training systems diverge widely across DCPs, with different histories, traditions and embedded practices. Many DCPs also have a track record of attempts to reform teacher education that stretch back several decades. It makes sense to build on these with diagnostic analysis of where the problems lie and what investments will provide the most effective initial training and continuous professional development. Investment should therefore be targeted on a case-by-case basis and linked to a relevant national evidence base.

# 4.4 Curriculum

Curriculum and pedagogic issues are critical to learning achievement. Although much has been invested in diagnosis and intervention in early-grade reading and mathematics, other subject areas, curricula in higher primary grades, and the secondary curriculum have been widely neglected. Many DCPs still have secondary curricula designed for academically selected groups of students from households with high cultural capital and income, reflecting a legacy of highly selective secondary systems designed to meet the needs of elites. Technical and vocational education and training curricula are often more supply driven than demand led and linked to qualifications—with consequences for employability in national economies. Mass participation in lower and upper secondary school requires large-scale curriculum reform and pedagogic innovation to meet new needs and respond to a wide range of capability among the next generation of young adults. Multigrade and other innovative pedagogies can expand access, especially in small secondary schools, and enhance achievement.

Preschool provision is now widely recognized as vital to child development. Delivery modalities can differ widely, have dissimilar costs and be of highly variable quality. Some DCPs embed preschool in primary schools and others do not. Some have national preschool curricula and others do not. The content and pedagogy of preschool need to be developed within disparate cultures and child-rearing practices. Systems for provisioning and for quality assurance need to be established. The priorities in LICs may be different from those in LMICs.

Expanding education access to all 15-year-olds creates new challenges of how best to manage flows of students into labor markets and higher and further education. These flows are poorly understood in many developing country partners and there is little data. The selection and certification processes that directly shape learning and teaching may not be fit for new purposes. Labor markets are changing rapidly in many developing countries, and employable knowledge and skill are shifting. Thus, 20th century skills will remain highly relevant in labor markets in LICs and LMICs and will coexist with 21st century

skills. Science, technology, engineering and math (STEM) subjects are poorly learned and taught—yet in most economies employment prospects are much better for those with STEM skills, and product and process innovation depend on the kind of problem solving that STEM subjects promote. Investment in curricula relevant to labor markets in different developing country partners is a priority if expanded access is to have an impact on economic development. The scope is extensive for investment in new generations of learning material, pedagogies providing more access and ownership, and professional development of teachers as curriculum developers. Low-cost and license-free learning technologies and materials could provide an investment opportunity for GPE that will have long-term impact.

# 4.5 Assessment

New investments in assessment systems at school levels are crucial to system management, curriculum reform, and the development of formative assessment systems that can help manage learning at the school and classroom level so that no child falls behind. Formative assessment linked to national curricula is widely absent in developing country partners and should be part of any investment program to manage enhanced learning. It is essential to effective school management.

National systems of qualification and certification are central to the development of modern labor markets and to the promotion of social cohesion. In most developing country partners, public examinations determine and legitimize who gets what in terms of employment and social role selection. If they do not reliably certify competencies in a fair manner, then the scarce opportunities for jobs and higher education will be misallocated. Investment in robust, equitable and curriculum-driven assessment systems is therefore of considerable importance as modern sector employment grows.

National assessments and international standardized testing can be useful as a catalyst for development; however, both are low-stakes assessments and may not feed directly into curriculum and pedagogy. If they are not linked to the national curriculum and high-stakes assessment, their impact on learning and teaching will be limited. Policy on assessment should evaluate the options and determine whether investment in formative evaluation—which would be linked to classroom practice and improved high-stakes examinations that have positive backwash into the curriculum—is likely to have more impact on learning achievement than national monitoring assessments. This is a challenge for the various initiatives that link assessment for learning (e.g., LMTF, 2015).

# 5.0 Eligibility for GPE Funds

The Global Partnership for Education has had a range of eligibility criteria for its grants. Most recently, the criteria applied to the current 67 DCP member states were:

- All LICs with gross national income (GNI) per capita below US\$1,035 (36 countries).
- All small island and landlocked developing states, or SILDS (18 countries).
- LMICs with GNI per capita between US\$1,035 and US\$2,560 and a primary completion rate of less than 85 percent.

In addition, fragility (e.g., DCPs facing multiple challenges of armed conflicts, natural disasters and political instability) and vulnerability (e.g., large numbers of out-of-school children)<sup>23</sup> are considerations.<sup>24</sup>

There are five kinds of GPE funds now available. ESPIGs provide funding up to US\$100 million to finance the implementation of approved education sector development plans. Education sector plan development grants (ESPDGs) provide funding of up to US\$500,000 to develop or improve education sector plans. Knowledge and innovation exchange grants (KIX—US\$60 million) and advocacy and social accountability grants (ASA—US\$60 million) provide support for implementation and dissemination of good practice. Leverage funds totaling US\$100 million are available to DCPs that do not otherwise qualify for grants on the basis of income per capita or completion rates, and some options exist for other countries that fall outside the core funding eligibilities.

From 2002 to 2015, approximately US\$4.1 billion was allocated to funding and about US\$2.5 billion has been disbursed. Of this, ESPIGs accounted for US\$3.9 billion of the commitments, or over 95 percent of all GPE resources. Between 2002 and 2014, 54 countries were beneficiaries of 110 ESPIGs. In 2014, US\$2.2 billion worth of grants were still open. US\$1 billion in new grants was approved in 2013, representing a new peak in commitments.

# 5.1 Eligibility and National Income

Historically, all low-income countries with GNI per capita up to US\$1,035 have qualified for GPE ESPIGs if they have approved ESPs endorsed by development partners. LMICs with GNI per capita of less than US\$2,560 are eligible if they have primary completion rates below 85 percent,<sup>25</sup> and some other, higher-income DCPs have been admitted. The grants offered are primarily for plan development, program development and implementation. Most of the disbursement (99 percent in 2012–2015) was for implementation. Over the period 2011–2014, about US\$2 billion was pledged to support GPE grants across 64 countries. Six countries received about 60 percent of all funds in 2013.

Eligibility criteria for grants have evolved since the establishment of the Global Partnership for Education (originally called the Education for All–Fast Track Initiative) in 2002. The most recent formula for grant allocation eligibility (GPE, 2017a) takes account of the primary- and lower-secondaryage population, and the primary and lower secondary completion rates once national income criteria have been met. There is a loading of 15 percent for countries affected by fragility and conflict that increases the chances of eligibility but does not affect the size of the award. A cap of US\$100 million is applied to maximum country allocations (MCA) to limit the grant allocation to the largest DCPs with the lowest completion rates. Small states with allocations that fall below US\$1.3 million will qualify for this amount as their MCA. Larger DCPs that have MCAs below US\$5 million qualify for up to US\$5 million. The new needs-based formula prefers to use GDP per capita (PPP) rather than GNI per capita in USD. GNI per capita and GDP (PPP) per capita correlate at about the 0.7 level, indicating that some DCPs may change status depending on which is used.

The consequences of growth in economy and population will be to cause some DCPs to change their status in relation to GNI and GDP (PPP) per capita thresholds for implementation grant eligibility, assuming the criteria remain constant. The likely transitions can be anticipated by taking the real and projected growth rates for the economy and population over the five-year period from 2013–2018 as anticipated by the World Bank and UN Population estimates, and overlaying these onto current GDP per capita<sup>26</sup> for the next decade. This then allows a new profile of countries to be constructed showing which DCPs will cross the national per capita income thresholds by 2025.

<sup>25</sup> If on-schedule primary completion rates are used rather than any-age completion, more countries will fall short of an 85 percent PCR.

<sup>26</sup> GDP per capita in USD by country has been used because this is the basis for World Bank classification of LICs and LMICs.





Source: World Bank online database and author's calculations.

Economic growth of DCPs is projected to average between 4 percent and 5 percent using current five-year predictions of the World Bank. Population growth is projected to average about 2 percent. Using country-by-country growth projections based on the period 2014–2018, about half of the LICs on which there are data<sup>27</sup> will graduate to LMIC status by 2030. Similarly, about a quarter of the current LMICs will become UMICs with per capita GNI close to or above US\$4,125. These country-level projections are based on data from the World Bank projections for GDP and are shown in Figure 20.

The result of the country-by-country projections is that some DCPs that are LICs, or are borderline cases, become LMICs. Thus, Bangladesh, Cambodia, Chad, Kyrgyzstan, Mauritania, Tajikistan and Tanzania cross the threshold. Kenya and Senegal are confirmed as LMICs. Benin, Burkina Faso, Ethiopia, Mozambique, Nepal and Rwanda approach transition to LMICs. Ghana, PNG and Vietnam become upper-range LMICs above the current GPE threshold of US\$2,560. Albania, Georgia, Guyana and Mongolia become UMICs, with Bhutan approaching the threshold. Despite these transitions, about 50 percent of existing DCPs that are LICs remain LICs. They would therefore retain povertyrelated eligibility.

These projections of growth have all the uncertainties of measurement of GDP per capita and of best guesses about future macroeconomic development. GDP per capita figures from different sources can vary by as much as 25 percent, and when the statistics are rebased—as happened in Ghana—apparent GDP may increase by as much as 30 percent. The growth projections should therefore be regarded as limited by the accuracy of the underlying statistics reported to the UN system (see, e.g., Easterly, 2013)

The thresholds between LICs and LMICs, and between LMICs and UMICs, will be adjusted at some point in time. The midrange cutoff for income eligibility of US\$2,560 will also shift, and it has no standard definition. The income levels chosen are arbitrary and reflect a normative consensus, the existing International Development Association thresholds, and other World Bank assumptions. They are therefore subject to changing sentiments about levels of development and national income, as well as poverty thresholds. There is a high probability that economic development will take place, and the number of countries affected by fragility and conflict will diminish, and national income will rise. Fewer DCPs will be LICs by 2030 unless the thresholds are revised upward. The thresholds need to be kept under review, especially if they result in unpredictable "graduation" of DCPs from one kind of eligibility to another, or out of eligibility altogether. There are three key issues.

First, eligibility depends on national income per capita. This criterion has no distributional element within the country; in other words, it is not sensitive to different levels of income inequality. It is very possible that some subpopulations within LMICs are poorer than some subpopulations in LICs. Changes in income distribution over time will change patterns of educational exclusion within countries. If the national income per capita were unpacked into quintiles, then it would be clear that particular income quintiles of households in LMICs still qualified for GPE support even though national average income per capita might exclude them. Some consideration may need to be given to distributional indicators, e.g., the proportion of the population below the poverty line and the incidence of poverty among different social groups and geographic locations.

<sup>27</sup> Sixteen countries will graduate. Countries with no data include some small island states and some countries affected by fragility and conflict that make no returns to UIS.

Second, clear thinking is needed that anticipates progress in terms of development and avoids moral hazards whereby there is a diminishing incentive to achieve goals. If the consequence of success is a reduced probability of future funding, then the motivation to succeed is tempered. If there are no transition arrangements for DCPs that cross the income per capita or other thresholds for eligibility, progress may be impeded.

Third, income per capita gives no insight into political will and financial commitment for providing universal access to basic education up to grade 9 and beyond. This could be judged but cannot be simply measured, since what is appropriate is dependent upon context. The proposed indicators are related to the proportion of GDP allocated to education and the percentage of the government budget allocated to education. These beg questions about the subsectoral distribution of the financial commitment within the education budget, about the cost per child of delivering services, and about the relationships between financial benchmarks and demographic differences that shape demand for school places in different countries. The proposed leverage fund seeks to apply norms for domestic funding, but these need to be tailored to each system's specificities. The issues are sufficiently nuanced to make simple conditions and benchmarks elusive and in tension with priorities for national ownership.

# 5.2 Eligibility and Completion Rates

Currently GERs for primary enrollment in developing country partners average about 105 percent, with only 20 percent of countries falling below GER 95 percent. There is little difference, on average, between LICs (107 percent) and LMICs (105 percent), though much data are incomplete, especially for LICs. Data on primary completion rates is also incomplete, with over half the country cases for DCPs unavailable in UIS data using standardized methods. Only 15 percent of LMICs have PCRs above 85 percent and no LICs reach this level. Most of the missing cases likely have PCRs below 85 percent. Completion rates do not signify the achievement of competence. Every system needs to develop indicators that show what proportion of children reach minimum learning outcomes related to national curricula.

DCPs that are LICs have average GERs of 57 percent at lower secondary and 29 percent at upper secondary levels. This can be compared to GERs of 71 percent and 52 percent in the LMICs. Completion rates at lower and upper secondary will be substantially lower than this because many systems have large proportions of over-age children at the secondary level and queuing around high-stakes examination points with much repetition to improve grades.

The primary completion rate is defined by the UIS and the World Bank as "the total number of new entrants in the last grade of primary education regardless of age, expressed as a percentage of the total population of the theoretical entrance age to the last grade of primary." This indicator is also sometimes known as the "gross intake rate to the last grade of primary education." It can exceed 100 percent as a result of early or late entry and under-age or over-age progression. This definition includes those who enter the last grade but fail to complete it. It also includes those who complete the last grade but fail to demonstrate mastery of the national curriculum at an acceptable level of learning outcomes.

The PCR used in monitoring the Millennium Development Goals was different. It was defined as "the ratio of the total number of students successfully completing (or graduating from) the last year of primary school in a given year to the total number of children of official graduation age in the

population." This definition ignores the effect of repetition in the last grade of primary, introduces uncertainties about the age composition of the graduating-year group, and fails to clearly distinguish the meanings of "completion" and "graduation." These definitions of the PCR should not be confused with the primary cohort completion rate (PCCR), which is also reported by UIS and the World Bank. The PCCR is the "percentage of a cohort of pupils enrolled in the first grade of primary education in a given school year who are expected to complete primary education." The PCCR is the product of the probability of reaching the last grade and the probability of graduating from the last grade. Though the definition is clear, the data to determine reliable values is often missing. Appendix 2 discusses the PCR in more detail.

Changes in the definition of the PCR will change the proportion of DCPs that are eligible for GPE finance. Over the next 15 years, the PCR will become less useful as an indicator of progress, assuming that more and more DCPs cross the current threshold of PCR 85 percent. Above this level, the PCR is not a good indicator of participation, especially where robust information on repetition, age and levels of achievement is unavailable. Variations in its value will be small and may fall within the margins of error of measurement. Lower secondary completion rates will show more variation and be a better guide to progress over the next decade, assuming a definition can be agreed upon with awareness of its limitations.

Grade-specific enrollment rates (GSERs), as previously discussed, not only proxy participation rates at each grade level but also show how children are flowing through school systems and what proportion are reaching different levels. As data quality improves, they can be refined to take into account levels of repetition and proportion of children who reach achievement thresholds.

Most DCPs have education systems with certification at the end of lower and upper secondary. Where these are linked to high-stakes examinations, the entry and pass rates provide useful data to corroborate participation indicators obtained from administrative and census data. There is also an opportunity to link participation data to performance data, and to feed analytic insight into formative assessment at school levels, thus allowing evidence-based pedagogic and curriculum reform.

# 5.3 Eligibility, Fragility and Vulnerability

*Fragility* is a GPE eligibility criterion. The allocation formula is weighted in favor of countries affected by fragility and conflict. As a result, these countries may qualify even if their GNI per capita is high because they have unmet educational needs. The World Bank, Global Education Monitoring Report and OECD identify countries affected by fragility and conflict according to different criteria. GPE combines both World Bank and *Global Education Monitoring Report* (UNESCO, 2015) criteria.

Currently most countries affected by fragility and conflict are eligible for GPE support. The GPE members that fall into this category are identified in Appendix 4. There are also 22 countries among the LICs and LMICs that fit the definition but are not DCPs. These include several that are very small, and others that have high PCRs but are very large, with many out-of-school children.

Countries affected by fragility and conflict that are not DCPs may or may not have poor educational indicators and may have needs for external finance. They could therefore be eligible for GPE implementation grants if primary and lower secondary completion rates were low, though they may not qualify on income grounds. If they have good educational indicators, the case for educational funding from the GPE would seem to be weak. If the fragility and conflict issues are mostly around displaced people and cross-border migrants, then very different indicators are likely to be needed. Fragility is likely to have causes that extend beyond GPE's capabilities to ameliorate.

Thus, if fragility and conflict is used as an eligibility criterion, especially for LMICs that would not otherwise qualify, it needs to be clear what being a country affected by fragility and conflict adds to GPE eligibility. Among such countries listed are some small island states that could only absorb a small amount of funding before becoming overly dependent on aid, and others where civil security and other factors are likely to add high levels of risk to educational investment. If "fragile" status provided access to a different profile of GPE support mechanisms, or different volumes and modalities of disbursement, this could be a reason for maintain such a classification related to eligibility. The current system of enhancing eligibility scores by 15 percent for countries affected by fragility and conflict is unlikely to change the status of most of the DCPs. If it does, it is most likely to advantage those with higher levels of educational development and income that would not otherwise qualify.

*Vulnerability* has been suggested as an additional consideration for eligibility. It is currently defined in terms of "large numbers of children not completing primary education."<sup>28</sup> This would seem to be functionally similar to the primary completion rate. If vulnerability is interpreted as the number of out-of-school children relative to those of primary school age, it will produce a result similar to using the PCR or the grade 5 completion rate in terms of classification for eligibility. If the absolute number of OOSC is used as the criteria, rather than the rate, the result would be different in terms of lists of country eligibility.

The indicator used for vulnerability will determine different eligibilities among DCPs. Large programs in a small number of developing country partners would have the largest impact on the global number of OOSC. But this would result in a further concentration of GPE resources in a small number of countries. The relationships between eligibility criteria and allocation formula need to be clearly understood since they are sometimes confused.

Vulnerability is a concept that is difficult to capture in advance of the events to which a population is vulnerable. Measures of exclusion indicate outcomes that have already occurred. Vulnerability is susceptibility to events in the future, which requires judgement and quantification of risk based on previous experience. None of this is easy or very robust, especially if applied to countries affected by fragility and conflict, where data is likely to be patchy and unreliable. The concept of vulnerability needs much clearer definition if it is to be used as a criterion for GPE eligibility. If it produces the same classification as GNI per capita and PCR, then it is adding no value.

# 5.4 Eligibility and Grant Distribution

Eligibility is independent of actual grant distribution, which varies across countries and between years. Over time, the intention is that needs are met equitably across countries according to the GPE criteria. The historic pattern of allocation provides some insight into the distribution of grants across countries. Education sector program implementation grants to DCPs have totaled about US\$3.9 billion since 2003. They represent over 95 percent of all GPE expenditure but only about 45 percent of the number of grants approved. About 24 percent of DCPs have received 60 percent of the ESPIGs by value since 2003. Conversely, 38 percent of all DCP grant recipients have received about 5 percent of the total.

The most recent 2017 indicative maximum country allocations for ESPIGs are consistent with historic practice, with a slightly wider spread across countries. This may reflect the larger number of DCPs that are now recipients. The new formula projects indicative allocations under several assumptions. If the base model is used, the main assumption is that US\$1.4 billion will be mobilized by the next replenishment. It will then be allocated according to maximum country allocations determined by the new formula, which considers primary and lower secondary child population and completion rate, GDP (PPP) per capita, and a 15 percent weighting for countries affected by fragility and conflict with respect to eligibility. The projected allocation for Scenario 1 provides for 24 percent of DCPs receiving 60 percent of funds by value, and 42 percent of DCPs receiving 5 percent of funds as shown below.

The question to ask is whether the patterns of grant allocation are consistent with stated priorities and whether they should be maintained or modified. Needs-based funding formulas devised by GPE "take into account financial needs associated with delivering a certain level of educational services to a given number of children" (GPE, 2015b). The share allocated to each country "will be based on the country's needs in relation to other countries and thus lead to a more equitable distribution of funding across the globe."



#### FIGURE 21 GPE GRANT DISTRIBUTION 2003-2014

Source: GPE Secretariat, 2016.



FIGURE 22 PROPOSED INDICATIVE MAXIMUM GPE GRANT ALLOCATION 2017

Source: GPE Secretariat, 2016.

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Needs-based approaches raise a series of issues. Relative need is different from absolute need, so large countries with many OOSC may have lower relative needs than small countries with small numbers out of school that are large relative to the number of school-age children. Need is related to national aspirations and to baseline starting points. It has to be separated from aspiration. A country may aspire to free upper secondary schooling for all, but does it need it? There is a risk that determining country allocation in relation to the needs of other countries creates a zero-sum game where one country gains at the expense of another. Needs are time sensitive and can change. This adds a layer of complexity to the application of mechanical formulas, since some judgement is needed as to when and over what time period support may be most effective. The conditions that influence impact in different countries are likely to follow different windows of opportunity.

# 5.5 Aid Dependence and Eligibility

DCPs include many countries that receive substantial external assistance for their public finances. The impact of GPE grants depends partly on complementary inputs by other development partners to education and to public finances across different sectors. Aid dependence does not have a singular definition. It has variously been defined as one or more of these circumstances (Lensick and White, 1999): receiving aid above a certain level; receiving more aid than can usefully be utilized; receiving ineffective aid; receiving aid that is needed as a result of previous aid; and receiving aid the need for

which is externally determined by the donor community. None of these conditions should apply to aid that accelerates sustainable development.

Aid dependence is relevant to decisions on eligibility for GPE support. High levels of external support may create dependence and distort domestic decision in favor of externally defined priorities. Aid dependence may make sustainable development financed from domestic revenue more elusive. If external support is intended to be catalytic, leading to transformations that generate sustained development, then it must flow and ebb according to need and impact.

A simple indicator of aid dependence is the value of aid as a proportion of GDP. More than half of GPE-supported countries have over 5 percent of overall GDP accounted for by aid. Fully 35 percent receive more than 10 percent of GDP in external assistance. On average, LICs receive 11 percent of GDP in aid and LMICs receive 4 percent. DCPs typically finance their public budgets from revenues that represent about 15 percent of GDP. Where aid is more than 5 percent of GDP, then more than a third of government spending is externally supported and will be a visible component of politics.

Feasible development plans should include judgements of sustainability that are likely to plan for a falling share of aid as a proportion of GDP over a defined period. Analysis may also suggest that, above a particular threshold, GPE should redirect its resources to DCPs with lower levels of aid



#### FIGURE 23 AID AS A PERCENTAGE OF GDP IN DEVELOPING COUNTRY PARTNERS

Source: World Bank Data Tables 2016: Net ODA received as percentage of GDP.

dependence so that there is a realistic prospect of graduating toward the financing of the education systems from domestic revenue. The alternative of increasing levels of external dependence into the indefinite future suggests development plans need to be revisited to chart pathways toward more autonomous development. Aid dependence and sustainable financing should be a consideration in eligibility.

# 5.6 Results-Based Finance

GPE has adopted results-based financing (RBF), which links approval of education sector plans to the retention of 30 percent of grant monies contingent on performance against agreed-upon indicators. This conditionality is another kind of eligibility. RBF is seen as a means to improve efficiency and effectiveness of public expenditure in general, and aid in particular. It can shift the policy dialogue toward outputs and away from an emphasis on inputs. It may sustain effort over time and ensure that there are detailed discussions about outputs after implementation has commenced, and it may encourage improved data collection that can be used to inform decision making related to the release of tranches.

The GPE funding model provides 70 percent of its funds to a qualifying country when grants are agreed upon after specific criteria are met. These criteria are that (1) ESPs have been endorsed by development partners at the country level; (2) data collection and Education Management Information Systems (EMIS) have been improved; and (3) commitments are made to domestic financing (20 percent of government budget to education) and more external financing.

Making judgements to establish whether these criteria are met is not simple, especially in relation to financing. Current levels of funding depend on many factors, including the size and growth of the school-age population; the cost per student of delivering services at different levels; current and projected participation rates; intra-sectoral patterns of investment in education; balances between public and private funding of services; and goals for present and future participation and investments in quality. It is not currently linked to levels of external assistance and aid dependence.

Under RBF, the residual 30 percent of GPE funding is available after performance-related goals related to the sector, not the grant,<sup>29</sup> are met in relation to (1) equity (girls, disability), (2) efficiency (more efficient, equitable and effective financing), and (3) learning outcomes (unspecified). There are currently no common standards for these performance criteria across countries for equity, efficiency and learning, but there will be "no one size fits all approach" (GPE, 2015b). Definitions and standards will have to be developed to suit each country circumstance. The issues include whether equity is primarily conceived of in terms of income and assets or in terms of social exclusions, whether efficiency should include more than financial considerations, and if learning outcomes have to be specified against national curricula or international benchmarks.

RBF may favor more disbursement to LMICs, as these countries are more likely to have absorptive capacity and infrastructure that can support implementation than are LICs and countries affected by fragility and conflict. The more that the performance of the GPE is judged by performance on difficult-to-achieve goals in difficult development circumstances with a high risk of underperformance, the more likely that the incentives will favor interventions with a lower challenge and higher

<sup>29</sup> If RBF is applied to the sector and not the specific grant, the theory of change may be problematic since it distances the decision makers from the implementing agents.

probability of success. Five key questions are relevant to using RBF to improve the efficiency and effectiveness of grant disbursement and program implementation.

- First, are the incentives and sanctions that modify the behaviors of individuals applicable to governments and ministries of education and finance? RBF typically links payments to indicators of achievement and withholds some funding unless performance targets are met. The assumption is that service providers will be motivated by the rewards to achieve the goals. But do people in organizations behave like this? Do political office holders and public officials feel bound by promises made by their predecessors? How are they motivated by targets set by others and rewards that make no difference to their income?
- Second, what happens when targets defined by RBF are not met? Difficult issues may arise if performance targets for tranche release are not met. How can the cause of underperformance be attributed? If the reasons given for underperformance include insufficient resources or slow release of funds, what is the appropriate response? If targets are not met, is the implication a reduced flow of funds in the future and thus a greater likelihood of deteriorating development outcomes? Do failing schools and school systems need more or fewer resources?
- Third, data on performance must be provided independently by organizations that have no stake in the financial outcomes. If the organization collecting the data for indicators receives funding or other benefits from the sponsor, results may be biased to reflect favorable outcomes. All indicators can be "gamed" unless steps are taken to discourage manipulation of data. Results measured by indicators are difficult to evaluate over a short time period with uncertain baselines and realworld constraints on the design of fair tests and singular attribution of causality.
- Fourth, if governments need to receive performance-related financial incentives in order to achieve development goals, does this indicate a lack of domestic commitment to goals and a lack of trust related to delivery? If incentive payments are necessary to achieve goals, is there a prior problem about motivation and political will? Are outcomes sustainable after the incentive payments have been made? If incentive payments are made after goals have successfully been achieved, what are the activities they finance?
- Fifth, how does RBF respond to the new aspirations of the SDGs to invest in Education for Sustainable Development (ESD) rather than continue to focus on Sustainable Educational Development (SED) (Lewin, 2015b)? ESD means investing in ways that value the future at least as much as the present. RBF generally values results in the near future over those in the longer term that reflect sustainable development. It links payment and reward to defined outcomes over the short lifetime of an (aid-financed) project. Should the discount rate applied to educational projects be low or high? How can RBF value sustainable (educational) development? If sustainability is an integral part of a well-founded education sector plan, then it needs to be translated into what is measured. The unit of analysis must be understood clearly, since it is the overarching ESP and not specific program projects.

These must be answered if established practices of working consistently over longer time periods toward goals and targets are to be replaced with RBF, which relies on narrowly focused and static outcomes that may or may not be sustainable. Critically, the results that RBF seeks to promote must have durability and be resilient over time if they are to be reflected in a credible ESP. They must also be associated with imaginable levels of domestic revenue and finance that do not assume indefinite dependence on external resources. Achieving enrollment, completion and achievement-related goals for this generation of children is insufficient for development. The gains have to be replicated and improved for every future generation of children. The goal is therefore more about developing and embedding financially viable and educationally effective delivery systems than it is about achieving thresholds of performance related to specific indicators. Any viable theory of change has to have a theory of motivation—both for individuals and for individuals in organizations. Otherwise, it is a plan with no people. Making this explicit might lessen gaps between expectations and achievements, and enhance levels of trust between development partners so that financing leads to results rather than results leading to financing.

# **6.0 Financing Sustainable Educational Development** in Developing Country Partners

Financially sustainable development of education systems in developing country partners is central to GPE's mission. It can be facilitated by investments that are designed to contribute to economic growth, fiscal reform, efficiency gains and equitable development of public goods, including preschool and basic education (which includes secondary grades). Both economic growth and social cohesion require new patterns of educational investment that respond to the changing educational priorities of LICs and LMICs.

# 6.1 The Financing Dilemma

The financing dilemma facing developing country partners can be described simply. Europe and North American (ENA) countries raise 43 percent of GDP in domestic revenue, on average. This finances all of their government services, including education. In LICs, domestic revenue only averages 14 percent of GDP, and in LMICs about 18 percent (ICFGEO). This is what supports the public budget.

Public educational spending in ENA countries averages about 12 percent of the government budget, or about 5 percent of GDP (12 percent of 43 percent). In contrast, DCPs that are LICs and LMICs allocate about 16 percent of public spending to education (UIS, 2016). This is well below the normative benchmark of 20 percent suggested by the SDGs and GPE, well above the allocations in high-income countries (UNESCO, 2016). An allocation of 16 percent of the public budget coupled with domestic revenue between 14 percent and 18 percent translates into less than 3 percent of GDP (16 percent of 14 percent = 2.24 percent and 16 percent of 18 percent = 2.88 percent). UIS statistics indicate that spending on education in developing country partners averages about 4 percent. The difference between this and the amount generated by domestic revenue is made up from external resources. Thus, as much as a third of all spending on education in developing country partners may already be aid related.

The proportion of government education budgets spent on primary schools also differs. In the developing country partners, it averages around 47 percent. In Europe and North America, it is less than 24 percent. DCPs have about twice as many school-age children per working adult as countries in Europe and North America. To achieve the same level of participation in a financially viable way, DCPs need to commit much more effort—the result of much less revenue collection, less government spending as a proportion of GDP, and less favorable demography.

The dilemma and the challenge can be explained graphically. Figure 27 shows domestic revenue and amounts allocated to education based on typical values for OECD, LICs, LMICs and UMICs. The



#### FIGURE 24 EDUCATION EXPENDITURE AS PERCENTAGE OF GOVERNMENT BUDGET

Source: UIS online database, 2016.



FIGURE 25 EDUCATION SPENDING AS PERCENTAGE OF GDP



FIGURE 26 EXPENDITURE ON PRIMARY AS PERCENTAGE OF TOTAL EDUCATION

Source: UIS online database, 2016.

parameters together determine the percentage of GDP allocated to education. Using these average values, OECD countries spend about 5 percent of GDP and LICs, LMIC and UMICs only about 3 percent (excluding aid).

DCPs that are LICs and LMICs currently allocate about 3.8 percent and 4.5 percent of GDP to education respectively, according to UIS data. This is considerably more than is generated by allocating 15 percent of the government budget to education since this could only produce less than 3 percent of GDP as shown. The difference between these levels and the 3.8 percent and 4.5 percent shown by UIS-data LICs and LMICs is a result of aid grants and loans to education.

Financial modeling in this report shows that at least 6 percent of GDP would need to be allocated to education to achieve the goals set by the SDGs. To achieve this, LICs and LMICs would have to increase domestic revenue substantially to between 20 percent and 30 percent of GDP, as shown in Figure 28.

Large increases in domestic revenue will not be easy and require a large increase in taxation. It will also require governments to allocate between 20 percent and 30 percent of the public budget to



Source: Author's elaboration, 2016.





education. This is as much as double current spending. These projections represent upper limits on what may be possible. To generate more resources from domestic revenue beyond 30 percent of GDP, or increase the proportion of the budget to education beyond 30 percent, would seem fanciful in all but the long term. In addition, aid to education has stagnated and the appetite to increase the levels of commitment remains to be demonstrated (UNESCO, 2017).

# 6.2 The Cost of Universalization

Detailed modeling for this report indicates that if both primary and lower secondary school were to be universalized in developing country partners, the amounts needed for education would be about 6.2 percent of GDP in LICs and 6.3 percent in LMICs.<sup>30</sup> This is shown in Table 5, with more details in Appendix 6. In scenario 1, typical values of key parameters are chosen for education systems in LICs and LMICs. The key assumptions are that for LICs the starting condition specifies GERs for primary, lower and upper secondary of 85 percent, 50 percent and 20 percent, respectively, and for LMICs 105 percent, 70 percent and 40 percent. Costs per student in LICs are estimated at 8 percent, 30 percent and 40 percent of GDP per capita in LICs, and 10 percent, 25 percent and 40 percent in LMICs. With these levels of enrollment and cost, LICs spend about 3.8 percent of GDP on education and LMICs spend 4.8 percent.

The model shows what would be necessary to achieve full enrollment—that is, GER 105 percent in primary and lower secondary in LICs and LMICs, GER 60 percent at upper secondary in LICs, and

		GER %	Cost per Child USD	% GDP Needed	Total Billion USD	GER %	Cost per Child USD	% GDP Needed	Total Billion USD	"Gap" Billion USD
LICs										
	Primary	85	10	1.5	7.8	105	12	2.3	11.6	3.8
	Lower	50	25	1.0	5.1	105	20	1.7	8.6	3.5
	Secondary									
	Upper	20	40	0.6	2.9	60	30	1.3	6.5	3.6
	Secondary	3	<i>.</i>	07	27	10	200	1 2	6.2	25
	Total	5	400	3.8	<b>19.5</b>		200	6.4	32.9	<b>13.3</b>
LMICs	Primary	105	10	1.6	22.4	105	12	1.9	26.9	4.5
	Lower	70	25	1.2	17.5	105	20	1.5	20.9	3.5
	Secondary									
	Upper	40	40	1.0	13.7	80	30	1.4	20.5	6.8
	Secondary	- -	/00	1.0	1/0	15	200	1 5	21 /	7 4
		5	400	1.0 1.0	14.3	15	200	1.5 <b>4.2</b>	21.4 00 0	21 O
	Ιυιαι			4.0	07.8			0.3	07.0	21.7

# TABLE 5 FINANCE NEEDED FOR HIGH LEVELS OF PARTICIPATION

30 Universal preprimary school would add between 10 percent and 20 percent to these estimates, depending on the delivery methods and costs per child.

GER 80 percent in LMICs—and finance some expansion of higher education. This can be achieved with a little over 6 percent of GDP allocated to education if cost-saving reforms reduce costs per student at lower and upper secondary and higher education. In this model, it would also be possible to increase costs per child at the primary level from 10 percent to 12 percent of GDP per capita to improve quality. However, this scenario still leaves almost half of all children in LICs without access to upper secondary. It does not compute the costs of providing universal access to preschool that would add between 10 percent and 15 percent to the total cost.

The current estimated total public expenditure on education across the LICs is about US\$19 billion and for LMICs US\$68 billion,<sup>31</sup> representing 3.8 percent and 4.8 percent of GDP, respectively. This includes current aid contributions. To reach or exceed 6 percent of GDP would cost at least another US\$12 billion per year for the LICs and US\$23 billion for the LMICs. Most of the additional cost would be in expanded participation in secondary school. The additional cost would be greater for the LMICs than the LICs because their systems are much more expensive.

The amounts needed are much larger than current or planned GPE disbursements. They are also recurrent, and sooner or later would have to be supported from domestic revenue. If DCPs did allocate 6 percent of GDP to education, they could go a long way toward financing universal access to grade 9. However, currently fewer than 20 percent of DCPs spend more than 20 percent of their government budget on education, and 40 percent spend less than 4 percent of GDP on education (of which at least a third is aid related). These are the benchmarks for GPE.

If the share of the government budget for education was not to exceed 20 percent (which is 33 percent greater than is the current average), the amount collected from domestic revenue would have to double from the current average of 16 percent of GDP to over 30 percent to achieve spending on education over 6 percent of GDP. If DCPs did allocate 20 percent of the government budget to education, and only collected 16 percent of GDP in domestic revenue to fund government, then only 3.2 percent of GDP would be allocated to education (20 percent of 16 percent). This is not nearly enough. Thus, achieving substantial increases in the levels of domestic revenue needed to finance government spending on education requires substantial fiscal reform and much more effective revenue collection, and should be a major focus of external assistance.

The financial gaps identified for LICs and LMICs are large and are predominantly recurrent, as opposed to development funding for capital works—though clearly both are important. This means that whatever efforts are made to fill the gaps have to be sustainable into the indefinite future. Most analysts recognize that the volume and the recurrent nature of demand for financing mean that the bulk of financing in all but the short term has to be supported by domestic revenue, especially in developing country partners where private expenditure is severely limited by two-dollar-a-day poverty.

# 6.3 Alternative Financing

There are proposals to boost educational spending to much higher levels (ICFGEO, 2016), such that by 2030 nearly 12 percent of GDP would be allocated to educational spending in the LICs, half of which would have to be provided from development partners to the LICs. The International Commission on Financing Global Education Opportunity (ICFGEO) also anticipates substantial contributions from private households. These very large commitments would have to extend well beyond 2030 since

<sup>31</sup> For the countries in the database that include all DCPs on which there is equivalent data.

they would be financing teachers' salaries. Exiting the arrangement would depend on governments raising enough domestic revenue to sustain whatever gains were made should the appetite for aid to education deteriorate below its current plateau. It would also appear to depend on sustained real economic growth of as much as 7 percent per annum in developing country partners, which would increase real GDP. This may be optimistic.

On average, 48 percent of the population live below national poverty lines in LICs and 35 percent below the poverty line in LMICs, indicating they have no discretionary expenditure. Those at or below the poverty line are not in a position to finance educational development. Private fee-paying schools have expanded but do not provide the poor with access. Charging fees to those at or below the poverty line, or requiring other contributions, has the immediate effect of increasing the number below the income poverty line. Cost structures in LMICs make education above the primary level widely unaffordable for most below the second quintile of household income. Progressive taxation is likely to be a better option than increasing the direct costs of school attendance for poor households.

Complementary sources of providing finance could make useful additional contributions. Some current suggestions from the ICFGEO are listed below with comments on efficacy.

First, there is a need to *invest in greater efficiency and productivity*. School systems in LICs and LMICs are inefficient in terms of the amount of learning and teaching delivered in relation to their inputs. They may also be deficient in quality. School management systems in the public system may not encourage efficient use of scarce resources, teaching workloads may be variable and low, time on task is often compromised by poor infrastructure and uneven supervision and support, and physical plants may not be used effectively. Investment in the existing workforce and infrastructure may be the cheapest way of generating more capacity and enhancing learning and teaching. Identifying where opportunities lie for improved efficiency is a system-specific issue.

Second, *cost recovery is attractive where there is evidence of regressive funding* of education systems in which those from relatively wealthy households persist longer in school—and have more benefit from the common tax base—than those from poorer households. Generating contributions to costs from beneficiaries may be an easier method of raising additional finance than progressive taxation. The scope for cost recovery depends on income distribution, existing levels of taxation and patterns of household expenditure, the socioeconomic characteristics of the flow of students at different levels, and the political appetite to promote Rawlesian equity that gives more to those with least. LMICs have more income distributed more evenly than do LICs, where discretionary expenditure may be small or nonexistent for large proportions of the population.

Third, *levies and taxes can be used to support educational services.* Some countries require employers to contribute to training funds to support Technical and Vocational Education and Training (TVET). In others, a proportion of value-added tax (VAT) is retained and hypothecated to educational investment (e.g., the GETFund in Ghana). There have been various suggestions for a tax on financial transactions, including on remittances from migrant workers and diaspora compatriots. These arrangements can result in complementary funding but tend not to be of a volume sufficiently consistent to support recurrent expenditure. Most recurrent expenditure is related to salaries, and therefore this needs to flow predictably and be protected from short-term fluctuations.

*Impact investing,* which links investment to defined social development outcomes, may be possible if there is a market for it that does not require significant underwriting of risk. In principle, a service

provider contracts to deliver an outcome, e.g., children completing primary school with evidence of minimum levels achievement. The provider gets paid against measured success and bears costs if there is insufficient evidence of impact. Social impact bonds and development impact bonds can take many forms. All depend on the ability to define and measure outcomes without conflicts of interest at modest levels of transaction and administrative costs. They are not appropriate where desired outcomes are medium- to long-term, e.g., sustained employment post-school, since these cannot be assessed in a timely way.

Impact investing requires developed infrastructure and independent institutions. The service provider takes the risk of underperformance and reduced payment. The commissioning agent is exposed to the risk that it will have to recommission or directly deliver the service if the performance is unacceptable. There are also other assumptions—that discrete inputs can be linked to discrete outputs; that investors are available for projects that are judged desirable, including those with high risk; that capital markets function reliably and do not provide much greater returns in other sectors; and that cross-border flows of capital are consistent, reliable, subject to defined legal systems, and have low transaction costs. Cross-national arrangement with fragile states often requires an external guarantor, which may or may not be available.

Nongovernmental resources can be mobilized. Philanthropy, corporate responsibility and private forprofit service providers may all have the capacity to contribute more to educational investment. They are unlikely to want to enter into recurrent commitments. What they can contribute needs to be tailored to the quality of the capital they may wish to provide. The organized private sector in most LICs is very small and may employ less than 10 percent of the labor force. Its resources may not be sufficient to mobilize resources for educational development above a local level. LMICs have larger private sectors with more scope to contribute within frameworks that provide public benefits as well as private satisfactions.

More participation is available at affordable costs. A summary list of cost-saving and costredistributing reform options is presented in Appendix 5. The contribution each option can make is system specific and depends on starting points, political will, and financial and nonfinancial constraints on growth. Prioritization will also be influenced by the existing patterns of enrollment at different levels and the distance that needs to be traveled to reach target enrollment levels.

All new methods of financing education in developing country partners and of mobilizing more finance from international sources should be tested against some key questions:

- Are they suitable for financing recurrent costs or capital investments?
- What are the transaction costs of generating additional resources, and who pays them?
- Do methods of financing education increase indebtedness, and, if so, who bears the cost?
- Is the domestic private sector large enough to be a source of new investment?
- If more investment is needed, is this because of failures in the national capital markets?
- What rates of return will attract additional international finance?
- How will new methods of financing educational services benefit the poorest children?
- If domestic revenue in a developing country partner can be increased by 5 percent of GDP, how would this amount compare to the new resources raised through innovative finance initiatives?

There are many structural changes that could facilitate greater enrollment rates and expanded access without diminishing quality. Greater productivity could also lead to enhanced salaries for

teachers, with manageable cost implications, as it does in high-participation systems. There are many possible methods of cost sharing and cost recovery that could be facilitated. Central policy questions are which relationships should be facilitated, how they should be regulated, and to what extent public subsidy should be directed toward which kinds of nongovernmental providers.

# 7.0 Key Issues from the Analysis

The Global Partnership for Education was established to meet educational development needs in lowincome countries. The Sustainable Development Goals provide a framework for addressing the most pressing challenges. These include ensuring every child completes primary school, managing the expansion of access to secondary school, providing all children with access to preschool, and controlling the public costs of growth in higher and further education.

Additional investment is needed to enhance quality and raise levels of achievement. Inequalities will grow unless public financing promotes equitable participation at all levels. Pro-poor public financing will necessarily remain at the core of the education policy agenda in developing country partners. GPE support can leverage progress toward its goals of more equitable provision that is delivered more efficiently and effectively through its program of grants and technical assistance.

# 7.1 Twelve Findings

This review highlights 12 findings that will shape the future as poor countries transition to higher levels of development.

First, there are five factors that affect educational participation and outcomes. These act at the level of the individual, household, community, education district, and schools and classrooms children attend. Theories of change that inform national and local plans supported by GPE need to consider development support and causal pathways at each level, and in the interactions between levels. Thus, children have different *individual* capabilities and changing motivations and aspirations. These influence the extent to which they attend formal schooling and the things that they learn. The *house-holds* in which children live shape educational participation and experience. Families have different levels of cultural capital and different abilities to support the costs of schooling. Both individuals and their households are influenced by *community*-level social, political and economic aspirations and expectations around schooling. These factors are complemented by the *management and resources* provided by authorities above the level of the school, which support the infrastructure on which learning depends and which employ teachers, provide school buildings, and ensure the availability of learning materials. The fifth factor is the organization of learning at *school and classroom* levels through the curriculum and pedagogic practice that determines worthwhile educational outcomes.

Second, flows of children through education systems can be analyzed in terms of zones of inclusion and exclusion. Seven zones have been identified that are analytically powerful in unpacking which kinds of problems exist at which level of the school system. Key issues of access, progression, dropout and learning achievement have different manifestations in different zones and at different levels. Supply- and demand-side bottlenecks differ for younger and older learners, as do exclusions related to poverty, location and gender. **Zone 0** refers to children *excluded from preschool;* **Zone 1** includes children who are *not enrolled and may never attend primary school;* **Zone 2** is children *who are*  excluded and drop out after initial enrollment in primary school; **Zone 3** contains children included in primary school but at risk of dropout; **Zone 4** embraces children who fail to transit to secondary education; **Zone 5** identifies children who have dropped out of secondary grades; **Zone 6** refers to children included in secondary school but at risk of dropping out. Silent exclusions are a problem at all levels when age, attendance, achievement levels and other factors interact to compromise learning outcomes. Many children are nominally enrolled but are failing to reach appropriate levels of achievement.

Third, extensive analysis of flows of children through schools in developing country partners results in the identification of five different types of education systems. Effective policy and planning depend on understanding historic and current patterns and profiles of growth. The five education system types can be described in terms of their profile of enrollment by grade: (1) convex, (2) highly convex, (3) linear decline, (4) concave and (5) linear full enrollment, as shown in Figure 29.

Education systems may evolve from Type 1 (low enrollment rates), through Type 2 and Type 3 (very high initial enrollment with high dropout, with gradually reducing over-age entry and repetition) to Type 4 (full primary enrollment and a majority completing lower secondary) and Type 5 (full enrollment to grade 9 and beyond). Differences between LICs and LMICs are consistent with this model of progression, and countries falling into each group are identified in this review.

If education systems did evolve through stages, then transitions from one to another could be managed by replicating the actions of the countries that succeeded in achieving high enrollments. This is the default position of much policy dialogue at the international level: it assumes that highperforming countries offer lessons that can be from high performing countries and translated into



#### FIGURE 29 TYPES OF ENROLLMENT BY GRADE

*Source:* Author's chart based on aggregated enrollment data.

advocacy for reforms in countries that lag behind in educational development. However, if the evolution of enrollments were sequential through the types, it would almost certainly be very inefficient. Type 2 systems are wasteful because they over-enroll by a factor of two or more in grade 1, followed by extremely high dropout rates and high costs per successful graduate. If no more than half the children who enter grade 1 reach the end of the primary cycle, many additional years of primary school are needed to produce one graduate.

If the patterns established in Type 2 systems remain in place for a decade or more, as is the case in some developing country partners, then these systems have transitioned from one kind of equilibrium—low enrollment and high dropout—to another: very high initial enrollment and very high dropout. The policy challenge is to establish whether it is possible to move directly from a Type 1 pattern directly to a Type 4 pattern and then Type 5, especially for those LMICs that are Type 1. Current theories of change do not dwell on what would be necessary to manage enrollment growth to leapfrog from Type 1 to Type 4.

Fourth, DCP education systems can also be profiled by gendered participation. There are four different patterns of gendered exclusion: (1) strong exclusion of girls in all grades; (2) weak exclusion of girls in primary, strong exclusion at secondary; (3) near equity in primary and weak exclusion of girls at secondary; and (4) gender equity in all grades. A fifth pattern may emerge where some DCPs have more boys than girls enrolled, especially in the higher grades. This is beginning to be true, more so in LMICs than in LICs, and is often true in middle- and high-income countries.

In Figure 30, DCPs with Pattern 1 have differential enrollment by gender throughout their education systems. They have a low level of overall participation for both boys and girls. Countries with Pattern 2 have fewer than 45 percent girls enrolled through primary. This kind of exclusion is often concentrated among particular subpopulations, e.g., the poorest households, specific social groups and geographic areas. Pattern 3 countries have equal enrollments of girls and boys up to the end of primary if equity is defined as participation of girls = 50 percent +/- 2 percent. The problem in these countries is that at secondary level girls' participation falls off. The common reasons are over-age progression through primary, early marriage, underachievement, low returns for household investment, and social prejudices against the education of girls. Pattern 4 necessarily exists where there is full enrollment. It also exists where there is less than full enrollment but equitable participation through all grades. The best way to achieve Pattern 4 is to ensure that all boys and girls remain in school to completion. Achieving Pattern 4 without universal completion falls short of the ambition of SDG 4. A substantial risk across all DCPs is that in 2030 the participation of boys will have fallen such that values of the GPI will often exceed 1 as older boys leave school at a greater rate than older girls.

Nearly half of DCPs have Pattern 4 and about 25 percent Pattern 3. In Pattern 1 countries, 80 percent of girls and boys have similar enrollment status. In Patterns 2 and 3, 90 percent of girls and boys have the same participation rates. In most countries boys out enroll girls, but in several Type 4 countries more girls are enrolled, especially in the higher grades. There is an association between LIC and LMIC status and patterns of enrollment by gender. Patterns 1 and 2 are more common in LICs and Patterns 3 and 4 in LMICs. The association is blurred at the boundaries, and some DCPs do not fit the pattern. The most obvious explanation is that cultural preferences related to gender and education are largely unrelated to national wealth. More generally, in many developing country partners girls who are enrolled tend to be younger than boys. This is true for 17 African countries in the SACMEQ assessment system. The problems may be more about keeping older girls in school and on schedule than about entry into school.



# FIGURE 30 PERCENTAGE OF GIRLS BY GRADE IN DEVELOPING COUNTRY PARTNERS WITH ILLUSTRATIVE CASES

Source: UIS online database, 2016.

Fifth, current theories of change are not based on time series data on the evolution of systems that flags what has been achievable in the past. In some countries, grade-specific participation has remained quite static, while in others, there have been rapid improvements. For some, the most rapid growth has been in the early grades of primary, whereas others have seen growth spread across the grades. In many countries, secondary enrollments have remained low despite large increases in primary completion rates.

Development strategies for DCPs are largely undifferentiated by system type. However, the system type determines starting positions and distance to travel to goals, and is mediated by varying capacity and political will to allocate resources. Some patterns of expansion are likely to be unsustainable financially, and some may exacerbate increased inequality. Lessons need to be learned from past patterns of development to inform credible planning. Flows of students constrain rates of growth and determine costs that may or may not be sustainable.

The most likely patterns of educational development are those that replicate the past. The profile of growth over the last decade is the best indicator of the profile of growth over the next decade; trend analysis can suggest what is most likely to happen in the future, all things being equal. This is the point of departure for programs and projects. Evolutionary change of systems can persist indefinitely. Radical shifts in policy depend on events that change the direction and momentum of development but then revert to evolutionary change. The former needs nurturing and nudging to consistently improve system-level outcomes; the latter generally requires large investments in infrastructure, persistent political will and sustained consensus about goals.

Sixth, most DCPs have very unequal patterns of access to education and of achievement. Low household income consistently excludes more than location and more than gender, but all are important correlates of exclusion. Critically, there is some suggestive evidence that improved participation can advantage the already advantaged, especially where access to higher levels of schooling has costs that exclude the poorest, and where privatization results in rationing of opportunity by price. The chances are that children from middle-income households are likely to benefit more from the expansion of secondary school, especially if there are significant direct costs to households for attendance. Concentration curves of inequality show this is happening. LICs are more unequal than LMICs, though there is considerable overlap between the two groups of countries, suggesting that inequality is susceptible to policy intervention.

Seventh, expanded access and enhanced learning require considerable investment in infrastructure. In LICs, the number of additional school places needed between now and 2030 is about 40 million at primary and 70 million at secondary. In LMICs, less expansion is needed but still amounts to about 25 million at primary and 55 million at secondary. If two-year preschool is universalized in a school environment, this adds another 35 million places in LICs and 25 million in LMICs. This would require much higher levels of investment in physical infrastructure, especially at higher levels, to enable LICs to double current capacity at secondary levels and LMICs to increase capacity by about 50 percent over the next 15 years. Across the LICs and LMICs, this translates into about 500,000 new primary and secondary schools that could cost about US\$60 billion in LICs and US\$100 billion in LMICs, or at least US\$10 billion per year over the 15 years to 2030.

DCPs will have to devise ways of delivering educational services at affordable costs. Small schools can be very expensive, especially at the secondary level, and may be four or more times the cost per student of larger schools, and much more if they are boarding schools. New designs are needed for secondary schools that can deliver a full curriculum at costs that can be financed, especially at secondary levels. Preschool facilities should be linked to primary school sites and share facilities where feasible.

Large numbers of schools in LICs and LMICs do not have a full range of reliable services. These include electricity, clean water, sanitation, and transport. Innovative finance mechanisms and philanthropy are more suited to support investments in infrastructure than to support recurrent costs. Internet connectivity is essential, yet the reality is often far from the possibility. Many teacher-education institutions and most schools do not have reliable connectivity. IT services and internet access may be charged at global prices that are unaffordable. New strategies are needed that make internet services available to all learners in schools. Telecoms and IT companies could offer free internet access to educational institutions as a condition of licensing. Development partners could invest in copyright-free learning materials related to national curricula and make them freely available online to all learners.

Eighth, the number of primary teachers needed in LICs and LMICs will need to increase 50 percent or more by 2030 to account for population growth and reductions in pupil-to-teacher ratios. The number of lower secondary teachers will have to more than double if lower secondary is to be universalized. In LICs, most of the growth in demand will be at the primary level unless demographic transition is more widespread. In LMICs, most of the growth in demand for new teachers will be at the secondary level. Overall, DCPs will need to recruit and train about 17 million new teachers by 2030. More than two-thirds of these new teachers will be secondary teachers if access is provided to all children to the end of secondary school by 2030.<sup>32</sup>

Most of those teaching in 2030 will not have been teaching in 2015. The next wave of expansion at the secondary level requires trained teachers who have degree-level subject knowledge and understanding and are not employed casually. That is what rich parents demand and what middle- and low-income children deserve. Arguably, the same is true of preschool and primary school teaching when teaching is configured as a profession rather than a job to be undertaken by unqualified teachers who are paid by the lesson. There is an opportunity to invest in diverse pathways into teaching and establish which are most cost-effective and suited to circumstance. Teaching assistantships offer opportunities to work while training on the job. College-based systems can be complemented by school-based training and mentorship. New modalities of training, with managed continuing professional development over a career lifetime, should replace single-shot pre-career certification. Teaching may not be a lifetime career for all those who enter the profession. In some developing country partners and in some school subjects, the half-life of a trained teacher (i.e., the time it takes for half those trained to leave the profession) may be less than five years. If so, methods are needed to manage both those who may leave early and those who remain for their entire career.

Ninth, curriculum and pedagogic issues are critical to learning achievement. Although much has been invested in diagnosis and intervention in early-grade reading and mathematics, other subject areas, curricula in higher primary grades, and the secondary curriculum have been widely neglected. Many DCPs still have secondary curricula designed for academically selected groups of students, reflecting a legacy of highly selective secondary systems designed to meet the needs of elites. Technical and vocational education and training curricula are often more supply driven than demand led. Mass participation in lower and upper secondary school requires large-scale curriculum reform and pedagogic innovation to meet new needs and respond to a wide range of capability among the next generation of young adults. Multigrade and other innovative pedagogies can expand access, especially in small secondary schools, and enhance achievement. Preschool provision is now widely recognized as critical to child development. Delivery modalities can vary widely. The content and pedagogy of preschool need to be developed within different cultures and child-rearing practices. Systems for provisioning and for quality assurance need to be established.

Expanding education access to all 15-year-olds creates new challenges of how best to manage flows of students into labor markets and higher and further education. These flows are poorly understood in many developing country partners and there is little data. Labor markets are changing rapidly, and employable knowledge and skill are shifting. Thus, 20th century skills will remain highly relevant in labor markets in LICs and LMICs and will coexist with 21st century skills. Science, technology, engineering and math subjects are poorly learned and taught—yet in most economies employment prospects are much better for those with STEM skills, and product and process innovation depend on the kind of problem solving that STEM subjects promote. Investment in curricula relevant to labor markets in different developing country partners is a priority if expanded access is to have an impact on economic development.

Tenth, investments in assessment systems at school levels are crucial to system management, curriculum reform, and the development of formative assessment systems that can help manage

<sup>32</sup> The number of teachers needed is dependent on the change in the population of school-age children, the change in enrollment rates, the pupil-toteacher ratio and the rate of teacher attrition. This yields the results shown in Table 4 using aggregated data from across the LICs and LMICs.

learning at school and classroom levels so that no child falls behind. Formative assessment linked to national curricula is widely absent in developing country partners and should be part of any investment program to manage enhanced learning. It is essential to effective school management.

National systems of qualification and certification are central to the development of modern labor markets and to the promotion of social cohesion. In most DCPs, public examinations determine and legitimize who gets what in terms of employment and social role selection. If they do not reliably certify competencies in a fair manner, then the scarce opportunities for jobs and higher education will be misallocated. Investment in robust, equitable and curriculum-driven assessment systems is therefore of considerable importance as modern sector employment grows.

Formative evaluation linked to classroom practice, and to improved high-stakes selection examinations that have positive backwash into the curriculum, is likely to have more impact on learning achievement than low-stakes national monitoring assessments. Institutionalizing formative assessment is a challenge for the various initiatives that link assessment for learning (e.g., LMTF, 2015).

Eleventh, eligibility determines which countries and programs qualify for GPE support. Currently, the criteria include all LICs with GNI per capita below US\$1,035 (36 countries), all small island and landlocked developing states, or SILDS (18 countries), and LMICs with GNI per capita between US\$1,035 and US\$2,560 and a primary completion rate of less than 85 percent. In addition, fragility and vulnerability are considerations (GPE, 2017a).<sup>33</sup> A new framework for eligibility was introduced in 2017 and is currently being implemented. From this analysis, there are some key issues for eligibility:

- Between one-third and half of LICs will graduate to become LMICs, depending on whether country-level projections of growth are robust and whether the threshold GDP per capita for LICs stays the same. About a quarter of LMICs may become UMICs with per capita GDP at or above US\$4,125. DCPs in transition may be disadvantaged if they abruptly fall out of eligibility.
- Current criteria do not actively assess distribution and equity. Where income and educational inequality are high, the most disadvantaged in LMICs may resemble the disadvantaged in LICs. If the unit of analysis is the excluded child, then those in richer countries with high levels of exclusion may be considered as eligible as those in the poorest countries.
- Primary completion rates cease to be a useful indicator of progress when they exceed 90 percent, not least because it is difficult to measure them with a high degree of precision because of uncertainties in the school age population and in repetition rates. Lower secondary completion rates are likely to be a preferable indicator. Investment is needed to link these to performance, as measured by high-stakes selection assessments, to give an indication of which national curricula competencies are being robustly acquired.
- Grade-by-grade age-specific enrollment rates are helpful in providing more nuanced indicators of
  progress toward universal access. They draw attention to the dynamic flow-related aspects of enrollments and can be analyzed in different ways to inform policy and planning that is sensitive to
  historical patterns, constraints on growth, and consequences for teacher supply and school construction. Dynamic planning iterates goals and strategies against data-driven indicators of development.
- Patterns of grant distribution between countries are such that, historically, about 60 percent of GPE grants by value have been allocated to 24 percent of the members, and 5 percent by value

<sup>33</sup> There are now five kinds of GPE funds: education sector program implementation grants (ESPIGs) provide funding up to US\$100 million to finance the implementation; education sector plan development grants (ESPDGs) provide funding of up to US\$500,000 to develop or improve education sector plans; knowledge and innovation exchange grants (KIX—US\$60 million) and advocacy and social accountability grants (ASA—US\$60 million) provide support for implementation and dissemination of good practice. Leverage funds totaling US\$100 million are available to DCPs that do not otherwise qualify for grants.
have been allocated to 38 percent of members. The dynamics are complex. No single algorithm will result in equitable distribution across multiple criteria. Balances should be sought over a time period of, say, five years and not every year.

• Results-based financing that retains 30 percent of grant allocations contingent on performance against agreed-upon indicators is incorporated into GPE grants. This review identifies many issues with this approach to funding and the underlying presumption that incentives and penalties are appropriate to aid relationships. There are risks that transaction costs can be significant and payment is rarely suspended, and that accountability is reduced if the unit of performance is the education sector plan rather than the program. The social psychology of motivation for individuals is not the same as the sociology of organizational adaptation to top-down, goal-focused planning.

Twelfth, there are several conclusions from the financial modeling that are particularly relevant to DCPs graduating to much higher levels of enrollment and making greater investments in quality. Investment strategies not only have to close the gaps that exist between domestic revenue and demand linked to the ambitions of governments and the SDGs, but also have to be within plausible recurrent resource envelopes. These are bounded by economic realities and feasible levels of political will that are sustainable.

- 1. More than 6 percent of GDP is needed for education to achieve GPE goals and more than 20 percent of the government budget for education. Reaching either of these two benchmarks associated with the SDGs will be a major challenge for most DCPs. Plans funded under ESPIGs have to develop financial allocation systems that are plausible and linked to what can realistically be delivered with different levels of domestic revenue allocation and external assistance. These plans need to be cast within medium-term estimates of likely resources, not just short-term annual work plans and budget cycles lasting less than three years. The ambition is that funding can be used catalytically to move national systems toward high enrollment patterns with investments in quality and equity. This means identifying and implementing reforms that result in more efficient and effective delivery systems that fit within plausible budget growth. Many of the possible reforms are already known and can be shared and linked to sector-level analysis of bottlenecks and opportunities.
- 2. The financing equation has both fixed and variable elements. The proportion of children in the population is fixed until changing fertility and infant mortality rates result in demographic transitions. The goal of universal access at different levels is also fixed, though the time over which it may be achieved can be varied. In contrast, costs per child can be changed. As DCPs develop and graduate from being LICs, more efficient methods of organizing learning will be needed so the ratio of costs per child in primary/lower secondary/upper secondary levels begin to converge toward less than 2:1, as is the case in the OECD and other high-participation countries. This is inevitable, and GPE should encourage and support graduating countries to achieve the transition in cost structures and delivery systems that will be needed.
- 3. LMICs have income distribution patterns that mean the full costs of schools staffed by qualified teachers are beyond the means of at least half of all households, especially above primary school level. Those at or below the poverty line cannot be asked to finance school attendance without increasing the numbers in poverty. This also risks counterproductive substitutions of household expenditure among the poorest, e.g., school fees compete with expenditure on food and on preventive health interventions, and the possibility of those with no assets contracting unsustainable debt.
- 4. A balance has to be struck between financing quality improvement and expanded access at different levels. What is appropriate is a policy choice determined in part by current patterns (especially distance from universalizing primary and assessments of quality and levels of achievement), and

partly by domestic prioritization (especially the choice of expanding lower secondary while managing publicly financed growth at upper secondary and higher education). Enrollment patterns, the direction and pace of change in LICs' and LMICs' education systems, and levels of inequality all condition what is possible and what is desirable.

5. The last point is that it is essential to develop credible plans that mobilize the external finance that may be available. For those countries that are aid dependent, and which are often also fragile with limited capacity and infrastructure, external assistance can play a catalytic and transitional role in transformation toward domestically financed mass education systems. New circumstances challenge development partners to reexamine what their roles should be and how the resources they influence may best be used to create sustainable financing that does not generate new debt for borrowers or lenders.

Other sources of finance should be explored. Possible mechanisms include education bonds, impact investing, levies and hypothecated taxes, debt swaps and leveraged loans, and disaster insurance. None seem likely to generate finance in the volume necessary to meet the needs identified. These mechanisms are generally unsuited for financing recurrent costs, e.g., teacher salaries, for indefinite amounts of time into the future. So also are leveraged loans that displace accountability for repaying debt onto future generations in developing country partners and in donor countries.

There are many structural changes that could facilitate greater enrollment rates and expanded access without diminishing quality. Greater productivity could also lead to enhanced salaries for teachers, with manageable cost implications, as it does in high-participation systems. There are many possible methods of cost sharing and cost recovery that could be facilitated. Central policy questions are which relationships should be facilitated, how they should be regulated, and to what extent public subsidy should be directed toward nongovernmental providers.

Public financing must be sustainable and linked to domestic revenue. About 10 percent of GPE countries receive more than 20 percent of GDP from external finance, and half receive more than 5 percent of GDP in aid receipts. On average, 7 percent of GDP is received by DCPs in aid flows. Where domestic revenue is only 15 percent of GDP, this means those countries are dependent on aid for half of their government budgets. This sets a long-term ceiling on the magnitude of external assistance that can lead to sustainable development rather than indefinite dependence.

If external finance is made available to support progress, it needs to be provided in ways that lead to sustainable financing from domestic revenue. Otherwise, dependence will become a permanent feature of national budgets and, increasingly, recurrent costs, including salaries of teachers, will be financed from aid. The support must therefore be catalytic and designed to lead to system-level reforms, rather than to fill short-term gaps in financing capacities by governments. How much support is proportional and sustainable has to be judged in relation to need, capacity and political will.

#### 7.2 In Conclusion

The implications of this new analysis for future GPE grant support are considerable. The patterns of enrollment indicate different starting points for strategic planning, with varying pathways toward system-level goals that may not be the same across countries. There will be diverse preferences and priorities within each education system, and very different histories and starting points. The grant development process should recognize the differences. If it does, there will be disparate patterns of support in various DCPs.

There is now a need for eligibility criteria and balanced investment programs that reflect the dynamic aspects of system growth proven to determine sustainable growth in participation and learning. Theories of change need to be based on empirical insights from the past about how systems actually behave, rather than how in an ideal world they should or could behave. The basis for generating these theories is provided by this analysis of existing patterns of growth.

The challenge of sustainability is to depart from piecemeal, short-term external inputs to national systems designed to produce "quick wins" in the participation of some groups. These wins tend to come at the expense of evolutionary gains in valued outcomes that are sustainable over the medium term across systems. If GPE support going forward looks similar in character to that of the past, then it will not have responded to the core sentiment of the SDGs that finance and development are about tradeoffs of the present to protect and build the future.

A core dilemma is finding a balance between investing in the margins (thus reaching the most marginalized) and investing in the core of education systems so that they expand to be inclusive of the margins. Problems associated with uneven patterns of participation between social groups, and with low levels of learning achievement across broad swathes of learners, are better understood as problems with the core of the system rather than problems of the most marginalized. The question is whether the margin should merge with the core or the core reach out to the margin.

Different development strategies will suit different DCPs. Low-enrollment LICs may still need more support for infrastructure to provide physical access to all children and to ensure that learning materials and trained teachers are available in sufficient quantity. LMICs and graduating DCPs will see their priorities shift toward improving levels of learning achievement, universal secondary schooling with diversified curricula reflecting a range of capabilities and aspirations, reductions in educational inequalities within countries and between schools, and more emphasis on curriculum development, school effectiveness and school improvement. LMICs and LICs will need to invest sub-stantially in infrastructure to provide the buildings, learning materials and information technologies needed to support learning between the ages of 12 and 18. Eligibilities for GPE support need redefining in the light of progress and changed aspirations to meet new needs.

If the purpose of aid to LMICs is to accelerate development toward sustainable outcomes in education, then two things are essential. Aid must be focused on areas where there is a comparative advantage and long-term benefits, and aid must be configured so that it is no longer needed at some point in the foreseeable future. This means that medium-term sector plans should locate external assistance within a framework of sustainable development. It also implies that aid to education is not primarily about meeting short-term targets defined by cross-sectional indicators, but rather about whether the achievements it supports can be sustained for the next generation of children, and the next. This valuing of the future over the present was the core idea of the Brundtland Commission on Sustainable Development and Our Common Future<sup>34</sup> in 1987. It should inform the next generation of external assistance to LMICs and LICs, and should lead to sustainable recurrent financing and consistent improvements in access, learning and equity that do not generate debt or transfer income and assets from education services of poor countries to rich countries. In the spirit of the SDGs, the next generation of investment in educational development should ensure that we are all the members of the crew of planet Earth, contributing to well-being and sustainable development, and that none of us are simply passengers.

<sup>34</sup> The Brundtland Commission, http://www.un-documents.net/our-common-future.pdf.

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#### **APPENDIX 1: Time Series Enrollment by Grade, 2000–2014**

















Grade











Nepal







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Grade

















Source: UIS Online Database, 2016.

### APPENDIX 2: DCPs Ranked by Equity in Primary Completion (Weighted Index)<sup>35</sup>

LICs	Rank	LMICs	Rank
Niger	1	Côte d'Ivoire	7
Mozambique	2	Cameroon	11
Guinea	3	Mauritania	12
Central African Republic	4	Nigeria	13
Burkina Faso	5	Senegal	18
Liberia	6	Pakistan	21
Chad	8	Yemen	22
Ethiopia	9	Congo	23
Madagascar	10	Lao PDR	25
Mali	14	Zambia	29
Uganda	15	Ghana	31
Haiti	16	Sao Tome and Principe	32
Burundi	17	Lesotho	36
Тодо	19	Nicaragua	38
Benin	20	Honduras	39
Rwanda	24	Guyana	41
Democratic Republic of Congo	26	Kenya	43
The Gambia	27	Vietnam	44
Malawi	28	Mongolia	45
Sierra Leone	30	Albania	46
Cambodia	33	Kyrgyzstan	47
Tanzania	34	Moldova	48
Nepal	35		
Comoros	37		
Bangladesh	40		
Zimbabwe	42		
Weighted Average	19	Weighted Average	31

Source: Authors computation, 2016.

35 Most unequal listed first.

Definitions	Ever Been tr School [ever0]	0	In Primary School [in1]	Primary Completion com1]	In Lower Secondary School [in2]	Lower Secondary Completion [com2]
Initial level of the indicator						
Very low level	<= 50%		<= 50%	:= 30%	<= 50%	<= 10%
Low level	> 50% and <=	= 75%	> 50% and <= 75% >	· 30% and <= 50%	> 50% and <= 75%	> 10% and <= 20%
Intermediate level	> 75% and <=	= 90%	> 75% and <= 90% >	· 50% and <= 75%	> 75% and <= 80%	> 20% and <= 40%
High level	~ 90%		> 90%	. 75%	> 80%	> 40%
Ever been	Very low level			Guinea, Niger		Burkina Faso, Ethiopia,
in school	Low level	Pakistan		Chad, Madagascar, S	enegal	Mali, Sierra Leone Benin, Burundi, CAR, Côte d'Ivoire, The Gambia. Mozambique
	Intermediate level	Bangladesh, Cai Nigeria	meroon, Mauritania,	Cambodia, Congo De Liberia, Rwanda, Tar	:m. Rep., Lao PDR, izania, Yemen	Comoros, Ghana, Haiti, Nepal, Togo
	High level	Albania, Congo, Kenya, Kyrgyzsta Tome and Princi	Guyana, Honduras, an, Malawi, Moldova, S pe, Uganda, Zimbabwe	Lesotho, Mongolia, V ao	ietnam, Zambia	Nicaragua
In School primary (in1)	Very low level			Burkina Faso, Guine	a, Mali	CAR, Ethiopia, Liberia, Niger, Sierra Leone
Primary	Low level	Chad, Nigeria, P Tome and Princi	akistan, Rwanda, Sao pe, Senegal	Burundi, Comoros, T Honduras, Lao PDR,	he Gambia, Yemen	Benin, Côte d'Ivoire, Congo Dem. Rep., Haiti, Madagascar, Mozambique, Nepal, Togo, Tanzania, Zambia
	Intermediate level	Albania, Bangla Mauritania, Uga	desh, Cameroon, Keny nda	a, Cambodia, Lesotho,	Malawi, Nicaragua	Ghana
	High level	Congo, Guyana,	Kyrgyzstan, Moldova	Mongolia, Vietnam, <sup>7</sup>	2imbabwe	

Primary completion (com1)	Very low level	Guinea, Niger, Rwanda	Burkina Faso, Burundi, CAR, Chad, Madagascar, Mozambique	Benin, Ethiopia, Mali, Senegal, Sierra Leone, Togo
Completion	Low level	Côte d'Ivoire, Uganda	Comoros, Haiti, Liberia, Malawi, Mauritania	Cambodia, Congo Dem. Rep., The Gambia, Lesotho, Nepal, Tanzania
	Intermediate level	Cameroon, Congo, Lao PDR, Nigeria, Pakistan, Sao Tome and Principe, Yemen	Bangladesh, Ghana, Honduras	Nicaragua, Zambia
	High level	Albania, Guyana, Kyrgyzstan, Moldova	Kenya, Zimbabwe	Mongolia, Vietnam
In school secondary (in2)	Very low level	Tanzania	Côte d'Ivoire, Guinea, Niger, Senegal	Burkina Faso, Burundi, CAR, Ethiopia, Mali, Rwanda, Sierra Leone
Lower Secondary	Low level	Chad, Mauritania, Mozambique, Nigeria, Pakistan	Albania, Benin, Cambodia, Cameroon, Gambia, Honduras, Lao PDR, Zambia	Comoros, Congo Dem. Rep., Madagascar, Nepal, Togo
	Intermediate level	Bangladesh, Haiti, Lesotho, Malawi, Yemen	Uganda	Ghana, Liberia, Mongolia, Nicaragua
	High level	Congo, Guyana, Kenya, Kyrgyzstan, Sao Tome and Principe	Moldova, Vietnam, Zimbabwe	
Lower completion (com2)	Very low level	Burundi, CAR, Mozambique	Burkina Faso, Ethiopia, Madagascar, Niger, Tanzania	Benin, Rwanda, Senegal, Togo
Secondary Completion	Low level	Comoros, Côte d'Ivoire, Lao PDR, Malawi, Uganda	Chad, Mali	Cambodia, Guinea, Sierra Leone
	Intermediate level	Cameron, Lesotho, Sao Tome and Principe	Bangladesh, Congo, Honduras, Liberia, Mauritania	Congo Dem. Rep., ThGambia, Haiti, Nepal, Nicaragua, Zambia
	High level	Albania, Guyana, Kyrgyzstan, Mongolia, Nigeria	Kenya, Pakistan, Moldova, Yemen	Ghana, Vietnam, Zimbabwe

•		•		
Indicator School (ever0)	Level of Indicator	Moving Slow or No Progress	Some Progress	Strong Progress
Ever been to school	Very low level			Burkina Faso, Ethiopia, Guinea, Mali, Niger, Sierra Leone
	Low level	Burundi	Côte d'Ivoire, Madagascar, Pakistan	Benin, CAR, Chad, The Gambia, Mozambique, Senegal
	Intermediate level			Bangladesh, Haiti, Rwanda
In School primary (in1)	Very low level		CAR	Burkina Faso, Ethiopia, Guinea, Liberia, Mali, Niger, Sierra Leone
Primary	Low level	Haiti, Madagascar, Sao Tome and Principe, Tanzania	Comoros, Honduras, Lao PDR, Nigeria, Pakistan, Rwanda, Senegal, Yemen, Zambia	Benin, Burundi, Chad, Côte d'Ivoire, Congo Dem. Rep., The Gambia, Mozambique,
	Intermediate level	Albania, Cameroon, Ghana, Kenya, Lesotho, Malawi, Uganda	Bangladesh, Cambodia, Mauritania, Nicaragua	Nepal, Togo
	High level	Congo, Guyana, Mongolia, Moldova, Vietnam	Kyrgyzstan, Zimbabwe	
Primary completion (com1)	Very low level	Burundi, CAR, Madagascar	Burkina Faso, Ethiopia, Rwanda	Benin, Chad, Guinea, Mali, Mozambique, Niger, Senegal, Sierra Leone, Togo
Completion	Low level	Côte d'Ivoire, Lesotho, Mauritania	Comoros, Congo Dem. Rep., Liberia, Malawi, Nepal	Cambodia, The Gambia, Haiti, Tanzania, Uganda
	Intermediate level	Congo, Ghana, Honduras, Nicaragua	Bangladesh, Cameroon, Lao PDR, Nigeria, Pakistan, Zambia	Sao Tome and Principe, Yemen
	High level	Albania, Guyana, Kenya, Kyrgyzstan, Mongolia, Moldova	Vietnam, Zimbabwe	

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In School lower secondary (in2)	Very low level	Tanzania	Burundi, CAR, Côte d'Ivoire	Burkina Faso, Ethiopia, Guinea, Mali, Niger, Rwanda, Senegal, Sierra Leone
Lower	Low level	Albania, Madagascar, Mauritania, Nigeria	Cameroon, Chad, Comoros, Honduras, Pakistan, Zambia	Benin, Cambodia, Congo Dem. Rep., The Gambia, Lao PDR, Mozambique, Nepal, Togo
Secondary	Intermediate level	Bangladesh, Ghana, Haiti, Malawi, Mongolia, Nicaragua, Yemen	Lesotho, Liberia, Uganda	
	High level	Congo, Guyana, Kyrgyzstan, Moldova	Kenya, Sao Tome and Principe, Vietnam, Zimbabwe	
Lower Secondary completion (com2)	Very low level	Burkina Faso, Burundi, Madagascar, Niger, Togo, Tanzania	Benin, CAR, Rwanda	Ethiopia, Mozambique, Senegal
Secondary	Low level	Chad, Côte d'Ivoire, Malawi	Mali, Sierra Leone	Cambodia, Comoros, Guinea, Lao PDR, Uganda
Completion	Intermediate level	Mauritania, Nicaragua	Cameroon, Congo, Congo Dem. Rep., Haiti, Honduras, Liberia, Nepal, Zambia	Bangladesh, Gambia, Lesotho, Sao Tome and Principe
	High level	Albania, Guyana, Mongolia, Nigeria, Moldova	Kenya, Kyrgyzstan, Pakistan	Ghana, Vietnam, Yemen, Zimbabwe

### **APPENDIX 4: DCPs and Countries Affected by Fragility** and Conflict

	GPE and Fragile	GPE	Fragile	GPE Not Fragile	GPE	Fragile	Fragile Not GPE	GPE	Fragile
1	Afghanistan	x	x	Albania	x		Algeria		x
2	Burundi	x	x	Bangladesh	×		Bosnia & Herzegovina		x
3	CAR	x	x	Benin	x		Colombia		x
4	Chad	x	x	Bhutan	x		India		x
5	Comoros	x	x	Burkina Faso	x		Indonesia		x
6	Congo Dem. Rep.	x	x	Cambodia	x		Iran		x
7	Côte d'Ivoire	x	x	Cameroon	x		Iraq		x
8	Eritrea	x	x	Rep Congo	x		Kiribati		x
9	Ethiopia	x	x	Djibouti	x		Kosovo		x
10	Gambia	x	x	Georgia	x		Lebanon		x
11	Guinea-Bissau	x	x	Ghana	x		Libya		x
12	Haiti	x	x	Guinea	x		Marshall Islands		x
13	Liberia	x	x	Guyana	x		Micronesia		x
14	Madagascar	x	x	Honduras	x		Myanmar		x
15	Mali	x	x	Kenya	x		Philippines		x
16	Nepal	x	x	Kyrgyzstan	x		Solomon Islands		x
17	Nigeria	x	x	Lao PDR	x		Sri Lanka		x
18	Pakistan	x	x	Malawi	x		Syria		x
19	Rwanda	x	x	Mauritania	x		Thailand		x
20	Sierra Leone	x	x	Mongolia	x		Turkey		x
21	Somalia	x	x	Mozambique	x		Tuvalu		x

		UL	Trayite		UL	Trayite	Tragile Not OF L	UL	Trayite
22	South Sudan	x	x	Nicaragua	x		West Bank & Gaza		х
23	Sudan	x	x	Niger	x				
24	Timor-Leste	x	x	PNG	x				
25	Тодо	x	x	Moldova	x				
26	Uganda	x	x	Sao Tome and Principe	x				
27	Yemen	x	x	Senegal	x				
28	Zimbabwe	x	x	Tajikistan	x				
29				Tanzania	x				
30				Uzbekistan	x				
31				Vietnam	x				
32				Zambia	x				
33				Lesotho	x				

GPE and Fragile | GPE | Fragile | GPE Not Fragile | GPE | Fragile | Fragile Not GPE | GPE | Fragile

Source: Author's table, 2016.

*Note:* A further 22 countries were affiliated to GPE in 2017. These are mostly small island states and landlocked countries. The affiliation came too late to include them in data analysis.

### **APPENDIX 5: Summary Table of Options for Policy Reform**

Торіс			Options		
Allocation of National Resources	Increase share of GDP allocated to education where it is low.	Increase share of education in public expenditure.	Increase allocations to preschool and secondary within public expenditure.	Reduce discretionary defense expenditure, especially where there are more soldiers than teachers.	Seek cash and in-kind contributions from corporate entities, e.g., utilities, mobile phone companies, food and beverage companies, natural resource-based extractive industries.
Aid from Development Partners	Increase DAC commitments to 0.7% GDP with pro rata increase in education aid.	Reverse declining share of education in total aid as a result of a new education compact among development partners.	Link aid to education to incentives to decrease nonproductive spending, e.g., defense.	Establish mechanisms to channel philanthropic and corporate responsibility contributions into sustainable development finance.	Engage new development partners and sovereign wealth funds in the global architecture of aid.
Structures	Shorten the length of school systems where these are 13 years; consider 6:3:3 pattern or 6:4:2.	Extend primary schools upward to cover lower secondary grades. Extend primary schools downward if institutionally based preschool is to be universalized.	Double shift schools where population density is high. Limit enrollments in high cost technical and vocational secondary schools, and link provision to labor market demand.	Increase average school size, especially at secondary level, and staff schools at economic ratios. Use school mapping and demography to anticipate changing geographic patterns of demand.	Phase expansion of lower secondary before high growth in upper secondary in LICs and LMICs; manage preschool provision at no more than primary unit costs.

Торіс			Options		
School Financing	Review teacher salaries, salary scales and ratios of salary costs as percentage of GDP; manage contract teachers effectively in ways consistent with developing a teaching profession.	Reduce nonteaching- salary budgets where these are excessive. Audit payrolls for underemployed staff.	Control nonsalary costs, but protect expenditure on learning materials.	Implement formula-based school funding to improve equity and flow of funds to schools with high levels of deprivation.	Target school improvement grants on quality improvement and effective management of learning using formative assessment.
Flows of Pupils	Ensure universal entry at national age of entry of 6 years or as appropriate; monitor and eliminate over- age enrollment and progression. Manage automatic promotion as a curriculum and pedagogic issue.	Address cause of dropout on both the supply and demand sides. Reduce direct costs to households where this is a cause of dropout, and ensure curricula and pedagogy have real and perceived relevance.	Review selection and promotion methods to improve the flow of pupils, reduce wastage, and manage examination backwash and very high levels of private tuition.	Regularize children's attendance to 95 percent or more to maximize learning opportunities; revise curricula to create resilience in relation to pupil absence.	Award pro-poor bursaries and scholarships to encourage participation from low- income households especially postprimary; offer preschool free to low- income households.
Teacher Deployment	Increase pupil- to-teacher ratios where these are low, to a maximum of 40:1 at primary, 35:1 at lower secondary and 25:1 at upper secondary.	Reduce teacher-to- class ratios where these are high, to below 1.5:1 at secondary level and 1.2:1 at primary.	Reduce variation in pupil-to- teacher ratios and teacher- to-class ratios between schools to +/– 10 percent of the average.	Increase the proportion of teaching assistants where these can complement the use of trained teachers; encourage younger teachers to remain in teaching with graduated incentives.	Include periods of self- instruction, peer-to-peer learning, distance and mixed-mode delivery for senior pupils; adopt multigrade curricula and pedagogy in small schools.

(continued)

Торіс		OptionsReduce teacher absenteeism to less than 5%; ensure school management is continuous and effective, with no periods without on-site management.Increase time on task of pupils through effective timetabling and full use of the teaching days in the year.Develop core curriculum with reduced number of subjects; produce core learning materials at low cost, copyright-free downloadable at no cost.Make all core curriculum learning materials and teachers guides available as free downloads lncrease more modularization of learning and development of multigrade curricula.herDecide entry qualification levels of toachers to by in corvice			
School Management	Provide incentives to increase efficiency of school management by principals and governing bodies of human and physical resources.	Reduce teacher absenteeism to less than 5%; ensure school management is continuous and effective, with no periods without on-site management.	Increase time on task of pupils through effective timetabling and full use of the teaching days in the year.	Increase teaching hours in contact with pupils through better timetabling and monitoring of workload norms.	Manage learning consistently and regularly using formative assessment linked to interventions.
Curricula and Pedagogy; Learning Materials	Implement systematic curriculum reform at all levels on a regular cycle; invest in reformed secondary curricula as a priority to increase relevance and teachability, and develop free learning materials for preschool teachers.	Develop core curriculum with reduced number of subjects; produce core learning materials at low cost, copyright-free downloadable at no cost.	Make all core curriculum learning materials and teachers guides available as free downloads. Increase more modularization of learning and development of multigrade curricula.	Develop effective methods to finance and distribute learning materials to meet target textbook-per- pupil ratios for core subjects. Consider textbook loan schemes and revolving funds to build stock of learning materials.	Invest in STEM subject curriculum reform to give access to wealth- enhancing 21st century skills; invite telephone companies to provide free internet to all schools as part of corporate responsibility.
Teacher Education	Review teacher training structures to establish whether they can meet growing demand at affordable costs. Train teachers to teach several subjects.	Decide entry qualification levels of teachers to reflect realities of supply and demand.	Consider short initial training supplemented by in-service support and mixed-mode training.	Review teacher education curricula for fitness for purpose, and decide mix of subject upgrading and pedagogic training.	Manage newly qualified teachers through their first appointments with constructive mentoring and local support networks.

Торіс			Options		
Construction	Develop efficient procurement systems for expanded program of school and classroom construction.	Develop standardized school and classroom designs within affordable costs.	Undertake school mapping exercises to locate new schools in areas of need and minimize oversupply of small schools where this is a problem.	Identify specifications and needs for specialized facilities, especially at upper secondary level.	Explore multiuse designs for new buildings to increase utilization of structures and equipment.
Cost Recovery	Review policy on tuition fees at all levels above and below primary school; design fee waivers and bursaries, and progressive methods of financing schools that are pro-poor.	Review policy on facilities fees, other levies and costs, and private tuition to establish costs of attendance and need for subsidies to low-income households.	Sponsor copyright and royalty-free curriculum development of core learning materials. Consider textbook loan schemes and revolving funds for learning materials.	Withdraw subsidies for nonessential boarding.	Facilitate voluntary fundraising by communities and schools; consider matching grants.
	Facilitate in-kind contributions to school feeding programs and labor and materials for construction.	Facilitate revenue- generating activity where appropriate, e.g., sale of goods and services, charges for the use of facilities.	Facilitate links and sponsorship with local employers.	Consider efficacy of earmarked educational taxes.	Resolve financing of information technology and internet access; invite mobile phone companies to provide free services to schools.

# **APPENDIX 6:** Gaps in Finance for Higher Participation at Sustainable Costs

Estimating costs of reformed systems that could provide much higher levels of participation, and at costs that could be sustained from domestic revenue, requires detailed country-level projections since many choices are involved. The main parameters of choice are captured in the identity:

#### X = GER \*A \*C

This can be used on aggregated data for the DCPs that are LICs and LMICs, or it can be done individually. Scenario 1 models partner LICs and partner LMICs using typical data. It calculates X, which is the proportion of GDP necessary to provide current levels of participation. LICs have participation rates averaging about 85 percent, 50 percent, 20 percent and 3 percent at primary, lower secondary, upper secondary and higher education levels. This requires about 3.8 percent of GDP to finance. In LMICs, participation rates average 105 percent for primary, 70 percent for lower secondary, 40 percent for upper secondary and 5 percent for higher education. This would require about 4.8 percent of GDP to finance.

The total estimated cost across the LICs of the existing systems is about US\$19.5 billion.<sup>36</sup> For LMICs, the cost is as much as US\$68 billion. Though there are similar numbers of school-age children in the partner LICs and LMICs, the aggregate GDP of the LMICs is more than three times greater than that of the LICs. The costs of their education systems are therefore much greater.

	GER	% School-Age Children	Cost per Child USD	% GDP Needed	Total Billion USD
LICs					
Primary	85	18	10	1.53	7.85
Lower Secondary	50	8	25	1.00	5.13
Upper Secondary	20	7	40	0.56	2.87
Higher	3	6	400	0.72	3.69
Total				3.81	19.55
LMICs					
Primary	105	15	10	1.58	22.44
Lower Secondary	70	7	25	1.23	17.46
Upper Secondary	40	6	40	0.96	13.68
Higher	5	5	400	1.00	14.25
Total				4.76	67.83

#### SCENARIO 1: DCPS-CURRENT EDUCATIONAL FINANCE NEEDED IN LICS AND LMICS

*Source:* Author's projections, 2017.

36 For the countries in the database, which include all DCPs on which there is equivalent data.

	GER	% School-Age Children	Cost per Child USD	% GDP Needed	Total Billion USD	"Gap"
Primary	105	18	12	2.27	11.63	3.79
Lower Secondary	105	8	20	1.68	8.62	3.49
Upper Secondary	60	7	30	1.26	6.46	3.59
Higher	10	6	200	1.20	6.16	2.46
Total				6.41	32.87	13.33
Primary	105	15	12	1.89	26.93	4.49
Lower Secondary	105	7	20	1.47	20.95	3.49
Upper Secondary	80	6	30	1.44	20.52	6.84
Higher	15	5	200	1.50	21.38	7.13
Total				6.30	89.78	21.95

## SCENARIO 2: DCPS—EDUCATIONAL FINANCE NEEDED IN LICS AND LMICS TO UNIVERSALIZE PRIMARY AND LOWER SECONDARY

Source: Author's projections, 2017.

If participation rates are increased to universal levels (GER = 105 percent) in primary and lower secondary, and upper secondary and higher education levels, and are allowed to expand to the levels shown below, the additional cost can be estimated. Scenario 2 does this. In order to contain total demand for finance to not much more than 6 percent of GDP, the highest level likely to be sustainable, it is necessary to reduce costs per student at all levels above primary. The result for LICs is then a system costing US\$33 billion, which is US\$13 billion more than current levels of expenditure. For LMICs, the total cost is US\$90 billion, which is US\$22 billion more than current levels.

The DCP average cost of about 10 percent of GDP per capita for a primary school place is low when translated into USD and into what it can purchase to improve learning quality. OECD countries tend to spend 20 percent of GDP per capita or more on primary education per child. If per-student costs are only 12 percent of GDP per capita, then lowering this is not an option consistent with improving quality and achievement. Increasing the cost per child at the primary level to 12 percent of GDP per capita would increase the need for GPE support and could be justified if directly linked to quality improvement, an enhanced learning environment, and a universal provision of learning material for all core subjects.

Costs at lower and upper secondary appear to average about 30 percent of GDP per capita, and sometimes much more in developing country partners. These costs are high and would have to be reduced if universal access and financing from domestic revenue are medium-term DCP goals. Simply put, all high enrollment countries have ratios of costs per child between primary and secondary of less than 2:1, and many fall below 1.5:1.

In addition, most OECD countries have public costs per student in higher education of less than 2:1 relative to primary education, and many make widespread use of direct and indirect cost recovery

from tertiary students. Currently, DCPs appear to spend about 0.7 percent of GDP on higher education, with high unit costs (often 10 times or more those at the primary school level). Consequentially, they have low or very low rates of participation, averaging between 5 percent and 10 percent of the age group.

These are the "gaps" between what is plausibly available and what is needed that external finance can help to reduce.

These two scenarios produce a "gap" between current expenditure in Scenario 1 and what would be needed in Scenario 2 to configure systems in order to produce universal access up to grade 9 and support other costs.

The difference is about US\$13 billion for the LICs and US\$22 billion per year for the LMICs. This is additional to current costs that include aid to education at existing levels. Looked at differently, the additional recurrent cost of moving LICs and LMICs to universal completion of primary—with increased spending per child to around 12 percent of GDP per capita—is about US\$3.8 billion for LICs and US\$4.5 billion for LMICs. Universalizing completion of lower secondary depends on lowering costs per student. Without any reductions over current levels, US\$9 billion would be needed in LMICs and US\$8 billion in LICs. With reductions to 20 percent of GDP per capita per student for lower secondary students, the amounts needed fall to an additional US\$3.5 billion for LMICs and US\$5 billion for LICs annually.

This model does not compute the costs of providing universal access to two years of preschool. This would add between 10 percent and 15 percent to the cost, with a pro rata effect on the total amount needed. The amounts needed are all sums that are much greater than current GPE disbursements. They are also recurrent, and sooner or later would have to be supported from domestic revenue. If DCPs did allocate 6 percent of GDP to education, they could go a long way toward financing universal access through to grade 9. They would, however, have to collect double the amount of domestic revenue (up from 15 percent of GDP to 30 percent) if the share of the government budget for education was not to exceed 20 percent (which is 33 percent greater than is currently the case). This seems unlikely.