WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Education and Skills 2.0: New Targets and Innovative Approaches

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World Economic Forum
91-93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland
Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744
contact@weforum.org
www.weforum.org

Contents

4 **Preface**
Martina Gmür and Klaus Schwab

6 **Forewords**

6 *Gordon Brown*

7 *Amina Mohammed*

8 **Introduction**
David E. Bloom, Ayla Goksel, Jody Heymann, Yoko Ishikura, Brij Kothari, Patricia A. Milligan, and Chip Paucek

16 **Never Too Early to Start**

16 Chapter 1 The Early Bird Catches the Worm
Pia Rebello Britto and Ayla Goksel

24 **Calling All Minds**

24 Chapter 2 Investing in Girls (and Women) to Spur Economic Development
Tae Yoo

31 Chapter 3 Scaling Up to Meet the Enormous Education Challenges in Africa
Omobola Johnson, Leslie Maasdorp, and Colin McElwee

36 Chapter 4 An "E.Y.E." to the Future: Enhancing Youth Employment
Arup Banerji, Vivian Lopez, Jamie McAuliffe, Amy Rosen, and Jose Manuel Salazar-Xirinachs, with Poonam Ahluwalia, May Habib, and Tanya Milberg

41 Chapter 5 Education System Reform in Pakistan: Why, When, and How?
Mehnaz Aziz, David E. Bloom, Salal Humair, Emmanuel Jimenez, Larry Rosenberg, and Zeba Sathar

51 Chapter 6 Better Late Than Never
Brij Kothari

59 Chapter 7 Getting Past the Basics: Pursuing Secondary Education
David E. Bloom

64 **Learning Anything, Anytime, Anywhere**

64 Chapter 8 Online Education: From Novelty to Necessity
Chip Paucek, Jose Ferreira, Jeremy Johnson, and Christina Yu

70 **Much Needed and Still Useful After All These Years**

70 Chapter 9 Older and Wiser: Tapping the Full Potential of the Mature Workforce
Patricia A. Milligan and Patty P. Sung

78 Chapter 10 Reinvigorating Japan's Economy With More Women and Older Workers
Yoko Ishikura

84 **Measuring and Managing Our Assets**

84 Chapter 11 Pay It Forward
Sami Mahroum and Elizabeth Scott

92 Chapter 12 The Human Capital Index
Saadia Zahidi

98 **Statistical Appendix**
David E. Bloom, Ciara Browne, Thierry Geiger, Kenneth O'Friel, Lauren Graybill, and Larry Rosenberg

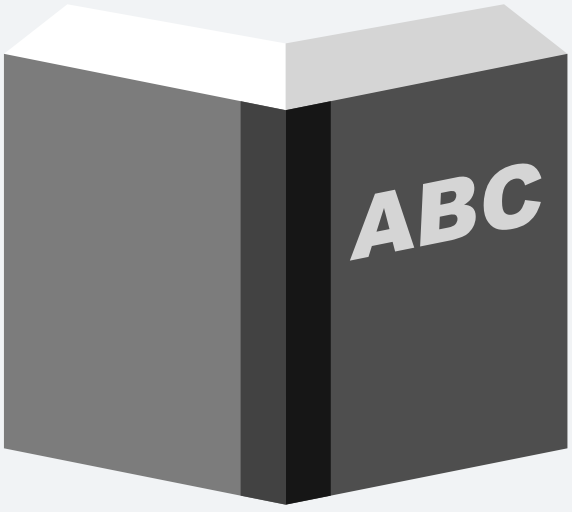
154 **Biographies of Co-Editors and Authors**

158 **Acknowledgements**

158 Membership of the Global Agenda Council on Education and Skills: 2012-13 and 2013-14

Preface

As policy-makers look for ways to make their economies more competitive in today's fast-changing world, a critical factor will be the extent and quality of education and skills training available for their populations. After all, education is both a compelling indicator and powerful instrument of human progress, which is why it occupies such a prominent place in the UN 2015 Millennium Development Goals and all countries' development plans.



Yet the reality is that despite impressive progress made in educational systems in recent decades, especially with respect to primary enrolment, enormous challenges remain. Over 100 million children are not enrolled in primary or lower-secondary school, and even for those that are or were in school, an alarming number lack basic reading and writing skills. At the same time, many countries face unacceptably high unemployment rates, while others have extremely high underemployment rates – such as Sub-Saharan Africa and the Middle East and North Africa, regions that are expecting their youth populations to swell greatly in the coming decades. Moreover, in some parts of the world, many potential employers complain that their jobs are not being filled because jobseekers lack the requisite skills.

This timely book provides an up-to-date statement about the importance of education, with a special emphasis on the education-skills nexus. It does this by taking us on a journey through the life cycle of learning, beginning with the earliest days of life, then formal schooling at primary, secondary and tertiary levels, the transition from school to career, and finally on to mature workers – who may want (or need) to acquire new skills or to stay in work longer in response to greater longevity and population ageing.

On this journey, we discover that much learning can, and needs to, occur outside formal school systems, which may be done through lifelong education, vocational programmes, on-the-job training and online education. We also discover that although the hurdles to a better educated and skilled populace are immense, there is already a rich inventory in developed and developing countries alike of new approaches and innovations (some of it rooted in modern technology and communications) that can enable us to deliver on our commitment to education as a fundamental human right.

Given that education is central to most global issues – from economic growth and social welfare to global information technology and entrepreneurship – this topic is highly relevant to the Network of Global Agenda Councils. *Education and Skills 2.0: New Targets and Innovative Approaches* is the product of a true collaboration among a number of Global Agenda Councils, including the Global Agenda Councils on Africa, Pakistan, and Japan, as well as the Council on Youth Unemployment and the Council on Population Growth. To this end, we would like to thank authors from the Network of Global Agenda Councils, as well as those from further afield who have contributed chapters and essential input to this book. We would also like to thank David Bloom, the Chair of the Global Agenda Council on Education & Skills, who led this work.

This book is the result of much individual effort and collective deliberation, and it will provide the background for future activities of the Global Agenda Council on Education & Skills, which can only gain salience as the global community takes on the challenge of widening and deepening our human capital.

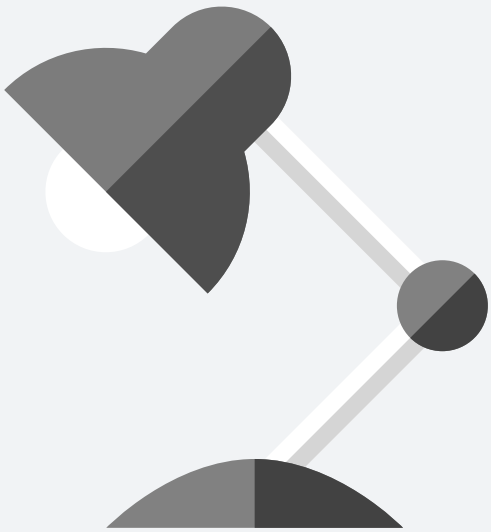
Martina Gmür

Senior Director
Head of the Network of
Global Agenda Councils
World Economic Forum

Klaus Schwab

Founder and Executive Chairman
World Economic Forum

Forewords



Rt. Hon. Gordon Brown

United Nations Special Envoy for Global Education

For centuries, societies the world over have managed only to realize some of the potential of some of their young people. At no point in history have we succeeded in developing all of the potential of all of our young people – and today hundreds of millions are not obtaining the education they deserve.

And yet at no point in history has education been so essential to the well-being of society. The majority of employees in the global workforce, who were once manual workers, will soon depend on other skills for the first time. More than ever, the labour market now demands workers who have technical attributes, knowledge and the ability to innovate and adapt to a fast-changing world where workforces compete internationally.

The biggest rise in tertiary education ever seen – a 160% increase in global enrolment from 1990 to 2009 – is testament to unprecedented demand for education as students seek to prepare themselves for nonmanual work.

However, access to even the most basic of schooling in many parts of the world still remains staggeringly limited. Globally, there are 57 million out-of-school children of primary age, a figure that has not fallen much in the past two years after big advances in the first decade of this century. There are a further 69 million young adolescents out of school – and 500 million of today's school-age girls will leave education before they finish their schooling. The latest estimate is that even in 2030, 1 billion workers will not have completed basic education.

Crucially, quality does matter. The standard of education that children receive will often determine whether parents allow them to stay in school – or force them to drop out. High global dropout rates meant 31.1 million children left school early in 2010.

And even as quality becomes evermore important, young people are too often taught antiquated curricula where the focus on teaching students is what to think – not how to think. Countries need to learn quickly what works and how they can benefit from the best of modern ideas, methods and technology.

Roland Berger Consultants reported this year that only between 10% and 20% of graduate students in developing countries are employable by international standards. Even in fast-modernizing India, just 25% are considered by multinationals to be employable. In Russia, it is just one-fifth.

Indeed, the way countries use their human capital has become an important factor in explaining why some – many of whom are in Asia and Latin America – remain stuck in a "middle-income trap", unable to make the transition to high-income status. Others in Africa are condemned to low-income or, at best, lower-middle-income futures. Researchers trying to understand their failure to break through increasingly focus on the quantity and quality of basic skills, qualified graduate manpower and the lack of expertise in research and development.

But by the end of the decade, as research by the McKinsey Global Institute suggests, we will at once be faced with a shortfall of up to 40 million high-skilled workers and a surplus of up to 95 million low-skilled workers. It is evident that without urgent action to improve access to and quality of learning, the world faces a huge skills shortage, especially in the emerging markets and developing countries where most new economic growth will be concentrated.

The adult illiteracy rate in Somalia, for example, is 63%. Even in Nigeria, a country hoping to become one of the new growth economies, this figure is 39%. According to new figures from the Wittgenstein Center's forthcoming book, *World Population and Human Capital in the 21st Century*, only 3% of young adults (30–34-year-olds) in countries such as Mali and Mozambique will have received tertiary education by 2050; in Niger, Liberia, Rwanda and Chad, it is just 4% and in Malawi and Madagascar, only 5%. While the projection for North America as a whole is 60% with tertiary qualifications – and in countries such as Korea and Singapore, 80% – the forecast for Sub-Saharan Africa is, at best, 16%.

The high out-of-school numbers make my immediate priority as UN Special Envoy for Global Education the delivery of the second Millennium Development Goal – universal primary education.

We must become the first generation that delivers on every child's right to schooling. Our global economy will only flourish in the long term if we find a way of ensuring that every young person everywhere has the chance to reach his or her full potential.

Ms. Amina J. Mohammed

United Nations Special Advisor to the Secretary-General on Post-2015 Development Planning

The ongoing efforts of the United Nations and its member states to delineate a new development agenda to succeed the Millennium Development Goals (MDGs) when they expire in 2015 presents a unique opportunity for a paradigm shift in international development – one that can address the eradication of poverty within the context of sustainable development, enabled by the integration of economic growth, social justice and environmental stewardship.

For this ambitious development framework to take shape and unfold, a profound structural transformation will be required at all levels and domains. A new and expanded vision of education and training that is inclusive, responsive and of quality must play a central role in this endeavour. The world has seen significant progress in achieving universal primary education and gender parity, but there are still multiple challenges confronting the sector.

Successful efforts to expand access to basic education have been undermined by growing inequalities in the quality of education and learning outcomes. An alarming number of children still do not have access to preprimary education and millions are leaving primary and secondary schools without acquiring any basic knowledge, skills and competencies. Too many education systems around the world are either failing to provide access to the most vulnerable in their societies and/or falling short in providing good quality and relevant learning and skills-building opportunities. Millions of youth and adults are being prevented from reaching their potential to lead productive, healthy lives and to acquire decent jobs.

Quality basic education, including during the most formative years of life, is a prerequisite for meeting the unalienable right to learn and to develop. However, the complexities of new and emerging global challenges demand that the education agenda must be more aspirational. Provision of quality education and skills training at all levels, seamlessly linking with pathways to lifelong learning, must be equitably accessible for all through a range of flexible modalities in order to cater to the diverse needs of learners today.

Education systems must expand access to quality education at secondary and tertiary levels, as well as to technical and vocational education and training, which remains a viable avenue for youth who had poor quality basic education or no chance at all to acquire skills for work and life. The expansion of these subsectors must be well-articulated in the global development agenda and in national policies, as well as in human resource development policies in both private and public sectors. These policies must ensure that stronger links are made between the learning outcomes and skills achieved through education and training and the needs and prospects of young people and adults in the world of work.

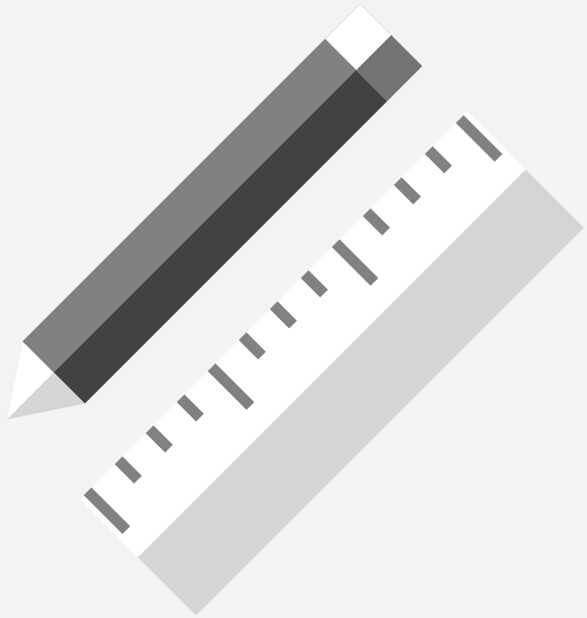
Many of the chapters and case studies in this publication reinforce the arguments for the new development agenda to focus on improving the quality of education across the board and the imperative to expand and improve opportunities in education and skills development beyond basic education. We must ensure that all girls and boys have the best start to life and learning and that learning leads to a smooth transition from school to the world of work, accompanied by constant reskilling, upskilling of adults and the realization of their lifelong learning potential.

The book offers insights into innovative technologies and approaches that could be applied to narrow the education and skills gaps for those lagging behind. Furthermore, it showcases a number of proven and potential solutions to address some of the most intractable issues mentioned earlier. Finally, the statistical appendix of this publication is a welcome addition to the international community's drive for a data revolution. The business community's views of the state of education presented on a country-by-country basis is of particular interest, as the quality and responsiveness of education and skills training rely on the need to better connect education to the world of work. Hopefully, this will evoke more attention on improving the timeliness and accuracy of labour market information systems and in identifying future labour market trends.

The cross-sectional representation of countries at different levels of development and the sector-wide approach in presenting the case for the relevance of education and training makes this publication a particularly rich compendium of the latest discourses in education and skills development. It is my expectation that it will serve to enrich the ongoing debates on education, training, and skills acquisition within the post-2015 development agenda.

Introduction

David E. Bloom, Ayla Goksel, Jody Heymann, Yoko Ishikura, Brij Kothari, Patricia A. Milligan and Chip Paucek



That education is an enormous contributor to individual and collective development and well-being is beyond dispute (see Box 1). This is why Article 26 of the Universal Declaration of Human Rights (1948) defines education as a basic human right and calls for making it free, at least at the fundamental levels, and compulsory. It is also the dominant reason why countries at all income levels have expanded and improved their education systems so significantly in the past half century.

Box 1: Education – A One-Stop Shop

Education has a diverse but mutually reinforcing set of goals. It aims to do the following:

- impart the skills and capacities people need to be productive members of the workforce and their communities;
- generate and promote the assimilation of new knowledge to spur economic, social and political, advancement;
- promote social equity and cohesion and the legitimacy that comes from equal opportunity;
- give people access to a broad swath of knowledge and ideas;
- promote the study and development of culture and values, including arts and the humanities;
- inculcate the desire and ability to learn throughout life;
- enhance critical and creative thinking;
- promote acceptance and tolerance of difference and diversity;
- develop media literacy and the capacity to effectively evaluate large amounts of often-conflicting information – a reflection of evolving needs in the 21st century.

Thus, the goals of education are many. As William Butler Yates succinctly put it, “Education is not the filling of a pail, but the lighting of a fire.”

What is the state of global education today (see Box 2)? Education achievements abound in countries throughout the world. At all levels of education, enrolment has increased and the disparity between access for girls and boys has diminished. However, much remains to be done, especially on secondary and tertiary school enrolment and the quality and relevance of education at all levels. Moreover, the indicators of improvement belie significant disparities in other dimensions, as, in many countries, education results are stronger in urban than rural areas and racial, ethnic and gender differences in outcomes persist. In addition, educational outcomes are questionable in many regions of the world. Students may be enrolled in school, but enrolment does not guarantee attendance, let alone an opportunity to receive an education of high quality. Many students complete their formal education – including in some instances higher education – without the skills needed to participate productively in the workforce or as part of an informed citizenry.

Education priorities are inevitably shaped by demographic, technological, social, political and economic trends. Some parts of the world (like Sub-Saharan Africa (SSA) and the Middle East and North Africa) will need to gear up to handle the expected explosion in the number of students requiring and seeking an education. Other parts of the world (mostly industrial at this point) will need to rethink how they are going to handle low fertility and people living longer than ever – many workers will need to stay in work longer and many of them will need to reskill, maybe repeatedly. Plus the dramatic technological advances, which have catapulted us into the digital age, are putting a premium on technical skills and know-how, along with the ability to continuously adapt. In a nutshell, education is inextricably entwined with skills development.

Box 2: A Global Snapshot of Education

Enormous progress . . .

For the world as a whole, the primary gross enrolment ratio rose from 89% in 1970 to nearly 100% just a decade later. Improvement in low-income countries has been particularly spectacular, where this measure rose from 51% in 1970 to more than 100% today.[2]

Improvements in gender equality at the primary school level have been widespread, with the ratio of female to male enrolment for the world as a whole rising from 81% to 97% since 1970. In low-income countries, this ratio rose from 62% to 95% during the same period. Similar improvement in gender equality has taken place in secondary education.

Literacy rates among youth (aged 15–24) have risen from 83% to 90% for the world as a whole between 1990 and 2010 and from 60% to 74% for low-income countries.

Enormous challenges remain . . .

About 126 million children are not enrolled in primary or lower-secondary school (about 13% of the age-relevant population). This figure includes 57 million children of primary school age and 69 million of lower-secondary school age.

Secondary school enrolment is still low (42%) in low-income countries, with SSA (40%) and South Asia (58%) particularly far behind. In SSA, the ratio of female to male enrolment in secondary education stands at only 82% (although this figure has increased from 62% in 1980).

Tertiary school enrolment is extremely low (9%) in low-income countries and lower-middle-income countries (18%), with upper-middle-income countries (32%) still way below the level of developed countries (73%).

Globally, 123 million youth (aged 15–24) lack basic reading and writing skills – 61% of them young women.

The progress on youth literacy has been inadequate in specific regions, standing at 72% in SSA and 79% in South Asia.

Sources: WDI, UNESCO and UN

The Education–Skills Nexus

How does the education–skills nexus work? At the individual level, education has an array of effects that promote welfare. Employment in productive work (and also in the formal sector of an economy, where the most secure and best-paying jobs tend to be available) depends on an individual having the skills that education can provide – the right skills, at the right time – to take advantage of the economic opportunity. In most countries, a higher level of education is linked to higher income. In addition, greater education is often closely connected to the achievement of better health, which in turn allows a worker to be more productive and, often, to reap the rewards of greater productivity.

At the national level, countries with effective systems of education reap the rewards by seeing faster per capita economic growth. A well-educated populace that has both the array of skills needed for a modern economy and the capacity to adapt those skills to new industries and services provides the basis for a country's firms and industries to compete successfully with those of other countries. In an era when a large and growing portion of the world's economic output can be and is created nearly anywhere, such competitiveness is important for raising living standards.

Furthermore, longer lifespans change the calculus of educational investments: with the pace of change greater than ever, educated individuals – and especially those who pursue lifelong education – can adapt more quickly and are better equipped to take advantage of new opportunities. A country that manages to educate its people better can realize the economic and social benefits that emerge from higher-skilled people working for a longer period of time – among them, reducing the pressures on pension systems. At the same time, employers have to be more attentive to workers' needs and capacities as people live and work longer. The bottom line here is that greater alignment of education and job skills is a necessity and that lifelong skills updating is more worthwhile than ever.

Against this backdrop, the global community has made a series of pledges over the past two decades to achieve universal primary education, reduce illiteracy and ensure gender parity. One of the most highly watched initiatives is the UN Millennium Development Goals (MDGs), which is aimed at improving living standards worldwide by 2015. Two of the eight

goals centre on education: MDG 2 calls for achieving universal primary education (as measured by enrolment and completion); MDG 3 calls for eliminating gender gaps at all levels of education. Although impressive gains have been made globally and by many individual countries, for low-income countries as a group these goals are still out of reach – with the biggest hurdle being primary completion rates rather than primary net enrolment rates.[1]

Moreover, the MDGs do not include a goal for secondary education, or for the quality of education, both of which are increasingly being recognized as essential for competitive, knowledge-based economies. And girls are especially being left behind at the secondary level, despite the fact that their participation would boost standards of living through myriad channels.

In today's increasingly competitive, fast-changing and technically demanding labour markets, in which individuals are likely to pursue multiple jobs over longer working lives, more attention is also needed outside formal school systems to developing both hard and soft skills. The requisite training can occur in private vocational programmes, online programmes or on-the-job training (via, for example, apprenticeships, mentoring programmes and advanced training programmes in corporations). Employers, workers and society at large would also be well served by the active use of (possibly new) communication channels among prospective employees, businesses, educators and trainers to promote effectiveness in skills development and job-matching.

Purpose of the Book

As the global community weighs next steps on the education and skills front, this book aims to provide the latest thinking on the critical importance of education and highlight what can be done to ensure that all people around the world can benefit. To this end, it critically reviews existing and new ideas, perspectives and frameworks on education through relevant analyses and case studies. And it explores the full array of social benefits of different programmes and interventions (including complementarities among efforts to improve health, education and cognition) and related evidence of return on investment. But we believe our real value-added is on conceptualizing and describing innovative, plausible, scalable, compelling and high-impact solutions that will improve access to education, strengthen educational quality, improve workers' skills and increase equity – across income level, gender and other demographic subgroups.

At the same time, the book tries to shine a light on the relevance of education and training to the labour market and the need to facilitate school-to-work transitions. In pursuing these goals, it takes a lifecycle approach, examining the full range of educational experiences – from preprimary education to postgraduate training to worker education and training to mature worker reskilling. This vast educational experience can occur in both formal educational settings (schools) and informal systems (such as via the family).

This book also hopes to contribute to decision-making and research by presenting an accessible and up-to-date compilation of quantitative and qualitative education data across countries, country-income groups, and geographic regions, and over time. These data are juxtaposed with corresponding economic and demographic data to facilitate their use and analysis (see Box 3).

Box 3: Sizing Up Key Educational Data

The Appendix offers country-by-country statistics on relevant demographic and economic data, as well as key education-related indicators. It also focuses on the portions of the Forum's Executive Opinion Survey (EOS) that are relevant to education. It describes the survey and the data that the survey makes available. Finally, it includes league tables of the actual data, so that readers can be made aware – on a country-by-country basis – of the business community's views of the state of education throughout the world. Descriptive statistics from the EOS shed light on the business community's views of countries' education systems, which are important because of the need to connect education to the labour market.

Note: The Appendix was compiled by David E. Bloom, Ciara Browne, Thierry Geiger, Kenneth O'Friel, Lauren Graybill and Larry Rosenberg.

This book is not meant to be an exhaustive report on global education. Rather, it is an effort to highlight what the Forum's Global Agenda Council on Education and Skills views as a selection of the most pressing issues and opportunities in education today. We are calling it "Education and Skills 2.0" because we believe that the urgency is such that we now need to take a leap to an entirely new order of education that is being facilitated by the advent of the digital age and much more interactivity than the classrooms of the past. And we are subtitling it "New Targets and Innovative Approaches" to highlight our emphasis on best approaches to often neglected demographic groups such as preschool children, illiterate adults and mature workers, and also to emphasize the opportunities for intervention created by new technologies and a deeper understanding of the underlying mechanisms causing the access and quality shortfalls.

We hope that this book will help a wide range of audiences review interrelated issues in education – across the lifecycle and in very different regions of the world – and learn from the practical solutions and proposed action items discussed here. Although we hope this book will be stimulating, we also want to acknowledge the need for humility when weighing in on issues that have been problematic for a very long time. The field of education is full of seemingly good ideas that have come to naught, in part because of various harsh, unforgiving and unanticipated realities (including entrenched interests and conflicting agendas).

Chapter Highlights

Section 1: Never Too Early to Start

We begin with the beginning, that is the learning that occurs after birth. In "*The Early Bird Catches the Worm*" Pia Rebello Britto and Ayla Goksel underscore what a huge difference early childhood development (ECD) can make in the lives of those born without the privileges conferred by either higher class and income or membership in advantaged demographic, ability and geographic groups. By offering early experiences that strengthen cognitive, emotional and social capabilities, ECD can help to overcome a wide set of inequality gaps – making it one of the most cost-effective investments in human capital creation. Yet a third of the world's children are at risk of not being able to actualize their potential. This chapter is a call for action to the global community to pay attention to the compelling, effective and relevant evidence-based solutions that emanate from ECD programmes and to commit to actions that provide early-learning opportunities for young children – notably better parenting, early stimulation and learning programmes. They review a number of promising programmes under way that focus on both the first and

second 1,000 days of life. Such programmes must now be scaled up and secure broader support, likely involving government. Perhaps there is even a need for making ECD a global development goal.

Section II: Calling All Minds

The next big opportunity in the life cycle occurs as children grow up and reach traditional school-going age. But as Tae Yoo points out in "*Investing in Girls (and Women) to Spur Economic Development*", all too often it is the girls who are at a distinct disadvantage, especially in developing countries. This happens despite the fact that educating girls is recognized as being one of the most effective tools for promoting gender equality, improving individual and family health and promoting economic well-being and development. So what can the global community do? She explores how to tackle some of the biggest barriers by providing resources to the poorest, creating a healthier environment, ensuring positive role models, building more schools closer to where girls live (like Barefoot College in Rajasthan, northern India, built by and for the poor in rural areas), developing more teachers, updating the curriculum and providing broadband access to data and services. She emphasizes that solutions will need to identify strategic investments (like broadband) and account for complex cultural, religious and national sensitivities.

One region of the world with a "youth bulge" – male and female – is SSA, making it a prime candidate for harnessing the strength of younger adults to accelerate growth. However, the jury is still out on best approaches to encouraging this. As we hear in "*Scaling Up to Meet the Enormous Education Challenges in Africa*" by Omobola Johnson, Leslie Maasdorp and Colin McElwee, the good news is that the authors believe that SSA has the opportunity to leapfrog the skills/education gap with the help of connectivity and innovation in education, in part by greater use of public–private partnerships (PPPs). This chapter focuses on three cases: (a) how Nigeria is trying to bring education innovations to scale, especially with information and computing technologies (ICTs); (b) how South Africa's Leadership Academy tries to leverage and develop the leadership talents of a small number of individuals to become catalysts for others; and (c) how Worldreader is trying to educate the largest number of children and young people using the least amount of incremental investment in technology and infrastructure.

In "*An 'E.Y.E.' to the Future: Enhancing Youth Employment*" the authors (Arup Banerji, Vivian Lopez, Jamie McAuliffe, Amy Rosen and Jose Manuel Salazar-Xirinachs) note that over the next 15 years, 600 million jobs will be needed just to maintain current employment rates in the developing world, let alone increase them. Yet many regions – notably the Middle East and North Africa – are already battling high youth unemployment rates, exacerbated by high underemployment rates (in which workers are underutilized). What can be done? In the short term, they suggest: (a) using apprenticeships to bridge from school to work; (b) acquiring soft skills (like Education for Employment in Egypt); (c) creating PPPs; and (d) teaching youth how to think like entrepreneurs (like Qordoba in Dubai). In the longer term, countries will need to rethink traditional education and labour market institutions – like using the Internet to democratize the flow of information.

Focusing in on Pakistan, the "*Education System Reform in Pakistan: Why, When and How?*" warns that the country risks falling even further behind if it cannot educate its young people effectively. That said, the authors (Mehnaz Aziz, David E. Bloom, Salal Humair, Manny Jimenez, Larry Rosenberg and Zeba Sathar) believe that there is now a window of opportunity for education reforms to finally materialize after many failed attempts. The key will be to recognize that reform must tackle all sectors of the education system – primary/secondary, higher and vocational – as Pakistan does not have the luxury to delay reform in one sector until the other sectors improve. Such an overhaul will also require a certain political and personal resolve on the part of the political leaders, bureaucracy and civil society. Here the authors cite Sir Michael Barber's "The Punjab School Reforms Roadmap", a project of the United Kingdom's Department for International Development, as an emerging example.

But what happens to all the people who either miss out on primary or secondary education or graduate without actually having learned much, perhaps even being functionally illiterate. In "*Better Late Than Never*" Brij Kothari argues that those left out need new pathways to learning – notably, quality functional literacy, broadband access and English-language proficiency. Encouragingly, there are many innovations under way to do just that, in effect offering everyone a second, third and perhaps lifelong chance. They range from same language subtitling (audio-visual content that is subtitled in the ''same'' language as the audio) to Questscope in Jordan (a nonformal education programme to catch up dropouts) to Yoza in South Africa (reading content made broadly available through mobile phones) to BBC Janala in Bangladesh (English-language learning pathways available through multiple delivery platforms). The big challenge now, he says, is to candidly assess the scale of the problem and then pursue an open-minded consideration of proven, culturally adaptable, scalable and sometimes out-of-the box solutions.

In "*Getting Past the Basics: Pursuing Secondary Education*" David E. Bloom picks up on the increasing realization that a major focus on primary schooling, without an attendant focus on secondary schooling, is inadequate for today's globalized knowledge economy. Many of the benefits of education do not accrue until students have had 10 or more years of education and secondary education can and should impact a higher level of skills – such as those useful for creating new technologies. Yet the latest statistics show that there are 69 million children of lower secondary school age not enrolled in school, representing 17% of that age group worldwide – with the figure at 37% in SSA. Education system improvements must focus on secondary school infrastructure (ranging from working toilets to Internet connections) and personal hygiene education, the training of teachers and administrators, the establishment of performance incentives, the updating of curricula and learning materials to make them appropriate to skill-building for workforce needs and a strong higher education system to which secondary graduates can aspire. Such initiatives will be powerfully complemented by labour, financial market and macroeconomic policies that result in the steady creation of "good jobs" and by policies that discourage early marriage and childbearing.

Section III: Learning Anything, Anytime, Anywhere

On the digital front, a revolution in learning is underway, via new technologies that can be called "disruptive" because of the new learning paradigms – and changed social relations – they may bring about. Think digital open content, cloud computing, mobile and tablet technology, game-based learning, machine learning, and big data technology. Does the big one-time switch from analogue to digital solve one of the biggest problems in education – that of access – thereby serving as an economic leveller? In "*Online Education: From Novelty to*

Necessity" Chip Paucek, Jose Ferreira, Jeremy Johnson and Christina Yu explore the revolution in online education – including massive open online courses (MOOCs) – as played out in two main areas: distribution and data-mining. On the plus side, they see an end to a one-size-fits-all factory model of education, enormous room for individualizing (and continuously adapting) course learning and an almost unlimited scope for lifelong learning for anyone, anytime, anywhere. But how quickly that occurs – and which institutions and nations reap the benefits of getting there first – will hinge on overcoming two hurdles: (a) expanding credit acceptance policies for online courses; and (b) overcoming the digital divide, a result of insufficient adequate infrastructure and too little digital literacy.

Section IV: Much Needed and Still Useful After All These Years

A longstanding and widespread view of older workers is that they are ill-equipped to meet the physical demands of either rural or urban work and that they are particularly ill-suited to the evolving expectations that come with many of the jobs available in a modern economy. But in "*Older and Wiser: Tapping the Full Potential of the Mature Workforce*" Patricia A. Milligan and Patty P. Sung suggest that this view may be a bit dated. Moreover, the ageing of national populations – occurring globally and at an unprecedentedly rapid rate in many countries – should sufficiently motivate both public and private employers to ensure that mature workers (aged 50+) can continue to measure up. They propose three levers for employers to pull: (a) retaining mature workers to close critical skills gaps in the short term; (b) leveraging the extensive knowledge and experience of mature workers and retirees to prepare the next generation workforce; and (c) recruiting and reskilling mature workers and retirees for new roles and new fields. At the same time, governments and academia should pitch in to help address the needs of employers and mature workers at the industry or national level.

In Japan, with its shrinking and rapidly ageing workforce, the need to tap the skills of older workers and women is taking on greater urgency as a way to help the country snap out of two decades of near stagnation and regain its competitive edge. What happens there should be quite illuminating for other countries that are slowly (or not so slowly) moving up the ageing curve. In "*Reinvigorating Japan's Economy with More Women and Older Workers*" Yoko Ishikura explores initiatives (being taken by government, business, educational institutions and nonprofit organizations) to reskill the older generation (65+), improve the status of women in the labour market and both transform the educational system and the company approach to work, skills development and learning. She stresses that what Japan needs now is for stakeholders to develop a comprehensive and coordinated package embracing education, skills and employment – rather than the sequential model of education, skill development and employment.

Section V: Measuring and Managing Our Assets

So who is going to foot the bill for rising demands for primary education (in response to demographic changes) – let alone secondary, preprimary and tertiary – at a time when many countries are struggling to fund universal and quality education objectives? In "*Pay It Forward*" Sami Mahroum and Elizabeth Scott note that the answer matters both for finding the resources and for social cohesion and equity. And a big part of the debate, as always, is who benefits, given that education is both a public and private good. They believe that the private sector will increasingly be asked to supplement public resources, while governments can help by targeting disadvantaged children. At the same time, all stakeholders must work together to find innovative and scalable funding models that deliver affordable and quality education at all levels while maintaining equity of access. They point to a number of emerging, innovative mechanisms – including MOOCs, digitization of educational tools, securitization of student loans and reversible bonds. There is even talk of creating a global market for skills (akin to the global carbon market), with each country receiving a quota for "mobile talent".

Finally, how can countries objectively benchmark their stocks of human capital? Traditionally, attempts to measure human capital – the skills and capacities that reside in people and that are put to productive use – have focused on education and experience (reflecting both training and learning by doing). But in recent years, health (including physical capacities, cognitive function and mental health) has come to be seen as an additional component of human capital. In "*The Human Capital Index*" Saadia Zahidi reports on the Forum's initiative to construct a Human Capital Index (HCI). The tool takes account of 51 country-level indicators of human capital – centred on education, experience, health and "enablers" (i.e. the existence and efficacy of national policies that allow the three core elements to lead to greater productivity and reward) – which it rolls up into a single summary measure. The initial results show Europe is way ahead of the rest of the global pack, with Singapore the only Asian country in the top 10. But for the other regions and countries, the good news is that the rankings are a moving target. What matters is the series of interventions that countries undertake across a person's lifetime in the areas of health, education and employment.

Key Themes

The chapters in this book trace key points in the full lifecycle of learning in different parts of the world, along with concrete ideas about how we can measure and pay for the widening and deepening of our human capital stocks. The key themes, which are amplified by their cross-cutting nature, include the following.

Education's many forms. The linear progression of people's lives no longer provides a good guide to what education should be. We should not be beholden to preconceptions of education as being strictly formal in nature and taking place only early in life. Rather, much education and training can take place in informal settings and at different stages of life as we age. In addition, we need to recognize the value and appropriateness of different types of education for people with different skills and interests. We must also act on the fact that catching up is possible; failure to benefit from education early in life does not mean that a person should be excluded from the benefits of education forever. With both delivery methods and the content of education changing, all sectors of society can continue to learn and grow.

Ownership of the issues. Education systems have multiple stakeholders – individuals, governments, businesses and national and global civil society – whose interests and needs must be taken into consideration. Their perspectives differ, but they all matter. Moreover, complex, multisectoral issues require complex, multisectoral solutions.

Synergies. The existence of a diverse set of stakeholders does not diminish the fact that, in the end, everyone has an interest in better education. No society will do as well as it could unless it addresses and successfully meets the challenges

imposed by the weaknesses in its education systems. Improving education can address the interests of widely disparate groups, even within a single country. The benefits of doing so can accrue not only to individuals but also to whole countries and even the world.

Expanding education and improving it at the same time. Education must be expanded substantially if it is to reach all children. Although the world has made great strides in this direction in recent decades, there is further to go, particularly in the realm of secondary education and beyond. But at the same time it is crucial that the quality of education is also significantly improved. Merely upping enrolment rates does not ensure attendance, the existence of well-equipped schools or the presence of effective teachers, let alone that actual learning is taking place – or even that the quality of education is adequate for what students and countries need and desire. Improving quality will be especially difficult in the many regions that have rapidly growing school-age populations (like SSA and the Middle East and North Africa), but one that must nevertheless be met.

Need for accountability. What would it truly mean to hold governments accountable for the promises they have made to young people, their families and their employers? There are a lot of efforts under way – and being considered – that would improve accountability for educational access and quality at the national level.

A skills mismatch? One arena in which accountability matters hugely is the effort to ensure that the skills imparted by an education system match those needed by employers. This issue has recently come to prominence because of the large number of reports from business owners who say they cannot find workers who have the skills needed to perform specific jobs, even when pay levels are high. Many economists, by contrast, say that the empirical evidence does not support the existence of any significant skills gap. This is an issue that is unresolved in countries at all income levels. Its resolution has implications for educational curricula and advising and also for whether investments being made in the acquisition of human capital are efficient and whether the responsibility is being appropriately born by all stakeholders.

Distinguish between means and ends. Education is both a means of development and an end in itself – that is, there is a consensus on everyone's basic right to be educated. As such, it is both an instrument and an indicator of progress. For example, information technology (IT), which is highlighted in several chapters, is an important means to the ends education seeks to serve. It offers new opportunities that are and can be customized to different problems and populations and its incorporation into the education arena may succeed in opening up education to populations that have had little access in the past. But the means of education must not be confused with the goals themselves, which must remain paramount. The novelty of IT is not sufficient to trump more traditional approaches to classroom education where these are being used and in an efficient manner.

Science. In a world that is increasingly driven by technological advances, societies and individuals need to accord increased importance to the STEM (science, technology, engineering and mathematics) fields. It is unlikely that any country will be able to realize its full potential without nurturing young people's interest in science, prioritizing means for ensuring that at least a significant core of talented individuals have access to high-quality science education and then building on that education by adopting policies that allow the knowledge gained to be put to good use in promoting social and economic development. For the population as a whole, science literacy, as distinct from a focus on science, is increasingly important, because the ability of a population to assess claims and to participate fully in democratic decision-making requires a solid understanding of scientific methods and principles.

Context is crucial. No examination of education worldwide would be complete without explicit, frequent and sensitive acknowledgment of the considerable differences that exist within and across countries. No one solution is likely to apply, unmodified, to all countries. Social, economic, political, cultural, religious and even historical differences mean that solutions will need to be attuned to both specific country circumstances and within-country variations in socioeconomic characteristics. The case studies on Japan and Pakistan underscore this point. Japan has to focus on effectively combining many stakeholders' interests in education in a way that can reignite economic growth, improve the status of women and update the skills of the older generation. Meanwhile Pakistan faces problems of significantly widening access to basic education (particularly for girls) and increasing the quality of schooling.

Changing demographics. Demographics are changing in all countries. These changes – whether taking the form of ageing societies or youth "bulges" – affect countries' fiscal situations and their opportunities for economic growth. Changing demographics also interact with the changing nature of jobs. In addition, the accumulation and greater importance of scientific knowledge emphasizes the necessity of early preparation for education. In utero health matters for education, as do infant and child health and preprimary learning.

Forward-looking focus. We need to solve tomorrow's problems, not yesterday's. We also need to keep in mind that education has a longer payoff horizon than workforce training (and even within education, primary school has a longer payback horizon than higher education). This longer horizon often conflicts with policy-making cycles, which tend to be relatively short term. Because a good education system requires long-term investments, staying the course is often challenging.

Recommendations for Action

In terms of recommendations, we focus on actions that either (a) close knowledge–action gaps (we know what to do and just need the resources); or (b) facilitate developing and learning how to implement new knowledge and tools. Our calls to action are about political will, financial muscle, reform and innovation. And they all require that we not fall victim to preconceptions about the nature of work or of education and its delivery or the stereotyping of workers.

(1) Don't forget anyone. We need to cast a much wider net so that education reaches everyone – and continuously throughout their life. This means making education available from the earliest days of life to old age; targeting populations that are currently lagging behind, like girls and the vulnerable and disadvantaged; ensuring that all youth pursue and complete a secondary education; not letting the post-17 adults and dropouts fall through the cracks, because it need not be too late for them; offering mature workers ways to update their skills and work longer; and not giving up on certain regions (like SSA) and countries (Pakistan) that must overcome daunting hurdles.

(2) Create more and better and more flexible schooling. First, we need to *attract more and high-quality teachers*. Given the millions of children still out of school, let alone the millions coming up in the population pipeline – especially in SSA and the Middle East and North Africa – we still will need to attract and retain large numbers of quality teachers. This can be done through providing monetary incentives (Chile), monitoring attendance actively to reduce teacher absenteeism (India), creating better physical working environments (including sanitation), and cultivating educators' ties to their local communities.

Second, we need to *modernize what we teach* so that we are meeting the educational needs of people throughout the lifecycle. This means placing greater emphasis on early education; soft skills (like a strong work ethic and good communication skills); entrepreneurial and vocational education (employment, apprenticeships); and curriculum development and connections to labour force needs (both domestically and internationally).

Third, we need to *modernize how and where it is delivered*. New technology offers all stakeholders new ways to learn, from low-tech (like Worldreader and same-language subtitling) to high-tech (like online education, including the MOOCs). Hence the new motto: learning anything, anytime, anywhere. For companies hoping to retain or attract mature workers and recent retirees, a further twist will be modifying the workplace so it is better suited to the scheduling needs of older workers and women and appropriate to the capacities of older workers – in other words, more emphasis on knowledge, wisdom and experience, and less on physical strength and stamina. Companies should also consider setting up bridge-to-retirement programmes that make retirement more gradual and asking mature workers to mentor young ones to create a new generation of workplace leaders.

(3) Act together. We need to coordinate our efforts so we do not bump into each other and duplicate work. This call is appropriate because the challenge is complex and multistakeholder in nature (including the private sector). Moreover, one-off interventions are less efficient than a portfolio of interventions that is well integrated – after all, we need to build up primary, secondary and tertiary in tandem and make them consistent with culture and social mores, labour force needs (school-to-work transitions) and other policy arenas like macroeconomics, trade, governance, infrastructure and retirement policy (retirement age and incentives). The chapter on Pakistan underscores the need for tackling many educational sectors at once (not just primary or secondary or tertiary), while the chapter on Japan underscores the need for all stakeholders to combine efforts to include more women and older people in the workforce.

To accomplish our educational goals we must be creative about better using existing resources and develop innovative financing arrangements. Here, the private sector's involvement is essential and there is enormous scope for PPPs, as highlighted in examples cited throughout the book. With the advent of online education, in many instances free, we must together work out its place in the education system so it has legitimacy and students and employers know what it means and stands for (accreditation).

(4) Act now. Because the world economy is more competitive than ever and because of the changing demographics happening all over the world – like youth bulges in SSA and the Middle East and North Africa or high elderly shares, as in Japan – there is an urgency to act now. Indeed, not acting quickly will leave many countries in the competitive dust. Fortunately, for many countries like Pakistan, there is a window of opportunity to tackle educational reforms thanks to several forces for change both within the educational system and in the broader polity. However, as history teaches us, to make a difference with such a large and complex issue, we will need vision, communication, leadership and resolve on the part of all of the major actors. Moreover, this vision will have to be appropriate and customized to the social, political, economic and cultural context. In Pakistan, Sir Michael Barber showed the way with the Punjab School Reforms Roadmap, an excellent example of how provincial governments and private education providers can move swiftly to improve access to high-quality school education.

(5) Rigorously evaluate what works and what doesn't. One new contribution to enabling the measurement and evaluation of how countries are doing in building up their human capital endowment is the World Economic Forum's new HCI, released in October 2013. It explores what helps and what hurts nations in their efforts to develop a healthy, educated and productive labour force. It also provides country rankings that facilitate effectively comparing countries across regions and income groups. More broadly, technical experts throughout the world have become extremely adept at designing compelling strategies for measuring the effects and economic efficiency of a wide range of interventions related to building skills and reaping rewards therefrom. Investing in such evaluations promotes the global public good nature of knowledge and prevents us from duplicating effort and repeating the mistakes of others.

Within Our Reach

The history of education and skills is a core chapter in the story of human progress. It has powerfully shaped improvements in material well-being, as well as the development of human values that define our achievements and guide our behaviour. It is also an unfinished chapter with a multiplicity of paths ahead. The options we choose will naturally reflect our circumstances, our understanding and our aspirations.

As Winston Churchill once said, "The pessimist sees difficulty in every opportunity. The optimist sees the opportunity in every difficulty." By this standard, we are decidedly optimistic about the future of education and skills, as there are so many plausible options for their enhancement – and for concomitant gains in human well-being – within our reach, both individually and collectively.

Endnotes

1. World Bank, Learning for All: Investing in People's Knowledge and Skills to Promote Development, World Bank Group Education Strategy 2020, Washington DC: World Bank, 2011.

2. The gross enrolment ratio is the total enrolment at a given educational level, regardless of age, divided by the population of the age group that typically corresponds to that level of education. The specification of age groups varies by country, based on different national systems of education and the duration of schooling at the first and second levels. Gross enrolment ratios may exceed 100% if individuals outside the age cohort corresponding to a particular educational level are enrolled in that level.

Never Too Early to Start

Chapter 1: The Early Bird Catches the Worm

Pia Rebello Britto and Ayla Goksel

At the turn of the 21st century, the world was offered a whole new realm of scientific results, one of which illustrated the detailed process of brain development and function. In doing so, it compellingly confirmed the potential of the formative stage of human development and the power of the environment in actualizing that potential. This eloquent evidence set in motion multidisciplinary work – spanning the fields from natural to social sciences – that remarkably arrived at a similar conclusion: Early childhood development is not only critical for human development but also transformative for economic, social and sustainable development.

- Economic analyses from the developed and developing countries show that investing in the earliest years of life leads to some of the highest rates of returns to families, societies and countries – one of the most cost-efficient investments in creating a strong foundation for human capital.
- Neuroscience studies illustrate that the plasticity of the brain and the pace of development in the first few years of life are never again repeated. Also, these early connections form the basis of a lifelong capacity to learn and adapt to change, along with physical and mental health.
- Social science studies demonstrate that early childhood interventions help mitigate the impact of adverse early experiences that, if not addressed, lead to poor health (e.g., obesity, diabetes and cardiovascular disease), poor educational attainment, economic dependency, increased violence and crime, and greater substance abuse and depression (Britto, Engle and Super, 2013).

While the science and evidence in support of early childhood is burgeoning, the results for children have not kept pace. An estimated 200 million children in low- and middle-income countries do not achieve their developmental potential in

the first five years of life because of a lack of stimulating, nurturing, safe and responsive environments (Grantham-McGregor et al., 2007). Here, we are talking about one-third of the world's children (Britto and Ulkuer, 2012). And it is they who must bear the greatest burden of poverty, disease, war, social marginalization and limited health, nutrition and education services. In addition, these risks prevail not just for children living in these countries but also for the disadvantaged children in high-income countries.

On the plus side, it is interesting to note that national policy planning in early childhood development has grown, with over 40 nations now having passed national legislation and action plans, typically spanning the health, education and other sectors of services (Vargas-Baron, 2013). This suggests an acknowledgement of the importance of early childhood at national policy levels – although the translation of that recognition into budget allocations, strategies and government commitment has yet to be realized.

> **"A child born today must master skills and knowledge that were needed only by elites a century ago."**
>
> O'Gara, 2013

This chapter opens with a description of early childhood development and why it is the critical beginning to the formation of skills and workforce development. It then provides examples of best practices in early childhood as potential solutions to the world's immense education and skills challenges. And it concludes with an action agenda consisting of programmatic and policy recommendations. This chapter is a call for action to the global community to pay attention to the compelling, effective and relevant evidence-based solutions that emanate from early childhood programmes and to commit to actions that provide early learning opportunities for young children – notably, better parenting, early stimulation and learning programmes.

It Is Never Too Early to Invest in Children

What exactly do we mean by early childhood development (ECD)?[1] This term is a multifaceted concept that covers the early childhood period from prenatal to eight years of age, encompassing the complex interactions between the growing child and the multilayered contexts of development. It is during these very formative years that development and education have a symbiotic relationship, and it is the period in which the most rapid gains are made in all aspects of growth and development.

Brain development begins shortly after conception and progresses at a very rapid pace through the first three years of life – the stage of greatest development and also the period when development is significantly influenced by the environment. In the first 1,000 days of life, neuronal development and brain circuitry are stimulated by positive experiences that shape brain capacity and inform the ability to process complex information, skills and tasks. This development begins during the foetal stage then accelerates rapidly upon birth. Infants and young children benefit from positive and responsive interactions with at least one consistent caregiver, including exposure to language and opportunities for exploration and learning. For example, verbal engagement between parents and young children is one of the strongest influences on subsequent language development (Bakermans–Kranenburg and Van IJzendoorn, 2010; Shonkoff and Levitt, 2010).

Between the ages of three and five there is a second window of opportunity, but also vulnerability. The pace of development of visual, auditory, language and prefrontal regions of the brain peaks by five to six years of age. Thus great attention is required in areas of disease prevention; basic healthcare; cognitive and language stimulation; social and emotional responsiveness of family, community and friends; and safety and protection (Pinheiro, 2006; Zigler, Gilliam and Jones, 2006). From around the age of six up to the age of eight or nine, after which the transition to primary school is complete, child development and learning have a symbiotic relationship. Cognition and language are used to learn new numeracy and literacy skills. This is also the stage in which socialization, tolerance and respect, regulation of emotions and positive learning are reinforced through new behaviours and interactions. This age range is characterized by school readiness, which is vital for school completion, later skill development and acquiring academic competencies as well as non-academic success (Kagitcibasi et al., 2009; Rouse, Brooks-Gunn and McLanahan, 2005).

The bottom line is that if children do not receive adequate stimulation, support and protection during the critical windows of growth, they can lose the opportunity to develop specific skills and abilities associated with that stage of development (see Box 1). Intensive remediation later in childhood is needed to obtain these missed skills or abilities, an exercise that is very costly and often unsuccessful (Young and Mustard, 2008).

Box 1: Investing in Early Brain Health

Starting from the moment of conception and going throughout our lifetime, our brains – and consequently our personalities, behaviour and well-being are shaped by many factors. Our genes play a vital part in determining how our brains develop and our susceptibility to brain diseases. But the environment we are exposed to and individual experiences can also powerfully affect brain health.

Early development is a time of massive building and organization in the brain through a highly orchestrated process by which cells are born, develop into the correct type, move to their correct places and wire to the correct partners. Although the brain largely cannot repair itself after injury, its capacity for reconfiguring itself, particularly in childhood, is extensive.

Influences on Early Brain Health

Stress: Long-term, uncontrolled stress can impact the brain at any stage of life, with particular harm noted early in life. Stress, such as living in poverty, trauma of violence and abuse can trigger mental illness or substance abuse. Long-term release of stress hormones causes shrinkage in the hippocampus, a part of the brain associated with learning and memory. Stress also affects the immune system and metabolism.

Nutrition: Healthy early brain development depends on proper nutrition. Although many of the mechanisms are not completely understood, we know that nutrients such as fatty acids, iron, vitamins and amino acids are required for neurons to develop and function correctly, while

deficiencies in them can lead to abnormal brain development – some of which may be irreversible. Poor prenatal nutrition can lead to poor cognitive and motor development in the child, as well as poor long-term heath. Malnutrition in early childhood is also linked to lower IQ, poorer academic performance and antisocial behaviour.

Lack of stimulation: The early years are a critical time for developing emotional and cognitive skills. Children raised in impoverished environments suffer consequences for years to come with differences in the structure and growth of their brains, pointing to the permanence of the deficits at a biological level.

Interventions to Improve Early Brain Health

Reducing trauma and deprivation: Sometimes the deleterious effects of trauma and deprivation on brain health can be reversed by better life conditions. Providing social support to at-risk mothers improves the subsequent well-being of their children. Compared to children of mothers who do not receive support, rates of antisocial behaviour and substance abuse are reduced and health is improved. Likewise, enrolling children from traumatic backgrounds in early intervention education programmes raises their social and cognitive performance.

Exercise: Physical activity boosts cognitive performance. Children who regularly perform aerobic exercise have higher IQs and perform better on a variety of cognitive functions, particularly those related to executive control (such as planning, memory, task-switching and decision-making). Exercise also reduces stress and may therefore remove its deleterious effects on brain health.

Language stimulation: Being multilingual is not only advantageous in today's world, there is evidence that learning more than one language as a child confers cognitive benefits. Bilingual children outperform monolingual children overall on a number of cognitive abilities, particularly those requiring mental flexibility, attention, inhibitory control or task-switching. These abilities are relevant to domains beyond language, such as decision-making and creativity (Hilchey and Klein, 2008).

For society, education is a key building block. It has been almost universally established that children who participate in quality early education programmes outperform their peers who did not attend such programmes with respect to any measure of cognitive and noncognitive development. That is why UNESCO's Education For All (EFA) goals and the UN's Millennium Development Goals (MDG) call for a universal primary education and a good quality one. Yet while these initiatives have succeeded in getting children enrolled in school and improving access, little progress has been made on better learning. Recent evaluations have shown high rates of grade repetition and drop out in the primary grades, along with children reading at levels far below their grade (World Bank, 2011).

For the individual, skills and knowledge gained through early education are strong predictors of later achievement and success. This includes better primary school outcomes, in the form of lower attrition rates and higher achievement and engagement. For example, the OECD's 2009 Program for International Student Assessment (PISA) survey shows that in 58 countries, 15-year-old students who attended one year of preprimary school outperformed their peers who lacked early educational enrichment. Similar results arise in secondary schooling and young adulthood (Schweinhart et al., 2005).

Investing in Early Childhood Makes Economic Sense

Early childhood is being hailed by many economists as the smartest investment with respect to sustained returns in the form of individual learning and earning potential, internal efficiencies in the system, a lesser burden on society (especially for the health, justice and social protection systems) and a way to narrow the gap between disadvantaged and advantaged young children and families. The evidence for this assertion comes from two streams: (a) benefits to the individual (including increased school success and educational attainment, improved health and higher after-tax earnings; and (b) benefits to society.

On the cost side, investing in preprimary education has been linked to increasing the internal efficiency of primary school education by lowering its costs. Because children who attend preschool are less likely to repeat grades, drop out or require special education, significant cost reductions are realized in education budgets (Naudeau, Kataoka, Valerio et al., 2011). Furthermore, there are decreased costs of public education, improved classroom climate and greater learning from peers (because some children are better behaved and children learn from each other).

Social returns – that is, benefits to society resulting from public costs of education – are also noted in terms of decreased healthcare costs, reduced crime and violence, increased tax revenues, higher economic growth due to productivity enhancements and lower social and economic inequalities (Barnett and Nores, 2010). It is the developing countries that benefit the most with estimated social returns on investing in primary school education at 24% for SSA, 20% for Asia and 18% for Latin America – higher than the 14% for developed regions.

Among the most frequently presented data in support of ECD as one of the smartest investments in human capital development is the "Heckman Curve" (Heckman, 2006). It shows the steepest gradient in returns during the early years leading to primary school. Thereafter, it levels out during the secondary and tertiary education years. Although the data used to compute the return on investment in the original charts were primarily from the United States, more recent work has focused on low-and middle-income countries (Nores and Barnett, 2010). Increasing enrolment in just one type of ECD programme (e.g. preschool) in a sample of 73 low- and middle-income countries can result in a benefit to society of US$ 10 billion to US$ 34 billion – and a benefit-to-cost ratio of 6.4 to 17.6, depending on the percentage of children enrolled (Engle et al., 2011).

Furthermore, programmes for marginalized and disadvantaged young children – in the areas of health, education and environmental sustainability and protection – have been able to demonstrate remarkable effects. For example, one study found that disadvantaged children enrolled in quality ECD made greater gains than their more advantaged peers, thereby reducing gaps in readiness for school and reducing racial and ethnic inequalities (Rouse, Brooks-Gunn and McLanahan, 2005). Evaluations show that one reason for their effectiveness is that, as children grow, the disparity between an average growth trajectory and a delayed trajectory widens. Intervening earlier requires fewer resources and less effort with greater effectiveness. These early identification and intervention programmes are also vital to assist children with disabilities to achieve to their fullest potential and, to the greatest degree possible, eliminate later disparities and inequalities.

A Report Card on Current ECD

So how is the global community doing on meeting early childhood needs? The best data to draw on come from UNICEF's Multiple Indicator Cluster Survey (MICS), which is a nationally representative and internationally comparable household survey implemented in many low-and middle-income countries to capture the ECD situation. It follows a robust methodology for sampling, data collection, validation and analyses (Bornstein et al., 2012). To date, four rounds of MICS have been implemented. We report on data from MICS3 that was carried out in over 50 countries in 2005–2006 and MICS4 in about the same number of countries in 2009–2011. MICS3 has three questionnaires: a Household Questionnaire, a Questionnaire for Individual Women (15–49 years old), and a Questionnaire for Children Under Five. We begin with a snapshot of child outcomes through a composite ECD index and then focus on contextual influences on development through a series of indicators of the early caregiving environment collected in 30 countries.

Child Outcomes

Overall, a composite ECD index – which combines literacy–numeracy, physical, social–emotional and learning domains – suggests that one-third of children under five years of age are not achieving their developmental potential, with a large variation across and within countries. Across countries, there is a set such as Bosnia and Herzegovina and Mongolia, where strong national investment has been made in ECD and nearly all children are developmentally on track. The other set of countries are in SSA, where only about one-third of children are developmentally on track. In all countries, however, there is a significant difference between those who are in the richest quintile compared to those in the poorest, with the majority of children in the poorest quintile not developmentally on track. Among the development domains, there are also large differences. For example, in physical development nearly all 30 countries are doing well; however, in literacy–numeracy there is a significant spread among the countries, although overall even the best performing country (Belarus) is not yet at 50%.

Caregiving

As for contextual influences on child outcomes, a series of analyses focusing on caregiving behaviours (based on the MICS3 data across a sample of 28 countries) indicates that for one-third of the children, their basic health, development and protection rights are not being met. A major concern is nutrition, with on average only 25% of mothers reporting exclusive breastfeeding the previous day for their infant under six months of age. Although the reported range is wide (5– 57%), even at the uppermost limit it is still at best half the desired percentage of mothers reporting exclusive breastfeeding (EBF).

In the area of cognitive caregiving, the results (based on the MICS3) suggest that children are not receiving enough stimulation. The data reveal that, on average, 25% of mothers have read to their child in the past three days, slightly over 33% have told stories to their children in the past three days, and close to one-half (47%) have engaged in counting, naming and other learning activities. With respect to the socio-emotional scales, the frequency of engagement is higher, with at least 25% in all countries and, on average, 50% of mothers, reporting singing with their child in the past three days, about two-thirds (64%) reporting taking their child out of the house and 60% reporting playing with their child. As for disciplinary practices, about two-thirds of caregivers report that their children have experienced psychological aggression from the parent (66%) and mild physical discipline (63%) in the past month.

Access to ECD Programmes

The picture for access to ECD programmes is still rather unclear because of the difficulties in monitoring access – a myriad of programmes fall into this category and many of them are either nonformal or receive nongovernmental support. The clearest data available are for preprimary education provided by ministries of education, usually for children between four and six years of age. And this data suggests that more than 50% of children access a preprimary programme. But this average is misleading in that it is driven by high enrolment rates in a handful of countries and within the highest income brackets.

By contrast, MICS data for early education programme enrolment show that, for one-third of countries in the sample, preprimary school enrolment is less than 10% (UNICEF, 2012). Moreover, in most countries, there is a significant disparity in enrolment, favouring the richest 20% in a country, compared to the poorest 20%. These data point to the pervasive negative influence of poverty on equitable access, along with the limited and unequal nature of access to early education.

The Landscape of ECD Programmes

The inequitable distribution of opportunities and resultant inequality in educational outcomes and workforce development need a bold systematic approach that addresses the underlying mechanisms that perpetuate these circumstances. A sustainable and systematic response to these challenges can be found in the evidence from ECD. When policy and programmatic action addresses the most formative and foundational stage of human development, then we can expect more inclusive and equitable social and economic development. Indeed, early childhood sets in motion an equity-based pathway from opportunity to outcome.

To better understand the current landscape of ECD programmes, it is helpful to view the interventions and programmes as varying on a range of dimensions, as illustrated in Figure 1.

Using a developmental perspective, programmes can be considered on the continuum of child age, from prenatal to eight years of age, with transitions noted at the ages of three and six years.

Using a sector perspective, these programmes can be viewed as falling into various sectors – typically health, education, social protection and welfare and child protection. Of these, the dominant sectors, health and education, typically focus on different age groups within the ECD period. The health sector typically leads during infancy and toddlerhood through programmes focusing on immunization, nutrition and health interventions, and during the preschool years the lead sector is typically education. However this transition is often not coordinated, with many gaps in services.

Using a sponsorship perspective, these programmes can be grouped by those falling under the auspices of the government, a nongovernmental organization (NGO) or the private sector for fee or profit. Government programmes are implemented primarily through national systems. However, the main sponsors of ECD programmes are international, national and community-based organizations. Some of the international groups are: Save the Children, Plan International, Child Fund International and World Vision. Another growing sector in ECD is the private for fee or for profit, which is starting to gain dominance in early learning programmes for children in the preschool age bracket (Woodhead and Streuli, 2013).

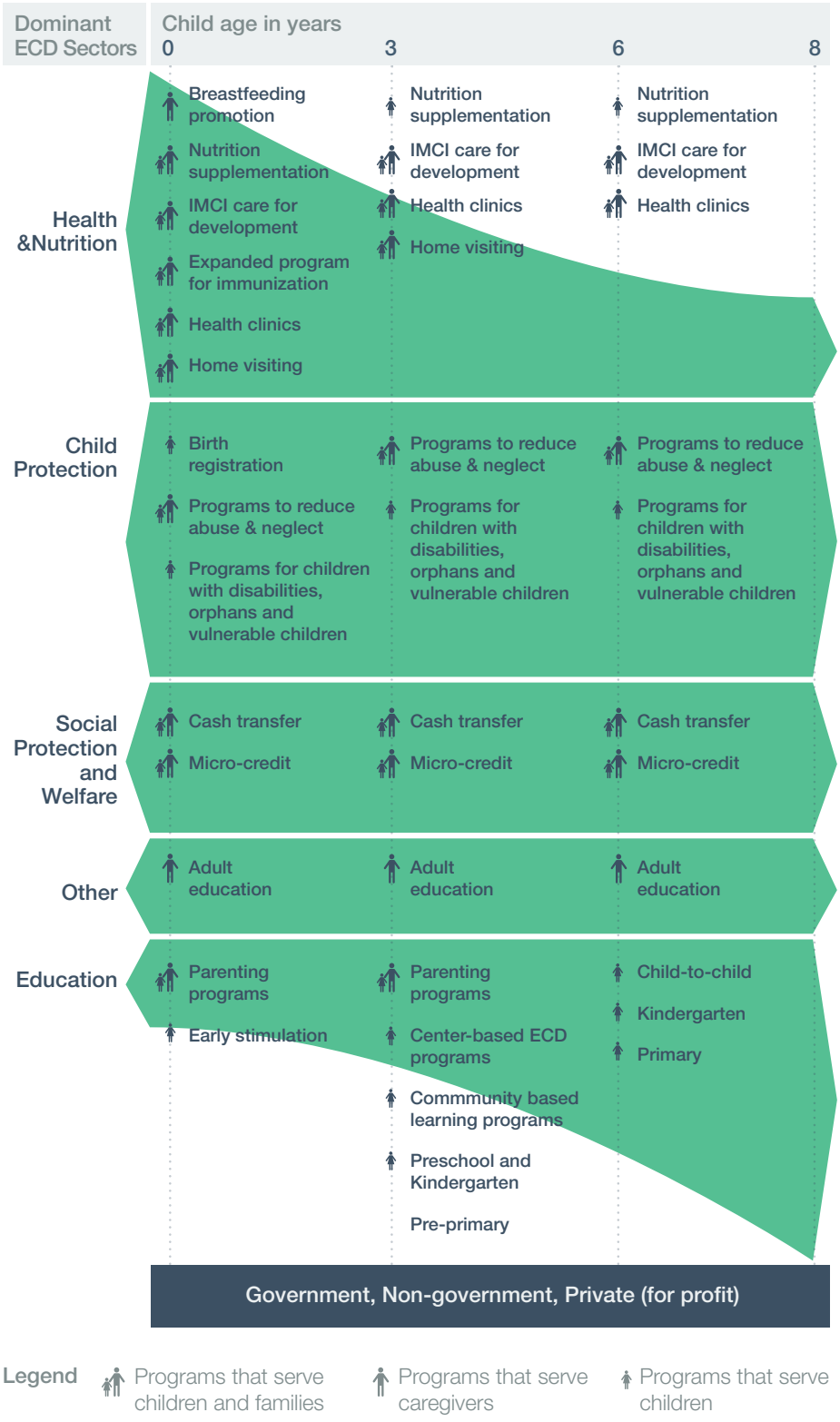
Using a generational perspective, some programmes serve a single-generation (either the parent/caregiver or the child). Common examples of single generation programmes are parenting programmes (e.g. the Better Parenting Programme in Jordan) (Al-Hassan and Lansford, 2010). Common examples of child-focused programmes are typically centre- or community-based, where children are served in groups (e.g. the Madrassa Early Childhood Programme). There are also two-generation programmes that serve both the caregiver and the child (e.g. Educa a tu hijo in Cuba).

Using a location perspective, these programmes can be organized by where the services are provided. Typical locations include homes, clinics, community centres, schools and other nonformal settings (e.g. libraries, mobile technology and television).

It should be noted that this delineation of dimensions is not quite so linear or systematic in reality. Programmes may include more than one feature of a dimension. For example, programmes are implemented in homes and communities or they may be implemented through a national system with nongovernmental support. Furthermore, these programme modalities offer a range of options for action. For example, programmes targeted for families living in poverty that provide integrated child development services (e.g. Head Start in the United States and Sure Start in the United Kingdom) have a very different model compared to programmes that provide social assistance to families living in poverty (e.g. Attencion a Crises in Nicaragua and Bolsa Familia in Brazil).

Given this huge variation, we have chosen to focus on programmes that directly impact the most proximal or influential context for early development – the home and the family – as the basis for recommending what the international community can do to transform the power of early childhood. These two types of programmes, which occur all over the world, have shown that they can succeed in a variety of environments. Indeed, the body of evidence on them is now vast, but an exhaustive review would be beyond the scope of this chapter. So let us cite two examples that together give a sense of what can be done to cover the critical early years.

Figure 1: Landscape of ECD Programs



Source: Britto, Yoshikawa & Boller, 2011

The first example addresses the first 1,000 days of life, when the proliferation of neuronal connections and brain development is acute (see Box 2). It shows that by providing nutrition and stimulation in formative period of development, the complexity and pace of brain function and development are supported. The second example addresses the second 1,000 days of life (three to six years of age) (see Box 3). It shows that by providing a stimulating, enriching social, emotional and learning environment, children's holistic development to achieve their potential is facilitated.

Box 2: The First 1,000 Days: Care for Child Development

For the first 1,000 days of life, the Care for Child Development package is a landmark, holistic intervention that brings together the essential evidence-based components. Developed by the WHO and UNICEF, it aims to guide the interaction between a caregiver and a child in a family setting, and also improve the caregiving skills of parents and other caregivers. The intervention starts with improving the skills of (mostly health) service providers, who work with families on ways to improve care practices (including the feeding practices, stimulating a child's learning and care of the sick child), and prevent child neglect and abuse. The goal is to strengthen families' knowledge, skills and belief in themselves to provide the best possible care, stimulation and environment for their children's optimal development. The package was originally developed in the late 1990s and most recently updated in 2012 (WHO and UNICEF, 2012).

How is the programme doing? A recent evaluation (in an experimental randomized controlled trial) shows that within a year of implementation, the children of families participating in the programme had better cognitive development, social relationships, emotional bonds and language and communication skills. The mothers were less depressed and the family environment was more positive and stimulating. All these impacts are among the strongest predictors of later health, achievement and success (Yousafzai and Petrovic, forthcoming).

Box 3: The Second 1,000 Days: Turkish Early Enrichment Project

For the second 1,000 days of life, probably the only robust research on the longitudinal effects of ECD intervention from a developing country is the Turkish Early Enrichment Project (TEEP). It was carried out in 1983–1985 with 255 children aged four to six years of age from deprived backgrounds. It was designed to examine the separate and combined effects of two types of enrichment: a centre-based education and a home-based education (Kagitcibasi, Sunar and Bekman, 2001). For the programme, mothers of about half the children were randomly assigned to receive mother training – such as how to support the children's development through cognitively stimulating structured activities – and the other half did not receive any mother training.

So far, there have been four evaluations: preprogramme, immediately postprogramme, seven years after the programme, and 19 years after the programme. TEEP has shown a positive, long-lasting impact on both mother and child. Right after the original study, benefits were found in all spheres of development and children of participating mothers achieved higher scores in intelligence and general aptitude tests. In the first follow-up, the results point to sustained benefits in cognitive development, school achievement, school attainment and socio-emotional development and social integration. Mothers and families also benefited from the programme in terms of better family relations and increased women's intra-family status.

What makes TEEP unique is not only the comprehensive research results but how it has evolved and been taken to scale nationally as well as replicated in several countries. After the impressive results of the first follow-up of TEEP it was decided that the programme provided a viable low-cost early childhood education model that could be offered to underprivileged young children across Turkey. The Mother Child Education Foundation (ACEV) was thus established in 1993 with this mandate. TEEP was renamed as the Mother Child Education Programme (MOCEP), with the premise being that the early developmental needs of children must be met and supported by their immediate environment and parents play an important role as "first educators".

MOCEP is now implemented over 25 weeks in the form of structured weekly group meetings and home visits with mothers conducted by ACEV-trained groups leaders, along with a weekly curriculum for the child that is implemented at home by the mothers. The programme targets both mother and child, with educational outcomes geared toward both groups: enriching children cognitively to boost school readiness and optimal psycho-social development and training of mothers to create a sustainable nurturing and healthy home environments. Instead of a teacher, it leverages the mother in her natural educator role. Rather than a preschool, it implements cognitive development exercises at home. It also promotes inclusion as children without access to preschool are provided with a proven alternative.

In the second follow-up of TEEP, 19 years after the original study that tracked the original sample in young adulthood, the results further pointed to long-term benefits in educational attainment (including university education), cognitive performance, occupational status and social participation of the young adults whose mothers had participated in the training programme. There are many individual stories from both the original sample and children and mothers who participated over the years. Ceren, for example, is today a young architect and still recalls practising the worksheets at home with her mother, a factory worker. She calls her mother her "first teacher" and believes that preschool year was instrumental in her academic success. Twenty years later, she also participated in the MOCEP for her son and is an active community leader that has established a parent-led preschool in Istanbul.

Today, MOCEP has been implemented on a wide scale in Turkey, in collaboration with the Ministry of National Education, and it has also been replicated in several European and Middle Eastern countries, reaching over 400,000 mothers and children. Yet despite the mounting evidence on the critical period of the early years, over half the world's children still lack access to preschool services and are unable to fulfil their potential. In this respect, MOCEP is an effective and cost-efficient viable model, capitalizing on the critical role of the mother to maximize our investment in young children.

An Action Agenda for Policies and Programmes

First, mobilize stronger commitment to ECD. We call upon the global community to demonstrate commitment through international frameworks and strategies. Governments in particular have an important role in ensuring ECD is an integral part of human development policy, enforced through national legislation and harnessing of resources. Careful attention must be paid to ensuring the access of the most vulnerable populations. And creative, holistic solutions should be used to meet the multidimensional development needs of young children and their families.

Second, invest in evidence based programmes. Programmatic action has to be rooted in evidence that moves beyond proof of concept to being implementable at scale. The educational needs are vast and small demonstration programmes fall short of reaching the required populations. The genesis of the Care for Child Development can be traced back to the original study in Jamaica in the 1980s, which compared the impact of nutrition and stimulation on height and cognitive development of children age 9 to 24 months in a randomized trial in a poor disadvantaged urban neighborhood of Kingston. Most recently, this evidence was validated through a similar trial in Pakistan with an added emphasis on understanding scalability (PEDS Trial; Yousafzai and Petrovic, forthcoming). Similarly, the Turkish Early Enrichment Project has been rigorously evaluated using robust research designs to establish the accuracy of the evidence.

Third, invest in quality. Programme evaluations have shown consistently that the positive outcomes of early development and education interventions are dependent on the quality of programming. It is therefore critical for policy-makers to invest in high quality programmes to ensure that the greatest benefits accrue to both the individual and society. This is particularly critical when taking demonstration or pilot programmes to scale. Once the Turkish Early Enrichment Project had proven successful as a demonstration project, it was translated into the Mother Child Education Programme (MOCEP) in a manner that it could be implemented in multiple sites, across Turkey, and now internationally, while maintaining the quality and credibility (see Box 3). The Care for Child Development Programme, also using similar mechanisms for scale up, is being supported by UNICEF and the WHO. A key recommendation for programming at scale is to ensure that programmes are built on a strong foundation of evidence with the potential to be scaled up to reach targeted access objectives, with quality.

Fourth, provide integrated services because development is holistic. As demonstrated by these two programmes, it was a set of integrated services (such as nutrition and stimulation) that produced the desired impact. Thus, interventions need to be able to address the complexity of young children's environmental and developmental needs. These models also demonstrated the importance of including multigenerational approaches by addressing both the children and their primary caregivers. In doing so, these interventions were able to maximize their impact. There are a series of other intervention models – such as media-based models (e.g. Sesame Street), childcare in the work place, adult literacy and parenting – that also include multigenerational approaches and have been successful.

Fifth, promote partnerships. The nature of ECD is multidisciplinary and multisectoral. It necessitates at the very least the coordination of the health, education and child protection sectors. It also requires the cooperation of families, communities, and local, as well as national, institutions. ECD has already benefited from the innovations in the NGO sector that have advanced the field in evidence-based programmes going to scale. Advancing ECD today will be successful if we involve the various sectors and stakeholders that touch the lives of young children and harness their power.

Sixth, commit to financial sustainability of programmes. This is probably one of the greatest constraints for ECD programmes and social sector programmes in general. Typically, the programmes are supported by NGOs or international agencies and are sustained for the duration of the funding. Currently, governments provide a meagre amount of ECD funding, and with the funds that are available, decisions for allocating resources to programmes are not systematic. This pattern of support for ECD programmes needs to be changed through policy commitments underwritten with financial allocations. Donors who have invested significantly in education must align their funding with the evidence for ECD on educational outcomes. A Global Fund for Early Childhood could be an important innovation in mobilizing a commitment to ECD.

In closing, given the overwhelming evidence now available on the importance of investing in children in the early years – and the fact that doing so would make good economic sense – we strongly believe that governments and donors can no longer afford not to invest in early childhood programmes and policies. As the global community discusses the next generation of development goals, we need to place a high priority on creating a sound foundation for human development – including seriously considering a goal for early childhood. We believe all young children will achieve their developmental potential through access to quality early childhood programmes and policies. If we want a more equitable and prosperous world, it begins with making the smart and the right investments in the earliest years.

References

Al-Hassan, S.M. and Lansford, J.E. Evaluation of the better parenting program in Jordan. In Early Child Development and Care, 2010: 217–226. Doi:10.1080/03004431003654925.

Bakermans-Kranenburg, M.J. and Van IJzendoorn, M.H. Parenting matters: Family science in the genomic era. In Family Science, 2010. 1: 25–35.

Barnett, W.S. and Nores, M. "National Institute for Early Education Research: Investing in Early Childhood Education: A Global Perspective". http://nieer.org/sites/nieer/files/Investing%20in%20Early%20Childhood%20Eduation%20A%20Global%20Perspectivei.pdf, 2010.

Bornstein, M.H., Britto, P.B., Nonoyama-Tarumi, Y., Ota, Y., Petrovic, O. and Putnick, D.L. Child development in developing countries: Introduction and methods. In Child Development, 2012

Britto, P.R., Engle, P.L. and Super, C.S. (eds). Handbook of Early Child Development Research and its Impact on Global Policy. New York, NY: Oxford University Press,2013.

Britto, P.R. and Ulkuer, N. Child development in developing countries: Child rights and policy implications. In Child Development, 2012, 83(1): 92–103.

Britto, P., Yoshikawa, H. and Boller, K. Quality of early childhood development programs and policies in global contexts: Rationale for investment, conceptual framework and implications for equity. In Social Policy Reports of the Society for Research in Child Development, 2011, 25(2): 1–31.

Engle, P.L., Black, M.M., Behrman, J.R. et al. Strategies to avoid the loss of developmental potential in more than 200 million children in the developing world. In Lancet, 2007, 369: 229–242.

Engle, P.L., Fernald, L.C., Alderman, H., Behrman, J., O'Gara, C., Yousafzai, A., de Mello, M.C., Hidrobo, M., Ulkuer, N., Ertem I., Iltus S. and The Global Child Development Steering Group. Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. In The Lancet, 2011, 378(9799): 1339–1353.

Grantham-McGregor, S., Cheung, Y.B., Cueto, S., Glewwe, P., Richter, L. and Strupp, B. Developmental potential in the first 5 years for children in developing countries. In The Lancet, 2007, 369: 60–70.

Harvard Center on the Developing Child. The Science of Early Childhood Development: Closing the Gap Between What We Know and What We Do. Cambridge, MA: Author, 2007.

Heckman, J.J. Skill formation and the economics of investing in disadvantaged children. In Science, 2006, 312: 1900–1902.

Kagitçibasi, Ç., Sunar, D., Bekman, S., Baydar, N. and Cemalcilar, Z. Continuing effects of early intervention in adult life: The Turkish Early Enrichment Project 22 years later. In Journal of Applied Developmental Psychology, 2009, 30: 764–779.

Naudeau, S., Kataoka, N., Valerio, A., Neuman, M.J. and Elder, L. K. Investing in Young Children: An Early Childhood Development Guide for Policy Dialogue and Project Preparation. Washington DC: World Bank, 2011.

Nores, M. and Barnett, W.S. Benefits of early childhood interventions across the world: (Under) investing in the very young. In Economic of Education Review, 2010, 29: 271–282.

O'Gara, C. Education based approaches to early childhood. In P.R. Britto, P.L. Engle and C.S. Super (eds). Handbook of Early Child Development Research and Its Impact on Global Policy. New York, NY: Oxford University Press, 2013.

Pinheiro, P.S. “Report of the independent expert for the United Nations study on violence against children. United Nations General Assembly”. http://www.unicef.org/violencestudy/reports/SG_violencestudy_en.pdf, 2006.

Schweinhart, L.J., Montie, J., Xiang, Z., Barnett, W.S., Belfield, C.R. and Nores, M. Lifetime effects: The High/Scope Perry Preschool Study through age 40. In Monographs of the High/Scope Educational Research Foundation, 14. Ypsilanti, MI: High/Scope Press, 2005.

Shonkoff, J.P. and Levitt, P. Neuroscience and the future of early childhood policy: Moving from why to what and how. In Neuron, 2010, 67: 689–691

Rouse, C., Brooks-Gunn, J. and McLanahan, S. Introducing the issue, “School readiness: Closing racial and ethnic gaps”. In The Future of Children, 2005, 1: 5–14.

United Nations Children's Fund. Inequities in Early Childhood Development: What the Data Say – Evidence from the Multiple Indicator Cluster Survey. New York, NY: UNICEF, 2012.

Vargas-Barón, E. Building and strengthening national systems for early childhood development. In P.R. Britto, P. Engle and C. Super (eds). Handbook of Early Childhood Development Research and Its Impact on Global Policy. New York: Oxford University Press, 2013: 443–466.

Woodhead, M. and Streuli, N. Early education for all: Is there a role for the private sector? In P.R. Britto, P. E. Engle and C. Super (eds). Handbook of Early Childhood Development Research and Its Impact on Global Policy. New York: Oxford University Press, 2013.

World Bank. Learning for All: Investing in People's Knowledge and Skills to Promote Development. Washington DC: World Bank, 2011.

Young, M.E. and Mustard, F. Brain development and ECD; a case for investment. In M. Garcia, A. Pence and J. Evans (eds). Africa's Future, Africa's Challenge: Early Childhood Care and Development in Sub-Saharan Africa. Washington DC: The World Bank, 2008.

Yousafzai, A. and Petrovic, O. The PEDS Trial: Impact of Care for Child Development in Pakistan. UNICEF and Aga Khan University, forthcoming.

Zigler, E.F., Gilliam, W.S. and Jones, S.M. A Vision for Universal Preschool Education. New York: Cambridge University Press, 2006.

Endnotes

1. Early Childhood Development (ECD) is known by a multitude of names, including “early childhood care”, “early childhood care and development”, “early childhood care and education”, “early childhood development”, “early childhood education”, “early childhood intervention,” and “early childhood services.” The presence of these related and sometimes interchangeable terms demonstrates deliberate efforts to address the development, care, and education of young children. In this chapter we use the term “Early Childhood Development” (ECD) to capture a multifaceted concept that focuses on the child's outcome (development) which depends on characteristics of the child and the context such as care or education (Britto, Engle and Super, 2013). In this conceptualization, we describe both the child and the context.

Calling All Minds

Chapter 2: Investing in Girls (and Women) to Spur Economic Development

Tae Yoo

On the face of it, the 21st century has, so far, improved educational opportunities for girls. There is greater understanding throughout the world that women play a vital role in society and the economy and there is greater emphasis globally on the need to educate female children.

Widespread ratification of the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), which many consider to be an international bill of rights for women, shows that countries are willing (or, at least, have publicly said that they are willing) to take concrete steps to end discrimination and violence against women and to improve their status in society. At the same time, increased acceptance of gender equality as a right in and of itself is bringing specific attention to the issue of girls' education.

In 2000, the United Nations adopted eight Millennium Development Goals (MDGs) aimed at boosting living standards by 2015, many of which include a focus on gender. MDG 3 calls for promoting gender equality and empowering women – with a specific target of eliminating gender disparity in primary and secondary education, preferably by 2005, and in all levels of education, no later than 2015. The other MDGs call for achieving universal primary education; reducing child mortality; improving maternal health; eradicating poverty and extreme hunger; combating HIV/AIDS, malaria and other diseases; ensuring environmental sustainability; and creating a global partnership for development.

These international goals have produced measurable results for girls and women and show how valuable it can be to frame issues in terms of gender. UNICEF, UNESCO and the World Bank, along with organizations like the Nike Foundation and the NoVo Foundation, have helped place girls' education on the global agenda and are increasing efforts to provide a quality education to more girls worldwide. All of this has, in turn, fueled

the efforts of national governments and nongovernmental organizations (NGOs) to get more girls into school.

Developed countries have seen the biggest increases in female enrolment and graduation rates. However, many of the countries that have made the greatest strides in improving girls' education, regardless of their stage of development, are those that have also had the strongest political will and leadership to help girls – such as Colombia, Liberia, Mexico, Morocco, Nicaragua and Turkey.

Yet despite all this progress, there are still millions of girls and women around the world, especially in developing countries, who lack the information, resources or know-how they need to participate in the global economy (see Box 1). In addition, girls accounted for 53% of out-of-school children in 2010, compared to 58% in 2000.[1] There are many reasons for this – mostly cultural and economic – but the end result is consistently the same for girls and women who fail to get an adequate education: they have lower incomes, many social disadvantages and are less able to contribute to economic growth.

Box 1: Facts About Girls' Education

Literacy:

- Worldwide, females ages 15–24 have lower literacy rates (87%) than males (92%). However, the gap has closed somewhat since 1990, when the corresponding figures were 79% and 88%.
- Of the 774 million illiterate people in the world, two-thirds are female.
- By far the largest female–male differences are in SSA and South Asia, with notable differences also persisting in the Middle East and North Africa.

Primary enrolment:

- Girls have nearly caught up to boys in primary enrolment. As with boys, more girls are enrolled than the number of primary-school-age children of that sex in the population (which can happen because older children are often still in primary school).
- This is true at all income levels – a marked change since 1990, when girls' enrolment was far lower than that of boys (except in high-income countries). It is also true in all world regions, though some notable disparities remain in SSA and South Asia.
- Within this overall success story, quite a few countries stand out for the low fraction of girls enrolled in primary school – for example, Pakistan (85%), Nigeria (79%), Mali (75%) and Eritrea (41%).

Secondary enrolment:

- Girls' enrolment in secondary education has increased substantially since 1990 and, on a global basis, is nearly equal to that of males. The largest disparities are in low- and lower-middle-income countries, where girls' enrolment (approximately 49%) lags that of boys (approximately 54%).
- Girls' secondary enrolment is furthest behind in SSA and South Asia. In Pakistan, only 29% of girls (against 39% of boys) are enrolled. Other countries with exceptionally low shares of girls enrolled include Tanzania (28%) and Chad (15%). By contrast, in Latin America and the Caribbean, girls (93%) are ahead of boys (87%).
- In numerous countries (such as Argentina, Bangladesh, Colombia, Honduras, Lesotho, Qatar and Uruguay), girls' secondary enrolment substantially exceeds that of boys.

Out-of-school tally:

- An estimated 31 million girls of primary school age and 34 million girls of lower secondary school age are not enrolled in school.
- Together three countries – Nigeria, Pakistan, and Ethiopia – have around 9.5 million girls of primary school age out of school.

Tertiary enrolment:

- Worldwide, more girls than boys are enrolled in higher education. The disparity is greatest in high-income countries (82% versus 65%) and is reversed in low- and lower-middle-income countries.

Completion rate and transitions:

- Globally, the primary completion rate for girls matches that of boys – a big change since 1990. Girls do still lag, however, in low-income countries, in the Middle East and North Africa, and in SSA.
- In developing countries, almost 25% of young women (aged 15–24) – for a total of 116 million – have never completed primary school, meaning they lack the needed skills for work.

Repetition rate:

- In general, both primary and secondary repetition rates are similar for girls and boys. A major exception to this pattern is seen in secondary education in the Middle East and North Africa and even more so in Latin American and the Caribbean, where male repeaters (17%) greatly outnumber female repeaters (5%).

Source: World Development Indicators and UNESCO.

Of the many arguments in favour of girls' education, one of the most compelling, from the standpoint of economic development, is that education enables jobs, a key source of economic growth and development.

What can the international community do to ratchet up progress on girls' education at all levels? This chapter explores how investing in girls can spur economic development and looks at successful models for better educational and economic opportunities for girls and women. It also provides suggestions for the way forward – with the emphasis on considering local sensitivities and issues, using different methods to target different aspects of the problem, identifying strategic investments – such as expanding the broadband infrastructure – working closely with all of the stakeholders and staying the course with this long-term investment in girls' lives.

Why Educating Girls Matters

In the past few decades, research has shown there is a clear link between the amount of education a girl receives and her long-term ability to participate in the economy. There are several ways that educating girls leads to economic empowerment.

Higher Per Capita Income

One way is by securing higher per capita income. The Council on Foreign Relations finds that "one additional year of primary education alone can increase a girl's future wages by 10 to 20%, while an extra year of secondary school adds another 15 to 25%".[2] More broadly, after looking at 100 countries, the World Bank found that "increasing the share of women with a secondary education by 1% boosts annual per capita income growth by 0.3 percentage points".[3] A later report, also published by the Council on Foreign

Relations, adds context to this finding, saying that 0.3 percentage points "is a substantial amount considering that per capita income gains in developing countries seldom exceed 3% a year".[4]

Even girls who gain only basic literacy can increase a country's chances for economic growth. The World Bank claims that "no country has ever achieved economic growth without reaching a critical threshold of about 40% in its adult literacy rate".[5] In 2013, UNESCO estimated that "two-thirds of the 774 million illiterate people in the world are female",[6] so this is a serious issue. Teaching more girls to read and write does not deal with the fact that so many adult women are already illiterate, but it does have the potential to improve adult literacy in the future. For countries trying to reach the World Bank's target of 40% literacy, ensuring that more girls are literate can, over time, make the goal of economic growth easier to reach.

More Prosperous Communities

The beneficial economic impact of educating a girl continues into her adulthood in other ways, beyond her ability to earn an income. Mothers with education use the knowledge they have acquired to improve the health of their children and other family members – leading to better maternal health, reduced infant mortality rates, better nutrition for their children and increased prevention against HIV/AIDS. In fact, the World Bank finds that "women reinvest 90% of their income in their families and communities", acquiring "food, healthcare, home improvement, and schooling for themselves and their children".[7] As Shashi Tharoor, India's minister of state for human resource development and former under-secretary-general for communications and public information of the UN, puts it, "Scholarly studies and research projects have established what common sense might already have told us: If you educate a girl, you educate a family and benefit an entire community."[8] As educated girls become women, they become capable of transforming local communities and adding even more to the world's economic prosperity. They also act as role models for other girls, so the next generation can follow their examples and offer their own contributions to economic development.

When the effect that educated women can have on their families and local communities begins to take hold, the results can be dramatic, with gross domestic product getting a noticeable boost. In a Council on Foreign Relations report, Barbara Herz and Gene B. Sperling write that "girls' education leads to increased income, both for individuals and for nations as a whole".[9] Since girls and women represent 50% of the world population, enabling them to participate in the economy helps broaden the employment pool in a given region. The World Economic Forum, in its 2013 annual report on the Global Gender Gap, states that "because women account for one-half of a country's potential talent base, a nation's competitiveness in the long term depends significantly on whether and how it educates and utilizes its women".[10] The world needs thinkers, leaders and doers more than ever, so neglecting the minds of half the population means foregoing the beneficial ideas, contributions and actions those minds could potentially produce. In economic terms, educating girls increases the potential of human capital and makes the knowledge economy more productive.

Better Skill Sets

In the past decade, new technologies – like smartphones, tablet computers and cloud computing – have transformed the way we live and interact, on a global scale. Looking ahead, to the rest of the 21st century and beyond, we can be certain that technology will continue to play a defining role in all our economic futures. Educated girls, equipped with the skills needed to use today's technologies and the not-yet-invented technologies of tomorrow, are enabled to perform jobs of all kinds, including those we can't even imagine today.

Skills development is a vital part of lowering unemployment, increasing gender equality and reducing poverty. The labour market is becoming increasingly dependent on science, technology, engineering and maths (STEM) skills, and there is a growing need, worldwide, for people with information and computing technology (ICT) skills. In fact, computer networking skills will be "the global currency of 21st century economies", according to the industry analyst IDC, but there is a significant shortage of people equipped with these skills. In Latin America, for instance, IDC predicts that by 2015 there will be a shortfall of more than 296,000 professionals with networking skills, representing a skills gap of 35%.[11]

- Globally, "85 to 95% of jobs will require ICT skills by 2020",[12] according to the European Centre for the Development of Vocational Training.
- In the United States, the Bureau of Labor Statistics estimates that "ten of the 30 fastest growing occupations are STEM occupations, including medical fields".[13]
- In India, according to the online community SiliconIndia, a professional network with more than 5 million members, a recently published list of the 10 "Degrees That Employers Adore Most" showed that the top nine were all STEM-related: biomedical engineers, biochemistry, software engineering, environmental engineering, civil engineering, geology, petroleum engineering, management information systems and applied mathematics.[14]

Jobs in the public sector are increasingly dependent on technology too. More and more government services are now available online, in developed and developing countries alike. Women with ICT skills can help develop and deliver these services, even in places where the sexes are traditionally kept separate. In Bahrain, for instance, citizens can now renew a driver's licence online. This creates a need for people who can support the online renewals, and women with programming and other computer skills can do the necessary work, either at a government office or from home.

Equipping a girl with even rudimentary ICT skills can make a difference in her productivity when she grows up, especially in developing regions. Just being able to use a smartphone or a computer with Internet access can help women increase output, even in jobs that are traditionally viewed as "low-tech". For women who produce handicrafts or textiles, knowing how to access the Internet can be an efficient way to get to market – whether selling locally, regionally or even internationally – and can offer a pathway to microloans and other banking services, especially in remote areas that may be far from bricks-and-mortar financial institutions. Similarly, women who are involved in agriculture, which continues to be a major part of rural economies throughout the developing world, can use basic ICT skills to access online resources that help them discover new techniques, anticipate weather conditions and understand crop pricing.

Take the case of OneWorld South Asia, the South Asian Center of OneWorld International Foundation, which uses ICT to promote sustainable development. It has an initiative in rural India, called LifeLines, which lets farmers use mobile phones to record questions and access answers provided by agricultural experts. Participants, which include 150,000 farmers in 1,000 villages, report an average 20% to 30% increase in productivity and income.[15]

Removing Barriers: Programmes that Work

To help girls become educated, we must first remove the barriers that prevent them from attending and staying in school. UNICEF has identified many of the obstacles girls face and the observations made by NGOs and other groups that work directly with girls and women help complete the picture. This section explores some of the biggest barriers that girls in the developing world encounter. It also highlights select programmes – not necessarily the most well-known ones – that are working to break down those barriers and can serve as best-practice examples for new initiatives.

Providing Resources to the Poorest

Eliminating poverty is one of the great challenges of our time and education offers some routes to alleviating poverty. Several countries, especially in Latin America, have what are called "conditional" welfare programmes that aim to reduce poverty by giving money only to people once they have met certain behavioural criteria, generally related to education and children's healthcare. The World Bank has found that conditional (and unconditional) transfer programmes can be useful – if well designed and implemented – in addressing gender inequality in education. They highlight Malawi, one of the poorest countries in the world, where a pilot programme provided cash transfers to girls who enrolled in primary schools and kept up their attendance. The two-year pilot led to a significant improvement in girls' enrolment, attendance rates and grades.[16]

Another study, conducted by Johns Hopkins University researchers, looked at conditional cash transfers (CCTs) for school attendance in 14 countries. They found that there is "strong evidence for positive effects of financial incentives on improving attendance".[17] The Malawi programme, mentioned previously, and a programme in Guatemala, were the only two in the study that specifically targeted girls and the authors are quick to point out that rewarding attendance does not, on its own, guarantee scholastic success. However, CCTs, combined with other interventions discussed in this chapter, could be a possible solution for some countries. Scholarships, which waive fees instead of giving money directly to families, are another way of encouraging families with limited means to get their girls into school.

A Healthier Environment

If girls are not well enough for regular attendance, they can fall behind and eventually drop out of school. The WHO indicates that "272 million school days are lost each year due to diarrhea alone and about 400 million children in the developing world have worms that prevent them from learning".[18] Improving health and nutrition not only increases the likelihood that a girl will attend school but also increases her chances of growing up to be a healthy adult.

The onset of puberty is a critical time to ensure adolescent girls stay in school. UNICEF finds that one in 10 school-age African girls "do not attend . . . or drop out at puberty because of the lack of clean and private sanitation facilities in schools".[19] School latrines (if they exist) may have limited privacy and poor hygienic conditions, making it difficult for adolescent girls to be in school. Two programmes – one in Ethiopia supported by Save the Children[20] and another in Ghana supported by the international organization Plan International[21] – have introduced "girl-friendly" schools. These facilities give girls a private, protected and sanitary space, separated from boys. The Ghana programme uses standalone buildings, with ergonomically designed latrines and rainwater collected from the rooftop.

Positive Role Models

As more girls see educated women who are prominent in their careers and their communities – whether selling handmade goods online, teaching children to read, running a company or leading a nation – there is a greater incentive for them to stay in school.

Many countries have instituted quotas for women in political positions. In 1992, India amended its constitution to set aside one-third of seats, at every level of government, for women. What effect did this have on villages in West Bengal? A study by the Harvard Kennedy School of Government and the International Monetary Fund found that, with increased exposure to women in leadership roles, voters increased their approval of women as leaders. It also found that having women role models "raised the aspirations parents have for their girls and the aspirations teenage girls have for themselves".[22] That said, there is still a lot to do in this area. The UN reports that the global share of women in parliaments continues to rise slowly and reached 20% in 2012 – but this was far short of gender parity, although an increase of one percentage point was seen during 2012.[23]

Parents can be particularly effective in ensuring that girls go to school. Programmes that help redefine gender roles and increase gender equality within the family can increase the chances that a girl will get the support she needs to pursue her education. Take the ACEV Focus on Fathers in Turkey,[24] which uses classes and TV programmes to encourage fathers to become more involved in child-rearing.[25] It received a favourable review in a report by the Fatherhood Institute (a UK-based think-tank devoted to issues of male parenting), which found that "although [the ACEV courses are] not delivered from an explicit gender equality perspective, fathers are encouraged to think of the developmental and educational needs of their daughters as well as those of their sons, in what is a relatively patriarchal and sex-segregated society". In this regard, they found that the courses "demonstrated positive change".[26]

More Schools

If the only available schools are far away, and a girl is forced to travel long distances to get to school, the family may be less likely to allow her to attend. Transportation and the cost of travel can be part of the reason, but personal safety can also be a concern. Building educational facilities that are closer to where girls live can help increase attendance. There are many organizations dedicated to building schools in impoverished or politically and socially turbulent regions, and there are various philanthropic groups and individuals who are interested in establishing schools just for girls and women. Barefoot College is one such organization (see Box 2) and in 2012 became the first NGO to partner with UNESCO's Global Partnership for Girls and Women' Education.

Box 2: Barefoot College in Rajasthan, Northern India

Barefoot College, founded in 1975, teaches girls and women practical skills they can share with their communities. The schools are built by and for the poor in rural areas, using local labor resources, and run on solar electricity. They offer classes at night so girls who do household chores or graze cattle, goats or sheep during the day can still go to class. At present, some 7,000 girls attend more than 150 Barefoot College night schools across rural north India. Lessons are taught by Barefoot College teachers and community members, and classes address family and community-related issues.

One program trains adult women – many of them illiterate or semi-literate – to install and maintain solar-based lighting systems. The six-month course includes techniques on training others, so graduates are able to share their knowledge when they return home and thus serve as role models and leaders. Since 1989, the effort has brought solar electrification to villages in 52 countries.

> "Some people object to women working. But if we can add income to the household, that's a good thing, isn't it?"

Shahnaz Banu, solar technician and graduate of Barefoot College

Alumna Profile: Sita Devi, Solar Technician, India

Sita Devi, a woman with only a second-grade education, attended Barefoot College to learn about solar cookers. She now has an opportunity to work outside the home and believes the benefits will extend beyond her own generation. "My daughter must be educated," she says. "She will be able to do things, to progress so much faster than I can because of going to school more."*

"School in India Teaches Women to Improve Lives, Towns", PBS NewsHour, www.pbs.org/newshour, 2008.

Another way to extend access to schools is through broadband, which has changed how we define schools. In the past, learning often took place in large, formal educational institutions. Today, educational programmes that were once reserved for the few are now available to anyone, anywhere, and at any time. Many institutions, especially at the university level, have moved quickly to establish online coursework (known as massive open online courses (MOOCs)), and the number of enrolled students is going up quickly. There are widely recognized MOOCs available from top-tier universities in the United States (including Harvard, Stanford, MIT and Yale) and noteworthy adult-education and vocational programmes in countries like Brazil, Guatemala, India, Indonesia, Mexico and Japan. At the secondary level, the nonprofit online institution Khan Academy aims to provide "a free world-class education for anyone anywhere",[27] and has gained support from the Bill and Melinda Gates Foundation. In the United States, there are a growing number of tuition-free public online education courses that can take students from kindergarten through to high-school graduation. Online courses are typically open to students of both sexes, but the model can be used to develop targeted programmes intended exclusively for girls or women. Also, because online formats can be scaled up fairly quickly, these Internet-based programmes can have a widespread impact in a relatively short amount of time.

More Teachers

Even if a girl lives in a region with accessible schools, there may not be enough teachers to provide her with a quality education. Schools around the world are suffering from a significant lack of qualified teachers, especially at the primary level. This is partly due to population increases and a lack of funding for new teachers. It is also due to the impact of the 2005 UN Millennium Project, which identifies universal primary education as a goal for 2015 (MDG 2) and has boosted enrolment. UNESCO estimates that by 2015, 6.8 million teachers will need to be hired worldwide to meet the goal, with 60% of those new positions (over 4 million teachers) in Sub-Saharan Africa.[28]

Assuming adequate broadband infrastructure is available, online courses present a way of mitigating the impact of teacher shortages, given that online formats can connect teachers with students who are some distance away – even on another continent. If course content is aligned appropriately with culture and language, then Internet-based distance learning offers the potential to make more effective use of scarce teaching resources.

While the teacher shortage affects children of both sexes, girls can be particularly impacted because they may not feel as comfortable in classes taught by men. In a recent study the National Bureau of Economic Research (NBER), researchers found that women can be effective teachers for both boys and girls, and can be particularly beneficial to girls.[29] In some regions, teaching may be one of the few career paths that girls and women are encouraged to pursue, so the teacher shortage underscores the problem that not enough women are being trained to meet the need.

There are many organizations worldwide that train and deploy teachers in underserved regions where girls need help. Teachers Without Borders, for example, supports the professional development of teachers on a global scale. In operation since 2000, it provides local support for teachers worldwide. Its Certificate of Teacher Mastery (CTM) programme is designed by and for primary and secondary educators and helps teachers expand their professional knowledge, gain classroom practice and become mentors to other teachers. Programme materials are available for free, either online or off, and in several different languages. Since 2010, more than 1,900 teachers have been trained, with nearly 90% of them in Africa.[30]

Tutoring services, which offer after-hour classes in every subject, often for a fee, are growing globally and have already made an impact. Take the case of South Korea. About 60 years ago, after the Korean War, South Korea was a developing country. Today, it ranks as the 19th largest economy.[31] A recent article in the Wall Street Journal (by Amanda Ripley) notes that South Korea "now has a 93% high-school graduation rate, compared with 77% in the U.S." It highlights a for-profit online service, founded and run by long-time teacher Kim Ki-hoon, which makes his tutoring sessions available throughout the country. The sessions are recorded as videos that are posted online, for which students pay

a small fee to purchase and view. He answers student questions online, addressing individual learners directly. The bulk of his earnings, verified at US$ 4 million in 2012 alone, come from the 150,000 students who watch his lectures online each year.[32] A similar online tutoring system, with or without the fee structure, could be implemented anywhere that has adequate broadband access and could be targeted specifically at girls.

Updated Content

Girls and women are more likely to attend or stay in school when they feel the curriculum has some relevance to their own lives. In addition to basic literacy and numeracy, schools do well by teaching "life skills" that help girls face everyday challenges. A curriculum that addresses subjects like health, nutrition, HIV/AIDs, and gender equality can make girls (and women) better equipped to succeed. Class material must, of course, be presented in a culturally acceptable way, and with an appropriate level of respect for local sensitivities.

Making the curriculum relevant to present-day realities also includes helping prepare girls and young women to enter the workforce. In some countries, girls' enrolment in education has gone up, but this has not directly translated into increases in labour-force participation or productivity. Various factors, such as labour-market policies, cultural barriers, and lack of childcare facilities for working women, have an effect on this issue, but curriculum plays a role, too. It is crucial to equip girls and women with skills, including ICT, that will let them be economically productive.

One initiative that does that is Intel Corporation's informal education programme called Intel Learn.[33] Since its founding in 2004, the initiative has reached approximately 900,000 girls and young women in 16 countries worldwide. It includes more than 90 hours of curriculum that helps participants use digital skills to advance an idea, become familiar with basic concepts of business and propose solutions to community problems. In most areas, sessions are held outside the formal school setting, and the programme has consistently shown a completion rate of more than 90%.[34]

Programmes that teach adult women ICT skills can provide a path to employment, and having access to such programmes can guide girls as they finish their preliminary and secondary educations. Many of the well-established training programmes that teach high-demand ICT skills are available online or in a blended learning environment, and prepare graduates (men and women alike) for industry-recognized certifications. The Cisco Networking Academy[35] is an example. Since its launch in 1997, it has taught ICT skills to 4.75 million students in 165 countries. The global average of female participants is 20%, but in certain areas, including the Middle East, the average exceeds 35%.[36]

Bright, promising students often benefit from individual guidance, which is offered by Digital Divide Data, a digital-content company with operations in Asia and Africa. It recruits disadvantaged high-school graduates, half of them young women, from some of the poorest areas, including the slums of Kenya and rural areas of Laos, and trains them to work in digital jobs. These carefully screened young people provide digital services, such as data entry and eBook production, to Digital Divide Data's client base worldwide. The company helps its employees learn English and obtain college degrees. Since 2001, it has hired 1,745 young people and has supported 544 university graduates.[37] This kind of sustainable work-study programme can be used elsewhere to teach women digital skills, encourage them to pursue college degrees and help them escape poverty.

An Effective Broadband Infrastructure

In places where girls and women have broadband access to data and services, it is easier to provide them with the opportunities necessary to expand knowledge, generate ideas and build careers. Having broadband access can also increase gender equality in education, making it possible for female students from any environment – urban or rural, rich or poor, in the classroom or at home – to obtain the same information and services as their male counterparts.

Broadband access has, in fact, become so essential to modern life that the Broadband Commission for Digital Development, a group established by UNESCO and the UN International Telecommunications Union, declared in 2011 that broadband communication "is not just a human need – it is a human right", similar to food, shelter and healthcare. The Commission also stated that "the benefits for broadband are profound", especially in education, where it can "[open] young minds to new horizons through educational technology".[38]

Countries that are struggling to grow and develop are beginning to recognize that broadband access is a key enabler and accelerator for growth. Ethiopia, for example, a country ranked number 121 of 144 in the World Economic Forum's *Global Competitiveness Report* for 2012–2013, has established a Ministry of Communication and Information Technology, with Dr Debretsion G. Michael as its head. In 2012, in his opening remarks to the Innovation Africa Digital Summit, he said, "Bridging [the] ICT gap and ensuring the optimal and innovative use of ICT tools will have a decisive bearing on whether or not the implementation of development strategies is a success or a failure. In short, rapid progress for countries such as Ethiopia in this area is not a matter of choice, but of necessity." As an example of the ministry's efforts, he cited a government "school-net programme connecting all secondary and preparatory schools in Ethiopia and enabling pupils across the country to have access to quality education through ICT schools".[39] A few years ago, one might have thought that some countries were too poor to invest in ICT, but there is a growing sense that poor countries cannot afford not to invest in ICT.

A reasonable guideline for broadband infrastructure is the ability to support download and upload rates of 100 Mbps for every 1,000 students and staff members,[40] since this is generally the level that students and teachers need to support the audio and video content involved in digital learning and teaching. Even in developed countries, where broadband access may be commonplace in residences, commercial spaces and private institutions, the public school system may lag behind. In the United States, for example, broadband access is not always available in public education. The San Francisco-based nonprofit Education Superhighway is dedicated to closing this digital divide and is working to ensure that every US K-12 public school has 100-Mbps access. Similar initiatives could be used elsewhere to increase broadband access, especially for girls.

The Way Forward

Women can be instrumental in helping to solve the world's problems. They can help develop new technologies and can come up with better ways to use scarce resources, treat diseases, provide clean water and grow food.

Women also represent half the population. What politician who has the welfare of the population in mind would neglect such an enormous group? What corporation would hesitate to tap into such an enormous labour pool or service such an enormous market? And what community would hesitate to embrace innovative solutions that address critical social challenges?

It is essential that the international community continues to emphasize the importance of educating girls and women, especially in the most disadvantaged regions, so we can continue to pursue the goal of complete gender equality and parity, and so we can continue to promote economic development by building on the productive capacity of women. The focus needs to be on removing the barriers that prevent girls and women from getting a quality education or from pursuing economic opportunities. The programmes mentioned in this chapter serve as examples from which we can learn and can be used as templates for new initiatives.

When considering any programme aimed at improving girls' education, especially in developing areas, there are several things to keep in mind:

Consider local sensitivities and issues. The subject of educating girls is a topic bound up with complex cultural, religious, and national sensitivities and involves issues – physical, cultural, social, technical and financial – that often overlap.

Take a comprehensive approach. These programmes often work best when they take a multipronged approach, deploying different methods to target different aspects of the problem. It may not be feasible to create a single programme that addresses every barrier to girls' education, but an effective programme typically pursues one or more of the following goals:

- Make education affordable for all girls, even the poorest.
- Create girl-friendly schools that are supported by the local community.
- Ensure that girls who are in school get a quality education, with reasonably sized classes taught by well-trained teachers.
- Teach a curriculum that prepares girls to participate in our technology-driven economy.
- Leverage broadband to enable greater access to knowledge and increase employment opportunities.

Identify strategic investments. Establishing and expanding the broadband infrastructure is a wise investment, since it can generate a number of positive, long-term results for girls and women. Broadband access can improve the quality of girls' education, since it enables widespread, fast access to the latest curricula, subject-matter experts, mentorships and collaborative learning opportunities for the community at large. Investing in broadband infrastructure can also improve economic outcomes for women and their communities.

Work collaboratively. Education is an evolving process, one that is ideally suited to trying out new models and seeding sustainable strategies. Public–private partnerships can create a larger pool of resources, making it easier to include leading-edge technology in the solution and broaden a programme's scope. That said, implementing this kind of partnership is a complex task given the need to manage a group that includes nonprofits, NGOs, government agencies, private sector businesses, educational institutions and community groups.

Stay the course. Educational programmes require a strong commitment from everyone involved (families, communities, schools, government agencies, and the girls and women themselves), especially since results can be slow to materialize – after all, completing primary and secondary education can take more than 10 years.

In every corner of the world, regardless of a country's stage of development, there are countless examples of girls and women who have the imagination, desire and energy to participate productively and inventively in the local and world economy. It is vital that we continue to be vigilant in ensuring a quality education for girls. This fosters the potential of those who will, in turn, contribute to a brighter future for us all.

Endnotes

1. Education for All Global Monitoring Report, UNESCO Institute for Statistics, 2012.
2. Council on Foreign Relations, 2004.
3. D. Dollar and R. Gatti, Gender Inequality, Income, and Growth: Are Good Times Good for Women?, World Bank Development Research Group, 1999.
4. B. Herz and G.B. Sperling, What Works in Girls' Education, Evidence and Policies from the Developing World, Council on Foreign Relations, 2004.
5. Opening Doors, Education and the World Bank, World Bank, 2002.
6. "Education for All global monitoring report fact sheet on girls' education", http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/GMR/images/2011/girls-factsheet-en.pdf, October 2013.
7. The Economic Power of Women, Women Investing in Women Initiative, A Project of Calvert Foundation, 2013.
8. S. Tharoor, "Why we should invest more in the education of girls," Forum Blog, December 2012.
9. B. Herz and G.B. Sperling, What Works in Girls' Education, Evidence and Policies from the Developing World, Council on Foreign Relations, 2004.
10. The World Economic Forum's Global Gender Gap Report, World Economic Forum, Geneva: 2013.
11. Networking Skills Gap in Latin America, IDC, 2013.
12. Joint Research Center, European Commission, March 2013.
13. United States Bureau of Labor Statistics, Employment Projections, 2010–2020.
14. SiliconIndia (jobs.silicon.india.com), November 2013.
15. LifeLines Program, OneWorld South Asia, 2013. (Note: This is an initiative that is partially funded by Cisco.)
16. M. Baird and B. Özler, Designing Cost-Effective Cash Transfer Programs to Boost Schooling among Young Women in Sub-Saharan Africa, The World Bank, 2009.
17. R. Slavin, Can Financial Incentives Enhance Educational Outcomes? Evidence from International Experiments, University of York and Johns Hopkins University, 2009.
18. Raising Clean Hands: Advancing Learning, Health and Participation through WASH in schools. A Joint Call to Action, UNICEF, 2010.
19. Sanitation: The Challenge, UNICEF, 2005.
20. S. Lee and B. Kerner, "What Do Menstruating Girls Need in Schools?", Save the Children, A Global Village Journal, January 2013, Issue 9.
21. Girl-Friendly Toilets for Schoolgirls: Helping Adolescent Girls' IRC under the SSHE, UNICEF, 2006.
22. R. Pande and P. Topalva, "Women in charge", Finance and Development, June 2013, Vol. 50, No. 2
23. We Can End Poverty: Millennium Development Goals and Beyond 2015 fact sheet (http://www.un.org/millenniumgoals/pdf/Goal_3_fs.pdf).
24. ACEV is a member of the World Economic Forum and this chapter was edited by the ACEV programme's chief executive officer.
25. ACEV, 2013.
26. F. McAllister and A. Burgess, Fatherhood: Parenting Programs and Policy, Fatherhood Institute, August 2012.
27. "One man, one computer, 10 million students: How Khan Academy is reinventing education", Forbes, 19 November 2013.
28. "Global Teacher Shortage", UNESCO, visual.ly/global-teacher-shortage, 2012.
29. K. Muralidharan and K. Sheth, "Bridging education gender gaps in developing countries: The role of female teachers", NBER Working Paper No. 19341, September 2013.
30. Teachers Without Borders, 2013.
31. The World Economic Forum's Global Competitiveness Report 2012–2013.
32. A. Ripley, "The $4 million teacher", The Wall Street Journal, wsj.com, 3 August 2013.
33. Intel is a member of the World Economic Forum.
34. International Center for Research on Women, 2012.
35. Cisco is a member of the World Economic Forum, and the author of this chapter is a Cisco employee.
36. Cisco Systems, 2013.
37. Digital Divide Data, 2013 (note: the company receives support from Cisco and Cisco Foundation).
38. UN press release, www.un.org/apps/news/story.asp?Cr=broadband&NewsID=40191, 25 October 2011.
39. Dr Debretsion G. Michael, "Summit Speech", Innovation Africa Digital Summit, www.mcit.gov.et, 2012.
40. State Educational Technology Directors Association, www.setda.org, 2012.

Chapter 3: Scaling Up to Meet the Enormous Education Challenges in Africa

Omobola Johnson, Leslie Maasdorp and Colin McElwee

Sub-Saharan Africa (SSA) has the youngest and fastest growing population across the globe. About one-third of the population, or nearly 300 million people, are aged between 10 and 24 years old and this group is expected to nearly double in size to 561 million people by 2050. [1] This "youth bulge" offers the region a major economic opportunity – often referred to as a "demographic dividend" – because a larger workforce will mean a more productive economy on a per capita basis and more of what is produced can be reinvested in productive resources.

However, this demographic gift is not an automatic one. It will only be realized if the youth are productively employed. And today's youth, let alone tomorrow's youth, are already facing a bleak jobs picture – on top of those unemployed, the World Bank notes that millions of youth are working either in very low quality jobs or in a situation where they are neither studying, nor working, nor looking for a job.[2] Moreover, SSA's human capital is lagging behind other regions. The 2013 World Economic Forum's Human Capital Index, which ranks countries relative economic performance, shows that most SSA countries fall in the lower rungs of this global Index. SSA scores poorly even when compared with other lower-middle-income economies, on health, education and enabling environments. Only in the area of workforce and employment does the region match the average for this group of economies.

Against this backdrop, education in its broadest sense – from primary through secondary and tertiary and professional skills and training – is increasingly considered the multifocused lever that can drive the region forward. Over the past decade, school enrolment has improved across SSA, especially with the introduction of universal primary education. However the drop off is enormous at the secondary and tertiary levels, with girls especially lagging (see Table 1). In addition, UNESCO reports that 30[3] million children in SSA are not even in school, which is more than one-half of the world's out-of-school children.

The major challenge now is to continue to improve enrolments, especially in secondary, while also improving the quality of education. Too many young people are leaving school without the basic foundational skills, such as literacy – only 57% for adults and 69% for youth (age 15–24)[4] – that they increasingly need to enter the work place. Without these skills they will find it difficult to develop the other higher-level and more transferable skills relevant for remaining in work over the long term. A big obstacle is a shortage of trained teachers as well as the lack of textbooks and materials. Also, there are so many varied stakeholders whose approval is needed before new practices can be implemented that any meaningful initiative can be easily diluted or shunted aside completely.

What is needed are new, innovative models of education that can be rapidly scaled up. Some are beginning to emerge, often involving the entry of the private sector in education and the use of appropriate technology in and out of the classroom. However, when it comes to technology, a fundamental and often underrated break on advances is the concept of "fit" or what has become known as "appropriate technology". The main fear of many teachers is that new technology may not only supplant their services but also that students will embrace and better understand technology, thus undermining the teacher's authority. As the teacher is the gatekeeper to the classroom, it is key that teachers feel enabled and not weakened by the introduction of new electronic mediums. A potential win–win for teachers and students can easily end up in an opportunity lost for all if the needs of the teachers are not embraced.

Table 1: Enrolment Falls as Educational Levels Rise, Especially for Girls

% Enrolled in School in SSA[5]

	Male	Female
Primary	87	87
Secondary	45	38
Tertiary	8	5

This chapter explores three cases that demonstrate exemplary practices and the potential for having a real impact. Each one takes a different approach to SSA's educational challenges.

- The first case looks at how Nigeria, the most populous country in Africa, is trying to bring education innovations to scale. It focuses on the potential of information and computing technology (ICT) to offer a new education model, anchored by cooperation among all stakeholders.
- The second case, the Africa Leadership Academy in South Africa, features the philosophy of making a small surgical intervention into where the impact on society could be the greatest. The idea is to leverage and develop the leadership talents of a small number of individuals, who can then become catalysts for others.
- The third case, Worldreader, takes almost the opposite approach. It asks: How do you educate the largest amount of children and young people using the least amount of incremental investment in technology and infrastructure? This initiative believes in utilizing existing connectivity, digital files and simple reading devices to make the biggest impact in primary and secondary education.

There is rarely any one correct answer or approach and we offer no conclusive evidence of one intervention being better than another. But we hope that these cases deliver insights into the potential for managing the educational challenge over time in a singularly African context. Certainly, technology plays a vital role in educational solutions. But the real opportunity for success lies in the fact that the social need is so great – and the consequences of inaction so dire – that the resistance to experimentation is perhaps less in SSA than in other parts of the world. And it is this need to scale up quickly to meet the demands of the region's growing population that will largely shape which innovations are adopted.

Case Study 1: Bringing Educational Innovations to Scale in Nigeria

Nigeria is the most populous country in Africa and its third largest economy. It is also home to a huge youth population – 42% is under 15 years of age[6] – whose share is growing rapidly and expected to number 185 million by 2050. These figures suggest the magnitude of investment needed in education, especially education that is of a high quality and relevant to the needs and aspirations of the country. They also suggest the importance of enabling the country to be an economic powerhouse for the rest of the continent.

Yet the strain on the country's limited resources is seen across all educational levels. Nigeria accounts for a third of the estimated number of children (of primary school age) that are not attending school in SSA. Furthermore, many of the children enrolled are beyond the official age for the level of education they are receiving. At the tertiary level, of the over 1 million applications received each year, Nigerian universities have the capacity to admit only 20%. Nigeria needs many more teachers; existing ones are unevenly distributed across the country, poorly paid and poorly trained. Students are also taught a curriculum that is often said to be out of date and insufficient to provide ''graduates'' with the skills they require to be 'job ready'.

Against this backdrop, traditional approaches to education delivery – which focus on teacher-led instruction (using curriculum that does not address the skill requirements of employees) within physical classrooms – can no longer meet the challenges faced by the nation's educational sector. Thus, not surprisingly, there is enormous interest in the potential of ICT to mitigate these challenges by facilitating content delivery, quality improvements and a transformation in education delivery.

ICTs in Education in Nigeria

What are the prerequisites for effectively applying ICTs to socio-economic needs? The key ones include: (a) the accessibility of devices and affordability of connectivity; (b) the availability of relevant content; and (c) teacher adoption of the materials.

Delivering Access to Devices and Affordable Connectivity

Although the mobile cellular market in Nigeria has been growing quite rapidly, about 50% of rural areas still lack coverage. Furthermore, end-user devices remain prohibitively expensive to low-income and poor members of the population. Two major efforts are under way to improve the situation.

A key public sector initiative addressing challenges of connectivity and access to devices in the educational sector is the Universal Service Provision Fund's (USPF) School Access Programme (SAP). The USPF was conceived in the Nigerian Communications Act 2003 as a mechanism for providing access to ICTs in unserved and underserved communities to help bridge the digital divide. Telecommunications operators in the country pay up to 2.5% of their income to the Nigerian Communications Commission as an annual operating levy, with 40% of this going into the USPF. The SAP provides ICT equipment, broadband connectivity and educational content in public schools across Nigeria. By the end of 2012, 1,335 public schools had been connected, with about 670,000 students benefiting.

The DigiNet programme – a collaboration between the Federal Ministry of Education's Education Trust Fund (ETF) and SchoolNet Nigeria, a not-for-profit entity – focuses on the creation of computer labs and community education resource centres (CERC). Since 2002, the programme has built computer labs in 83 schools and established five CERCs. Each of these facilities was equipped with 21 computers, a server, Internet access via satellite and alternative (back-up) power supply. Curriculum-based content was also available, along with a teacher development programme. In recent years, the DigiNet programme has expanded to include private sector entities. As a result of a partnership with the largest mobile network operator in the country, MTN Nigeria, there are now computer labs in another 62 schools (branded as the MTN Schools Connect project). The DigiNet programme also receives support from Intel and Microsoft in deploying the teacher development component.

Together, these two programmes have helped address challenges in connectivity and access to devices in about 1,500 schools. But with about 59,000 primary and 11,500 junior secondary public schools[7] across the country and over 28 million children attending these schools, scaling up these initiatives to achieve a meaningful impact remains an elusive objective.

Making Relevant Content Available in Accessible Formats

Numerous efforts are also under way to improve access to educational content in formats that are engaging and help students attain set educational targets. Some of them have resulted in the digitization of the national curriculum, the online provision of past papers of national examinations, the development of multimedia tutorials and exam preparation applications, as well as digital access to thousands of textbooks (ebooks). One example is a computer application developed by Cinfores Limited, a private sector organization, called BrainFriend – an e-learning and examination preparatory software covering the Nigerian examination curriculum in 42 subjects for all levels of primary and secondary education. The solution through various partnerships is being deployed directly by up to four state governments and will indirectly be deployed in schools across the entire country through a recent partnership with the USPF's School Access Programme.

Increasing Adoption and Appropriation of ICTs by Teachers

Any effort to drive the technology agenda in addressing the education and skills gap or to improve students and schools performance requires high-quality capacity building, support programmes and resources for education professionals, especially teachers. One example is DSTV Multichoice Resource Centres, a private sector project that focuses on content creation and the promotion of ownership of ICT-enabled learning among teachers. Another example is iEarn Nigeria, which pulls together a global community of teachers and youth that use the Internet and ICTs to learn and collaborate on educational projects (see Box 1).

Both of these initiatives have recorded some measure of success. However, the impact such successes are having on the overall attainment of the nation's educational objectives is as yet unknown. This is for various reasons, including difficulties encountered in bringing these initiatives to an appreciable scale (given the sheer size of the country) and the lack of an agreed framework that clearly identifies what constitutes impact.

Box 1: Encouraging Teachers to Adopt ICTs in Nigeria

DSTV Multichoice Resource Centres. This is a solely private sector project championed by the satellite television provider Multichoice Nigeria, which was launched in 2004 and has been deployed in over 150 schools. It provides an educational bouquet of satellite TV programming to schools as well as the audio-visual equipment to access the content. It also trains teachers. The innovation here is in the class preparation process, which requires teachers to preview programmes and identify areas they can use to teach particular concepts. For example, a teacher finds a clip on volcanoes or snow storms, records and stores it. These individual repositories are building blocks in developing a library of learning objects that complement the traditional curriculum. In this manner, thousands of hours of learning content have been produced by local teachers for use in public schools. This compilation and sharing of learning objects or clips, strictly for use in schools, is a unique example of content creation and promotes ownership of ICT-enabled learning among teachers.

iEARN Nigeria. This is the Nigerian chapter of a global community of teachers and youth that use the Internet and ICTs to learn and collaborate on educational projects. It builds on the class preparation process encouraged by initiatives such as the DSTV Multichoice Resource Centres by helping teachers structure learning around projects. For example, a teacher may join a project called "medicines in our backyard". She would encourage students to research common medicinal plants, list the local and scientific names, classify them, identify their various uses and share with other students worldwide. She would also describe set objectives and organize students in teams. The entire project would be completed using technology tools or programmes (like spreadsheets, word processing, presentations and multimedia). This approach is aimed at attaining various objectives, including: (a) learning subjects as specified in the national curriculum; (b) higher levels of understanding of content; and (c) greater proficiency (both teacher and student) in using ICTs.

Scaling Up for Impact

So what can be done to increase impact in the deployment of ICTs for educational purposes? We would like to propose a menu of possibilities that involve all stakeholders.

Teacher development. Many programmes identify the critical role that teachers play in technology deployments, yet they continue to spend on average less than 5% of their total investment in building the capacity of teachers to effectively make use of technology, rather than just operate it. That said, there is an increasing understanding that capacity-building efforts must now include rich, engaging activities that are professionally rewarding and support the teacher's ability to occupy new roles dictated by the information age. Moreover, with many information sources to choose from, students now look to teachers to play the role of facilitators, directing the understanding and use of information to meet a set of needs and expected outcomes. This is especially important given that businesses now demand such critical thinking.

However, adopting the role of facilitator requires a major shift in thinking and behaviour and is often initially resisted by teachers. If the potential of technology to address the skills and education gaps in Nigeria is to be harnessed, there is an urgent need to support teachers at a scale that impacts learning in every classroom. Lessons from various pilot projects suggest that teachers need innovative and exciting ways to help them effectively assume their role of facilitator and use technology while still delivering on curriculum expectations. This can be done via a mix of online and offline professional development opportunities and ongoing engagement with communities of educators.

Relevant content. The importance of digitizing and distributing the national curriculum (like examination papers) cannot be overemphasised. However, the real opportunity in ICTs for education lies in providing content in a manner that reinforces what is being taught in the classroom – thereby helping to improve and extend acess beyond the physical location of the classroom.

Public–private partnerships (PPPs). The high costs involved in deploying ICTs in education projects require innovative PPPs that can support or leverage the government's limited resources. Attempts at scaling up pilot projects have met with several challenges, including: (a) absence of an appropriate management model and a well-defined role for the government; (b) lack of infrastructure, especially power and broadband Internet connectivity; (c) lack of a predictable and supportive policy environment; (d) use of inappropriate and unaffordable technologies that cannot be adopted nationwide; and (e) absence of a viable PPP model.

Thus, a neutral agenda needs to be crafted for conceptualizing and implementing ICTs in education projects. Such an agenda, instigated by the government, should develop an agreed roadmap for addressing the skills and education gaps that have been identified and articulate in measurable terms the expected long-term impact. The agenda should show how each stakeholder could complement the project and add to the attainment of the "big picture", while providing opportunities for contributors to have some "bragging rights".

For government, the resulting partnership facilitates pooling the expertise and experiences of committed organizations and bringing them to bear on the nation's educational goals. For the private sector, the structured framework facilitates clearly identifying the impact of social or business investments. Lastly, it is hoped that such partnerships would lead to informed decisions on directing scarce resources to urgent areas of need and reduce wastage of resources caused by the duplication of efforts.

Measuring impact. Implementing a partnership framework must be accompanied by the establishment of agreed-to metrics for measuring impact, as well as strategies for making such measurements and publicizing them. To be clear, these metrics represent what application of ICTs in education are anticipated to achieve and may include tracking improvements in access to formal education (such as number of out-of-school children or number of girls enrolled in formal education) as well as improvements in performance in national examinations. The metrics may also include those that track the skills of teachers and quality of teaching, as well as the overall suitability of students to function in the business world.

Case Study 2: African Leadership Academy (ALA) – Grooming Leaders in South Africa

Will a new generation of African leaders emerge to follow in the footsteps and example of Nelson Mandela?

After a long period of colonialism, the African continent has produced numerous despotic rulers. With a few notable exceptions, the leadership track record of SSA has not been exemplary. Many resource-rich African countries have high levels of poverty and inequality combined with poor governance and mismanagement of their economic resources. Leaders with a long-term vision and a commitment to participatory democracy have been a rarity on the continent. Good leaders are an essential ingredient in ensuring that the benefits of the rapid economic growth the continent has experienced can be sustained.

With this leadership deficit on the continent as background, in 2008 a few social entrepreneurs established the African Leadership Academy (ALA) – a South Africa-based education institution dedicated to creating social impact in Africa by cultivating and providing lifelong support to the next generation of African leaders. The idea of the ALA was inspired by the notion that a small group of thoughtful, committed citizens can have a significant social impact in their chosen areas.

The leadership model of the academy is quite innovative and can be distilled into three essential components. The process starts by identifying young Africans between the ages of 15 and 19 who have already demonstrated their leadership potential in some manner through evidence of an entrepreneurial spirit and a commitment to community service. Next, they gain practical, hands-on experience in entrepreneurship by starting and running entrepreneurial ventures during their two years on campus. ALA then continues to develop these leaders by connecting them to other relevant networks that will enable their further growth, learning and impact. In this way the potential impact of these individuals are magnified by their access and connectivity to peers and like-minded communities.

Since its inception in 2008, the academy has evaluated over 16,000 youth from 48 African nations to select the almost 600 young leaders in its first six classes. To date, ALA young leaders have launched 45 nonprofit and for-profit enterprises as part of their unique curriculum in entrepreneurial leadership. Also, five young entrepreneurs have been recognized by the World Economic Forum for the innovative organizations they have launched in their home countries.

Notwithstanding its relatively short existence, the ALA has demonstrated its capacity to contribute to developing a new generation of leaders who are capable of understanding the challenges of governance in an increasingly complex, dynamic and globalized world.

Case Study 3: Worldreader – Connecting the Dots

Each day, more people in SSA, from fast-growing cities to remote villages, are progressively becoming part of a digital-reading revolution. They are accessing information they need to improve their lives, and among themselves forging a new generation of lifelong readers in places where printed materials are rarely found. And they are doing this with user-friendly, cost-effective, readily available devices and existing mobile technology (see Box 2).

An organization behind this digital revolution is Worldreader.[8] When Worldreader started delivering e-books through e-readers to rural areas of Ghana in 2010, it set a simple goal to bring "Books for all". The more specific intent was to develop a sustainable way for people the world over to use existing technology to access knowledge they could use to transform their lives. How could the idea be deployed and scaled rapidly in a cost-effective, global way? The solution hinged on three main elements: content, technology and partnerships.

Content. Worldreader teamed up with publishers, mostly African, to provide children with a wide choice of storybooks, school textbooks, reference materials, reading materials, language tools and fiction and nonfiction pieces written by local authors. Going a step further, it worked with the publishers in digitizing, translating and delivering e-books in various local African languages (such as Swahili, Hausa and Twi). The reason for this was that in order for literacy levels to improve and for children and adults to become avid readers, they must first be able to read, comprehend and learn in their mother tongue, not in a foreign language such as English.

Technology. E-readers and mobile phones that used the extensive and existing 2G (second generation) mobile infrastructure became clear options early on. Innovation, after all, is not always about creating something new from scratch; often, it is about leveraging what is already available and finding a new way to use it. E-readers, essentially single-purpose devices meant only for reading, are less distracting than computers, laptops, tablets or mobile phones in classroom settings. Additionally, around 3,500 books could be uploaded on to a low-energy-consuming device via Wi-Fi or local mobile phone networks, converting it quickly into a handheld library stocked with books. And, as with all technology, constantly falling prices make it an attractive tool.

Box 2: The Digital Reading Revolution in Africa

Dakarai, a student in Bulawayo, Zimbabwe's second largest city, clicks the menu button on his e-reader and stumbles on an e-book that captures his attention. It is a story written by an African author about a child like him, who is also in a wheelchair. He finishes that storybook and finds another one and another. In a few hours, he is enjoying his reading and becoming aware of a better future, one not limited by his disability.

Over in the Arusha area of Tanzania, an 11-year-old girl pulls up the world atlas downloaded on her e-reader and dreams of being a sailor so she can see the world she is discovering on her handheld library.

In Lagos, Nigeria, a teenager thumbs through his basic 2G-enabled feature phone and lands on a book-reading application loaded with thousands of short stories, textbooks, international classics and local fiction. He becomes engrossed in a science book and tweets: "I'm reading #CellBiology on @ Worldreaders Mobile".

Somewhere in a faraway corner of India, another teenager sees that in her Twitter feed and she browses her mobile phone, finds the app and chooses to read "The Museum" – a short story that earned author Leila Aboulela the Caine Prize for African Writing. She tells her brother about it and, soon after, the whole family is passing around their mobile phones, reading and learning together.

Moreover, basic feature phones are ubiquitous in the developing world. For example, SSA has more than 475 million mobile connections and is the fastest-growing mobile market in the world, with an average annual growth rate of 44% since 2000, according to the GSMA (the mobile phone manufacturers association). Through Worldreader Mobile – a book-reading application – millions of people globally could flip digital pages on a piece of hardware that they have in their pockets and carry with them everywhere.

Partnerships. To facilitate on-the-ground programme implementation and the long-term support required to scale in different geographies, Worldreader knew that it would be crucial to create wide-spread partnerships. For that reason, it moved quickly to establish working relationships not only with publishers and mobile operators but also with government leaders, education ministries, aid organizations and other nonprofits that had sponsored or invested in building schools. Some relationships led to large-scale e-reader deployments in countries like Ghana and Kenya; others resulted in smaller out-of-the-box programmes launched by individual donors or schools. Momentum from both sides paved the way for project launches impacting thousands of children in Ethiopia, Ghana, Kenya, Malawi, Nigeria, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. One such project, which focuses on children with disabilities, stems from a partnership with the King George VI Centre and School in Bulawayo, Zimbabwe (see Box 3). Unfortunately, in many countries, children with disabilities are often marginalized and their disabilities put them at an increased risk of poverty.

Box 3: One School in Zimbabwe, a World of Difference

King George VI, which serves 345 children, is the only school in Zimbabwe for disabled children, many of whom have been abandoned by their families. In mid-2013 it became the first school in Zimbabwe to have e-readers, which will be used to help secondary school students with their English language skills and encourage leisure reading during library time. This is also where Dakarai, who found a book he could relate to on his e-reader, read a few stories and began to see the world in a new way.

For these students, the e-reader is not just a device. It is a life-changing tool, something that will help them shed the stigma they commonly face and maybe, down the road, open doors for them that did not exist before. For the school, it is an opportunity to show how a simple ICT intervention could be embraced by teachers who view the e-reader device as akin to somewhere between a mobile phone and a paper book.

For Worldreader, the experience of King George VI, and schools like it, represent a potential to scale significantly. Operating in areas where paper books cannot be economically distributed, Worldreader is doing two things: (a) it is connecting the dots of three simple and existing technologies: e-books, mobile connectivity and e-readers; and (b) it is kick-starting a discrete market for companies operating in each of these areas, thereby making the project sustainable. The continual fall in the price of this technology means that it is now economically viable to deliver a book to anywhere in the world where a mobile phone works.

Using "Super Highways of Connectivity" to Boost Learning

The rapidly changing landscape of mobile connectivity across the continent has shown SSA to be capable of embracing rapid collective and individual behavioural change. That Africa has no legacy system of landline connectivity has meant that mobile adoption has happened faster – and at a bigger scale – than in any other part of the world. And that rapid change bodes well for the much-needed leap in skills and knowledge generation to bridge educational gaps. In many senses such a change in society itself opens minds to many other changes that only a decade ago would have seemed impossible.

That the private sector and in most cases a healthy competitive mobile sector has been the main catalyst behind better connectivity would indicate that there is an opportunity to encourage the private sector to embrace emerging commercial opportunities in and around education. Governments can help encourage companies to do this when awarding connectivity licences to mobile operators. They can also help move private investment in education away from just corporate social responsibility to something more sustainable. It is key that these "super highways" of connectivity be further leveraged to drive educational impact.

It is often said that it is highly improbable that real and substantial innovation will come from any one sector alone. That is why it is vital that the ministries of education engage with other ministries, especially those responsible for technology, to ensure that fresh thinking is brought to the table – an approach that more and more countries across SSA appear to be embracing.

Thinking even bigger, SSA should be looking to other countries across the world that are in a similar economic and social situation to many of the countries of SSA. By utilizing knowledge and sharing the experience with those countries, shortcuts to drive impact in education can be realized perhaps more than looking for inspiration from the northern hemisphere. The south–south mutual transfer of knowledge needs to be leveraged.

Finally, and perhaps most fundamentally of all, the forthright campaign in recent years to ensure SSA countries can generate improved and just earnings on extracting natural resources will enable governments to better invest in long-term improvements in education.

Endnotes

1. http://www.prb.org/pdf13/youth-data-sheet-2013.pdf.
2. https://www.jobsknowledge.org/JobsandDevelopmentBlog/Lists/Posts/Post.aspx?List=2865966b-969e-44d4-a556-19cf83c472ab&ID=125&Source=https%3A%2F%2Fwww%2Ejobsknowledge%2Eorg%2FJobsandDevelopmentBlog%2FHome%2Easpx&Web=0883d59e-523e-4969-b84d-4e317deed77c.
3. http://www.uis.unesco.org/Education/Documents/fs-25-out-of-school-children-en.pdf.
4. See the Statistical Appendix.
5. Source: http://www.prb.org/pdf13/youth-data-sheet-2013.pdf, UIS Data Centre.
6. 2006 Census Data, http://www.population.gov.ng/images/Priority%20table%20Vol%204.pdf.
7. Universal Basic Education Commission, "Pupils enrolment in primary and junior secondary school 2011/2012", http://ubeconline.com/Pre/2012%20pry%20enrl%20by%20state.pdf and http://ubeconline.com/Pre/2012%20JSS%20Enrlmnt%20by%20State.pdf, 2012.
8. Colin McElwee is a co-founder of Worldreader.

Chapter 4: An 'E.Y.E.' To the Future: Enhancing Youth Employment

Arup Banerji, Vivian Lopez, Jamie McAuliffe, Amy Rosen and Jose Manuel Salazar-Xirinachs, with Poonam Ahluwalia, May Habib and Tanya Milberg

Six hundred million jobs. That is what is going to be needed over the next 15 years just to maintain current employment rates in the developing world, let alone increase them (World Bank, 2012). Today, with youth unemployment rates peaking at well over half in southern Europe alone and with the continuing struggles for opportunity in the Arab world, the prospect of attaining that job creation goal – quantitatively as well as qualitatively (in terms of safe, secure and remunerative jobs) – seems fraught with uncertainty.

Yet unemployment (young people seeking jobs but not finding them) is only one facet of the job challenge facing young people. In developing countries, where much of the world's poor live, an even bigger issue is underemployment (in which workers are underutilized), given that youth are in low-productivity, informal, or irregular employment. Indeed, a recent ILO survey of 10 developing countries shows that four out of every five young workers worked informally – typically associated with low paid, insecure and even unsafe work. Beyond the waste of human energy and talent, this dismal youth job picture threatens to upend the social and political order. Take the following headline statistics:

- One in six young people are unemployed globally, with young people almost three times more likely to be unemployed than older workers, according to the latest ILO numbers (ILO, 2013).
- Young people are more vulnerable to changing economic conditions. In South Africa, for example, when the economy slowed down, youth unemployment began to rise sooner than adult unemployment.
- Youth idleness (i.e. underemployment) is a major issue in the Middle East and North Africa (MENA) as well as in South Asia, with roughly as many young people there idle as are employed, according to recent World Bank estimates (see Table 1).
- Young women are significantly more likely to be idle compared to young men – with the differences largest, again, in MENA and in South Asia.

So how does education fit in? Actually, the story of the interaction is complex, varying among countries and among youth groups. While unemployment and underemployment are widely prevalent in every country, employers still complain about a skills mismatch. According to World Bank enterprise surveys, 36% of firms in Latin America and the Caribbean (69% in Brazil) contend that an "inadequately educated workforce" poses a major constraint to their activity, as do 29% of firms in Eastern Europe and Central Asia. Equally, as has been evident in South Asia and in recent years in MENA, even the young people who have university degrees are not always employable, because they may not have the specific technical or vocational skills needed by employers (see World Bank, 2012b and 2013).

Worryingly, the skills mismatch is not just about inadequate education or being "under-qualified" for available jobs – a problem that exists in many of the poorer countries of the world, where the educational systems have not caught up with the specific skills needs of employers. Increasingly, especially in richer and middle-income countries, young people are "over-qualified" for the jobs they may be seeking and hold, in the sense that they have higher qualifications than the jobs require. As a result, the hardest hit are those with low education and qualifications, who may be more numerous than available jobs for their level of education and skills, as well as squeezed out for available jobs by those with more education and qualifications.

Given the sheer size of the employment challenge, it is unlikely that time-honoured approaches and policies used in mid-20th century industrialized countries will be able to address the issues. Moreover, solutions are likely to vary for different parts of the world and different groups of youth – from young women in Yemen to young African-American men in the United States and from young agricultural labourers in Uganda to university graduates in Spain.

This chapter, without attempting to paint broad-sweep solutions, picks out principles and examples from across the world, including the voices of youth themselves, to present vignettes of promising solutions. It also points to the need for targeted policies and

Table 1: Youth Unemployment and Underemployment are the Highest in MENA

(estimated primary activity rates for youth, ages 15–24)

	Employed	Unemployed	Student	Idle
East Asia	38%	7%	37%	18%
Europe and Central Asia	30%	6%	44%	20%
Latin America and Caribbean	47%	8%	30%	15%
Middle East and North Africa	26%	11%	35%	28%
South Asia	34%	4%	35%	27%
Sub-Saharan Africa	48%	7%	32%	13%
Low-income	50%	3%	30%	17%
Lower middle-income	36%	6%	36%	22%
Upper middle-income	37%	10%	36%	18%
High-Income	28%	9%	53%	9%
Total	38%	6%	35%	20%

Note: "Idle" is defined as neither working, seeking work, nor enrolled in school; this is distinct from "unemployed", who are actively seeking work and not finding it.

Source: Newhouse 2013.

programmes to increase youth employment, given that youth face significantly more barriers to labour market entry (including their high cost of labour, low skill, difficulty with job search and persistently low employment outcomes) (Woolard, 2013). Indeed, some of these programmes are "active labour market policies" – government programmes that address labour market problems by helping the unemployed find work, whether through public employment services, training schemes or employment subsidies.

But applying these and other innovative solutions requires that policies, programmes and new initiatives be rigorously evaluated for short-term or transitory effects versus long-term or permanent effects. Evaluations will also need to examine both individual benefits and collective benefits – i.e. if one individual getting employment means another is crowded out of employment, there is no net employment gain, although there could be a productivity gain if the lower-productivity worker is crowded out of the job by the higher productivity worker. Such efforts are vital given the still limited knowledge about the effects of active labour market programmes. The research in both the OECD and developing countries shows mixed results (see Robalino and Sanchez-Puertas, 2009; Robalino et al., 2013; Sepulveda, 2013). In general, what the programmes are able to do depends on context, design and implementation (see Almeida et al., 2013). A critical issue, as efforts under way in Australia show, is to give service providers the right incentives to respond to the needs of workers and employers (Robalino, 2013).

Thinking about Today: Short-Term Responses to Youth Unemployment

At this point, we know that millions of young people are leaving school and unable to find work – and that number will continue to grow over the next several years. At the same time, businesses face a shortage of talent with appropriate skills. A recent McKinsey report estimates that by 2020 developing countries could have 45 million jobs for workers with secondary education that will go unfilled (Dobbs et al., 2012). In many regions and sectors across the globe, this skills mismatch represents a drag on economic growth, but it also offers a significant opportunity for youth employment.

Bridging from School to Work: The Role of Apprenticeships

Successful initiatives in both developed and developing countries confirm that practical, work-related skill-building and on-the-job experience through internships or apprenticeships help create critical bridges from school to work for youth. They not only allow youth to overcome the "experience trap" that can be a barrier to getting a first job but they also ensure that systems of education and labour market intersect rather than operate in parallel universes. Apprenticeship systems, in particular, have shown great promise and can be adapted to new contexts, as the TEN Youth initiative of the World Economic Forum Global Agenda Council on Youth Unemployment is planning to demonstrate with the corporate sector. TEN Youth will work with companies to encourage them to invest in "M&A" (Mentoring and Apprenticeship) support, provide knowledge and develop tools for companies to implement. The initiative already includes firms such as Infosys and Educomp (India), Aramex (Jordan) and CompTrade (Serbia) and many other companies have expressed interest in being part of the pilot exercise.

A national apprenticeship model that is currently under close examination by policy-makers across the world is Germany's "Dual Apprenticeship" system. In the system, apprentices alternate between learning and working in vocational schools and participating companies, either on a block basis or on agreed weekly schedules. These internships are developed through intensive social dialogue between the business community, the German Government (Ministries of Labour and Education), the BIBB (German Federal Institute of Vocational Education) and the trade unions. The origins of this system go back to the 15th and 16th centuries, in which guilds (sectoral associations of employers) wanted to transmit the right sets of skills for example to carpenters, book-binders, goldsmiths, masons and skilled workers in other occupations. And the system seems to work well today.

In 2010, almost two-thirds of German apprentices were taken on as full-time employees in their apprentice firm. Another 20% were taken on in different companies (BIBB, 2012). However, the success of the dual system in Germany has been thanks to specific socio-economic and historical factors not often found in other societies. For that reason, the "export" of the German dual apprenticeship system to a number of countries (such as the Philippines, Malaysia, China, Lebanon and Egypt) has not been a real success.

That said, there are a number of lessons that we can draw from the German system to help design apprenticeship systems that lead to better employment, at least in more similar contexts. These include: (a) high levels of trust and cooperative behaviour among public authorities, employers, training providers and young people, usually achieved by robust social dialogue; and (b) clear governance structures (institutions) that take account of any costs to employers (which might play out in a temptation to exploit apprentices) while also protecting apprentices' rights and the benefits.

More generally, ILO reviews of formal apprenticeships (Steedman, 2012) and the lessons from countries' experience reflected in the G20's Key Elements for Quality Apprenticeships (G20, 2012) reveal that quality apprenticeships can be successfully designed when keeping in mind the following parameters suggested by the ILO (Axmann and Hofmann, 2013):

- Using sector-based approaches in skills development to sustain public–private partnerships and assure the quality of formal apprenticeships and the quality of apprentices' subsequent employment.
- Combining classroom and workplace learning enables employers to match training to their needs and allows for relevant apprenticeship training that is innovative, responsive to labour market needs and leads to higher productivity, better working conditions and higher transferability of skills within and across sectors.
- Considering an appropriate balance between specific and transferable skills and reinforcing core skills such as problem-solving, teamwork and communication, allows to build a pool of competent workers for specific sectors in a sustainable manner.
- Providing a structured apprenticeship system of skills tracking, testing and certification, against competencies defined in advance, improve skills signaling (the acknowledgement of skills by employers) and the predictability of the performance of newly hired workers.
- Combining training with earnings ("learn as you earn"), access to social protection, respect for labour rights and a higher likelihood of post-training employment makes apprenticeship attractive to young people.

- Using employment services to expand young peoples' awareness of formal apprenticeships and the kinds of jobs they can lead to, along with avoiding gender stereotyping so that formal apprenticeships can broaden career choices for young women and men.
- Incorporating entrepreneurship education with technical training inspires young people interested in starting their own business to choose apprenticeships and raises the social status of vocational education and training.

The Importance of Soft Skills Acquisition

Among the disparate contributing factors that have led to the supply and demand mismatch is the dearth of "soft skills" that young people, educated in more traditional systems and lacking practical experience, never develop. These include (World Bank, 2010):

- *problem-solving skills* or the capacity to think critically and analyse;
- *learning skills* or the ability to acquire new knowledge ("learning to learn"), distill lessons from experience and apply them in search of innovations;
- *communication skills*, including reading and writing, collecting and using information to communicate with others and using a foreign language and information and communication technologies (ICTs) as communication tools;
- *personal skills* for self-management, making sound judgements and managing risks;
- *social skills* to collaborate with and motivate others in a team, manage client relations, exercise leadership, resolve conflicts and develop social networks.

Today, such skills are frequently not being absorbed and, in many countries, there are few opportunities for on-the-job training, quality internships or practical learning to build these skills outside the family. CEOs, in survey after survey, note that while there are specific technical skills that candidates may lack, more important for many businesses is the requirement that young people come to work already prepared in some of the more basic, soft skills.

An innovative programme in the Dominican Republic, Juventud y Empleo (Youth and Employment Programme), combining classroom training with an internship period, has demonstrated promising results with respect to "soft skills" acquisition among its youth participants. Most notable in the programme is its built-in evaluation mechanism allowing managers to adapt the programme design as necessary based on concrete regularly conducted evaluations (Polanco, 2013). Another programme, Education for Employment[1] which focuses on the MENA region, underscores the value of training in vocational and professional skills, including the soft ones (see Box 1).

Box 1: Training in Soft Skills in Egypt

After graduating from the Faculty of Computer and Information Technology at Cairo University, Shaimaa Moussa, a confident 27-year-old professional's three-year job search yielded no results. She attributes her inability to find a job to a lack of self-confidence and weak communication skills. Accustomed to excelling at technical and written tests, she was uneasy working in teams and found job interviews especially daunting. After an intensive two-month job training programme, provided by Education for Employment, a nonprofit that specializes in bridging the gap between school and work by providing work-ready skills training and job placements with private sector partners, Shaimaa was able to land a job with an e-commerce company Souk.com, the Arab world's first online auction site. For Shaimaa, the training "was vital in my practical life to discover myself, learn new skills, and stimulate hope and energy inside me".

Source: Education for Employment.

The Promise of Public–Private Partnerships

Given the complexity of the youth employment problem, it is often noted that solutions will remain small and marginal if the critical stakeholders fail to band together with clear, comprehensive strategies and commitments. This collective approach to achieving better results and impact has been shown to work in a number of diverse industries and geographies.

In Morocco, Education for Employment has brought together large Moroccan businesses, international philanthropy and the Ministry of Youth and Sport to fund, train and place 3,000 young people in jobs as well as partner with universities to assist an additional 10,000 young people to develop job search and interviewing skills before they graduate from university.

In South Africa, where two out of three South Africans between the ages of 18–28 are unemployed, the Harambee Youth Employment Accelerator is helping a select group of low-income South African youth "bridge" to their first jobs in the private sector. Although currently small in scale, the initiative provides a positive model for private sector engagement. Some of South Africa's largest companies in the retail, hospitality and tourism sectors are partnering to provide the job commitments. The South African Development Bank has established a Jobs Fund that provides resources, matched by private investors and employer fees, to allow Harambee to scale up its programmes.

In Costa Rica, CAMTIC, the industry association of technology companies, is implementing the Specialist programme to match vulnerable young people with needed IT skills to fill a gap of several thousand unfilled jobs in the IT sector. Educational institutions, informed by IT companies like Cisco, Microsoft and others, have designed certificate-level training courses that combine soft skills, language and technical training and result in jobs that pay three to five times the country's minimum wage.

These initiatives and many others (e.g. Dobbs et al., 2012) share a number of common traits, including the following:

- They are demand-driven, responding directly to the needs of the private sector, often with a sector-specific focus.
- Employers precommit to hiring, which gives educational institutions and youth the confidence that their efforts will result in a tangible benefit.
- Programmes range from several weeks to several months and include soft skills, as well as more specialized technical skills training related to the specific sector.
- Youth attain formal sector jobs with decent wages and benefits.
- All the relevant constituents (youth, businesses, educational institutions and government) are contributing something concrete (like tuition fees and time, matching fees from businesses, subsidized training and government funds or enabling policies).

Thinking like an Entrepreneur: The Way Forward?

Despite the many approaches being recommended and piloted to ensure better access by young people to employment, the sheer numbers – 600 million new jobs, against the perspective of fast-shifting technologies and global movement of industries – is daunting. Indeed, the shape of new global economic realities is becoming clearer. Businesses, along with those who own, run and work for them, are going to need to be more flexible, quicker to learn and smarter at understanding markets and cross-cultural dynamics. And in the Knowledge Age, with its backbone of digital information and communication, all of it happens faster. Take the case of Qordoba, which provides an example of the possibilities (see Box 2).

Box 2: Creating Digital Content in the Middle East and North Africa

May Habib leads a team of five – or perhaps more than 500. The founders of Qordoba, a two-year-old language services and digital content creation company, are spread across Dubai, Egypt, Lebanon and Syria, but can equally be thought of as headquartered anywhere in the world.

Young people from the MENA region constitute the content creators of Qordoba. They utilize its platform to create jobs for themselves. They write and translate just about anything into Arabic and English using their online platform and a distributed network of translators and editors, and their clients range from the world's largest multinationals to news agencies and software startups.

Qordoba utilizes an algorithm that ranks the abilities of each translator, copywriter or editor. Ongoing assessments of their work are also undertaken. As May writes, "It shocked me when I realized that more than 60% of our content creators were born between 1980 and 1990… and could be working from an Internet cafe in Tripoli, Lebanon; their editor could be a stay-at-home mom and journalist in Cairo, Egypt; their client could be in Boston, USA. The technical support guru answering their questions was in Aleppo, and the person wiring them their monthly earnings was in Damascus."

May likes to think of Qordoba as building a platform that allows young, ambitious, educated leaders earn a great living by plugging them into a global marketplace for talent.

Source: Habib (2012).

But not every young person knows how to be an entrepreneur. That is why entrepreneurship education – teaching young people to create opportunities for themselves – is so important. It instills an opportunity-focused orientation, resulting in an ongoing cycle of learning and innovation that can bring sustainable job creation and recreation to young people and economies. Preparing youth to squarely face the new global economy means nurturing them to think differently; to acquire perspectives and habits they will need to succeed academically, personally and professionally; and to be economically competitive locally and globally.

By putting these skills into practice, youth can more quickly move towards direct business creation in situations where needs and customers are quickly identifiable. In other cases, youth can approach the open job market with an entrepreneurial mindset that employers often identify as lacking in young workers. The encouraging news is that entrepreneurship education has broad applicability to students from the widest range of socioeconomic backgrounds. Indeed, in the past few years, it has had a particularly high return on investment when focused on underserved young people, as the following innovative approaches demonstrate.

The Youth Entrepreneurship and Sustainability (YES)

YES, a nonprofit based at the Babson College for Entrepreneurship, works to address poverty eradication through community organizing and global agenda-setting. Its first project was the Youth Employment Summit – a global decade campaign of action from 2002 to 2012 – that organized summits in Egypt 2002, Mexico 2004, Kenya 2006, Azerbaijan 2008 and Sweden 2010. At each summit over 2,000 diverse stakeholders attended from over 100 countries. In 55 countries young people set up YES networks that have implemented over 400 projects and touched the lives of over a million youth. The YES campaign builds the capacity of youth to work with governments and other stakeholders to create sustainable livelihoods and to establish an entrepreneurial culture. There are YES events being held every other day somewhere in the world. It is now a self-sustaining community.

YouthTrade

YouthTrade, inspired by Conscious Capitalism, certifies mission-driven entrepreneurs under the age of 35 and works to place them in premium markets such as Whole Foods Market (WFM) and Nordstrom. During the decade of the YES campaign, the team came to realize that access to markets for young entrepreneurs' demand-driven products was a major gap that needed to be filled. Young entrepreneurs could receive finance but most support ended once they launched their businesses. It is this last-mile gap that is filled by YouthTrade. Certified products can now be found in all 300 US-based WFM stores and in six Nordstrom stores. So far, 55 entrepreneurs have been certified and all the entrepreneurs who got into WFM have more than doubled their sales (see Box 3).

Box 3: Fostering Entrepreneurship in Rural West Africa

Rahama Wright was a Peace Corps volunteer in Mali from 2002 to 2004, where she witnessed the poverty and inequity facing many women in the Sahel region of Africa. She founded Shea Yeleen to develop and bring to the global marketplace high quality Fair Trade Shea butter products, which support living wages and economic development for women. YouthTrade and the WFM purchasing team coached and mentored her through the process of successfully entering Shea Yeleen products to retail distribution.

Today, shea butter products sourced from women's cooperatives in Ghana are on the shelves of WFM in the United States. And Shea Yeleen's coop members have increased their income from under US$ 30/month to US$ 100/month, helping them to send their children to school, buy food and medicine and become financially independent.

Source: YouthTrade, Rahama Wright.

The Network for Teaching Entrepreneurship

The Network for Teaching Entrepreneurship (NFTE) is an international nonprofit organization dedicated to engaging and inspiring youth in low-income communities to pursue educational opportunities, start their own businesses and succeed in life.[2] Its 25 years of success has proven that by bringing entrepreneurship into the classroom, young people can have a brighter future for employment, stay in school and learn smart financial management. NFTE helps young people develop a mindset to start a business, pursue further education or become a well-rounded employee who can think like an entrepreneur. To date, NFTE has educated 500,000 students globally and trained more than 5,000 teachers in entrepreneurship. Its school-based curriculum, which consists of over 65 hours of project-based learning, sharpens students' entrepreneurial mindset and leaves them with a set of related attitudes, knowledge and skills that mirrors those that years of research have found in successful entrepreneurs. NFTE has also created the World Series of Innovation (WSI), a prominent annual programme held each autumn as part of Global Entrepreneurship Week.

INJAZ-UAE Junior Achievement Worldwide

INJAZ-UAE, which is a member of Junior Achievement (JA) Worldwide, is a partnership among the business community, educators and volunteers to inspire young people to dream big and reach their full potential. Through an experiential programme, it teaches youth free of charge the key concepts of work readiness, entrepreneurship and financial literacy. According to INJAZ-UAE, its outreach efforts provide "the only education programme in the Arab world that teaches students business, entrepreneurship and life skills as part of a regular school curriculum". They instill Arab youth with a sense of self-motivation, confidence and empowerment, while fostering among business leaders a responsibility for investing their resources in the future of the region's youth. Its educational programmes have reached more than 23,000 students and engaged 1,500 volunteers at 43 schools and universities.

Thinking about Education and Labour Market Reforms

Over the long term, to ensure that young people are better able to find the jobs that they need and firms and economies can get the productive workers that they want for growth and revenues, it is necessary to rethink traditional education and labour market institutions. For one, governments need to create long-term strategies for economic growth that include job creation at their core as well as policies that will foster an overall environment more conducive to creating and growing businesses. Second, many countries need to make long overdue changes to their education systems to better align education content and delivery to the market needs of the 21st century. Third, societies have to find better ways of managing how information flows between those who are seeking jobs and opportunities and those who provide them.

These longer-term strategies are increasingly being adopted in different countries, offering hope for better outcomes for youth, as such interventions improve and are scaled up while societies learn and adapt along the way:

- Australia is piloting a vocational training curriculum that combines a core curriculum common to all students with a set of "top-up" elective courses designed to meet the needs of local employers.
- Australia and Singapore are providing incentives for all higher educational institutions (not just vocational schools) to make jobs a core educational objective by publishing and publicizing comparative metrics of the employment outcomes of their graduates.
- Babajob in India is using an Internet-based job search portal to connect those who seek informal and entry-level jobs with potential employers.
- Glowork in Saudi Arabia is matching skilled women with opportunities, while devising technology that allows them to work from home.

Overall, the democratization of information through the Internet, if scaled up beyond these niches, can help ease the "frictional" part of youth unemployment, by helping job-seekers and those who want to hire find each other more predictably and cheaply.

Thinking Fast and Thinking Differently: Improving the Future

How we can deal with the future of our societies, our economies and our world will depend greatly on what the youth of today – and those of a decade from now – can shape. That world is unlikely to be one where everyone will still have the traditional jobs that have been the drivers of prosperity over the last century. New ways of making things, from 3D printers to robotics, will change the skills needed for manufacturing. New technologies, from nanotech to biotech, will change the sorts of skills that will drive the economy. And unimaginably better information flows and processing power will empower all those who have the ability to harness them.

Accordingly, solutions for youth employment also have to increasingly embrace ways of endowing young people with the ability to adapt, to learn and to change. So many of the most promising approaches are those that build in that element of flexibility – whether quickly adaptable vocational curricula, apprenticeships that allow new skills to be rapidly identified and acquired, or indeed entrepreneurship education that provides an opportunity for young people to develop the insights necessary to create their own futures.

Finally, solutions for youth employment will also lie in the ability of adults to believe in youth – notably, offering youth opportunities to demonstrate creditworthiness and transform themselves.

References

Almeida, R., Arbelaez, J., Honorati, M., Kuddo, A., Lohmann, T., Ovadiya, M., Pop, L., Sanchez-Puerta, M. and Weber, M. Improving Access to Jobs and Earnings Opportunities: The Role of Activation and Graduation Policies. World Bank Human Development Discussion Paper, 2012.

Axmann, M. and Hofmann, C. "Overcoming the work-inexperience gap through quality apprenticeships – the ILO's contribution". ILO, http://www.ilo.org/beirut/media-centre/fs/WCMS_214722/lang--en/index.htm, 2013.

Almeida, R., Behrman, J., Robalino, D. The Right Skills for the Job? Human Development Perspectives. Washington DC: The World Bank, 2012.

Babajob, www.babajob.com.

BIBB. VET Data Report Germany 2012. Bonn: Bundesinstitut fur Berufsbildung, 2012.

CAMTIC, www.camtic.org.

Dobbs, R., Madgavkar, A., Barton, D., Labaye, E., Manyika, J., Roxburgh, C., Lund, S. and Madhav, S. "The world at work: Jobs, pay, and skills for 3.5 billion people". McKinsey Global Institute, http://www.mckinsey.com/insights/employment_and_growth/, 2012.

Education For Employment, www.efe.org.

G20."Key elements of quality apprenticeships". G20 Task Force on Employment, http://www.skillsforemployment.org, 27 September 2012.

Glowork, www.glowork.net.

Habib. "Get to work: Inclusive markets for labour". IFC-WEF essay competition, http://www3.weforum.org/docs/, May 2012.

Harambee, www.harambee.co.za.

ILO. Global Employment Trends for Youth 2013: A Generation at Risk. Geneva: The International Labor Office, 2013.

Mourshed, M., Farrell, D. and Barton, D. Education to Employment: Designing a System that Works. McKinsey Center for Government, December 2012.

Newhouse, D. New Estimates of Youth Idleness and Employment Outcomes in Developing Countries. mimeo. Social Protection and Labor. Washington DC: The World Bank, 2013.

Polanco, J.L. "Creating jobs for youth in the Dominican Republic". https://www.jobsknowledge.org/JobsandDevelopmentBlog/Lists/Posts/Post.aspx?List=2865966b-969e-44d4-a556-19cf83c472ab&ID=190&Source=https%3A%2F%2Fwww%2Ejobsknowledge%2Eorg%2FJobsandDevelopmentBlog%2FHome%2Easpx%3FPaged%3DTRUE%26p_GroupCol1%3Dllkka%2520Lakaniemi%26PageFirstRow%3D31%26%26View%3D%7BCEF3D237-6E58-4D68-A341-9CD93009F906%7D&Web=0883d59e-523e-4969-b84d-4e317deed77c, 2013.

Robalino, D. "Designing effective employment services – The Australian way". The World Bank, https://www.jobsknowledge.org/JobsandDevelopmentBlog/Lists/Posts/Post.aspx?List=2865966b-969e-44d4-a556-19cf83c472ab&ID=188&Source=https%3A%2F%2Fwww%2Ejobsknowledge%2Eorg%2FJobsandDevelopmentBlog%2FHome%2Easpx&Web=0883d59e-523e-4969-b84d-4e317deed77c, 2013.

Robalino, D. and Sanchez-Puertas, L. Managing Labor Market Risks and Creating Better Jobs: Alternative designs for Income Protection and Active Labor Market Policies. Washington DC: World Bank, 2009.

Robalino, D., Margolis, D., Rother, F., Newhouse, D. and Lundberg, M. Youth Employment: A Human Development Agenda for the Next Decade. Social Protection Discussion Paper No. 1308. Washington DC: The World Bank, 2013.

Sepulveda, C. "A better search ability for some young French workers reduces the search success of others". The World Bank, https://www.jobsknowledge.org/JobsandDevelopmentBlog/Lists/Posts/Post.aspx?List=2865966b-969e-44d4-a55([0-9])–([0-9])9cf83c472ab&ID=191, 2013.

Steedman, H. Overview of Apprenticeship Systems and Issues – ILO Contribution to the G20 Task Force on Employment. International Labour Office, Skills and Employability Department. Geneva: International Labour Office, 2012.

Woolard, I. "Targeting youth to reduce South Africa's unemployment". https://www.jobsknowledge.org/JobsandDevelopmentBlog/Lists/Posts/Post.aspx?ID=185, 2013.

World Bank. Jobs for Shared Prosperity: Time for action in the Middle East and North Africa. Washington DC: The World Bank, 2013.

World Bank. World Development Report 2013: Jobs. Washington DC: The World Bank, 2012a.

World Bank. More and Better Jobs in South Asia. Washington DC: The World Bank, 2012b.

World Bank. Stepping up Skills for More Jobs and Higher Productivity. Washington DC: The World Bank, 2010.

World Bank enterprise surveys. www.enterprisesurveys.org.

Endnotes

1. Note that co-author Jamie McAuliffe is Chief Executive, Office of Education for Employment.
2. Note that co-author Amy Rosen is CEO of the NFTE.

Chapter 5: Education System Reform in Pakistan: Why, When and How?

Mehnaz Aziz, David E. Bloom, Salal Humair, Emmanuel Jimenez, Larry Rosenberg and Zeba Sathar

Pakistan's education system faces many well-known problems. At the primary and secondary level, both access and student achievement are low – by international standards as well as the standard of meeting Pakistan's broad development challenges; and future outlook is pessimistic – with Pakistan likely to fall well short of the Millennium Development Goal (MDG) of achieving universal primary education by 2015.[1] Teacher preparation and teacher attendance at schools are inadequate. Stubborn inequalities in access, quality and educational outcomes persist across gender, across income, between urban and rural schools and among the country's four provinces. These inequalities create some startling disparities: for instance, Punjabi urban males completed primary school in the early 2000s at a rate of 65%; but only about 10% of rural Balochi or rural Pathan females did so.[2] New data on these disparities provide some encouragement but there is still a long distance to go in eliminating them.

The higher education system fares no better, in spite of strides made in the past decade. Enrolment stands at about 8% (including two-year colleges) of the age cohort, a statistic that compares unfavourably with countries such as India at 18% and Malaysia at 42%.[3] The problems in this system are legion: low quality of faculty, low student motivation, rote learning, outdated curriculum, poor student discipline in public universities, lack of funding, lack of research and so forth. As a result, a large majority of Pakistani graduates emerge from universities without the technical or social skills needed for them to be strong contributors in the workplace or society, either in Pakistan or on the global stage.

Vocational education in Pakistan is even more marginalized. Less than 1% of the population has ever received technical education or vocational training. For those who have, quality has been uneven. More than 75% of the graduates have some foundational skills but no marketable skills for employment. Poor administration, lack of interaction with industry and the outdated infrastructure of public institutions have been blamed.[4] Such issues, along with those that bedevil the other levels of education, explain why Skilled Workforce Indicators such as 'poor work ethic' and inadequate education rank as two of the top 10 most problematic factors for doing business in Pakistan, according to the World Economic Forum's 2012 *Global Competitiveness Report*.[5]

These problems are not new or unknown and various Pakistani governments have tried, with questionable resolve, to respond. Pakistan in fact has a long history of failed reforms and educational development plans. As early as 1959, the National Commission on Education produced a report that outlined the problems in Pakistan's educational system and recommended reforms. By and large, the problems identified in that report remained unaddressed and have persisted through the Government of Pakistan's educational policies of 1970, 1972, 1979, 1992 and 1998. These problems have also survived more than eight five-year development plans that, among broader development efforts, aimed at resolving the problems in the education sector.

The long neglect has made these problems graver than ever before. In a world in which many countries (including in the developing world) are moving ahead quickly in terms of their economic and social development, Pakistan risks falling ever further behind if it cannot educate its young people effectively. Moreover, the challenges to Pakistan's education system are about to multiply, given that the number of young people is projected to rise significantly in the coming decades. The current education system in Pakistan is for the most part unable to educate the existing and the coming large numbers of students so that they are fully functionally literate, are able to contribute productively to the economy and are fully aware citizens, able to constructively contribute to overcoming the country's vast development challenges.

Fortunately, Pakistan is not doomed to follow this scenario. It has enormous potential, but we believe it will need to act quickly because a unique opportunity exists to initiate educational reforms now. We also believe that Pakistan no longer has the luxury for piecemeal reforms; rather, the whole system must be tackled, simultaneously, with all stakeholders – the government, donors, youth, parents, employers, and workers. This chapter articulates that opportunity for reform and summarizes the current state of education, including challenges raised by recent developments. It then focuses on how to design reforms at the system level, how to initiate them, and how to sustain them to overcome the inevitable obstacles that will arise.

Opportunity for Reform

Given the rather dismal history of educational reform in Pakistan, a pragmatic question is if anything can be done and if it has any reasonable chance of success. We believe the answer is a qualified yes, as several forces both within the educational system and in the broader polity in Pakistan have come together to create a window of opportunity for education reforms to materialize.

The first force for change is the rising expectations of the Pakistani public.[6] Pakistan's educational deficits – along with the country's inability to provide productive work to all those who are educated – have led to widely unfulfilled expectations. Partly because of technology and global connectedness, the generation that grew up in the last decade, the one that is growing up now, their parents and businesses and leading thinkers are much more aware of global currents and of their own disadvantage with respect to other countries. Rising economic insecurity has added to the anxiety of parents and youth about their future. Pakistan's rapidly growing population has made these problems all the more acute. Although the share of 15- to 24-year-olds is currently at its peak and will be declining in the coming decades, the absolute size of that cohort is projected to grow from about 38 million today to about 43 million in 2035. Young people, and indeed all age cohorts, will increasingly expect and demand that the country rapidly improve access to, and the quality and relevance of, its education system at all levels.

The second force is a rapidly evolving political system in which major actors are adjusting to new expectations. Pakistan's checkered history of governance – in which the military ruled the country for more than half of its 66-year history – never allowed democratic norms to stabilize. Interim civilian governments, with limited exceptions, were typically weak and insecure. In the limited time and perceived autonomy they enjoyed, their focus was mainly on rent extraction and personal gains, in part because few expected to go back to the electorate to seek re-election based on performance, as the military was often a more important power broker.

This has now changed. The public's power is increasingly the deciding factor in who comes to and remains in power. For instance, in spite of developmental initiatives, the end of the last military government (1999–2007) was brought about largely through popular discontent. The last democratic government (2008–2013), in spite of making important legislative gains, was emphatically voted out by the electorate – a signal that was widely interpreted as a vote of no confidence in its performance in service delivery.[7] Consequently, the new government appears overtly conscious of the fact that it must deliver, rather than just declare, and be seen to deliver on services demanded by the Pakistani public, including education for Pakistan's children. How well they can do remains to be seen.

The new government also knows that it will be kept in check by a highly active judiciary. The higher judiciary – historically pliant to the military and other political exigencies – has become aggressively independent since 2007, actively holding public officials to account. This has two significant implications for implementation of reform in the education sector. First, with the passing of Article 25(A)[8], it is possible for the public to go to court about being denied basic education. Second, government and bureaucracy now know that misconduct and corruption in implementation may result in serious and public consequences.

The third force is the rise of a highly active Pakistani media that regularly highlights the dysfunction within Pakistani institutions. It has provided a forum for voicing popular discontent on various issues, including education. Already there are aggressive campaigns for public dialogue and accountability in the education sector led by nongovernmental organizations (NGOs) and the media,[9,10] which highlight citizens' and the state's responsibility to get every child into school, improve the quality of schools and expose ghost schools.[11] The media have also put politicians and other leaders on notice in terms of accountability, with media reports regularly providing the basis for court cases filed against bureaucratic malpractices. Political leaders, higher courts and civil society activists are all adjusting to this sharp spotlight of public accountability. The system is far from perfect and an often over-exuberant media can at times behave regressively (such as sometimes stoking hysteria about curricular reform), but the point is that political leaders know that there is a new reality and that they can no longer hide behind a cloak of obscurity if service delivery or reform implementation is marred by corruption.

There are also other new and potentially powerful symbols of change. Malala Yousafzai, the Pakistani girl who was shot by the Taliban in 2012 but survived, has become a focusing icon for gender equality in education – not only in Pakistan but globally. The events after her shooting, recovery and rise to the global stage have challenged perceptions and expanded the discourse in Pakistan about girls' education in particular and education in general.

Although forces for change exist, it is not yet clear how much the government can focus on education, versus other highly visible and charged problems, such as the economy, energy and security crises. Even less clear is whether leaders who have the will to do something about the education system also have the political skill to take advantage of the country's considerable strengths, to effect lasting change at the scale needed. This matters greatly because without major, near-term improvements in the quality of and access to education, Pakistan may stagnate in its economic and social development, continue to experience significant challenges to its democracy, fail to build on its strengths, continue to suffer considerable internal strife and, ultimately, weaken itself in relation to neighbouring countries. Fortunately, Pakistan is not doomed to follow this scenario. But it will need to act quickly if it is to realize its enormous potential and satisfy the growing demands of its people for better lives.

The Current State: Unfulfilled Expectations, Uncertain Future

Dissatisfaction with the educational system is widespread, but Pakistani youth are especially unhappy. A British Council report in 2009 documented several concerns commonly expressed by Pakistan's next generation.[12] About 92% believed improving the educational system is an important issue and women were particularly concerned about the future of their children. Almost 50% believed they lacked the skills for the modern labour market and many expressed their inability to find an opportunity to gain essential skills. Those who were qualified struggled to find decent employment while battling discrimination and corruption. All of this was expressed as a simmering sense of injustice and hopelessness; in the British Council report, only 1 in 10 expected an improvement in the near future.[12]

Pakistan's business and leading thinkers are no less dissatisfied.[13] Indicators about education from the annual Executive Opinion Survey by the World Economic Forum (Forum) are dismal. These surveys ask corporate executives throughout the world about their businesses and the social, political and economic environment in which they operate. Some of these questions focus on the knowledge and capacities of their workforces and the formal and informal institutions that augment those skill sets. As Table 1 shows, almost one in two business leaders is dissatisfied with the ability of the educational system to support a competitive economy; 6 out of 10 express dissatisfaction with the quality of primary schools; and one in two with the quality of maths and science education. Further, these numbers have stayed roughly steady, and in some cases deteriorated, over the last four years of the survey.

These numbers suggest that Pakistan is not competitive with respect to the rest of the world in the domain of education, compared to respondent perceptions from other countries. One (largely) independent indicator of this disadvantage is Pakistan's ranking in the recently released Human Capital Index by the Forum.[14] This index attempts to rank countries in terms of their ability to maximize the long-term economic potential of their workforces. It focuses on four aspects of countries' environments: education, health and wellness, workforce and employment and an enabling environment to realize the economic benefits of the human capital. Pakistan ranks 112 among 122 countries in the overall index, all of the lower-ranked countries being in Sub-Saharan Africa (except Yemen). In education, Pakistan is ranked 111 out of 122. India, by comparison, is ranked 78 overall and 63 in education.

Low Enrolment and Literacy Statistics

This high level of dissatisfaction stems partly from deficits in access, literacy and student/teacher ratios. In 2011, the net enrolment rate for primary education was only 72% (compared with more than 90% in India and Indonesia)[15] with girls more disadvantaged, as fewer than 67% of girls of primary school age were enrolled. The same trends pertained to secondary school, with only 35% of secondary-school-age children enrolled (and only 29% of girls). By comparison, Bangladesh and Indonesia were doing better with enrolment rates of 47% and 74%, respectively – with no male/female difference in Indonesia and, in Bangladesh, a *higher* enrolment rate among girls than boys. Tertiary-level statistics tell a similar story: enrolment stands at about 8% (including two-year colleges) of the age cohort, well below that in India (18%) and Malaysia (42%).[16]

Literacy data also paint a discouraging picture. Only 55% of adults (and just 40% of women) are considered literate – figures below those of Bangladesh and India and very far below Indonesia's, where 93% of adults (and 90% of women) are literate. A similar picture emerges for data on literacy among 15-to 24-year-olds, with a youth literacy rate of 71% (and 61% for females), again well behind Bangladesh, India and Indonesia.

As for student/teacher ratios, the performance is mixed. In primary schools, the student/teacher ratio is roughly 40:1, about the same as in Bangladesh and

Table 1: Business Leaders Give Low Marks to the Education System
(responses from the World Economic Forum's Executive Opinion Survey about the state of education in Pakistan)

	2010	2011	2012	2013								
Sample size	218	131	110	130								
	Response rate %				At least moderate satisfaction %				Great satisfaction %			
	2010	2011	2012	2013	2010	2011	2012	2013	2010	2011	2012	2013
How well does the educational system in your country meet the needs of a competitive economy?	99	97	99	95	43	43	42	45	5	5	11	8
How would you assess the quality of primary schools in your country?	99	98	97	95	35	35	33	32	5	9	6	5
How would you assess the quality of maths and science education in your country's schools?	99	98	94	96	47	48	47	38	7	8	12	9
How would you assess the quality of management or business schools in your country?	99	97	98	95	54	70	68	70	11	14	19	16
To what extent do companies in your country invest in training and employee development?	98	97	97	98	42	52	43	44	6	4	5	6

Notes: Response rate is percentage of those who responded to the question out of those who responded to the survey. "At least moderate satisfaction" means that the respondent answered the question with at least a four out of a possible seven (maximum satisfaction). "Great satisfaction" means the respondent indicated a satisfaction level of at least six.

India, though much higher than Indonesia's 16:1. In secondary schools, Pakistan's relative position is worse, with a ratio of roughly 40:1, as compared with about 30:1 in Bangladesh, 25:1 in India and 15:1 in Indonesia. One area in which Pakistan does not lag is in the share of gross domestic product (GDP) spent on education. At 2.4% of GDP, the country sits in roughly the same range as Bangladesh, India and Indonesia.

Exacerbating these deficits are other less easily quantified factors. For instance, in Pakistan, like most countries, enrolment in school does not ensure attendance; many students begin a school year but attend infrequently and do not complete the year. Attendance, in turn, does not imply learning; inadequate curricula, teacher absenteeism and infrastructure deficiencies can thwart even motivated students and well-intentioned administrators. And the quality of curriculum, and the manner of its delivery, means students are taught a memorization of facts rather than inquisitiveness and problem-solving, leaving them less prepared to meet the demands of a modern economy and society.

Inequality of Opportunity

Inequalities in access, quality and educational outcomes have stubbornly persisted in Pakistan's educational system, across gender and income, across urban and rural settings and among the country's four provinces.

Even though girls' enrolment in primary and secondary education has improved in the past decade, it stills remains below boys', with significant urban/rural and regional differences. More than 50% of girls in rural areas do not attend primary school and more than 75% do not attend secondary school. Enrolment rates of boys in rural areas at both the primary and secondary level are about 7% higher than those of girls, a difference that is fast disappearing in urban areas. Even though rural areas in Punjab and Khyber Pakhtunkhwa are increasing girls' secondary enrolment at a faster pace than in the past (with enrolments at almost 30% and 23% respectively), rural Sindh is almost stagnant, with an enrolment rate at 10%.[17]

These inequalities have important developmental consequences for the children. Educated girls are more likely to have skills that allow them to earn more in the labour market; they are more likely to marry later, to have fewer children and to have them later; and they and their children are more likely to be healthy. Educated mothers are also shown to affect their children's learning outcomes at school.[18] Emerging evidence also suggests that benefits from girls' education may actually start even earlier than when they have children of their own, as educated elder sisters can have a significant positive effect on educational outcomes of younger siblings.[19,20] Overall, the return on investment in girls' education is higher than that for boys (Table 2).

Table 2: A Bigger Pay-off From Educating Girls

(rates of return on investments in additional years of education)

	Rate of return (%)	
Level of education	**Male**	**Female**
Primary	2.7	6.8
Middle	4.5	20.5
Matric (10 years of formal education)	13.2	27.4
Inter (12 years of formal education)	11.4	16.9
Bachelors (14 years of formal education)	15.4	22.6
MA and more (16+ years of formal education)	15.1	30.7

Source: Monazza Aslam, "Rates of return to education by gender in Pakistan", Global Poverty Research Group Working Paper, GPRG-WPS-064, Table 7a. No date, but this paper cites a 2007 publication and is based on data from 2002. Uses individual wages earned to determine rates of return but not including other potential social or health benefits.

The continued neglect of rural areas in terms of education also has negative developmental effects. It exacerbates the economic and cultural differences between those areas and cities to the detriment of the country as a whole. Further, since agriculture is about 25% of Pakistan's economy, a lack of education can hurt the long-term efficiency of agriculture and increase migration from rural to urban areas.

An Evolving System

The education system in Pakistan has seen major evolution in the last few decades. Prior to 1972, private providers delivered a substantial proportion of basic education in Pakistan. The 1970s saw a nationalization of most of these private institutions. But a lack of public funding for education, as well as a change in governments, forced a policy reversal. Since restrictions were lifted in 1979, private providers of education have "filled in" gaps where the public sector has failed to deliver,[21] a trend that has accelerated in the past two decades.

Private school education in fact is now a major phenomenon in Pakistan, with nearly one-third of all students, at both the primary and secondary levels, attending private schools (accounting for approximately six million and three million students, respectively). These schools span both elite schools catering to the high-income segment of the population, as well as more affordable schools catering to the middle-income segment and low-cost private schools serving low-income families. In addition, philanthropic organizations such as The Citizens Foundation (TCF), Cooperation for Advancement Rehabilitation and Education (CARE) and other organizations are a growing niche attempting to provide quality education to children from low-income families.

The growth of these private schools, particularly low-cost private schools, has been particularly important in Punjab and Khyber Pakhtunkhwa. In Punjab, in net terms, some argue that virtually all the gain in school participation over the period 2004/05–2010/11, especially at the primary level, is due to the gain in private school participation.

Within higher education, we have also seen the emergence of good private institutions. For instance, the Lahore University of Management Sciences (established in 1985) comprising schools of humanities and social sciences, business and science and engineering, has established itself as one of the best business schools in Pakistan. The Aga Khan University (established in 1983) is acknowledged as the country's best medical school. The Karachi School of Business and Leadership (established in 2010) aspires to be a world-class business school. The Habib University in Karachi (starting classes in 2014) aims to be a pre-eminent liberal arts university. Important as these initiatives are, in spite of their nonprofit status, they cater primarily to the high-income section of the population.

In addition, the infusion of resources and ideas fostered by the Higher Education Commission (HEC) in the past decade has had a salutary effect on a few public universities, such as the National University of Science and Technology (NUST) and Quaid-e-Azam University (QAU) in Islamabad. Admittedly, such universities are a small fraction of the total in Pakistan, and the progress they have made is checkered, but there is nonetheless improvement from their conditions at the turn of the millennium. The HEC also launched the Virtual University (VU) of Pakistan in 2002 as an attempt to circumvent the lack of capacity in existing universities and bring college education to scale. By October 2012, VU enrolment had crossed the 100,000 mark.

Vocational education, in contrast to primary/secondary schooling and the higher education sector, has not yet caught the attention of private providers, although exceptions have recently emerged such as AmanTech in Karachi.[22] Government remains the primary provider, with responsibility and authority devolved to the provincial governments.

Disruptive Changes

Educational governance in the country is in a state of flux because of constitutional changes and political dynamics. In April 2010, the legislature passed the 18th amendment to the constitution which, among other far-reaching changes, devolved a significant number of responsibilities for education to the provinces. Prior to the amendment, primary and secondary education was a shared responsibility of the federal and provincial governments and the federal government had powers to enact and enforce laws related to education. The 18th amendment was initially interpreted as the federal government completely devolving responsibility to the provincial governments, along with the abolition of the federal Ministry of Education (MoE). However, legal challenges were soon mounted and the Supreme Court ruled in November 2011 that education was an obligation of the federal government from which it cannot absolve itself. Consequently, an existing ministry, the Ministry of Professional Education and Trainings, was renamed to form the Ministry of Education and Training (MoET). However, even two years after its creation, the role, responsibility and authority of MoET is unclear and its relations with provincial ministries of education undefined.

At the higher education level as well, recent developments have created significant governance challenges. Prior to 2000, the higher education sector in Pakistan was overwhelmingly marginalized in favour of primary education. In 2002, the government created a powerful Higher Education Commission (HEC) that helped the sector make huge strides. But the HEC, too, has fallen to the vicissitudes of Pakistan's political turmoil. Under the last regime, HEC's budgets were radically reduced and it became party to political conflict when it was asked by the Supreme Court to verify the degrees of sitting parliamentarians. The resulting political enmity left the HEC with few champions in the government. As a result, there were several efforts to disband it or to put it under MoET's control, which would effectively revoke its status as an independent commission. There were also public rifts about appointments at senior positions within the HEC, with the government and the courts pushing the commission in opposite directions.

At this point, the HEC finds its future role and responsibility uncertain in regard to the higher education sector. For instance, it is not even clear if the HEC is reporting to MoET and thus MoET has ultimate responsibility for higher education, or if MoET is only supposed to channel funding to HEC (and broker its parliamentary affairs) and thus HEC is the final word. Until this challenge of governance is resolved and the new government firmly commits to higher education as a priority, reform in this very important sector of education is unlikely to be feasible.

Designing Reform: A Systems View

A chapter of this scope cannot offer a detailed blueprint for reform of the entire educational system in Pakistan. Nor should it – any blueprint must have the buy-in of all major stakeholders in Pakistan's educational system, such as the government, political leaders and civil society. This is particularly true because any reform will require making important choices about how much effort to spend on different sectors of the education system, what problems to tackle within the sectors, how to address them and what results to expect from these efforts. What such a chapter can do, however, is to lay out the perspective educational reform must adopt, the broad principles it must consider, propose the ends it should meet and the chief means it could adopt.

Adopt a System Focus

At various times in Pakistan's history, the pendulum of attention has swung from one sector of the education system (see Box 1) to another based on donor interest, prevailing economic theory (e.g. focusing on public versus private returns from investments in primary and higher education), or other political flavours of the day. For instance, in the 1990s donors focused primarily on school-level education to the neglect of higher education. In the 2000s, the government of Pakistan poured money into a dilapidated higher education system.

Education reformers in Pakistan must consider that the country does not have the luxury of focusing only on parts of the system. Each of the subsectors of the system – primary/secondary schooling, higher education and vocational training – has a vital role. Each can expand opportunity for different cohorts of Pakistani youth, enabling them to contribute to Pakistan's economic growth. It would, for instance, not be in the best interest of Pakistan to focus on school reform now and return to higher education 5 or 10 years down the road. It would also not be wise to neglect vocational training while focusing on the other two sector first. That said, each sector of the education system has its own constituencies, challenges and constraints. Therefore, the approach to mobilizing those constituencies, raising resources and addressing challenges will be very different.

Articulate Key Principles of Reform

Still, we believe some common reform design principles can be applied to all subsectors of the education system. *First, any reform must be systemic*, i.e. select a minimal set of areas for each subsector (such as governance, fiscal resources, human resources and curriculum) and address them simultaneously rather than omitting one. Of course, the nature of these areas and thus appropriate solutions will vary across the subsectors. For instance, governance reform for managing and monitoring of schools will likely be more focused on government bureaucracy. In universities, however, it may also encompass the often complicated structures of governance within institutions. Similarly, human resource development is very different for school teachers versus university faculty, in terms of resources required, the time needed and the eventual roles teachers and faculty are expected to fulfil.

Box 1: The Education System

By the system of education, we mean the collection of individual institutions that are involved in delivering formal education (public and private, for-profit and nonprofit, onsite or virtual instruction) and their faculties, students, physical infrastructure, resources and rules. We also include the institutions that are directly involved in financing, managing, operating or regulating such institutions (like government ministries and regulatory bodies, central testing organizations, textbook boards and accreditation boards). Finally, in an education system, we include the rules and regulations that guide the individual and institutional interactions within these institutions.

This description is not meant to strictly circumscribe what is and is not within the educational system. There will always be fuzzy areas where judgement will need to be exercised on whether an entity is or is not part of the educational system. For instance, NGOs and think tanks dedicated solely to educational advocacy, or private watchdog groups that focus mainly on education might be reasonably considered part of the educational system. In addition, the system is not closed to the outside. It is linked both on the input and output side to the labour market (faculty as inputs and students as outputs).

One way to view linkages in an educational system can be seen in a 2000 World Bank report on higher education in developing countries.[23] An even more expansive notion of the educational system is employed in the new World Bank Education Strategy.[24] There the education system is also defined to include employers, families of students and nonformal education. This inclusiveness is useful as it suggests reform mechanisms for the education system that can strengthen the demand side of education, where parents and civil society organize themselves to demand better planning, delivery and monitoring of their children's education.

Second, standards of excellence must be tailored to purpose. Systems of education are like terrains, with peaks, valleys and vast plains. The notion of excellence at the system level is not definable in the same way as it might be for a particular class of institutions. This notion for the system must be defined as "fit for purpose". An institution is excellent if it delivers well on the purpose for which it was designed, within the constraints it has. In that sense, design of any reform at the system level must recognize that imposing uniform standards of performance may work for subsets of the system, but not the whole system.

For instance, a private school may have the resources and the flexibility to admit only the brightest students to achieve world-class results, but a public school in a rural area may not, as its primary objective is access and affordability within the means it has. Holding them accountable to the same standards may be counter-productive and will in fact generally be infeasible. Similarly, in higher education, not all universities need to be world-class research universities. That would be beyond capacity for most countries, not just developing ones. A teaching university may be excellent if it graduates a large number of students with solid fundamentals, even if its faculty does not conduct substantial research. A vocational institute may be excellent if it graduates a large number of students who have no trouble obtaining international certification for their skills, even if it does not cover all vocational areas.

Third, implementation resources must be carefully nurtured and protected. This principle is particularly important because of the preciousness of implementation resources in Pakistan. Implementation eventually comes down to people – especially those with the motivation, skill, experience and stamina to steward the reform effort. Sometimes a promising reform effort fails if one or two key people exit. This is partly because of the difficulty of replacing talent in Pakistan and the high cost of learning for new participants to carry out reforms successfully in Pakistan's environment. For this reason, it is important for political and civil society leaders to nurture implementers of reform over a reasonable period of time and recognize the pitfalls of attempting to replace teams before the ground gained in reform has been secured.

Since much of the primary and secondary education is handled by the government, two complementary approaches to strengthen implementers of reform would be to identify and empower reformers within the government and give them the time and space to effect reforms in education; and/or bring into the government at very high levels of administration, a few highly talented and proven people from civil society or the corporate sector, with experience in reform, management, or education administration.

Define the Goals of Reform

Some of the ends any reform effort must seek to obtain are simple to describe and not controversial. Broadly, these must be to (a) increase enrolment, (b) decrease inequality across gender, income, location (urban/rural) and ethnicity, and (c) improve overall quality of education. This simple codification, appropriately interpreted, should apply to each sector of the education system (schooling, higher education and technical education).

Inequality deserves a special note as it is most likely to be overlooked in reform efforts and also because some of the means employed for addressing other ends may exacerbate the inequalities. For instance, an emphasis on private schooling as a major vehicle of policy may end up further disadvantaging girls in rural areas. Private schools are likely to be the last option for the poor and girls to catch up in rural areas. Poor families will forego private fees especially for girls, so private schools are unlikely to become major instruments of opportunity for poor rural girls. Areas such as these are where the state must take ownership of the problem.

In addition, there may also be other legitimate ends that reformers may seek to undertake, such as increasing tolerance and civic sense. But these are not measurable in the same sense as the ends listed above. Moreover, because explicit goals inevitably raise explicit challenges by interest groups, goals such as these are perhaps best weaved into the reform effort rather than made explicit.

Delimit the Key Means for Achieving Reform Goals

Given the daunting number of problems in Pakistan's educational system, it is easy to get distracted by creating a laundry list of potential challenges and reforms. But such a strategy is unlikely to be informative. Reform processes can often dissipate their energies by tackling too many challenges (some of which are not strategically important) and by omitting one or more key areas (the absence of which causes the reform in the intended area to fail).

We believe that four areas are key to the development of an effective reform programme for the educational system as a whole and are systemic in the sense that none can be avoided without seriously hampering the outcomes of the reform. Broadly construed, these are: (a) governance (including federal and provincial bureaucracy as well as the appropriate public and private sector regulation), (b) fiscal resources (including efficient use of such resources), (c) human resource development (including incentives for teachers and faculty), and (d) curricular reform. In our view, none of these areas can be implemented without support from a subset of the other three areas. Appropriately interpreted, these areas are relevant to each sector of the education system. Below are some examples of what reform in these areas might entail, described mainly in terms of the school system.

Governance

Governance encompasses at least four related areas: (a) delineation of the authority and accountability for government bureaucracy and within educational institutions; (b) good functioning of regulatory and enforcement frameworks; (c) creation of new partnerships in the public–private–civil society sector; and (d) establishment of monitoring and evaluation mechanisms for the system.

At this time, the lines of authority and accountability at the government level are hopelessly confused. Recent constitutional changes (like the 18th amendment) have thrown the education bureaucracy at both federal and provincial levels into uncharted waters. It is imperative to quickly resolve this confusion, or reform will be impossible to even envision at the system level, let alone initiate.

Governance reform will have to include streamlined regulatory oversight of the private sector, without increasing the bureaucratic burden unnecessarily (which can also create opportunities for corruption) and not hampering the growth of the private sector (which is providing an invaluable service within the education system). The proliferation of many nongovernment service providers means an ever-increasing burden of coordination to ensure that the outcomes of public and private schools are compatible. As the private education sector has grown, so have concerns about increasing potential disparity between public and private education – such as by private schools "stealing away" rich and capable students (and the best teachers), leaving the public schools with poor and underachieving children. Better coordination and oversight of private and public schools is needed so disparities do not reach unacceptable levels. If this is not done, at some point, the inequalities of access may necessitate legislative intervention as has recently happened in India, where 25% of the seats in private schools are now required to be reserved by law for children from disadvantaged families in the neighbourhood.

Governance reform should also focus on new ways of defining institutional partnerships between the public, private and civil society sectors. Here, some recent initiatives have shown promising results. For instance, the Pakistani government began a programme in 2005 in Punjab to expand access to low-cost private schools in a way that enhanced accountability. The Foundation Assisted Schools programme of the Punjab Education Foundation gave monthly per-student cash subsidies to schools, which had to waive tuition for all students so as to attract poor families and ensure that a minimum percentage of their students pass a biannual standardized academic test. An evaluation of this programme shows that these subsidies pushed schools to ensure better learning so that they kept their funding.[25] Such a model may not be scalable to the entire country but its success offers a vital policy instrument in areas where it is feasible and desirable (such as where existing private schools have the capacity and the students from public schools have the ability to attend such schools).

Finally, any large education system risks failing to achieve its objectives if it lacks clearly stated standards for compliance and monitoring. One task for reform is to create a new, clearly defined set of standards to ensure that everyone working in the education system (planners, administrators, teachers and support personnel) understands the goals of the system as a whole and their individual responsibilities in reaching those goals. Standards, in turn, require accountability. Well-thought-out mechanisms to encourage, and ultimately ensure, that all actors carry out their expected roles will need to be agreed upon and implemented. Creating and strengthening bureaucratic mechanisms for enforcing accountability are important, but so is strengthening the demand side of accountability. Emerging evidence indicates that disseminating timely information about schools' performance to parents has the potential to produce better outcomes.[26] Such possibilities should be seriously considered.

Fiscal Resources

Fiscal resources are a perennial problem and will remain so for the foreseeable future. The past few years have seen Pakistan's economy average a 3–4% growth rate[27] and double-digit inflation. As a result, for the first time in its history, Pakistan's per capita income has dipped below that of India. For the last few years, national budgets have routinely managed deficits of around US$ 8–10 billion, which have been financed by borrowing or other foreign inflows.

The situation today is no different. In this environment, a significant expansion of the fiscal space for education will require a major sustained push, particularly as the resources needed for investment in large-scale energy projects are likely to take precedence. Still, it can be done, and what is more important is that existing resources can be used to create better performance in the education system. Better use of resources will also provide the impetus to mobilize more resources, as there are strong voices in Pakistan that highlight the ineffectiveness of simply pouring money into a dilapidated education system.[28]

Better use of resources will require rethinking the private–public–civil society partnership in schooling as well as in higher education. Emerging evidence indicates that private schools have better outcomes, in spite of their teachers sometimes having less formal teaching education than public school teachers, and being lower paid. However, their absentee rates are lower, and in *A Dime a Day: The Possibilities and Limits of Private Schooling in Pakistan*, Andrabi, Das and Khwaja find evidence that "increased effort" in private schools "may indeed overcome the problems of poor educational qualifications and training". Sir Michael Barber's report *The Good News from Pakistan* also suggests that private schools are generally less expensive on a per-student basis. Thus, channelling some public funds into these schools via targeted scholarships may offer economically disadvantaged families an opportunity to pursue a higher quality education at a lower cost to the public exchequer.

Still, the use of such partnerships will need to be judicious. Private schools are not a panacea, as evidence shows they mainly crop up in areas where there are public schools already. This implies that they reduce the public schools' share of enrolment but do not necessarily increase total enrolment. More importantly, they are unlikely to create options in areas where girls or poor children lack access to school or have to travel far. This is an area where government cannot abdicate responsibility. Further, private schools have their own share of performance issues stemming from accountability.

Other, targeted uses of resources should also be considered to meet ends such as increased enrolment. For poor families who may not have the wherewithal to send their children to schools, demand-side subsidies may be an important instrument. For example, if Pakistan subsidizes school lunches, it could promote both better nutrition and higher rates of school attendance. And if mothers of the students actually do the cooking, it could create the collateral benefit of boosting local employment, while ensuring the quality of the lunches. Similarly, a requirement that students wear school uniforms can carry both educational benefits and spillover advantages (e.g. if local people make the uniforms and by virtue of that extra income gain extra economic stability). Programmes such as these can have promising outcomes, but in some settings have also led to undesirable consequences by increasing opportunities for corruption.

Human Resources

Development and retention of human resources are of course central to any reform effort. The former requires institutions and mechanisms of training, and the latter requires appropriate incentives to hire and retain quality teachers. Both will require significant choices to be made. For instance, a reform plan will need to consider development of teacher training institutes (and perhaps a graduate school of education). The setup of these institutes is itself a major development effort, at least at the scale Pakistan requires.

Revisiting the incentive structure for teachers will be an essential albeit complicated process. One aspect of incentives reform will be to rationalize the pay scales and perks of teachers with those of other civil servants. This will require a significant increase in recurring expenditures and will thus need to have the long-term backing of all political actors. The other aspects of incentives are linking pay with performance, a usually volatile issue, and the ability to hire and fire teachers, currently virtually impossible in public schools.

Good systems can often also be run down by regressive bureaucracy personnel. To set good governance on a long-term track, much of the educational bureaucracy will also need to be retrained to come up to speed with global trends and standards.

Curriculum

Curriculum in Pakistani schools has long been a focus of criticism and has been blamed for engendering intolerance and rigidity. But efforts at reforming curriculum have often faced resistance when changes have been proposed to Islamic studies, history (particularly Pakistan Studies), Urdu, or literature. It is not clear if there is an organized lobby for resistance, but it is clear that most often, politicians have backed off for fear of negative publicity. These controversies erupt every few years. The most recent one was April 2013 when the Punjab government beat a hasty retreat when its new Urdu textbook was accused of being anti-Islam and anti-Pakistan.[29]

Part of the concern with curriculum is its content and part with the manner in which it is delivered. Like many other countries, Pakistan needs to move away from rote learning and toward an education system that stimulates students' abilities to think, challenge and be creative. In studying science, for example, students need to be encouraged to apply logic and math to real-world phenomena. One way to counter rote learning is to link testing to curriculum rather than to specific textbooks. The other is to improve the quality of teachers. In addition, curricula need to expand so that they cover financial and health literacy and entrepreneurship. This cannot be done without competent teachers – another argument for why reform needs to be systemic rather than piecemeal.

Initiating Reform: Political and Institutional Challenges

The first challenge in educational reform is to get serious system-level reform – rather than piecemeal or cosmetic initiatives – firmly on the government agenda and to get it endorsed with visible resolve. This is likely to be difficult because the new government takes charge at a time of other highly emotive and visible problems such as the economy, energy and security. The economy has seen double-digit inflation in the last three years, and growth has been meagre in comparison with South Asian neighbours; energy riots are increasing; and growing sectarian violence and other security incidents are constantly in the news. Taken together, they distract the focus from long-term development as political parties instinctively understand that the return (in terms of votes) from investing in these problems is likely to be greater than investing in education. Visible resolve is also important. Even though Article 25(A) enshrines basic education as a fundamental right, and even though education was an election issue and the political parties were responsive in their manifestos, the long history of failed education reform in Pakistan should make reformers cautious in interpreting political declarations.

At the same time, reformers should also recognize the opportunity at hand for getting education reform onto the public agenda. Theories of agenda-setting suggest that problems are most likely to get onto the public agenda when three streams combine:[30] (a) a problem stream (a longstanding and well-recognized problem), (b) a political stream (a fortuitous political change that opens the doorway for that problem to get onto the agenda); and (c) a policy stream (when a base of potential policy solutions is available, perhaps through previous work or through the availability of think tanks and consultants). The beginning of this chapter discussed how two of these, the problem stream and the political stream, are already aligned in Pakistan – as the problem of education is of emergency proportions, and the new political leadership is more aware and probably looking to cement its political mandate by delivering services that can translate into votes in the next election. There is also a growing body of evidence about efficacy of delivery in education from NGOs following best practice solutions. What remains is to effectively build momentum for educational change and create credible policy proposals that incentivize the political leadership to act. The most likely source for this activism is civil society, policy entrepreneurs such as members of think tanks and advocacy organizations etc.[29] or political leaders who are delivery-conscious.

The second challenge in initiating reform is the institutional impasse created by the recent constitutional changes that have affected education. This impasse has left the government bureaucracy uncertain about who is responsible and has authority and accountability for different sectors of education. Resolving this uncertainty is crucial because actors will be reluctant to stake personal and political capital as long as it is unclear who can take credit from achievements in reform. Thus it will be extremely challenging to mobilize communities of reform and to build and maintain their momentum over a 5- to 10-year effort, a period of time that is likely to be required for reform. And it is unclear if the federal government can force all of the provinces to focus equally on education and to maintain a uniform push towards reform. But even after this impasse is resolved, the ease and difficulty of initiating education reform will vary greatly across Pakistan's four provinces (see Box 2).

Box 2: How Reform Might Unfold in Pakistan's Provinces

Initiating reform will be very different in the four provinces. For instance, in addition to having the most resources, Punjab's government has the most well-established political mandate postelection (an outright two-thirds majority) and a continuity of leadership from the last government and is thus likely to have the easiest time in reform. By contrast, Balochistan, which has faced an almost full-blown insurgency and devastating sectarian attacks in the last few years, will find it much more difficult to focus on reform. Similarly, Khyber Pakhtunkhwa, the frontline province in the Afghan war, the site of a steady stream of attacks on girls' education (even if in limited districts), and led by a coalition government with conservative partners, may find educational reforms a difficult proposition. Sindh is being governed by the party that held the federal government for the last five years, and it is not clear what agenda it will pursue provincially after its recent electoral loss (i.e. whether it will refocus on or retrench its policies on service delivery).

Sustaining Reform: Implementation Challenges

The grand challenge of educational reform in Pakistan will be implementation. The problem in Pakistan's educational system is not what needs to be done, but who will do it and how they will achieve their aims. As Sir Michael Barber[31] points out in a recent report,[32] everyone he spoke with in Pakistan before initiating a reform project for education agreed that the problem was implementation. Pakistan has had a long history of reports and plans, but appears to lack both the capacity and the serious intent to implement reforms. Even if there is intent, this lack of implementation capacity will be a major challenge to be addressed before and during any reform effort.

That is not to say it cannot be done, but it requires a certain political and personal resolve on the part of political leaders, the bureaucracy and civil society. Barber's *The Punjab School Reforms Roadmap*, a project of the United Kingdom's Department for International Development, is an emerging example (see Box 3).

Box 3: The Punjab School Reforms Roadmap

Since its initiation in 2010, the Punjab School Reforms Roadmap has pushed for greater efficiency in urban schools and has led to the creation of Punjab's Programming Monitoring and Implementation Unit (PMIU), a multipurpose institution that accomplishes everything from data collection to teacher training. In addition, the Roadmap has funded and expanded the Punjab Education Foundation, which gives vouchers to poor students to enable them to attend private schools at no cost. It has also funded the creation of private schools where government education is lacking, and "bought out" all the slots in some low-cost private schools so that the school is free for local students. In addition, it has attempted to tackle the political nature of educational job appointments and to increase merit-based appointments and promotions of both government teachers and the local district-level officers who oversee education.

The government of Punjab has supported the Roadmap by creating a Punjab Education Sector Reform Programme under the Department of Education, which oversees the PMIU. Through this unit, the government has brought new textbooks into its schools, recruited new teachers, collected data on the effectiveness of the Roadmap, and provided stipends for female students to help close the education gender gap.

Although there are questions about the success of the Roadmap that cannot be answered yet, particularly about the success it has claimed in increasing enrolment, it contains important lessons. The Roadmap has certainly been able to mobilize material and political resources, and it has rapidly scaled up. In that sense, it is an important example of the manner in which provincial governments and private education providers throughout Pakistan could move forward quickly to improve access to high-quality school education.

Implementation of education reform will also require great political skill, not just political will. Policy change, and its implementation, is driven at all stages by complex political interactions, but overwhelmingly policy literature focuses on the opaque notion of political will to explain why reform stalls. This notion is problematic for students and activists seeking to implement change.[33] It suggests that the main challenge for reformers is to find an appropriately powerful political leader or a small group and just convince them to want reform. They can then exert their "will" to make it happen. If reform fails, then the leader or group did not have sufficient "will". The rest of reform is viewed more as a technical matter: designing the right curriculum, agreeing on the right policies, and then political "will" can just make things happen.

The problem is that this is not the way reform works. What is technically feasible is often infeasible in practice even if top-level political leaders desire it. Interventions often have side-effects and raise unforeseen opposition.[34] Well-intentioned reformers will need to recognize the different types of political skills needed to manage the reform process, which will help them interpret the reactions their actions may generate, and thus help them adapt their strategies. This will require: astute political analysis (assessing the intentions and potential actions of stakeholders), defining political strategies (an analysis of the effects of proposed interventions on the players, their power, their positions in response to the intervention and the resulting public perception), executing these strategies and adapting to unexpected responses.[35]

While these implementation and political skills are important for providers of education, they are only one arm of a strong mechanism for sustaining reform. The other arm is the demand side. As Shantayanan Devarajan of the World Bank notes,[34] there are other important elements to maximizing the chance that reforms work. One of these is to empower the clients of the education system, the children and their families who stand to benefit directly from a quality education. Emerging evidence indicates that where the parents participate actively in their children's education, educational outcomes improve. Devarajan reminds us that while it is difficult for government agencies to monitor teacher attendance and quality of instruction in rural areas, the student in the classroom and the parents who watch over them can. Another important consequence of increasing "client power" (as phrased in the 2004 World Development Report[36]) is that parents and civil society can organize and lobby to break that destructive nexus between politicians and public institutions that creates dysfunction, where politicians compromise the educational system for personal or party benefit (whether through teacher appointments for political reasons, or creation of ghost schools or other mechanisms). Thus while altering provider behaviour is important, increasing "client power" can contribute significantly to ensuring reforms are sustained.

Seizing an Opportunity for System-wide Change

While the state of the educational system in Pakistan is dire and the gap between education providers and the aspirations of the people huge, we believe that a window of opportunity is now open for initiating system-level reform. It is urgent to seize this opportunity, because population dynamics will make education a graver problem in the next decade if immediate steps are not taken. It is also important to recognize that reform must tackle all sectors of the education system – primary/secondary, higher education and vocational education – as Pakistan does not have the luxury to delay reform in one sector until the other sectors improve. Of course, reforming the system poses a great challenge, but strong examples of success within Pakistan remind us that it can be done. This may be the time for public, private and philanthropic institutions and change-makers to pool their resources and initiate lasting system-wide change, which some of them have achieved, at least partially, in their respective domains.

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Endnotes

1. F. Barrera-Osorio and D. Raju, "Evaluating public per-student subsidies to low-cost private schools: Regression-discontinuity evidence from Pakistan", Policy Research Working Paper 5638, The World Bank, 2011.
2. M. Lewis and M. Lockheed, *Inexcusable Absence: Why 60 Million Girls Still Aren't in School and What To Do About It*, Washington DC: Center for Global Development, 2006, 38.
3. World Development Indicators 2013, The World Bank.
4. World Bank, "Youth skills training for employment in Pakistan" (web page), http://go.worldbank.org/NJN6OHFK80, 2013.
5. World Economic Forum, "Global competitiveness report", http://reports.weforum.org/global-competitiveness-2011-2012/#=, 2012.
6. Children's Global Network Pakistan, "25-A: Voices on implementation: Stakeholders' divisional consultations on implementation of article 25-A in Punjab", 2013.
7. For instance, spending on education declined as a percentage of GDP each year from 2008 onwards, from 2.9% in 2008 to 2.4% in 2010: World Development Indicators 2013 (online), World Bank.
8. Part of the Eighteenth Amendment to the Constitution of Pakistan passed in 2010.
9. For example: Zara Sochiye (Just Think) campaign by MKRF/Jang Group/GEO Television network, http://za.org.pk; Alif Ailaan campaign, http://www.alifailaan.pk.
10. A. Ailaan, "Politicians are responsible for education in Pakistan: Education campaigns", press release, http://www.alifailaan.pk/politicians_are_responsible_for_education_in_pakistan_education_campaigns, 8 March 2013.
11. A. Ailaan, "District education ranking 2013 report", http://www.alifailaan.pk/alif_ailaan_district_education_ranking_2013_report, 2013.
12. British Council Pakistan, *Pakistan: The Next Generation*, November 2009.
13. Pakistan Economic Forum, "Education panel report of Pakistan Economic Forum – II", http://www.pbc.org.pk/assets/pdf/education_report.pdf, 2013.
14. World Economic Forum, *The Human Capital Report*, 2013.
15. The most recent data available for this indicator for Bangladesh are from 1990, when net primary enrollment was 73%.
16. Comparing Pakistan with Bangladesh, India and Indonesia is instructive because two are in South Asia (Bangladesh and India), two have predominantly Islamic populations (Bangladesh and Indonesia), and all have had comparable levels of GDP/capita at some point in the last few decades.
17. Z. Sathar and M. Sadiq, *Struggling Against the Odds of Poverty, Access and Gender – Secondary Schooling for Girls*, Ninth Annual Conference on Management of the Pakistan Economy. Human Capital Development for Sustained Economic Growth, Lahore School of Economics, 20 March 2013.
18. T Andrabi, J Das and A Khwaja, "What did you do all day: Maternal education and child outcomes", *The Journal of Human Resources*, 2011, Vol. 47, No. 4.
19. J. Qureshi, "Additional returns to investing in girls' education: Impact on younger sibling human capital", Working paper, http://kellogg.nd.edu/events/calendar/fall2011/qureshi.pdf, 2012.
20. L. Begum, A. Islam and R. Smyth, "Girls' education, stipend programs and the effects on younger siblings' education", http://www.iza.org/conference_files/worldb2012/islam_a8183.pdf, 2012.
21. E. Jimenez and J.-P. Tan, "Decentralized and private education: the case of Pakistan", *Comparative Education*, 1987, Vol. 23, No. 2, 173–190.
22. http://www.amanfoundation.org/amantech.php.
23. World Bank, *Higher Education in Developing Countries: Peril and Promise*, The Task Force on Higher Education and Society, Washington DC: World Bank, 2000.
24. World Bank, *Learning for All: Investing in People's Knowledge and Skills to Promote Development*, World Bank Group Education Strategy 2020, Washington DC: World Bank, 2011.
25. World Bank, "Pakistan: can low-cost private schools improve learning?", Evidence to Policy, http://siteresources.worldbank.org/INTHDOFFICE/Resources/E2P_Pakistan.pdf, October 2012.
26. World Bank, "Are Kenyans being served? New data sheds light on health and education", http://www.worldbank.org/en/country/kenya/publication/are-kenyans-being-served-well-new-data-sheds-light-on-public-service-delivery?cid=ISG_E_WBWeeklyUpdate_NL, 2013.
27. The growth rate of income per capita is considerably less, since population growth is about 1.5% per year.
28. Z. Salahuddin, "Old school", *The Friday Times*, 12–18 July 2013, Vol. XXV, No. 22, http://www.thefridaytimes.com/beta3/tft/article.php?issue=20130712&page=22
29. Pervez Hoodbhoy, "Banning a textbook – the Punjab government panics", *The Express Tribune*, 5 April 2013, http://tribune.com.pk/story/531509/banning-a-textbook-the-punjab-government-panics/.
30. J. Kingdon, *Agendas, Alternatives, and Public Policies,* 2nd edn, New York: Harper Collins, 1995.
31. Special representative on education for Pakistan, for United Kingdom's Department for International Development.
32. M. Barber, "The good news from Pakistan", http://www.reform.co.uk/content/20419/research/education/the_good_news_from_pakistan, 2013.
33. M. Reich, "The politics of reforming health policies", *IUHPE – Promotion & Education*, 2002, Vol. IX/4.
34. S. Devarajan, "Deliverology and all that", World Bank, *Let's Talk Development* blog, http://blogs.worldbank.org/developmenttalk/deliverology-and-all, 2013.
35. A.M. Fox and M.R. Reich, "Political economy of reform", in A.S. Preker et al. (eds), *Scaling Up Affordable Health Insurance*, Washington DC: World Bank, 2013.
36. World Bank, *World Development Report 2004*, Washington DC: World Bank, 2003.

Chapter 6: Better Late Than Never

Brij Kothari

The statistics are dismal. Worldwide, 57 million children who should be in primary schools are not[1]. Of those, 47% children are unlikely to ever enter school, only 27% are likely to enter school in the future and 26% were in school but left. Moreover, 200 million children remain illiterate despite completing primary school (Brown, undated, 2011 or 2012). And globally, 743 million people aged 15 years and above will still be illiterate in 2015, the deadline for the Millennium Development Goals (MDGs) and two-thirds of them will be women.[2]

Complicating matters is that these deficits are concentrated in a handful of countries. For instance, 12 countries with at least one million children out of primary school account for 60% of the global out-of-school children (UIS, 2012) – Nigeria (10.5 million), Pakistan (5.1 million), China (4.3 million), Ethiopia (2.4 million), India (2.3 million), Afghanistan (2.1 million), Bangladesh (1.8 million), Philippines (1.5 million), Côte d'Ivoire (1.2 million), Burkina Faso (1.2 million), Niger (1.1 million) and Kenya (1 million).

As a result, generations of children in these and many other countries have grown up to become youth and adults who cannot read, say, a newspaper headline, often despite schooling. Have they missed the boat completely or are there some promising innovations and new pathways to adequately prepare this most challenging group for lifelong learning? How can we ensure that low-income populations get access to the preparation they need to benefit from the new learning opportunities served up by the communications' revolution?

This chapter builds on a central argument that in an increasingly connected, networked, information- and knowledge-driven world, quality reading, writing and numeracy skills have become an even more critical foundation for ensuring access to a rapidly emerging array of solutions for lifelong self-directed learning. While there are worthy video- and audio-based approaches that have attempted to overcome certain access barriers stemming from a lack of quality functional literacy, and are a necessary part of the solution mix, they nevertheless leave functional illiterates at a widening disadvantage.

In recent years, many countries have succeeded in getting large numbers of children into school through a combination of legislation and incentives, underscoring that the global push for universal primary education has paid off. Indeed, global primary school net enrolment went up from 83% in 2000 to 90% in 2011.[3] But they have not always succeeded in imparting basic literacy skills to children who may have attended even five or more years of school. To be certain, the quality of literacy education has to improve in schools to achieve minimum expectations. But equally important is what a child, whether formally in or out of school, also learns complementarily, independently or separately, outside school. Simply, more waking hours are spent outside school even when one is a student. The scale of the challenges requires that new pathways to learning are true breakthroughs. Incremental progress or boutique projects that work in limited contexts are insufficient.

The unfolding communication and digital revolution in learning is massive but still a distant dream for the masses. The digital education revolution has so far mostly favoured those at the relative upper echelons of the education ladder, or anyone with a good foundation in and access to learning. Innovative and exciting pathways to learning are rapidly being paved for the education "haves". There is little doubt that some day it will also benefit the "have nots". But for that to happen, the educationally deprived will somehow need to find themselves at least on connectors leading to the emerging new pathways to learning.

At a minimum, connectors for the base would include broadband access, quality functional literacy and English-language proficiency. Hard connectors like quality broadband are a technology challenge that is relatively easier to overcome. The number of mobile subscriptions already matches the number of people on this planet (over 7 billion).[4] As the cost of technology continues on a downward spiral, by 2015, 80% of handsets are expected to be Internet-enabled smartphones, tablets or hybrid phablets.[5] However, soft connectors like quality functional literacy, English-language proficiency and alternative pathways to a basic quality foundation for learning may take decades more to deliver if we fail to explore promising new approaches.

This chapter looks at innovations in education that build new connectors, or expand poor ones, to the emerging pathways to education and learning that the communication revolution is making possible. The good news is that these connectors can give everyone a second, third, and perhaps lifelong opportunity to learn or educate oneself. The reality check is that building these connectors will involve tackling a complex set of challenges. The best hope is to start with a candid assessment of the scale of the problem and then pursue an open-minded consideration of proven, culturally adaptable, scalable and sometimes, out-of-the-box solutions.

Challenge 1: How Do We Assess the Quality of Functional Literacy in the Population?

Global rankings are sometimes key drivers for policy action. But because many developing nations do not measure the quality of their basic education, they are unable to benchmark their own relative progress on quality achievement and where they rank with respect to other nations in functional literacy – that is, the ability to read and make sense of, a newspaper in any language – as opposed to "nominal literacy", thought of as limited alphabetic familiarity. In an effort to turn this situation around, two initiatives stand out. One civil society initiative excels in measuring the quality of reading development among children from an early stage in a population of over one billion. Another is an international initiative that does the same in an adult population.

India's Annual Status of Education Report (ASER)

Since 2005, Pratham, a nongovernmental organization (NGO), has been implementing India's Annual Status of Education Report (ASER), across all districts, primarily focused on rural areas.[6] What it gets right is an early measure of basic reading and numeracy achievement, through Grade 5, with a simple tool. To assess reading achievement, the tool measures a school child's ability to read simple text elements in their language and in English: letters, words, a very simple paragraph pitched at Grade 1 level and a story pitched at Grade 2 level. For maths, the tool measures one-digit and two-digit number recognition, two-digit subtraction with carry over and simple three-digit by one-digit division.

In the latest round, ASER administered its tool to over 700,000 children in 15,000 villages, on a scale that would normally be associated with national surveys by governments. It allows for comparison among states, regions and, to a statistically limited extent, districts. The good news is that, thanks to the laudable 2009 Right to Education Act (RTE) and state efforts leading up to RTE and postRTE, today only 3.5% of rural children in the 6–14 age group are out of school (ASER, 2012).

But the good news, unfortunately, ends there. The success of getting children in school is also accompanied by an erosion in the quality of reading and numeracy achievement in rural India, as ASER's findings from 2010 to 2012 show (see Table 1). Roughly 30% of children are clearly falling behind right from the beginning of primary schooling, that is, in Grades 1–2, and by Grades 3–5 nearly half still cannot read at the expected Grade 1 level and more than half cannot read at Grade 2 level. In government schools, the performance indicators drop further. Teachers continue to teach to the Grade level in mixed-ability classrooms primarily determined by age and many children continue to fall further and further behind.

Given this bleak quality picture, it is not surprising that of the children who start in Grade 1, roughly a third drop out before entering upper primary in Grade 6, as do a half before entering secondary schooling in Grade 9. The low transition from Grade 1 to 2 and from Grade 5 to 6 is of particular concern (Mehta, 2007).

The bottom line is that with 120 million children in India's primary schools (Grades 1–5), every five years, India is adding 60 million "schooled" but functionally nonliterate youth to the population. As a result, large numbers of people are not – and will not be – in a position to benefit much from the information and learning revolution wrought by the digital age without a timely dramatic improvement in functional literacy. Of course, India is fortunate to have a civil society initiative like Pratham's, given that ASER does a commendable job of putting the pressure on policy-makers to confront the reality of the abysmally low literacy level of students completing primary school. But the real challenge is to get governments to take the lead in assessing the quality of their population's reading literacy, in collaboration with the expertise and independence that civil society can bring.

A major stumbling block is the way literacy is measured. Although India's official literacy rate is 74%[7] – a huge leap from 12% at the time of independence in 1947 – the real question is whether these individuals have the requisite skills to read a newspaper. In a study we conducted in four Hindi states – Rajasthan, Uttar Pradesh, Madhya Pradesh and Bihar – we found that only 37.7% of the "census literates" could actually read a simple text functionally (Kothari and Bandyopadhyay, 2010). Admittedly these have traditionally been low literacy states and the findings cannot be extrapolated to the country. But these states also represent over 40% of the national population. So even if "census literates" in other states happen to have a higher proportion of functional readers, still, nationally, one can safely say that less than half the officially "literate" or 37% of the national population would be able to read something meaningfully. Nations may need to additionally move beyond measuring "literacy" as they do, to a measurement of functional literacy that is comparable across nations.

Many nations measure "literacy" in census operations that ask individuals to simply state, for themselves or for others in the household, whether they are literate or not.[8] As soon as someone begins to recognize a few letters, or is able to draw or write their name, the predominant tendency is to report that person as "literate". Yet, it is self-evident that literacy lies on a continuum. A considerably long journey has to be travelled before someone who is completely nonliterate is able to develop even basic but genuine functional literacy skills. It is easy to understand why census operations result in conundrums like, India is 74% "literate" but only 37% may actually be able to read any simple text with comprehension.

Table 1: A Dismal Report Card for Educational Quality in India
(comparison of ASER (2010) and ASER (2012) on selected indicators)

Quality Indicator	ASER (2010), Rural India (%)	ASER (2012), Rural India (%)
Out of school children (6–14)	3.5	3.5
Children in Grades 1–2 who can read letters or more	76.6	67.5
Children in Grades 1–2 who can recognize numbers 1 to 9 or more	76.6	71.4
Children in Grades 3–5 who can read Grade 1 level text or more	64.0	54.1
Children in Grades 3–5 who can do subtraction or more	54.9	40.7
Children in Grade 5 who can read Grade 2 level text (All schools)	53.7	46.8
Children in Grade 5 who can read Grade 2 level text (government schools)	50.7	41.7

Literacy Assessment and Monitoring Program (LAMP)

Another vital initiative – which is likely to reveal similar contradictions in other countries – is UNESCO's Literacy Assessment and Monitoring Program (LAMP). It is designed to enable developing countries to assess the quality of literacy in their 15+ population, on a continuum, by sampling and reporting the findings for four age groups: 15–24, 25–39, 40–64 and 65 and above. The countries that are at various stages of association with LAMP are: Afghanistan, El Salvador, India, Jordan, Lao PDR, Mongolia, Morocco, Namibia, Niger, Palestine, Paraguay and Vietnam. After initially agreeing, Nigeria and Jamaica decided not to implement LAMP, although Bangladesh and Sri Lanka may do so.[9]

LAMP instruments have already been piloted in several languages (including, Arabic, English, French, Hausa and Spanish). The cost of LAMP varies by country, depending on the number of assessment languages and the sample size for each language. The implementation costs are borne by the country, although, the UNESCO Institute for Statistics (UIS) assists countries in talking to potential donors whenever necessary. Given the depth and rigour of LAMP and because adult literacy skills take a while to change, UIS recommends subsequent rounds of LAMP in any country, between 5 and 10 years after the previous one. A LAMP cycle, from contract to results, may take anywhere from 12 to 18 months.

So far UIS has worked mostly with governments directly and international organizations such as the Organization of Ibero-American States (OEI) to implement LAMP. Businesses and civil society institutions have served as service providers but not implementers of LAMP. However, if a business or civil society institution is interested in implementing LAMP in a country, independently of the government, UIS is open to exploring this possibility but would still need the government's consent since UNESCO's larger mandate is to provide support to member states.

Governments that may not be willing to implement LAMP or ASER-like surveys may still be willing to consent to corporations or civil society institutions taking the lead. Bringing massive quality deficits in functional literacy into the national consciousness, with some independence, depth and precision, is a critical first step in galvanizing action.

ASER's strength is that it alerts policy-makers to the quality of functional literacy at an early stage of primary education. Any improvements at that stage (and the earlier the better) would have the maximum long-term benefits. With UIS' backing, LAMP's strength is that it gets nations' buy-in to assess the quality of literacy in their youth and adult population. However, developing nations have yet to go along with an assessment in a comparative framework that could result in a ranking of participating nations – for instance, the Programme for International Student Assessment (PISA). PISA results in a ranking of participating nations' performance among 15-year-olds in reading, mathematics and science, but it is attractive mainly to developed nations.

Developing nations would benefit from a sufficiently early assessment of the quality of reading. For most nations, Grade 5 would likely be an acceptable stage by which to aim for basic functional literacy for all. To achieve this goal, two assessment points can be suggested. The first, at the end of Grade 2 to allow for early diagnosis and individualized (or systemic) intervention as necessary before it is too late, and the second, by Grade 5 to assess the effectiveness of that intervention. Like PISA, this assessment could ideally be standardized to allow for cross-national comparison and international rankings to spur policy action.

Challenge 2: How Do We Raise the Quality of Functional Literacy, at a Mass Level?

It is sometimes argued that the challenge of overcoming illiteracy is really a challenge of having all children start and complete primary schooling. The assumption is that this is sufficient to acquire basic functional literacy. The reality, as ASER has shown, is that primary schooling is necessary but far from sufficient at present quality levels. However, primary education results in high levels of official "literacy" because, as soon as children are enrolled in school, they begin to be reported as "literate".

An innovation that has the potential to move large numbers of people from nominal "literacy" to quality functional literacy is Same Language Subtitling (SLS).[10] The SLS innovation is simply the idea of subtitling audio-visual content in the "same" language as the audio. Word for word, what you hear is what you read. It is built on the principle that literacy skills must be reinforced and practised over a sustained and sufficiently long period before they can become functional first and then irreversible.

Same Language Subtitling: Toward Functional Literacy for a Billion

Take the case of India, which is home to a staggering 273 million illiterate people – or one out of every three in the world (Census 2011). Moreover, studies indicate that over half the 778 million officially "literate" people (Census 2011) are actually weak-literates who cannot, for example, read a newspaper. That said, television has a larger-than-life presence in India's entertainment landscape, marked by 150 million TV households and 750 million viewers, with each viewer watching an average of 150 minutes per day. TV programming is dominated by content from Bollywood, India's thriving multilingual film industry, which produces 1,000 films and by implication 5,000 film songs a year. Film songs tend to enjoy an extended shelf-life on TV, where they are watched with lifelong passion by everyone, including most literates, weak-literates and nonliterates. By implementing SLS on existing Bollywood film songs on TV, the Indian Institute of Management, Ahmedabad (IIM-A) and PlanetRead (a nonprofit) became the first two institutions in the world to leverage the power of SLS on mainstream television for mass literacy. The individual elements – Bollywood, subtitling and television – are not new.

However, the combination of these elements for mass reading reinforcement, based on popular entertainment, is a novel approach. SLS makes reading an inescapable and automatic outcome of everyday television consumption, producing lifelong benefits. SLS for mass literacy was conceived in 1996 and explored initially as an academic research project. At various sites – railway stations, bus stops, villages and slums – two TV sets were set up, both playing the exact same songs, one with the lyrics subtitled in the same language and the other without. Nine out of 10 people preferred to watch the songs with the subtitles. This was an early but critical finding because SLS could not have a future on mainstream TV if viewers did not approve of it.

The first randomized control study was set up with three groups of children in a government-run school serving low-income children (Kothari et al., 2002). The baseline tests confirmed that all three groups' average reading scores were comparable. One group was regularly exposed to film songs with SLS, another group saw the songs without subtitles, and a third group saw nothing. The reading exercises used in the baseline were readministered after three months. The group exposed to SLS was found to be measurably further along in decoding skills (i.e. the ability to convert text into sound).

Supported with these early findings – that viewers overwhelmingly liked SLS on Bollywood and that it led to reading skill improvement – all the state and private television networks in India were approached to persuade them to try SLS on film songs. A couple of networks that did entertain a conversation were unable to overcome the force of their own conviction that SLS would hurt their ratings. As it turns out, SLS actually improved the ratings by an average of 15%. Led by an open-minded director, the state broadcaster in Gujarat allowed SLS on one of its film song programmes, resulting not only in improved ratings but also a study that, for the first time, was able to measure the impact of SLS on reading skills in broadcast (Kothari et al., 2004).

If networks could not immediately see SLS as a potential enhancer of the entertainment value of film songs, many educators, too, had difficulty in being open to the concept. Subsequently, a four-state study for which the data were independently collected by the Nielsen-ORG Center for Social Research, found that exposure to 30 minutes of SLS per week, in parallel with five years of

schooling, increased the functional literacy rate of rural children from 25% to 56%. Self-reported newspaper reading among youth and adults went up from 34% to 70%. SLS further contributed positively to writing skills.[11]

Since 2006, SLS has been implemented on 10 weekly half-hour song-based TV programmes, in as many languages. On Doordarshan, India's national and state television network, with an annual budget of US$ 200,000, the SLS project is delivering 30 minutes of weekly reading practice to 200 million weak-reading TV viewers. On a nationally telecast Hindi programme, and because of the large Hindi-speaking population and viewership, every US dollar spent each year on SLS effectively delivers regular reading practise to over 5,000 people.

IIM-A and PlanetRead are now on course to deliver regular reading practice to all the 750 million TV viewers in India at present, and growing rapidly. More than half the viewers are also weak-readers. The goal is to implement SLS on all songs on TV in India, in all languages, through national policy. The strategy is to scale up in India first and let that speak as a model for expansion to other countries, especially in South Asia and Sub-Saharan Africa, on popularly watched song-based programming, in local languages. The latest update in this developing narrative is that the Broadcasting Corporation of India (Prasar Bharati), the national TV network (Doordarshan) and the Planning Commission have supported, in principle, the scaling up of SLS nationally.

The SLS story would be incomplete without a mention of the enormous systemic resistance that has dogged it for quite some time. As simple an innovation as it is, backed by research, the journey from idea to possible national scale-up is in its 17th year. But with the help of policy champions within the government, the SLS innovation is close to policy acceptance.

SLS is expected to make it increasingly difficult for anyone with a modicum of letter recognition ability and TV access to remain functionally illiterate. From the very beginning of primary schooling, as the letters are picked up in school, they will automatically get practised at home the same day, as an integral part of entertainment such as song-based programmes and/or movies (most of which have 5–6 songs). Home-based practice would continue throughout life, well after the end of formal schooling. For whatever reason, if a child drops out of school, say before becoming functionally literate, inescapable reading practice would still continue as a by-product of entertainment. Those in their youth and adulthood who did not attain functional literacy but still have cognitive traces of letter familiarity – perhaps dormant through disuse – can be expected to experience a revival through exposure, effortless reinforcement and steady improvement of literacy skills. For the functionally literate too, besides reading practice, SLS provides a karaoke-like experience known to enhance the entertainment and interactive value of song-based TV programming.

Inescapable reading practice as an everyday part of entertainment, along with primary school, has proven to be an effective pathway for the attainment of quality functional literacy by Grade 5. A strong SLS presence on TV has the potential to considerably increase the number of children continuing longer in school and learning and reading more, in and out of school. With some imagination and political will, assured quality functional literacy skills are achievable for most.

Challenge 3: How Do We Create Alternative Pathways to Learning for School Dropouts to Give Them an Additional Chance at Learning or a Career?

Another set of interventions is needed to catch those who drop out along the way to graduation. In this area, a range of educational innovations – like Questscope from Jordan, Yoza from South Africa and Tostan from Senegal – offer additional pathways to learning.

Questscope from Jordan

Prior to 1988, school dropouts in Jordan lacked a clear path to a future built on an educational foundation. In school their common experiences were marked by strained relationships with school authorities and peer violence. After leaving school prematurely, many youth, especially males aged 14 and older, were prone to substance abuse and unhealthy relationships within their own families and with authorities in juvenile services.

As a response to this bleak outlook for youth, Dr Curt Rhodes founded Questscope, a nonformal-education (NFE) programme that has grown into a unique collaboration with Jordan's Ministry of Education (MoE). It was shaped by his experience in the region, first as assistant dean in the School of Public Health at the American University of Beirut and then as a volunteer during the 1982 invasion of West Beirut helping civilians who were wounded and ill.

Questscope offers an estimated 100,000 school dropouts – which include more males (55%) than females (45%) – a second chance at vocational opportunities and a pathway to formal college education.[12] Its work and lessons are instructive because of the paucity of good programmes that can or have been scaled up in any country that give dropouts a second chance.[13] For one, that requires a high degree of cooperation between the government, civil society and the private sector.

NFE in Jordan targets males up to age 18 and females up to 22 who have not completed 10th grade and have been out of school for over 365 days. This level was chosen because in Jordan, without a 10th-grade education, a young person cannot enrol in a vocational or technical (Voc/Tech) diploma course or earn a formal diploma that could open doors to professional career advancement and higher salary options. For that reason, Questscope, with buy-in from Jordan's MoE, designed a general education equivalence diploma (GED), an accredited certificate of completion equivalent to the first 10 years of compulsory education. The GED creates a number of pathways for young school dropouts: (a) enrolment in Voc/Tech diploma courses, leading to the starting of small businesses or better jobs; (b) the possibility of taking a placement test to reintegrate into the formal education system (FES) in 10th grade, depending on the placement score; and (c) the option of continuing to 12th grade and then a university degree, which some have obtained.

Irrespective of the school grade before dropout, Questscope is able to fast-track a school dropout to 10th-grade equivalence in three eight-month cycles, each organised around content/learning oriented to Grades 1–4, 5–7 and 8–10 respectively. If a learner passes the test for promotion to Grade 5, they can skip Cycle One, but not Cycles Two and Three. The hallmark of the latter two cycles is the attention paid to developing critical consciousness skills and interacting with adults and peers, requiring a minimum of 16 months with minimum 40% attendance but recommended at 60%. Around 50–60% youth enrolled in Questscope complete all three eight-month cycles.

The pedagogy in all cycles is reflected in Questscope's copyrighted, Participatory Learning Methodology (PLM®) publications. They draw upon Paulo Freire's theory of adult learning through an empowerment-based approach that builds mutual trust and respect between youth and adults, wherein both recognize the other as an equal and important partner. While "youth development" programmes focus broadly on youth skills, Questscope's youth empowerment approach additionally supports the involvement of youth in shared decision-making and leadership processes.

Questscope's PLM® and NFE differ from traditional education in that they are conceived as a "social" activity. Adult facilitators and youth are both co-learners and co-teachers. Youth drive learning topics, activities and group expectations, with adults helping to build youth's confidence and skills to contribute in self-fulfilling ways. Indeed, a key insight of Questscope is that relationships with significant adults are a key factor in youth empowerment. The theory of change suggests that youth who practise and develop such attitudes and skills in the programme eventually transfer them to other aspects of life, including work, family and society.

One of the two keys to achieving the fast track to 10th-grade equivalence was MoE's willingness to review curriculum requirements and hone the content of the textbooks to reflect the minimum standards for which certification could be granted. The other key was the willingness of teachers drawn from the FES to adopt in Questscope a completely different teaching methodology. They became, as Rhodes described, "leaders of dialogue, co-learners and facilitators of processes, not masters of didactics, so that students could explore, interact with adults and their peers, and learn how to learn". Once the social environment moved from authoritarian to welcoming in nature, and relationships created learning opportunities for everyone, "students" learned faster and "teachers" guided that learning better.

Besides Jordanian youth, Questscope's NFE programmes have benefited Iraqi student refugees in Jordan, disadvantaged and impoverished by war. In Syria, its programmes are located in a juvenile correction facility.[14] In Sudan, children were drawn from displaced populations owing to the civil war between North and South Sudan and in Darfur. In Yemen, children from marginalized social groups have enrolled. Since first implemented in Jordan, Questscope's NFE has benefited approximately 10,000 youth. About a third of them were rehabilitated into FES, a third resettled and a third are currently enrolled.

Yoza from South Africa

South Africa is a book-poor country. In 2006, 51% of households owned no leisure books and in 2009 only 7% of public schools had functioning libraries of any kind – one reason for low literacy scores at school and the absence of a culture of reading. Yet it is a mobile phone-rich country, with a penetration of more than 100% of the population. Mobile data infrastructure is widespread, and data costs, while not cheap, are affordable enough for low-bandwidth browsing. Most young people, especially in urban areas, can access the Internet through a mobile phone that they own or have access to. While smartphones are on the rise, most youth use "feature" phones, which can get online but still have very small screens and number-only keypads.

Out of this book-poor, but mobile phone-rich context, the m4Lit (mobile for literacy) project, as it was initially known, had its genesis. Today, this project, now known as Yoza, demonstrates that mobile phones offer a new way to bring reading content to a much broader audience (see Box 1).

Box 1: Spreading the Word through Mobile Phones in South Africa

Launched in 2009, with funding from the Shuttleworth Foundation, the m4Lit project, as it was known then, sought to investigate whether teenagers in South Africa would read stories – not just SMS or instant messages – on their mobile phones. To gauge interest, a mobile novel, or short ebook, called *Kontax* was published in English and isiXhosa, an indigenous language. The uptake among young South Africans was significant and, not long thereafter, another *Kontax* story followed. In seven months both stories were read over 34,000 times on mobile phones, over 4,000 comments were left by readers, and over 4,000 entries were received in the writing competitions. Readers requested more stories and in different genres, not just the teen adventure style of Kontax.

Based on this interest, Yoza Cellphone Stories[15] – or Yoza for short – was launched. This library of short stories, poems and classic literature published on mobile phones can be accessed through a web browser or via MXit,[16] a popular mobile instant messaging platform started in South Africa. Today the site has over 30 m-novels, 18 poems and five Shakespeare plays. A wide range of genres includes romance (the most popular), teen issues (like safe sex and HIV/AIDS) and soccer. When initially published, some stories are serialized with a new chapter released daily.

A key feature of Yoza is interactivity: users can comment, vote, enter writing competitions and review the stories. Another feature is its low cost: users need to pay data download charges to their mobile network operator (the content itself is free), but since the stories are short, the data consumption is very low. The average data charge for a chapter is less than 1 Euro cent. Moreover, all of the content is either openly licensed as Creative Commons or in the public domain. In its first two and a half years, Yoza users have read over 575,000 stories, poems and plays; left over 50,000 comments; and cast more than 44,000 votes on chapters. The number of unique visitors was over 220,000.

Yoza has shown that mobile phones represent a significant new medium for making reading content available more broadly and to engage readers with voting and commenting. Mobile phones, or other mobile devices such as tablets, are a viable distribution platform for e-books that is instant and vastly more cost effective than traditional distribution of print books. While print has its place (a book does not run out of battery life or need to be connected to the Internet), e-books accessed via mobile platforms are an exciting complement and, in some places, the only way to spread the word.

Contributed by Steve Vosloo, founder of Yoza Cellphone Stories.

Tostan from Senegal

Since its inception in 1991, Tostan (a nonprofit) has worked in remote regions in eight countries in West and East Africa, engaging thousands of communities in a three-year NFE programme (see Box 2). What makes Tostan so innovative is how it embeds social networking and community organizing into its programme to spur meaningful and sustainable social change. Indeed, its key operating principle is that social change can happen when people get access to good information using engaging and participatory methods – in their own language, designed for and with people who have never been to school.

Box 2: Empowering the Vulnerable through Education in Senegal

The cornerstone of Tostan's community-led approach to development is its human-rights based NFE programme. Offered to both adolescents and adults, all with none, or very little education, the classes are taught in 22 African languages in remote regions in eight countries in West and East Africa by culturally competent and knowledgeable facilitators who are from the same ethnic background as the participants.

In Wolof, the most widely spoken African language in Senegal, Tostan means "break through", as well as "spreading and sharing". The curriculum contains references to participants' values and experiences and, as they discuss new knowledge, they "break through" to new understandings of their situations, which lead them to undertake social change. The combination of human rights education and participatory classroom practices have profoundly affected women and girls, who, frequently for the first time, learn to speak up in class and community meetings about issues that influence their own futures and the wellbeing of their communities.

The curriculum has two phases. The first is called the Kobi, a Mandinka word meaning "to prepare the field for planting". It includes interactive sessions on visioning, democracy, human rights, problem-solving, hygiene and health. All information is shared orally given that most participants beginning the programme cannot read or write. The second phase is called the Aawde, a Fulani word meaning "to plant the seed". Devoted to economic empowerment, it includes literacy and numeracy lessons and small-project management training, along with teaching participants to learn how to read and write in their own language.

The motivation for social change in the classroom originates in the human rights dialogues held early in the Tostan programme. Participants deliberate the values they hold against the rights and responsibilities that they are learning. The human rights to health and education, for example, motivate examination of the social norms around female genital-cutting and child/forced marriage. Communities think through what it means for their daughters to have the right to bodily integrity and the right to education, among others. They realize that they have the responsibility to protect their daughters' rights – to not cut them and to keep them in school, for example. At the same time, in the adolescent classes, boys and girls are learning their rights and responsibilities.

Through Tostan's NFE, communities themselves lead the changes that result in more just and equitable social practices. Men and women make these decisions together over time, but because women and girls have not formerly had a voice in their communities' decision-making, the results are more dramatic for them. They experience this education as empowering. Getting educated changes everything.

Contributed by Molly Melching, founder and executive director, Tostan.

Challenge 4: How Do We Meet the Global Demand for English-Language Proficiency?

Most people today clearly see the economic, informational and educational value of English-language proficiency. While China's rise may introduce Mandarin into the global mix, in the foreseeable future English-language proficiency is likely to remain intimately tied to the benefits of the digital age in most countries. For that reason, the demand has grown rapidly, especially as more and more people come online. But the supply of appropriate learning pathways for English-language acquisition remains frustratingly weak for a majority in many countries. One promising initiative is the English in Action programme in Bangladesh.

English in Action in Bangladesh

The desire for a mass English-language learning project first came from high levels in the Bangladesh government. With political will in place, it was easier to design lessons in a country where one language predominates – of the 163 million people in Bangladesh, almost everyone speaks Bangla and around 18% speak English as a second language. High-level discussions with the United Kingdom's Department for International Development (DFID) gave birth to what became English in Action (EIA), a major collaboration between the Bangladesh government and the United Kingdom government, funded by DFID. EIA's stated goal is to raise the English-language skills of 25 million people in Bangladesh by 2017. EIA is both an intervention in schools – formal schools and schools run by NGOs – and in the NFE media space, where its flagship project is the award-winning "BBC Janala" (Janala means window in Bangla).[17]

Launched in 2009, BBC Janala is a window that opens to a world of English-language learning on multiple delivery platforms (such as mobile phones, television, the Internet, newspapers, CDs and books) – now reaching 24 million learners (see Box 3). Its core package is the Amar Engreji Course (AEC) (my English course), aimed at the 15- to 45-year-old adult population, designed to take a complete beginner through three courses, each course being a module of 96 lessons. At the end of every module, a learner can print a BBC Janala Amar Engreji course report – not exactly a certificate of competence but, nevertheless, a highly valued statement that certifies the completion of the module. While it has no particular significance for employment, it serves as a tremendous source of motivation and recognition for persisting to the end. By the end of course 3, a learner is expected to be at the preintermediate level.[18]

Considerable effort has gone into making the lessons culturally appropriate to Bangladesh, including ideas and topics relevant to Bangladeshi life and using a style of English that Bangladeshis would commonly use. Many of the lessons, especially the early ones, have a heavy dose of Bangla that in style and tone is friendly, colloquial and accessible, rather than formal or bookish.

The pedagogy is not just about teaching. On the one hand, BBC Janala is creating bilingual learning materials to help people improve their English-language skills through self-drive and self-direction. On the other, it is actively trying to break down psychological barriers to the idea of English learning – i.e it is scary, expensive, only for

people who have a high social status, embarrassing to make mistakes in the presence of others, or a difficult language to learn. Changing these perceptions is as much a challenge as teaching the language. The Janala brand and public messaging keeps a strong focus on making the entire process fun, accessible and affordable, on all media platforms. "Chailei Parben" – "If you try, you can do it!" – is a tagline for the campaign.

On the testing front, large-scale, quantitative surveys are scheduled once every three years. The baseline was in 2011, so the first impact survey is due soon. The survey tracks cross-over use of more than one product, self-perception of English use and whether it has improved with the use of Janala products and different ways of using English in everyday life. Among different groups, it assesses reach, popularity of different platforms and perceptions of whether people are learning and whether English is becoming more accessible and less scary. Although the beginner learner is the primary target, one of the findings is that many secondary school and university students, English teachers and professionals in the telecom and financial industries make use of the content.

In addition, objective English competency testing is coming soon. A pilot was conducted in 2012 with a baseline of 1,900 people and, after dropout, with 1,200 people. An English competency test designed by a scholar at the University of Dhaka was administered by a contracted field agency at the baseline and at the end. English Language Teachers (ELT) scored the tests. This is a work in progress because, as per BBC Janala's own admission, testing English outside the classroom is "really hard to do".

BBC Janala has pioneered several innovations, creating a decentralized, self-directed learning environment that has shown promise in Bangladesh and is well worth exploring in other countries. Its creative use of information and computing technologies (ICTs) has even helped break down several gendered barriers (Tyers, 2007). More recently, the NFE project has expanded into formal schools. An independent Annual Review (2013) of EIA concluded with these words: "The implementation of the schools component has demonstrated that behaviour change in the classroom to create an effective learning environment can happen and to scale. The adult learning and media component has generated enormous interest and appreciation across Bangladesh and for all socio-economic categories."

Can BBC Janala be replicated outside Bangladesh? EIA is careful to pitch the goal of the project to governments as teaching an economically useful skill and not a cultural endeavour. Even so, BBC Janala has yet to fully take root in other countries and, certainly in richly multilingual countries like Nigeria and India, the challenge is much more complex. That said, the government of Myanmar has expressed a strong interest in English learning; EIA is implementing a smaller project in Cambodia, where radio is the primary delivery medium; Rwanda, where the official language recently changed from French to English, is exploring the idea; and India has expressed an interest, although this has yet to mature into political will.

Box 3: Bangladesh's BBC Janala Takes Advantage of Multiple Delivery Platforms

BBC Janala is available on multiple delivery platforms – a combination that effectively works in sync to create English language learning pathways for huge numbers of people who would otherwise lack access. At this point, an estimated 24 million learners "tune in" in one form or another.

Mobile phone. Bangladesh has more than 100 million mobile phone users and counting. AEC can be accessed on the most basic voice- and text-enabled handset. At the front end, a learner has to simply call a standard number like '3,000' on a mobile and listen to the next lesson in sequence. Every lesson is a short audio lesson of around 3 minutes. The service costs only 50 paisa ($0.008) per minute, making it affordable even to people at the base of the pyramid earning less than US$ 2 per day. After every lesson, an SMS-quiz has to be completed before advancing to the next lesson. At the back end, the system keeps track of the mobile number to serve up the next lesson. So far, 6.5 million mobile users have accessed the lessons. At the end of any of the three modules of 96 lessons and after completing the quizzes, an SMS code is sent to the learner. The code can be entered on the BBC Janala website to print a Course Report.

Web. BBC Janala lessons and quizzes are available at www.bbcjanala.com. Though limited at the low-income base, web access in Bangladesh has grown phenomenally in the recent past. Of the 33 million Internet users in the country, over 95% access it on mobile phones. Many of these phones are relatively inexpensive Chinese-made smartphones. In 2012, 150,000 registered web users accessed 12 million page views. Although modest, these numbers are likely to grow exponentially along with Internet penetration on mobiles.

Newspaper. Lessons are also published four times a week in a Bangladeshi daily newspaper, Prothom Alo. Each module takes 24 weeks. A learner can dial a separate mobile service that offers just the week's quiz but no audio lessons. Newspaper learners can complete the 24 quizzes for 24 weeks on their mobile, then log in to the website, enter the code received by SMS, and print the Course Report.

Television. Initially, TV's essential role was for marketing. The goal was to use TV to drive people to learning platforms like mobile, web, and newspapers. But the project soon discovered that people were interested in learning English directly from TV programs. While teaching English on TV in a 30-minute program has limitations, even the little English that is learned is picked up by millions of TV viewers. The trick is to make it entertaining and educational. Successful series like Bishaash (Believe) have attracted 21 million viewers and Mojay Mojay Shekha (Learning with Fun), 14 million. They are telecast on Bangladesh Television (BTV), the national network (most target learners lack cable and satellite channels), on Saturday night in prime time.

Putting Learning in the Learner's Hands

Quality broadband, functional literacy and English fluency are the triangle of access that can get anyone today, in the remotest part of the world, a virtual front seat to learning from respected professors at Harvard, MIT, Stanford and Berkeley, among many other top universities. Courses offered by the best of the best, in any university in the world, are increasingly only a click away. We are moving toward a higher education system where access to affordable quality education is limited more by one's learning foundation, self-drive and desire to learn. Massive Open Online Courses (MOOCs) championed by Coursera, EdX and Udacity, are positively disrupting the entire model of brick and mortar higher education.

Other positive disruptors are rapidly building on MOOCs. 2U is a company that now offers full-fledged online degree courses, in partnership with well-established brick and mortar universities, at a fraction of the cost of in-person university education.[19] The remarkable University of the People is even "the world's first tuition-free online university," especially attractive to low-income people from around the world. In contrast to this revolution in higher education, education at earlier stages is perhaps not in as much ferment and similar, alternative pathways to learning are not easily created for those in and outside the formal system lacking the triangle of access.

The next big ideas coming of age in the digital learning space are adaptive learning and flipped education. Every learner, theoretically, learns at her/his own pace and could be at a different stage of mastering any given concept. Traditional group or classroom instruction can only aspire to incorporate customized learning. Adaptive education, driven by a learning system's ability for continuous individualized monitoring of concept mastery, can dynamically adjust the next learning challenge to the level, pace and capacity of the learner. Knewton is a rapidly growing company that offers a backbone infrastructure for educational systems interested in building adaptive digital learning environments.

Flipped education flips the locus of 'instruction' and 'homework' in traditional schooling. Anytime, anywhere access to video allows classroom instruction to be broken into lesson nuggets that can be seen at will, multiple times, outside the classroom. The balance of classroom activity can, thus, shift from direct instruction to problem-solving, clarification and project work that would have earlier been approached more as homework. The teacher of the future will need to be an able facilitator of access to quality content and encourage mastery of concepts through creative problem solving. She/he will be, much less, a fountain of knowledge.

The well-known Khan Academy began by being an open-access collection of short videos on practically any concept in K-12 math and science education. While it may have started off as a small intra-family initiative of its founder, Salman Khan, teaching his cousin via home-made videos, it struck a universal need for time- and place-shifted access to learning at one's own pace and direction. After a phase of organic growth fuelled by demand on YouTube, Khan Academy has more strategically embraced and built around the concepts of flipped instruction and adaptive learning. By further making its content available in many other languages, the academy increasingly serves as a complement to formal education, an integral part of formal education, and an alternative pathway for parents and anyone who wishes to revisit prior learning.

The irony of the digital education revolution is that most people who can, have and will benefit from it are already advantaged to leverage the emerging and exciting pathways to learning. The critical challenge facing the global community is to build new connectors to these learning pathways that would serve masses of people who have so far been denied the opportunities to propel their own learning.

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References

Annual Status of Education Report. ASER. http://www.asercentre.org/Annual/Status/of/Education/Report/The/Annual/p/80.html, 2010.

Annual Status of Education Report. ASER. http://www.asercentre.org/education/India/status/p/143.html, 2012.

Brown, G. Delivering on the promise, building opportunity: The case for a Global Fund for Education. http://www.educationpanel.org/brownreport2.pdf, undated, 2011 or 2012.

Kothari, B., Pandey, A. and Chudgar, A. Reading out of the "idiot box": Same-language subtitling on television in India. In *Information Technologies and International Development*, 2004, vol. 2(1): 23–44.

Kothari, B., Takeda, J., Joshi, A. and Pandey, A. Same language subtitling: A butterfly for literacy? In *International Journal of Lifelong Education*, 2002, 21(1): 55–66.

Kothari, B. and Bandyopadhyay, T. Can India's ''literate'' read? In *International Review of Education*, 2010, 56:705–728.

Mehta, A.C. Student flow at primary level: An analysis based on DISE Data. National University of Educational Planning and Administration, New Delhi. http://www.dise.in/downloads/reports&studies/studentflow.pdf, 2007.

Tyers, A. A gender digital divide? Women learning English through ICTs in Bangladesh, mLearn, 955: 94–100, CEUR Workshop Proceedings, 2012.

UNESCO Institute for Statistics (UIS). Opportunities lost: The impact of grade repetition and early school leaving. In *Global Education Digest*, 2012.

University of Oxford. A pilot impact and process study of empowerment-based non-formal education for out-of-school youth in Amman, Jordan. http://www.questscope.us/sites/default/files/documents/Attachment%205%20-%20B-%20Oxford_s%20Impact%20Study-Stakeholder%20Report-2011.pdf, 2011.

Endnotes

1. According to UIS (2012), 61 million children were out of school but a more recent UIS fact sheet (2013) has revised this figure to 57 million. See http://www.uis. Unesco.org/Education/Documents/fs-25-out-of-school-children-en.pdf (checked on 2 Jan 2014). The country-wise figures that follow are drawn from UIS (2012).
2. http://www.unesco.org/new/en/media-services/single-view/news/literacy_for_all_remains_an_elusive_goal_new_unesco_data_shows/, 17 October 2013.
3. http://www.un.org/millenniumgoals/pdf/Goal_2_fs.pdf, 17 October 2013.
4. http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2013.pdf, 17 October 2013.
5. http://www.gartner.com/newsroom/id/2209615, 17 October 2013.
6. http://www.asercentre.org/.
7. See http://populationcommission.nic.in/content/933_1_LiteracyRate.aspx for trends from census to census.
8. http://www.uis.unesco.org/literacy/Pages/lamp-literacy-assessment.aspx.
9. The LAMP outline here is based on inputs by Manuel Cardoso Fernandez at the UNESCO Institute for Statistics (UIS).
10. The author is a founder of the SLS project.
11. http://www.planetread.org/pdf/Research%20Summary_SLS.pdf.
12. This section on Questscope is based on inputs from Dr Curt Rhodes.
13. An independent evaluation of Questscope was conducted by the University of Oxford (2011).
14. Questscope's work is located in a part of Damascus where they can still be operative. The situation in Syria has not affected their programming at the juvenile correction facility.
15. See http://www.yoza.mobi for the stories and http://www.yozaproject.com for information about the project.
16. http://www.mxit.com.
17. The write-up on BBC Janala is based on an interview with Richard Lace, Head of Project, EIA.
18. Course 3 is in production.
19. For example, 2U recently partnered with Berkeley's School of Information to offer "the first" online master of information and data science degree.

Chapter 7: Getting Past the Basics: Pursuing Secondary Education

David E. Bloom[1]

Across the developing world, secondary schooling has been treated like the "forgotten middle child" in the education sphere. The power of wealthy elites typically ensures that tertiary education receives a disproportionately large amount of funding and attention. And since the 1970s, popular pressure and the interest of the international development community in expanding primary education has persuaded many developing country governments to direct substantial resources to the initial stages of schooling. Secondary education, by comparison, despite the burgeoning demand for the skills and capacities it can impart to students and the essential bridge it represents between primary and tertiary education, has been relatively neglected.

Much needs to be done to advance secondary education in the developing world. For starters, there is the perennial issue of expanding capacity, which is needed to absorb the increase in numbers of children emerging from primary schools, magnify incentives for primary school completion, train teachers and serve as a stepping stone for tertiary education. The latest statistics show there are 69 million children just of lower-secondary school age not enrolled in school, representing 17% of that age group worldwide (versus a 10% nonenrolment rate for the primary school-age population) – with the figure at 21% in South and West Asia and 37% in Sub-Saharan Africa.[2] The UN 2015 Millennium Development Goals include a goal for the achievement of universal primary education, but omit a corresponding goal for secondary education.

There are also huge shortfalls with respect to the quality of secondary education. Test scores for approximately 510,000 students aged 15 years, generated as part of the 2012 Program for International Student Assessment (PISA), reveal huge gaps between the 65 participating countries. The gaps coincide closely with income gaps, although it is notable that high-income Qatar ranks among the lowest-achieving countries while China (Shanghai) leads in all three testing categories: reading, mathematics and science.

Efforts to expand enrolments and to improve the quality of the secondary school experience have gained traction in recent years, as appreciation of the necessity of secondary education for productivity, innovation, poverty mitigation and economic growth has begun to take hold throughout the global development community (see Box 1). A recent OECD study[3] projects a total gain of US$ 115 trillion (in present discounted value terms) over the lifetime of the generation born in 2010 if all OECD countries boost their average PISA scores by about 5% over the next 20 years. The study deals only with OECD countries (which includes two "developing" countries, Mexico and Turkey), but its overall conclusions are still relevant to workforce skills globally.

Box 1: Key Facts on Secondary Education

Enrolment and Attendance

Lower-secondary education enrolment depends upon completing upper-primary schooling. Across all income levels, countries demonstrated improvement in primary education completion rates from 1999 to 2011. High- and middle-income countries achieved 100% and 94% rates of primary school completion, respectively, while low-income countries were around 67%.

Gross enrolment rates for secondary education improved on a global scale, by roughly 20%, from 1990 to 2010. Upper-middle income countries demonstrated the greatest leap in closing the secondary education gap, with gross enrolment rates up by about 36%.

There are 69 million children of lower-secondary school age not enrolled in school, representing 17% of that age group worldwide (versus a 10% nonenrolment rate for the primary school-age population). Sub-Saharan Africa is the region with the highest rate of out-of-school children (approximately 37% in 2009) – substantially above the world average of about 17%. In North America and Western Europe, these rates are well below 5%.

The five countries with the lowest net enrolment rates are: Niger, Angola, Central African Republic, Burundi and Mozambique – although the latter's rate improved from about 3% to 17% in the last decade (2001–2011).

In Niger and Angola, roughly 90% of all secondary school-aged students are not enrolled.

Repetition Rates

The 10 countries with the highest secondary education repetition rates are: Togo, Burkina Faso, Burundi, Democratic Republic of the Congo, Benin, Sao Tome and Principe, Iraq, Mali, Chad and Cape Verde. Roughly 25% of all students educated in these countries repeat grades.

From 2002 to present, Eritrea, Sri Lanka, Rwanda and Bhutan have decreased repetition rates by more than half, although Eritrea still has a repetition rate of 10.1%.

Gender

Globally, secondary school enrolment has reached an "acceptable" level of gender parity (defined by UNESCO as a range of 0.97–1.03); however, prominent levels of inequality persist in the Arab states and in Sub-Saharan Africa. (Note that gender parity is defined as the ratio of the number of female students enrolled at – in this case – the secondary level of education to the number of male students at that level. A GPI between 0–1 indicates a disparity in favour of male students.)

The biggest gender disparities occur in Chad, Afghanistan, Central African Republic, Democratic Republic of the Congo and Guinea – with a gender parity index range of 0.42 (Chad) to 0.59 (Guinea). Meanwhile, Slovenia, Mauritius, Swaziland, Japan, Indonesia and Cyprus register perfect gender parity scores of 1.0.

Overall, a slight majority of the world's secondary school teachers are female; however, only a minority (less than 30%) of all secondary school teachers in Sub-Saharan Africa is female, which may both reflect and exacerbate low rates of girls' participation in secondary education for this region.

Teachers

As global secondary school enrolment has increased, so too has the number of secondary school teachers – with this rise occurring in all regions between 2000 and 2009. Moreover, most regions (except Sub-Saharan Africa and Latin America and the Caribbean) saw an increase in female educators at both the lower- and upper-secondary levels.

Outcomes and Quality (International Assessment)

Since its inception in 2000, 30 countries currently classified as "developing" (not in the UN's high per capita GNI category) have participated in the PISA (Program for International Student Assessment). In 2012, Shanghai ranked highest in average reading, science and maths scores (Chinese regions tested separately), topping the charts among both developing and developed nations. Among participating developing countries, it was followed by Vietnam. Peru ranked the lowest in all three categories, although its reading scores had improved significantly, up to 384 from 370 in 2009.

Turkey also showed a major improvement, with average PISA science scores climbing from 434 in 2003 to 463 in 2012, as did Romania, whose maths scores rose from 415 in 2006 to 445 in 2012. No developing countries have experienced any significant declines in PISA scores since 2003 – except for Uruguay, whose reading scores fell from 434 to 411 and whose math scores dropped from 422 to 409.

Sources: WDI, UNESCO, EdStats and OECD

Human development and gender equity can also be expected to get a big boost from improvements in secondary education, not just through enhanced earnings but also – especially in the case of girls – via more meaningful and confident participation in family and community decision-making and individual and family health gains (see Chapter 2 for more on girls' education).

The economic development process generally involves a progression from the production of primary commodities (such as agricultural goods and minerals) to industry and services. This progression maps to workforce demands in so far as the value of education beyond the primary level is higher in industry and services than agriculture. The tools of basic education are necessary for many tasks, but secondary schooling can better equip workers with the knowledge and skills that economies demand as they develop. Education also promotes the ability to learn new skills and adapt to new circumstances, the need for which is heightened in a rapidly changing world.[4]

A More Robust, Reimagined Secondary Education

Addressing the challenges of secondary education will require a coordinated set of programmes and policies, both within and beyond the education system. Education system improvements must focus on secondary school infrastructure (ranging from working toilets to Internet connections), the training of teachers and administrators, the establishment of performance incentives and the updating of curricula and learning materials to make them appropriate to skill-building for workforce needs. A strong higher education system to which secondary graduates can aspire, a vibrant and meritocratic labour market and policies to facilitate girls staying in school are also key.

Updating Curricula and Learning Materials

Although "goodness" or "efficacy" of a particular curriculum can be difficult to measure, most education specialists seem to concur that in many developing country school systems, curricula are characterized by rote-learning practices, too much focus on outdated content and poor learning materials. Key recommendations for curriculum reform include (a) more emphasis on developing cognitive skills and an active approach to problem-solving in lieu of memorizing content, (b) frequent allowances to accommodate emerging new topics, and (c) greater emphasis on the versatility of vocational education. And given today's fast-changing, knowledge economy, more and better science will be essential – which can be taught in an updated, exciting manner (see Box 2).

- In Uganda, a recent World Bank study notes that the current secondary curriculum is overloaded with anachronistic content, especially in the sciences where curricula fail to reflect "... major epistemological and philosophical changes in our understanding of the subjects over the past half century".[5] It recommends a focus on skills instead of content, as well as making room in the curriculum for such topics as democracy, education, HIV/AIDS, health and the environment, with scope and flexibility for regular reform.
- In India, another World Bank account cites similar problems with the secondary curricula, which suffer from "over-emphasis on rote learning of facts" and an overload of content. Textbook quality is also "low" and the overwhelming majority of secondary schools lack computing facilities. It recommends revising texts "to emphasize higher-order thinking skills" and to "prepare and introduce comprehensive policies and programs for integration of ICTs into teaching/learning of core secondary syllabi".[6]
- In Chile, successful reforms in the secondary school curriculum in the 1990s still tended "towards the reduction and trivialization of knowledge, favoring a passive learning relationship". But in the late 1990s and early 2000s, Chile implemented a combination of "top-down" education reforms including curriculum redesign – with "bottom-up" and decentralized actions, such as making it easier for teachers to collaborate with one another and receive additional training. The reforms also extended the "common curriculum" from 8th to 10th grade, allowing students more time to choose between academic and vocational paths. Vocational subjects were redesigned to give "occupational sector" skills rather than skills for one specific job.[7]

Box 2: Creating a Spark: Does School Physics Need to Be Boring?

"Education is not the filling of a pail, but the lighting of a fire", W.B. Yeats, Irish poet (1865–1939)

Do you remember your physics lessons at school? Boring? Irrelevant? Highly mathematical? Ask your friends – you are likely to get the same reaction. Physics teaching in secondary school does not inspire or motivate, foster creative thinking or produce applicable skills. Worse, it fails to provide a framework for understanding the basis of modern technology and often discourages students from pursuing scientific or engineering studies.

At this point, many countries are experiencing a lack of interest in physics, which in turn is leading to a lack of young engineers and scientists. This trend affects industrial countries like Germany, but it is also detrimental to developing countries, which need young scientists and engineers to become competitive.

The problem behind this trend appears to be multifaceted:

- The physics syllabus is outdated. It is often centred on the 1675–1830 period, leaving out the great discoveries of 20th century physics.
- Physics teaching focuses much more on solving equations than on understanding the underlying models of nature. Even if pupils pass their exams, a rote learning of formulas does not result in applicable knowledge or foster creative thinking.
- The qualification and status of physics teachers remains an issue. In a number of countries, physics is taught (as a second subject) by science teachers who have never taken physics courses at university – and if they did, those courses were inadequate.
- The social status and salary of teachers does not necessarily attract the best students.

So what can be done to spark an interest in physics? First, the physics syllabus needs to be adapted to the 21st century. There is strong evidence that topics from frontier research, which make the headlines of newspapers, inspire pupils to learn more about the questions stimulating contemporary research. In addition, more time should be devoted to talking about the way science works. The laws of nature have not been issued by scientific authorities, as school teaching often makes believe. Rather, they have emerged from an iterative process, shifting between model-building, experiment and analysis.

Second, physics teaching has to be relevant to students' lives. Pupils should be encouraged to develop their talents and "learn how to learn". For example, the seventh framework programme of the European Commission puts a focus on "inquiry-based learning", encouraging students to be creative, develop their problem-solving skills and find solutions to real-life problems, with the support of their teachers.

Third, the teaching profession needs a facelift. Teachers are role models and we should aim at recruiting the best candidates. They should follow the same university courses as their peers who become researchers in academia or industry. We should also try to raise their social status. Finland's educational system scores high in many international comparisons, mainly thanks to the high respect accorded to its teaching profession. The job of a Finnish teacher is a desirable well-paid one and students must fiercely compete to become one.

Plato wrote: "Wisdom begins in wonder." It is tempting to add "…but not with a formula."

Contributed by Rolf Landua, head of education, CERN (European Organization for Nuclear Research).

Improving Sanitation Infrastructure and Hygiene Education

Although the issue of expanding and updating infrastructure to provide better sanitation can be difficult to study in isolation and suffers from a lack of conclusive and generalizable data, anecdotal evidence and common sense suggest that sanitary and toilet facilities, or lack thereof, are an important factor in school enrolment, attendance and value added – especially for girls.[8] Some food for thought, starting with a few anecdotes:

- In Bagamoyo, Tanzania, according to a study by the Global Poverty Project,[9] a local school headmistress says: "Enrolment at the school has gone up by 100% because the girls now have their own toilets. They are free to use them without fear of being victimized by boys."
- According to WaterAid, access to, and improvement of, water sources is a vital step toward improving enrolment rates in schools generally. It cites a UNICEF report showing 2011 data indicating that for schools in least developed and low-income countries, only 51% had satisfactory water sources; worse yet, only 45% had satisfactory sanitation infrastructure.[10]
- In the Philippines, the "Fit for School" programme, which targets school-aged children for hygiene education (including an essential healthcare package consisting of soap, a toothbrush, fluoride toothpaste and two deworming tablets), managed to reduce absenteeism by 30% within one year.[11] The programme focused on primary school children, but by improving their health, completion rates should rise, followed by higher secondary enrolment and completion rates.

Promoting the Quality of Secondary Teaching

Like curriculum, teacher "quality" can be difficult to monitor and measure. However, many schools in developing countries – both primary and secondary – suffer from such issues as endemic teacher absenteeism, high staff turnover and a lack of teachers with postsecondary qualifications. In Sri Lanka, for example, only 56% of upper-secondary school teachers hold tertiary-level degrees.[12] While the number of secondary school teachers worldwide has increased over the past 20 years, large numbers of teachers will still need to be suitably trained and recruited to keep up with growing student populations.

- Nationally representative surveys of schools in Bangladesh, Ecuador, India, Indonesia, Peru and Uganda recorded teacher absences in nearly one in five unannounced visits during October 2002 through April 2003. The results also reveal that teachers who were born in the district of the school in which they taught were significantly less likely to be absent, as were teachers in schools at which students' parents had higher rates of literacy.[13] Teacher absenteeism was not significantly linked to their salaries (indeed, higher-paid head teachers were more likely to be absent), but *was* correlated with the quality of school infrastructure. These patterns suggest that improving physical working environments and cultivating educators' ties to the local community may be more effective than increasing remuneration in decreasing teacher absenteeism, at least in some contexts. (Only primary schools were surveyed, but one can easily imagine that the same principles apply to secondary teachers.)
- In a randomized experiment in Rajasthan, India, monitoring teacher attendance and closely tying teacher pay to attendance records produced a dramatic drop in absenteeism and a corresponding improvement in student test scores. The experiment began in September 2002 and ran for 18 months. Under this experiment, a treatment group set of teachers was given a camera with a tamper-proof date and time stamp and instructed to ask a student to take a picture of the teacher and their classmates at the start and end of every school day. The result was a reduction in teacher absences by over 20% compared to schools in which no camera was provided, suggesting that technology-based solutions may be helpful in teacher-monitoring in other contexts.[14]

- Evidence from other developing country settings shows that greater monetary incentives can increase the quantity and aptitude of available teaching candidates. In the 1990s, Chile's massive increase in teachers' pay, along with campaigns to encourage college students to go into teaching, resulted in a significant growth in applications to teaching programmes, as well as an increase in the average university admissions exam scores of those applying.[15] Coupled with compelling recent evidence about the sizable long-term benefits to high primary/low secondary students of "good" teachers – measured in terms of teen pregnancy outcomes, college enrolment rates and adult earnings – the training, recruitment, retention and motivation of secondary school teachers should be accorded high priority.[16]

Educating Girls

According to Lawrence Summers, "Educating girls quite possibly yields a higher rate of return than any other investment available in the developing world."[17] This conclusion reflects a combination of earnings gains associated with additional schooling[18] and the benefits to reproductive and general health for both the girl/woman and other members of her family. It is conservative in the sense that it does not account for the significantly greater capacity of educated women to participate meaningfully in community decision-making or the benefits that educated grandmothers confer on their grandchildren.

In many traditional settings, parents perceive girls to be less worthy of educational investments than boys because girls' subsequent economic and social contributions will accrue predominantly to the family of their husbands. This perception, which denies many girls the opportunity to attend secondary school in favour of their participation in household activities (such as fetching water and wood, cooking, working in the fields or looking after younger siblings) can potentially be addressed by compulsory education laws. In so far as school enrolment and attendance are relatively more vulnerable to income shocks like those caused by droughts and ill health for girls than boys, expanded use of financial instruments like savings accounts and crop insurance will also promote educational attainment among girls.[19]

- In Turkey, in 1997, a change in compulsory education laws from five to eight years was significantly linked to girls getting married at older ages, according to a study by Kirdar, Davoglu and Koc (2009). Moreover, "the impact of extension of compulsory schooling persists beyond the completion of compulsory schooling and the magnitude of this impact is large".[20]

As a practical matter, marriage often marks the end of a women's formal education. As such, policies to deter child marriage or to strengthen the incentives girls have to remain in school have the potential to promote their secondary school attendance.

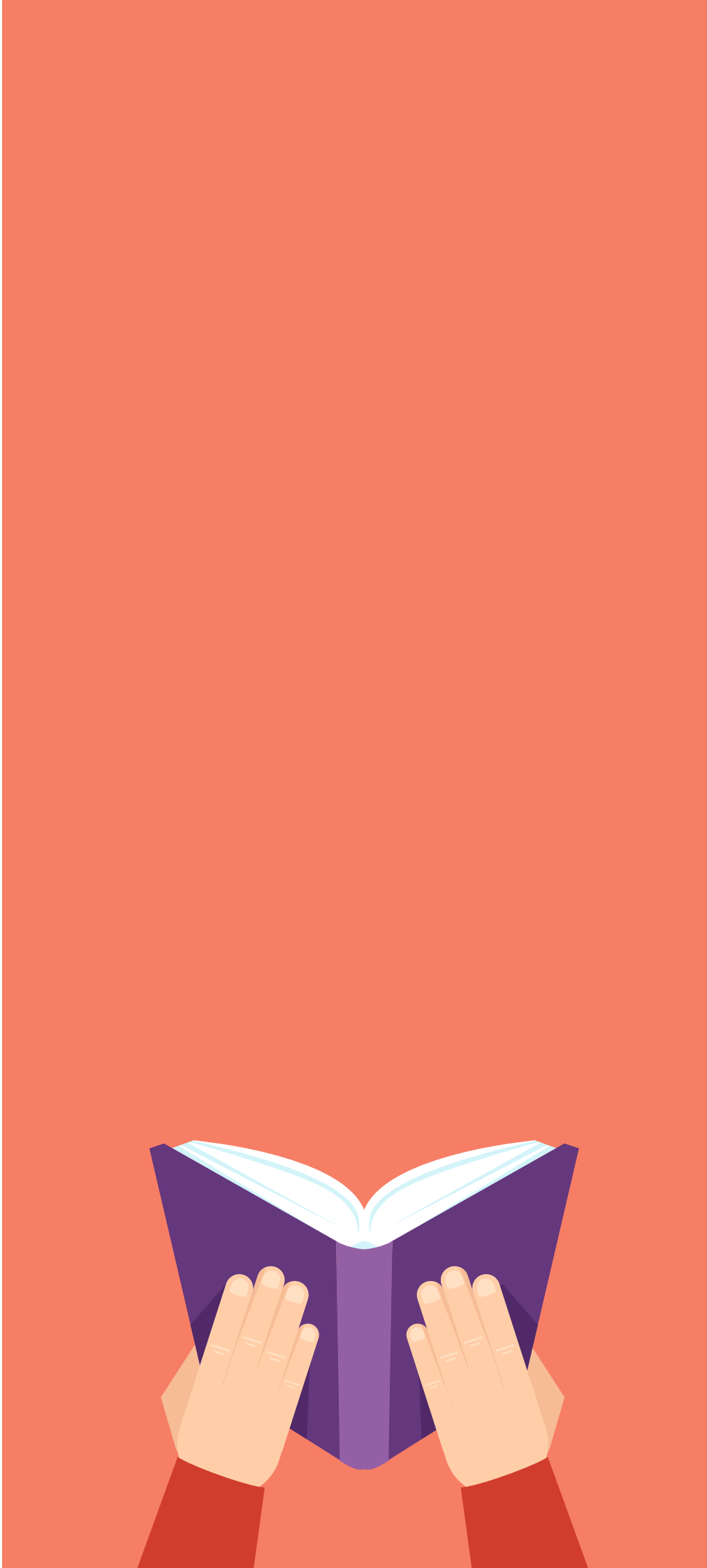
- In rural Bangladesh, traditionally known for its high rates of early marriage, it is estimated that a 0.22-year gain in schooling and a 5.6% gain in literacy is associated with each one-year postponement of marriage. The study also finds that a prohibition on marriages below age 17 would increase average female schooling by about 10%, or over one-half year. [21]
- Also in Bangladesh, a study of female garment workers shows that access to jobs allows women to delay marriage because it increases the cost of leaving the workforce to establish a family. It also suggests that access to jobs that rely on skills acquired in secondary school create an incentive to stay in school longer. According to one interview of a single, 20-year-old operator named Aleya: "I stopped studying after class five because my father was religious and did not believe in girls' education. Now I know the value of education. No one can take it away from you; it is your very own. If my father had let me, I would have been a doctor…. If you have more education, you earn more…you are more likely to become a supervisor if you are a matriculate [have 10 years of education]."[22]
- Evidence is now abundant in support of the view that families can be incentivized to keep their children in school. A recent World Bank review shows that conditional cash transfer programmes have a beneficial effect on secondary school enrolment rates in virtually every location where they have been used.[23] Such programmes make the receipt of cash transfers by needy families contingent on certain behaviours such as enrolling one's children in school. As another example, Amin and Sedgh show that secondary enrolments were increased in rural Bangladesh, with resulting later age of marriage, as a result of a female secondary school scholarship scheme.[24]
- Providing more convenient and effective sanitary products for menstruating girls is another promising intervention. Two recent studies deliver a mixed verdict, although they highlight the possibility of using rigorous empirical methods to improve our understanding of the link between menstruation and girls' school enrolment and attendance. In Ghana, one study reports that providing free disposable sanitary pads increased school attendance. The results, based on an intervention study involving 98 schoolgirls aged 12 and over in four villages (three treatment and one control), also suggests that this measure would facilitate girls' progression from primary to secondary school.[25] However, a study in Nepal – a randomized evaluation of the effect on school attendance of providing improved sanitary technology (that is, menstrual cups) to 198 seventh and eighth grade girls enrolled in four schools in Chitwan District – shows no effect of the provision of the sanitary product on the small number of lost school days due to menstruation (0.4 in a 180-day school year). That said, the girls valued the sanitary products, which increased their mobility and reduced time spent doing laundry.[26]

The Next Frontier

Secondary education is a complex and critical new frontier on the path of human progress. Although there is no singular universal remedy for the dual challenges of getting children enrolled and providing them a quality experience, we fortunately have many instruments at our disposal that can be adapted and pieced together in a way that is appropriate to myriad contexts to form a coherent portfolio of actionable and scalable interventions. As with most social change processes, the going may be slow at first. But as the improvements cumulate, the perception that enrolment in quality secondary education programmes is the norm will take hold – thereby accelerating the process of social change and allowing widespread enjoyment of its benefits.

Endnotes

1. Elizabeth Cafiero, Alyssa Lubet, Liza Mitgang, Larry Rosenberg and Laura Wallace provided helpful assistance in the preparation of this chapter.
2. UNESCO Institute for Statistics, *Global Education Digest 2011,* Quebec: UNESCO Institute for Statistics, 2011.
3. OECD, *The High Cost of Low Educational Performance: the long-run economic impact of improving PISA outcomes*, Paris: OECD, http://www.oecd.org/pisa/44417824.pdf, 2010.
4. According to Nobel economics laureate T. W. Schultz, "There is enough evidence to give validity to the hypothesis that the ability to deal successfully with economic disequilibria [changes in economic conditions] is enhanced by education and that this ability is one of the major benefits of education accruing to people privately in a modernizing economy. We see it in the equilibrating performance of housewives, laborers, students, and farmers. There is no reason to suppose it is not also important in the case of businessmen…." (T. W. Schultz, "The Value of the Ability to Deal with Disequilibria", *Journal of Economic Literature*, 1975, Vol. 13, No. 3, 843.)
5. A. Clegg, W. Ottevanger, J. Bregman, H. Nannyonjo and K. Klosowska, *Uganda - Secondary Education and Training: Curriculum, Assessment and Examination (CURASSE) : Roadmap for Reform*, Washington DC: World Bank. http://documents.worldbank.org/curated/en/2012/01/16453727/uganda-secondary-education-training-curriculum-assessment-examination-curasse-roadmap-reform, 2012.
6. R. Zagha, M. Rutkowski, A. Dar and S. Carlson, *Secondary Education in India: Universalizing Opportunity*, Washington DC: World Bank, http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079967208/Secondary_edu_India_Universalizing_v1.pdf, 2009.
7. C. Cox, *Policy Formation and Implementation in Secondary Education Reform: The Case of Chile at the Turn of the Century,* Washington DC: World Bank, http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079967208/Policy_SecondaryEd_Reform_Chile_3.pdf, 2006.
8. T. Crofts and J. Fisher, "Menstrual hygiene in Ugandan schools: an investigation of low-cost sanitary pads", *The Journal of Water, Sanitation and Hygiene for Development*, 2012, 2(1), 50–58.
9. Global Poverty Project, *Global Poverty Info Bank: Sanitation and Poverty,* http://www.globalpovertyproject.com/infobank/Sanitation, 2013.
10. UNICEF, "Raising even more clean hands: Advancing health, learning and equity through WASH in schools", www.unicef.org/wash/schools/files/Raising_Even_More_Clean_Hands_Web_17_October_2012(1).pdf, 2012.
11. Ibid.
12. UNESCO Institute for Statistics.
13. N. Chaudhury, J. Hammer, M. Kremer, K. Muralidharan and H.F. Rogers, "Missing in action: Teacher and health worker absence in developing countries", *The Journal of Economic Perspectives*, 2006, 20:1, 91–116.
14. E. Duflo, R. Hanna and S. P. Ryan, "Incentives work: getting teachers to come to school", *American Economic Review*, 2012, 102:4, 1241–1278.
15. E. Vegas, "Teacher labor markets in developing countries", *The Future of Children*, 2007, 17:1, 219–232.
16. R. Chetty, J. Friedman and J. Rockoff, "Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood", NBER Working Paper No. 19424, September 2013.
17. L. Summers, "The most influential investment", *Scientific American*, August 1992, 132.
18. Psacharapoulos and Patrinos 2004 report that women receive higher returns than men to investments in their schooling; they also report that women receive higher returns than men to investments in secondary education (18 versus 14%). (G. Psacharopoulos and H. A. Patrinos, "Returns to investment in education: a further update", *Education Economics*, 2004, Vol. 12(2), 111–134.)
19. M. Björkman-Nyqvist, "Income shocks and gender gaps in education: Evidence from Uganda", *Journal of Development Economics* 2013, Vol. 105, 237–253.
20. M. G. Kirdar, M. Dayoglu and I. Koc, "The impact of schooling on the timing of marriage and fertility: Evidence from a change in compulsory schooling law", working paper, http://mpra.ub.uni-muenchen.de/13410/, 2009.
21. E. Field and A. Ambrus, "Early marriage, age of menarche and female schooling attainment in Bangladesh", *Journal of Political Economy*, 2008, 116(5), 881–930.
22. S. Amin, I. Diamond, R. T. Naved and M. Newby, "Transition to adulthood of female garment-factory workers in Bangladesh", *Studies in Family Planning*, 1998, Vol. 29(2), 185–200.
23. A. Fiszbein and N. Schady, *Conditional Cash Transfers: Reducing Present and Future Poverty*, Washington DC: The World Bank, 2009.
24. S. Amin and G. Sedgh, "Incentive schemes for school attendance in rural Bangladesh", Policy Research Division Working Paper No. 106, New York: The Population Council, 1998.
25. L. Scott, C. Ryus, C. Dolan, S. Dopson and P. Montgomery, "The power of ordinary objects: Sanitary care in Ghana", University of Oxford Working Paper, Autumn 2011.
26. E. Oster and R. Thornton, "Menstruation, sanitary products, and school attendance: Evidence from a randomized evaluation", *American Economic Journal: Applied Economics*, 2011, 3(1), 91–100.



Learning Anything, Anytime, Anywhere

Chapter 8: Online Education: From Novelty to Necessity

Chip Paucek, Jose Ferreira, Jeremy Johnson and Christina Yu

Today, digital innovation is driving unprecedented change across the education sector. In doing so, it has the potential both to improve student learning outcomes and expand access to high-quality education opportunities in ways that would have been unimaginable even a decade ago. Because this revolution is taking place online, it is globally accessible and able to leverage the lower distribution costs afforded by the Internet. These digital innovations will transform both what happens in the classroom as well as broader educational policy in the years to come.

There is no shortage of alarming statistics that reflect the wasted potential of human capital owing to lack of access to quality education: in the United States alone, 30% of students fail out of high school; 33% of college students require remediation; and 46% of college students fail to graduate. (All this is to say nothing of education in the global economy and the social ills that have pervaded the world as a result.) Because of escalating tuition rates, unemployment and a massive student debt burden in the United States – which has now reached more than US$ 1 trillion – there is tremendous momentum to disrupt education as we know it and provide an alternative, or at least a complement, to the traditional and largely one-size-fits-all bricks-and-mortar school system.

On the business side, the potential is enormous. Education is a US$ 7 trillion industry. In other words, the total amount of money (both public and private) spent annually on education exceeds all spending, both online and offline, of every other information industry combined – i.e. all media, entertainment, games, news, software, Internet and mobile media and e-tailing.

Technological innovation has finally caught up to the potential at hand. Digital open content, cloud computing, mobile and tablet technology, game-based learning, machine learning and big data technology are sweeping through education and its associated industries. As a result, education is undergoing a monumental shift, from a factory model to a digital, personalized model.

The shifting of education from analogue to digital is a one-time event in the history of the human race. At scale, it may have as big an effect on the world as indoor plumbing or electricity. The consequence of nearly every human being receiving as much education as she wants and her ability permits will likely transform the quality of life and global GDP within one generation. Massive pools of human talent will be unlocked. Better-educated people will raise better-educated kids. How many more great minds – future Einsteins, Curies, Da Vincis, Pasteurs, Martin Luther Kings and McCartneys – will the world produce when we can quadruple the number of high school graduates?

This chapter will cover the revolution in online education, as played out in two main areas: distribution and data-mining. It will also assess the disruptive innovation occurring in higher education today and describe its ramifications for the future of universities. So how quickly will this revolution occur and which institutions and nations will reap the benefits of getting these first? The authors believe the answer lies in the ability to surmount two hurdles: (a) expanding credit acceptance policies for online courses; and (b) overcoming the digital divide, a result of insufficient adequate infrastructure and too little digital literacy.

Revolution in Distribution

The widespread growth and acceptance of online classes – whether primary, secondary or higher education; credit-bearing or not-for-credit; private or open; paid or free; delivered by for-profit institution or not-for-profit – reflect a seismic shift in the education universe.

According to *The New York Times*, 2012 is the "year of the MOOC" (massive open online course), but they easily could have called it the "year elite colleges embraced online courses". Reflecting public sentiment, Tom Friedman of *The New York Times* wrote about MOOCs that "nothing has more potential to lift more people out of poverty – by providing them an affordable education to get a job or improve in the job they have". However, online courses offered by prestigious universities are not new. In fact, orders of magnitude more students have paid for and completed online university courses for credit than all those who have completed a MOOC.

The MOOC Landscape

The MOOC ecosystem today provides free online courses in nearly every higher education field of study. Some MOOC providers, like Coursera, are for-profit and venture-funded – they will one day be forced to pursue revenue and liquidation opportunities for their investors. Others, like EdX and Khan Academy, are not-for-profit – meaning they will be perpetually capital-constrained versus any for-profit players that figures out a successful revenue model.

Though Khan Academy is not technically a MOOC platform, it serves much the same purpose. The not-for-profit provides an open online content repository that students can navigate at their own pace. Khan Academy's video library draws approximately six million unique visitors a month and contains a collection of more than 4,000 free micro-lectures on subjects ranging from maths to history to American civics. Their maths assessment material is lightly adaptive and self-paced; the system will serve up questions that escalate in difficulty. A badge system gamifies the learning process, with the most "legendary" badges ("sun" and "black hole") requiring years of work.

EdX, by contrast, is a MOOC platform founded by the Massachusetts Institute of Technology and Harvard University, which offers online, college-level courses free of charge to the public. As of May 2013, the platform offers courses from 27 participating universities, including Georgetown University, the University of California at Berkeley, Cornell University, Wellesley College and Rice University.

To date, MOOCs and Khan Academy offer only part of what constitutes a course. They offer lectures with top teachers. This is certainly revolutionary, but it is also incomplete. For all the massive size and bureaucracy of the global education system, students primarily do just two things to drive their learning: (a) attend classes; and (b) read or interact with texts and other materials. MOOCs offer very large and impersonal – but free – classes, sometimes supported with very light textbooks and materials. Professors generally contribute notes and suggest free materials to students, but to date the focus of MOOCs has been almost entirely on lectures. Almost all of the additional learning that students normally are expected to do on their own – by studying a carefully curated textbook, with professionally created scope and sequence, instructional design, assessment items and production values – is missing. The other supporting services that universities provide, both academic services like libraries and tutors, as well as other nonacademic services, are also missing.

Small wonder then that MOOCs have struggled with course quality and retention. Take Udacity. First, it announced a pioneering partnership with San Jose State. The partnership was front-page news in January 2013, but six months later San Jose State announced it would "pause" the partnership after trial courses reported failure rates ranging from 56 to 76%. Six months later, Udacity founder Sebastian Thrun announced the company would "pivot" to focus on corporate training rather than academic courses. "We have a lousy product", Thrun admitted.

At the time of this writing, Udacity is the MOOC provider most in the spotlight. But completion rates for MOOCs as a whole have been similarly problematic. One study found the average churn rate (or amount of customers who cut ties with a service or company during a given time period) for MOOCs to be 93%.[1]

Of course, given the large numbers of registrants some MOOCs attract, it is statistically inevitable that they will also produce a few heartwarming stories, like that of Khadijah Niazi, the 11-year-old Pakistani girl who completed Udacity's physics class with highest distinction. Offering unsupported but free classes to students dogged enough to complete them is certainly a great social good and will be a game-changer where the alternative is *no classes at all*. But MOOCs' promise of widespread disruption will go unfulfilled until the product is completed and the churn rate goes down.

The NonMOOC Landscape

The improvements – such as high quality textbooks, materials and supporting services – needed to turn MOOCs from just free *classes* into fully developed *courses* cost money, a fact that is unlikely to change soon. In response, some MOOC providers are beginning to offer nonMOOCs. Prior to its pivot, Udacity partnered with Georgia Tech to offer a masters in computer science priced at around US$ 7,000. The programme is neither "massive" nor "open". It is, however, showing early signs of traction and the sphere in which future trends will likely play out.

Given present trends, virtually every large university in the United States, and many elsewhere as well, will within 10 years, offer online courses – for credit and for a fee. For-profit institutions like the University of Phoenix, Education Management Corporation (EDMC), Kaplan University and others have been doing this for years, as have large public institutions such as Arizona State University, Penn State and the University of Maryland. Even institutions that were once slow to innovate are now rapidly following suit. According to a study by the Babson Survey Research Group, as of 2012 all but 13.5% of institutions had some online offerings. Furthermore, many schools that once offered only online courses now offer complete online degree programmes – 62.4% in 2012, sharply up from 34.5% in 2002. And it is not just public and for-profit universities increasing their presence in the online space. From 2002 to 2012, the fraction of private nonprofit institutions with online degree programmes more than doubled from 22.1% to 48.4%.[2]

Into this new landscape has come a wealth of new educational opportunities and models. Some small schools, like Southern New Hampshire State University, adapted early, focusing on assembling the best educational experience possible while maintaining ties to bricks-and-mortar community and regional businesses. Meanwhile, large flagship institutions like SUNY, Arizona State University and Penn State have chosen to offer a relatively low-cost education in order to serve hundreds of thousands and eventually perhaps millions of students. Elite institutions, most of which now offer online credits only, will begin offering online degrees (especially to overseas students) once it becomes clear that it will not dilute their brand (e.g. because enough of their competitors are already doing so).

A variety of third-party, mostly for-profit companies have emerged to help facilitate these courses. The for-profit company 2U (formerly "2tor"), which already facilitated masters degrees in partnership with schools like Georgetown and the University of Southern California, recently launched "Semester Online" – a self-governing consortium of elite undergraduate institutions (including Northwestern University, Washington University in St Louis, Emory University, Notre Dame, Boston College, Brandeis University and the University of North Carolina at Chapel Hill) that allows students to take for-credit classes online. As a higher price-point provider, 2U and others like it provide higher-end solutions involving considerable custom content and technical development as well as logistical support to their university partners and students. Meanwhile, Udacity's partnership with Georgia Tech is an example of a low price-point provider teaming with an elite university to offer a lower-price point product.

The Future of MOOCs

From 2012 to 2013, MOOCs were the poster child for online education. It is easy to understand why people are so excited. Education has always had an access problem. People intuitively understand that creating video versions of the world's great lecture experiences represents the beginning of a solution to this problem. By providing free access to world-class educators, MOOCs deliver tremendous social good. For many working adults with families, these courses represent an exciting way to improve one's professional value and get promoted or find new work. When coupled with innovations in Internet infrastructure and hardware, MOOCs also provide an opportunity for students in both developed and developing countries to access educational experiences from top-tier universities for the first time.

But the commercial value of MOOCs has not yet been proven. MOOCs' main value-added may lie in serving as a lead-generation mechanism for for-credit, for-fee courses provided by institutions – sometimes referred to as "small private online courses" (SPOCs). Today, the billions of people who have left the formal K-12 education system are largely invisible to that system, though countless numbers would love to take courses from reputable schools. MOOCs could provide a large, untapped demographic to which SPOCs can market their for-credit or for-certificate offerings.

Given the business dynamics at work, it will likely be high production value, for-credit online courses that will play the central role in the ongoing educational revolution. Before the advent of online education, we could not build a more efficient system in the United States, at scale. But now we can. The factory model of education is no longer necessary.

Revolution in Data-Mining

Education has always had the capacity to produce a tremendous amount of data – student proficiency data, student engagement data and content efficacy data to name some of the possibilities. Until recently, however, we have not been able to capture virtually any of it. With the potential of big data sweeping across industries – affecting social media, network monitoring, sentiment analysis, fraud detection, risk-modeling and marketing campaign analysis – technology has finally caught up. With our new capacity to capture data and analyse it, we can now use data to deliver personalized, world-class education on a global scale.

Educational data-mining is broadly defined as the process of developing new methods for using data to improve learning experiences. The field is closely related to that of learning analytics, which focuses more specifically on the application of these methods at large scales to predict student success and/or improve outcomes. Educational data-mining can perform advanced "user-modeling" to determine what a learner knows, what a learner's behaviour and motivations are and how engaged the learner is with a given course. Learning analytics can determine when students are getting off-track, or when they're becoming bored or frustrated.

By identifying and analysing patterns in educational data, technology can now do all of the following: personalize the learning process; predict future student performance and remediate pre-emptively; reduce administrative work for teachers; measure the efficacy of learning content; help publishers refine content; unlock the potential for cross-disciplinary education; gamify learning; aid in study habituation; conduct longitudinal studies; and facilitate community development and in-person activities (like study groups).

Ultimately, there is the potential for continuous improvement in all education products owing to the multiple feedback loops that provide valuable information to all parties. Students get immediate help on the next problem or piece of content they are tackling; teachers receive feedback each day on both individual students and their classes as a whole to guide individual intervention and class lessons; administrators can judge large-scale progress of their whole schools and district and state officials are able to see broad metrics quarterly or annually to inform overall initiatives. In

addition to user-modeling, the ability exists to profile learners into groups to allow for a deeper understanding of each learner, or a more productive collaborative learning experience among learners.

Categories of Educational Data

Educational data can be divided into five types: one pertaining to student identity and onboarding and four student activity-based data sets that have the potential to improve learning outcomes. They are listed below in the order of how difficult they are to attain:

1. Identity data: Who are you? Are you allowed to use this application? What administrative rights do you have? What district are you in? How about demographic information?
2. User interaction data: This includes engagement metrics, click rate, page views, bounce rate, etc. These metrics have long been the cornerstone of Internet optimization for consumer Web companies, which use them to drive sales and improve user experience and retention.
3. Inferred content data: How well does a piece of content "perform" across a group, or for any one subgroup, of students? What measurable student proficiency gains result when a certain type of student interacts with a certain piece of content? How well does a question actually assess what it intends to?
4. System-wide data: Rosters, grades, disciplinary records and attendance information are all examples of system-wide data. Assuming you have permission (e.g. you are a teacher or principal), this information is easy to acquire locally for a class or school. But it is not particularly helpful at small scale.
5. Inferred student data: Exactly what concepts does a student know, at exactly what percentile of proficiency? Was an incorrect answer owing to a lack of proficiency, or forgetfulness, or distraction, or a poorly worded question, or something else altogether? What is the probability that a student will pass next week's quiz and what can she do right this moment to increase it? Inferred student data are the most difficult type of data to generate. Doing so requires low-cost algorithmic assessment norming (standardization of assessment items) at scale. Why is this so important? Without the standardization of assessment items – a clear understanding of what each item assesses and at what level, it is difficult to determine what it really means for a student to answer questions correctly or incorrectly.

It is now possible to collect an unprecedented level of data per student per day and, as a result, capture and analyse data across these five categories.

Big Data and Education

Why exactly is education particularly suited for big data in the first place? What makes the industry uniquely suited for the potential of big data? Academic study requires a long period of engagement – students take a given course over months or even a full year and they spend a great deal of time each week on homework and other assignments. As a result, educational data sets are as broad and deep (if not more so) than those produced in other industries – such as consumers shopping online for a few minutes each day or users engaging in social media for a few hours each day.

What truly distinguishes the data produced by students from that produced in other fields like e-commerce is the very high degree of correlation between educational data and the aggregated effect of all those correlations. If, for example, a student has demonstrated a mastery of fractions, algorithms can reveal how likely it is that he will demonstrate a mastery of exponentiation as well – and how best to introduce that concept to him. The hierarchical nature of educational concepts means that they can be organized in a graph-like structure, which allows a student's flow from concept to concept to be optimized over time.

Anonymizing these data allows students to reap all the benefits of these technological innovations while preserving their privacy. No personally identifiable information need be collected from students. Because educational business models are subscription-based (and intrinsically linked to learning outcomes) – rather than ad-supported like the consumer web business models of Google, Facebook, etc. – educational data-mining will naturally be used to improve learning outcomes and drive product development.

Learning Analytics

Data-mining provides the opportunity to make educational data much more transparent and useful to students, teachers, parents, administrators and others. Rather than using this data to market other products to consumers within the platform, as is the case in many consumer Web business models, educational software providers can use concept-level learning analytics to improve learning experiences and outcomes.

Analytics allows teachers and others to assess student progress, predict future performance and identify any issues early on. Learning experiences can be personalized to every student, providing the most effective materials and instruction possible. Furthermore, big data makes it possible to move beyond observed metrics, such as test scores and homework performance. "Inferred metrics" can communicate far more complex and meaningful measures of performance. How well would a student do if tested on a particular set of educational content? Was an incorrect answer on a test question more likely due to a lack of proficiency or to a poorly written question or to a lapse in student engagement? What is the probability that a student will complete all of next week's assignment and what steps can be taken to improve that percentage?

Inferred student data are very difficult to generate and provide extremely useful insight – and context – for students, teachers, administrators and parents alike. Teachers can shape their lesson plans and individual help depending on what students need most. Administrators can understand not only how well students in a class or across a grade level are performing but also what factors are contributing to that performance.

Content analytics can help teachers, publishers and administrators determine the strongest and weakest aspects of their educational content. Content can be analysed for fine-tuned improvements so that students are never stuck with outdated or ineffective materials. Content analytics can ensure that effective content is promoted and weaker content improved or replaced.

Adaptive Learning

Thanks to advances in data science and machine-learning techniques, it is possible to provide every student in a classroom with a personalized learning experience. In the next few years, it seems likely that the majority of learning applications (known as "apps") will be not only digital but also adaptive. But there is a potential obstacle to such a world. While it is relatively straightforward to make simple differentiated learning apps, it is extremely difficult to make proficiency-based adaptive learning.

What is the difference? Data. Specifically, concept-level proficiency data for each student, which goes way beyond "observable data" like time scores or time taken. Capturing a student's performance on a test or assignment does not account for the difficulty of the material, the concepts to which it has relevance or a student's prior experience on similar content. A true model of proficiency can estimate what students know, how prepared they are for further instruction or assessment, and how their abilities evolve over time.

In other words, concept-level proficiency data is not what a student *did*, but what the system is confident that he or she *knows*, at a granular level. To extract this information, it is essential to have large pools of "normed" content. But doing so requires infrastructure to passively, inexpensively and algorithmically norm content at scale, as well as infrastructure to make sense of and take action on the resulting data. These infrastructures – when complemented by infrastructures to turn that insight into great product features to help students, teachers and parents – facilitate true adaptive learning.

Learning apps powered by such systems can respond to each individual's performance and activity in real time, maximizing the likelihood a student will obtain her learning objectives by providing the right instruction, at the right time, about the right thing. Such a system can predict, with extremely high accuracy, how a student will perform on concepts that have yet to be introduced and, if necessary, remediate her in advance to prevent failure. Teachers can use this information to shape lessons around the group's average understanding of concepts and optimize one-on-one time to focus on students who are struggling the most.

Teachers have for decades understood the importance of "differentiated instruction" – the process of tailoring instruction to meet individual learners' needs. At last technology has evolved to the point where we can produce instruction that is differentiated on an atomic or granular level.

Industry Barriers

Education has always been resistant to change. It is such a high-stakes industry – right up there with food, shelter and medicine in importance – that practitioners are reluctant to try unproven innovations that could possibly lower outcomes. Moreover, in education in particular, people are attached to longstanding habits and strongly defended interests that also slow innovation.

Regardless of industry, innovation is by its nature nearly always incremental. Tectonic innovation is extremely rare. It is only by adding myriad small innovations that most industries see steady product improvement over time. But, until recently, education has been one of the world's most difficult industries to measure and, of course, it is especially difficult to measure small changes.

Despite these challenges, education is right now undergoing a massive shift. In some countries, the Internet is revolutionizing the way today's students learn. But for the revolution to be fully realized, there are still battles to fight and barriers to overcome.

Expanding Credit Acceptance Policies

Right now, nearly all higher education and K-12 schools will readily accept credits from in-person courses that their students have taken at other schools. As the number of online courses from accredited schools continues to grow, it only makes sense that schools accept credits from these courses as well. Encouraging institutions at all levels to expand their credit acceptance policies to accept without friction online courses from any legitimate school is crucial to accelerating overall education innovation.

Such policies are likely to be inevitable within the decade. But those schools, colleges and even nations that get there first will have a long-term advantage over those who wait. Encouraging schools to start accepting these credits right now, without onerous terms and conditions, will in turn encourage more schools to produce high-quality online courses – which will encourage more students to take them and more innovators to power them, with ever better features.

What effects would this widespread credit acceptance have?

First, students would have access to a greater number of courses in subjects that they would not otherwise encounter. A community college student could experiment with courses in subjects her school does not offer, or from four-year schools that she is interested in attending. An ambitious high-schooler lacking local AP (advanced placement) course offerings could take them online.

Second, elementary school kids would have a huge selection of language courses to choose from (currently, many elementary schools do not offer any on-ground language classes, even though this is the best time for children to start a second language). A student who, owing to her unique developmental path, should be in higher-level or lower-level courses than the rest of her cohort, would be able to do so online without a stigma. Home-schooled kids, kids with special needs, kids who just want to do a little extra – all of them would have a huge online library of classes to choose from.

Third, schools needing to generate their own revenue could further leverage their on-ground operations to earn high margin revenue by offering online courses in what they teach best. Schools buying those courses would provide increased academic opportunities for their students at a relatively low cost. In some cases, the schools buying the courses could charge the provider school a processing fee and turn the acceptance of online credits into a modest profit centre. (Or perhaps they could charge parents or receive state financing assistance.) The schools accepting these credits would also free up additional capacity on campus. This would benefit all types of schools: colleges and private schools could accept more on-ground students and generate much more tuition, while public schools could reduce classroom-overcrowding problems. In New York City, these problems have reached such proportions that students are commonly denied entrance at their neighbourhood public school and bussed across town instead.

Fourth, this new credit "marketplace" would solve many of the problems that currently impede innovators. For one thing, it would significantly improve measurability. With hard student outcomes data, online learning technologies that work will spread quickly, as useful technologies do in every other Internet endeavour.

Fifth, this marketplace would also consolidate activity and buying power. Right now, entrepreneurs are so daunted by selling to schools that many are dissuaded from entering the industry altogether. Of those who try, many cannot raise capital from wary investors, or find that their distribution model is difficult to

scale. An ecosystem in which the best ideas can be measured and easily distributed would also help the natural entrepreneurs already inside the system – the teachers – spread best practices through a competitive online marketplace.

The most important concern in promoting an ecosystem of ready online credit acceptance is maintaining quality standards for every online course. The presence of such quality standards will make it possible for any school that would accept another school's credit from a transferring student to accept that school's *online* credit as well.

As the educational landscape continues to evolve rapidly, it is incumbent upon everyone – policy-makers, entrepreneurs, teachers, administrators, students and other stakeholders – to support the good while minimizing the bad. Encouraging widespread credit acceptance of online courses from reputable schools is the most immediate, and least disruptive, way to turbocharge innovation and demonstrably improve outcomes for students and schools.

Increasing Digital Inclusion

As education increasingly moves online, the need to increase digital access for all students and families is crucial. Lack of adequate infrastructure and lack of digital literacy are two core causes of the digital divide. Both must be addressed to achieve mass connectivity. In the United States, efforts are under way by a variety of organizations to bring reliable broadband infrastructure to every K-12 school in the country. Currently, 80% of US schools lack enough bandwidth to take advantage of all the possibilities of digital learning – such as Internet video, social learning, big data and cloud-based education. If students are to get the most out of online courses, appropriate infrastructure needs to be built up in schools everywhere.

In 2010, the Federal Communications Commission (FCC) created the National Broadband Plan to work towards increased broadband access in homes, schools and other institutions. Among many goals, the plan aims to provide at least 100 million American homes with access to high-speed connections by the year 2020. Other organizations have also taken up the cause – not-for-profits like Education SuperHighway and Connect2Compete are working to help ensure that every US public school is able to take advantage of digital education.

Of course, the United States is not the only country in need of adequate infrastructure. According to the International Telecommunications Union, only 39% of the world population currently uses the Internet. In developing countries, the percentage of users is only 31%, compared to 77% in the developed world.

There are a variety of projects under way that attempt to increase these numbers. Google's Project Loon involves a network of balloons, set out on the edge of space, that provide Internet access to people in remote areas and can help fill coverage gaps. One Laptop Per Child provides children in developing countries with rugged, low-cost computers. An organization called Green Wi-Fi uses solar energy to bring Internet access to "last mile" areas. The Kenya-based NGO Ushahidi has developed a device called BRCK, part modem and part Wi-Fi router, which has eight hours of battery life to allow it to work if the power goes out (common in rural Africa). A variety of organizations are introducing rugged, low-cost tablets with extended battery lives to students and others in developing nations.

This is just a tiny sample of the ideas out there. New ones emerge every day and the most effective and scalable solutions remain to be seen. Maintaining a steady focus on expanding infrastructure and innovative hardware solutions is key to increasing access to digital education to students. Increasing digital literacy – the capability to find, analyse and create information using digital technologies – is also critical.

Digital literacy is necessary to build a knowledge economy. Training in basic computer skills enables students to find and understand information communicated through technology. It also empowers individuals with the vital skills to solve problems in a scalable, sustainable way. According to the ECDL Foundation, "improved rates of digital literacy and access to [Information and Communications Technology] can help to 'leapfrog' the lag in education levels between those of more developed countries through improved teaching methods, and the potential to access the informational resources available through technology". Digital literacy gives individuals the skills they need to make use of new education options like MOOCs; increased education can help alleviate poverty rates in developing countries by providing individuals with the skills they need to play a more productive part in the local economy.

Endnotes

1. http://www.insidehighered.com/news/2013/05/10/new-study-low-mooc-completion-rates.
2. http://www.onlinelearningsurvey.com/reports/changingcourse.pdf.

Much Needed and Still Useful After All These Years

Chapter 9: Older and Wiser: Tapping the Full Potential of the Mature Workforce

Patricia A. Milligan and Patty P. Sung

Across the world, the view of ageing workers as ill-equipped to meet the physical demands of work and ill-suited to the new roles and expectations of the modern economy persists. It is a view that has dissuaded employers from engageing in human resource (HR) practices that could help them better recruit, engage, train and retain mature workers (see Box 1).[1] It has also limited the number of initiatives undertaken collaboratively across key stakeholders – employers, governments and academia – to enhance the productivity of mature workers. Take these two examples from the United States and Singapore:

- A study of companies in the United States found that a majority surveyed had made no special provisions for older workers despite the ageing of the workforce.[2]
- A study of mature workers in Singapore found that those over 50 have the highest unemployment rate and took longest to secure a job because of employers' negative perceptions of mature workers.[3]

Among the reasons employers cite for their lack of enthusiasm for mature workers – despite positive perceptions of this group's work experience, knowledge, loyalty and work habits – are higher compensation costs compared to younger workers and the costs of training mature workers in new technologies. In addition, employers hold many negative stereotypes: that mature workers are less productive than younger workers, produce lower quality work, are less mobile and are resistant to change.[4]

Our view is that ignoring the mature workforce may ultimately prove damageing to employers. Despite years of recession or sluggish growth, employers across the world are struggling to find employees with the skills they need for business success. Limiting the hunt for critical skills to those

under 50 unnecessarily restricts the field and increases the difficulties employers face. At the same time, the ageing of national populations – a phenomenon that is taking place in many developed and developing countries alike – means that both public policy-makers and employers have a large stake in ensuring that the mature segments of their workforces are capable of performing needed, and often changing, tasks. If these workers are left behind, they will suffer – but so too will businesses struggling to find the talent they need to compete, and societies burdened by individuals unable to contribute (see Box 2).

Fortunately, many innovative solutions exist to cope with this new workforce challenge. But so far, efforts to solve the problem have been pursued mainly on a piecemeal basis by individual entities – an approach that is insufficient to meet the needs of an ageing workforce or the threat of skills shortages and brain drain owing to major demographic shifts. While markets may ultimately adjust to bring the supply of labour into line with the needs of employers, employers are facing a possible global talent crisis in the short- and medium-term.

Fully leverageing the mature workforce for growth will require employers, governments, nongovernmental organizations (NGOs) and educational institutions to work together at the industry or national level to find ways to retain mature workers, prepare them for new job demands and facilitate the transfer of skills and knowledge to the next generation. This chapter tries to inform the debate by highlighting some of the steps that trailblazing stakeholders are taking to ensure that mature workers are well prepared and well utilized – and that their significant knowledge and experience is transferred to the generations coming up behind them.

Box 1: What Do We Mean by a Mature Workforce?

We define a mature workforce as that portion of the workforce born in 1963 or earlier that is now aged 50 years and older. This includes most of the "baby boom" generation, those born during the first two decades following World War II in the US, Canada, Europe, Australia and New Zealand. The mature workforce encompasses not only those workers approaching retirement, but also retirees who re-enter the workforce.

Box 2: The Benefits of Fully Leverageing Mature Workers

The returns to *individual businesses* that proactively accommodate mature workers, build on their talents and engage them to pass on their skills and knowledge to younger workers are substantial. Many of these employers are enjoying higher retention rates, lower recruiting costs and lower absenteeism as a result of policies and programmes aimed at hiring, training, accommodating and retaining mature workers. Moreover, with workforces that more closely mirror their customer bases, many have seen improved customer satisfaction and, with it, improved results.

The returns to *nations* are no less significant. Given ageing populations, accessing sufficient human capital to fuel economic growth and enhance national competitiveness will require all members of the workforce – not just the young – to be well utilized.

Of course, *mature workers* themselves stand to benefit from smarter policies designed to better train and deploy them. Individuals can achieve increased financial security as well as increased personal satisfaction – outcomes that strengthen their families and communities as well as themselves.

Global Trends Create Urgency for Lifelong Learning

Embracing mature workers – and ensuring that they are prepared for continued productivity – is critical to the success of businesses, the growth of economies and the security and prosperity of individuals as they age. Four significant trends are contributing to the urgency:

Trend 1: Changing Demographics

Dramatic changes in the composition of the global workforce are driving the need to ensure the productivity of all segments of the population, including mature workers. Across many key markets, populations are ageing and mature workers are making up an increasingly large share of the total workforce. Worldwide, the number of people over age 60 is expected to increase from 810 million in 2012 to more than 2 billion in 2050.[5]

In the United States, the share of the labour force ages 55 and older grew from 13.1% in 2000 to 21% in 2011 and is expected to increase to 25.2% by 2020.[6] This shift is being driven by demographic changes – the US median age increased from 32.9 in 1990 to 37.1 in 2012 – and by higher participation rates among older people who either do not want or cannot afford to retire. According to the AARP, 79% of US baby boomers do not plan to retire at age 65 for financial or personal reasons.[7]

Other mature economies are going through a similar transition. In Germany, the percentage of workers over age 60 is expected to increase from 26% in 2011 to 38% in 2050.[8] Similarly, over a third (38%) of Italy's workforce and 42% of Japan's are expected to be over the age of 60 by 2050. Over that same period, China's 60-plus population is expected to increase by 21% and the Republic of Korea's by 23%. By 2050, Korea will have one of the oldest populations among OECD countries.[9]

Many emerging markets are also dealing with an ageing workforce. The share of the population age 65 and over will reach 17% in Argentina, 20% in Mexico and Brazil and 22% in Chile by 2050.[10] In Russia, the elderly population will make up 26% of the total population by 2050.

Trend 2: Economic Uncertainty

Volatile economic conditions in the wake of the recent global economic crisis have accelerated the trend toward an ageing workforce as employees delay retirement because of financial concerns. In many countries, the risks and costs of funding retirement are being shifted away from government and employers to the individual, with increases in government retirement ages and decreases in the coverage rates of defined benefit plans. Insufficient retirement savings and pension shortfalls mean that many mature workers cannot afford to retire when originally planned.

In the United States, 22% of workers in the 2013 Retirement Confidence Survey (RCS) say the age at which they expect to retire has increased in the past year. Workers most frequently cite the poor economy (22%), followed by a lack of faith in social security or the government (19%) and the inability to afford retirement (19%), as reasons for postponing retirement.[11]

In other countries, the age at which employees can retire and collect pensions has been raised to reduce the drain on public finances and keep needed workers in the workforce longer. Finland, for example, raised the age at which retirees can receive a government pension in 2000 from 59 to 63–68 as decided by the individual worker.[12]

Trend 3: Industry Brain Drain

The changing demographics of populations around the world mean that employers have a smaller pool of new talent at their disposal. This is putting pressure on industries that require highly trained talent or specialized skills and whose current workforces are ageing.

In the US healthcare industry, the workforce is ageing and will be difficult to replace as individuals retire, according to the Institute of Medicine. As of January 2007, nearly 25% of physicians were 60 years old or older. By 2020, nearly 50% of all registered nurses will reach the traditional retirement age of 50. In addition, the number of dentists expected to enter the field by 2020 will not be sufficient to replace those likely to retire.[13]

One of the biggest risks facing the global oil and gas industry is an impending significant change in industry personnel and a potential shortfall of qualified technical talent in the future. More than 25% of petrotechnicals – geoscientists and petroleum engineers – currently working for exploration and production companies are over age 50 and many are expected to retire by 2016. These 22,000 experienced professionals are expected to be replaced by about 17,000 young petrotechnicals in the pipeline.[14] Not only will this result in vacancies, but the industry is bracing itself for a huge loss of knowledge and experience.

Major skills shortages already exist in the United Kingdom in professional services including accounting, finance, IT, engineering and marketing. The ageing workforce is projected to exacerbate this problem over time. For example, according to one report, the United Kingdom will face a shortfall of 10,200 qualified accountants by 2050.[15] Similarly, Canada faces a skilled trades workforce crunch as significant numbers of its mechanics, welders and construction workers near retirement. Findings from Canada's 2011 National Household Survey indicate that a labour shortage in the skilled trades is looming because a smaller proportion of the country's younger workers (those aged 25–34) holds a trades certificate compared with those aged 55–64.[16]

Trend 4: Technology Advancement and Social Media

Rapid technology advancements and the widespread use of social media are significantly changing the work environment of the 21st century. Computers, smartphones, the Internet and social media are just some of the elements changing many work processes as well as the tasks and skills required of workers. Moreover, accelerated technological change is likely to be ongoing, requiring all workers to continually upgrade their skills to remain competitive.[17]

In this environment, the adaptation of mature workers to new technology is a pressing concern. Studies show that while mature workers possess valuable institutional knowledge and experience that greatly benefit employers, they are less adept in using technology compared to younger workers and are more likely to retire when employers introduce new technology.[18] For example, a 2007 study of individual differences in performing computer-based tasks found that age was one factor impacting both performance and the change in performance resulting from practice and experience.[19]

This does not mean, however, that mature workers are unable to master new technology. Although research has shown that mature workers need more time, practise and environmental support than younger workers to learn new skills, training has proven effective in helping them develop the technology skills they need and level the playing field across generations.[20] Unlike younger workers who take technology for granted, though, mature workers respond best to training conducted in small classes and in which trainers help learners recognize the need to know the new technology being introduced, how it will help them better perform their tasks or handle routine workplace problems and how it will improve the bottom line.[21]

Yet employers' perceptions about the adaptability of mature workers remain a barrier. A survey of 800 Dutch managers found that most see mature workers as less adaptable and more resistant to innovation and technical change than younger workers. Similarly, 400 employers participating in an AARP survey characterized workers aged 50 and over as more resistant to learning new technologies than workers under 50.[22]

Predictably, these beliefs have resulted in a dearth of training opportunities for mature workers. According to a recent report, employers are much more likely to provide training to early- and mid-career employees, denying similar training opportunities to mature workers.[23] A study of Canadian workers found that between July 2007 and June 2008, 45% of workers age 25–54 took at least one job-related course or programme compared to 32% of those age 55–64.[24] And with less support for their learning, mature workers tend to engage in fewer training opportunities, causing their skills to fall behind.

Unfortunately, adding to the challenge are the self-perceptions of mature workers themselves. Studies have indicated that some ageing workers are dissuaded from participating in training because they too have bought into stereotypes about age-related performance declines and therefore see little benefit in participation.[25] In other words, beliefs about age among mature workers themselves are factors preventing them from accessing and benefitting from technology training.

Thus the circle is complete: the failure of employers to proactively train mature workers helps to realize a mature workforce less willing to participate in training and, therefore, less adept in using new technology. Unless employers commit to continuous learning for their older workers, they may see productivity declines when it comes to the adoption of this technology.

Together these trends underscore the necessity of ensuring that mature workers are a productive part of the workforce of the future. The dramatic demographic shifts underway combined with continuing rapid technological change is creating an urgency for employers and governments to act. Failure to tap the full potential of the mature workforce is likely to cause serious economic harm to businesses struggling with talent shortages and to vast and growing numbers of workers over 50 who want and need to remain productively employed.

Practices for Leverageing Mature Workers to Enhance Growth

What types of innovative solutions are being tried to better engage mature workers? Employers today are facing two major hurdles – preparing for the retirement of the large generation born in

the decades following World War II without sufficient skilled workers to replace them and manageing multigenerational workforce productivity issues. By and large, they are facing these hurdles with limited support from government and academia. While the case studies included below feature some examples of partnership among stakeholders, most detail the actions of individual employers, with a focus on the two key target groups: mature workers and retirees (see Box 3).

Box 3: Targets for New Initiatives

New approaches to better leverageing existing knowledge, enhancing skills and improving productivity are urgently needed for two key segments:

Mature workers. Mid- and senior-level workers in their 40s and above need access to continuous learning so they can keep their skills in sync with new technology, business models, work styles and modes of communication. In addition, highly skilled mature workers in declining and sunsetting industries could be effectively deployed to other growing industries with the appropriate retraining. This shift would benefit workers, their families and communities and the companies struggling to find the talent needed to fuel growth. Mature workers also represent a vast pool of knowledge and experience that must be effectively tapped to ensure the highest level of productivity for society. Plus current and looming talent shortages make it essential that businesses find ways to retain and improve the productivity of their mature workers.

Retirees. Many retirees either need to re-enter the workforce to supplement pensions and retirement savings or would like to be professionally engaged, although perhaps with greater flexibility in their schedules or locations. Mercer's recent Talent Barometer study found that less than 4% of companies across all industries tap this potential source of talent to fill critical skills gaps. Some industries are more aggressive than others – in the oil and gas industry, 12% of companies rely on retirees to fill critical gaps.[26] Retirees have experience, knowledge and flexibility, all of which can be leveraged to close the widening skills gap.

Successful organizations are using three levers, individually or in combination, to close skills gaps, transfer knowledge and enhance productivity: (a) retaining mature workers to close critical skills gaps in the short term; (b) leverageing the extensive knowledge and experience of mature workers and retirees to prepare the next generation workforce; and (c) recruiting and reskilling mature workers and retirees for new roles and new fields.

Lever 1: Retaining Mature Workers to Close Critical Skills Gaps in the Short Term by Implementing Progressive HR Policies and Creating an Environment that Fosters Productivity

Mature employees often possess a wealth of institutional knowledge and experience that greatly benefits their employers. Keeping these employees on the job and maximally productive is one important way that businesses can combat looming skills gaps and facilitate knowledge transfer to younger workers in the pipeline.

An increasingly popular way to try to retain mature workers is by rethinking traditional work schedules. Abbott Laboratories, a US global pharmaceutical and healthcare products company, introduced a phased retirement programme called Freedom to Work to encourage mature workers to work longer. One component, the Custom Schedule programme, provides employees with the option to take an additional five weeks of vacation or work four days per week with reduced pay but without affecting benefits. Another component, the Emeritus programme, allows employees to change job responsibilities without changing their pay. Since Freedom to Work began in 2008, about 500 US employees have enrolled and 97% of participating employees and 89% of managers say they are satisfied or very satisfied with the programme. Additionally, 84% of managers say it has aided in knowledge retention.[27]

The Aerospace Corporation, a nonprofit that conducts research and development for the US Air Force, created a "Retiree Casual" pool programme to retain the valuable institutional knowledge held by its most experienced employees. The programme allows retirees to be hired back for up to 999 hours per year at the same salary they earned when full-time employees while also receiving pension benefits.

MITRE, a not-for-profit that provides systems engineering, research and information technology support to US government agencies, has a workforce with an average age of 47. The majority of its workforce has more than 20 years of technical experience. Fearing the loss of that experience and intellectual capital, the organization implemented a part-time on-call programme in 2001 that enables mature workers approaching retirement and those already in retirement to provide short-term support for complex projects. This gives them the opportunity to scale back their careers while still continuing to contribute their critical skills and pass on their specialized knowledge to less experienced employees.[28]

Fidelity Investments, a US multinational financial services corporation, opted to hire mature workers desiring part-time work to cover peak hours, instead of hiring full-time employees to staff its call centre. This not only maximizes the productivity of its call centre, but also offers greater flexibility. Customer satisfaction has increased because those calling the centre – primarily those preparing for or in retirement – are now talking with more experienced staff who are at a similar stage in life and can relate to the callers' circumstances and concerns.[29]

Creating learning environments to boost engagement and productivity can also help employers retain critical workers and skills. Wells Fargo, a US-based multinational banking and financial services company, created a Boomers Network to focus on career development of its mature workers. The Network has partnered with St Catherine University in Minnesota to offer a custom graduate certificate in organizational leadership. The programme's courses are offered on-site at Wells Fargo and tuition can be reimbursed. Employees who have participated in the programme have benefited from their new ability to contribute to the firm through research and projects, as well as their increased self-confidence and leadership ability. At the same time, the company has benefited from developing a cohort of leaders across the firm who share common leadership concepts and abilities.[30]

Changing the physical work environment can also help boost the retention and productivity of mature workers. Aerospace Corporation's ergonomics programme offers employees an assessment of their workplace environment to ensure that desks, chairs and work environments properly support the workers.[31] In Germany, BMW overhauled its physical space in a way that has boosted mature workers' productivity and the quality of their output (see Box 4).

Box 4: BMW: From Barbershop Chairs to Magnifying Lenses

In 2007, to prepare for an expected increase in the average age of the workforce in its Bavarian plant, BMW, the German automobile, motorcycle and engine manufacturing company, conducted an experiment. It staffed an assembly line with workers with an average age of 47 and then made 70 small, ergonomic changes to see if adjusting the work environment for mature workers would increase employee productivity. The company added barbershop chairs so that workers could sit while working; wooden floors to aid knees; angled monitors, large typeface on computers and magnifying lenses to reduce eye strain; large-handled gripping tools to reduce strain on hands; stackable transport containers to ease physical strain; and manual hoisting cranes to reduce strain on backs. It found that workers could stay at the mild/moderately straining workstations for an entire shift but needed to rotate between the most and least physically demanding stations to reduce the chance of injury.

From its investment of €40,000, the company boosted productivity on the line by 7% over one year, making it just as productive as lines staffed by younger workers. Moreover, the line staffed by mature workers produced higher quality products than other lines. And during that first year, absenteeism dropped dramatically, from 7 to 2%. Now, six years later, the lessons learned from the experiment have been implemented on most of its assembly lines globally, impacting over 10,000 employees and are currently being piloted in office settings.[32]

Lever 2: Leverageing the Extensive Knowledge and Experience of Mature Workers and Retirees to Prepare the Next Generation Workforce

Given the ageing of the workforce, a growing and substantial percentage of employees in many companies are approaching retirement age. The potential loss of knowledge and expertise this represents could deal a serious blow to business success. In many industries, the knowledge required cannot be acquired solely through a college or university education but must be gained on the job. Thus, organizations need programmes to facilitate the transfer of critical knowledge from mature workers to the next generation, ensuring their readiness to assume new roles and the company's future success.

Some leading employers are doing this by pairing near-retirees with their successors for a period of time. Western Australian Petroleum Proprietary Limited (now Chevron Australia), an oil and gas exploration and processing company, incentivized near-retirees to spend their last three months on the job mentoring their successors by offering reduced schedules without reducing pay.[33]

Others are focusing on mentoring programmes. General Electric, the US multinational, created a network to enhance professional growth for women, particularly in the technical and engineering fields where it faces impending shortages. First launched in 1997 and now operating in 43 countries, the programme provides mentors to new hires and develops new and existing talent through workshops and networking activities.[34]

KPMG LLP, the US member firm of KPMG International, a professional services network, began a mentoring programme in 2004 that now encompasses over 10,000 mentoring relationships and offers less experienced workers access to and interaction with more senior professionals, personalized feedback, the potential for mentoring relationships to evolve into sponsorship opportunities and much more.[35] Mentorships also enable the transfer of knowledge from seasoned workers to those with less experience. The turnover rate in 2008 for employees with mentors was 17 to 18% lower than the turnover rate for employees without mentors.[36]

Lever 3: Recruiting and Reskilling Mature Workers and Retirees for New Roles and New Fields

Historically, learning has been seen as a process that begins at the primary level, progresses to secondary education and ends with higher education. But as careers begin to span five and even six decades, learning that ends in early adulthood is insufficient to elicit individuals' best work over entire careers. Leverageing this talent pool for maximal returns will mean designing continuous lifelong learning opportunities to support talent development.

Forward-thinking companies are launching initiatives to reskill mature workers to take advantage of their experience and perspective. Many are finding that they can reduce recruitment costs and absenteeism while increasing retention by focusing on this often-neglected segment. Employers are also finding that mature workers are highly productive once established in a role and can help improve the customer experience.

Westpac, an Australian bank, created a plan in 2002 to hire and train 900 recruits over the age of 45 for various roles including that of financial advisor. The company believed this would improve the overall customer experience and thereby strengthen the brand because older customers would feel better understood by older workers.[37] Besides providing better customer service, these employees exhibit lower turnover and longer tenure, lowering the bank's recruiting and training costs. An integral part of spurring the hiring of mature workers in the company was providing age-balance training to managers to combat stereotypes about the ability and productivity of mature workers and highlight the benefits of hiring mature workers.[38]

L'Incontro Cooperative, an Italian, nongovernmental social services organization, actively recruits workers over the age of 40. For example, one unit within the cooperative employs retired nurses as social workers while another employs retired art teachers as art therapists. L'Incontro targets mature workers for two reasons: the shortage of highly-skilled workers, particularly in the nursing sector, and "the possibility of having a highly flexible workforce, while limiting service costs". Major improvements have been noted in the quality of client services and overall staff management. Absenteeism among the entire staff has decreased since flexible scheduling options have spread from mature workers only to all employees.[39] Turnover has also decreased as a result of sourcing older workers.[40]

The public sector can also play a pivotal role. In the United States, the government created a three-year Ageing Worker Initiative (AWI) to better understand and prepare for demographic shifts. The initiative explored how best to serve mature workers and create business models to suit their needs. In 2009, AWI awarded US$ 1 million grants to 10 organizations to provide individuals aged 55 and older jobs and advancement opportunities. Targeted workers included mature workers who were seeking re-employment, those working beyond traditional retirement age who needed training and those who faced barriers from disabilities.[41] A 2012 evaluation found that about half of the exited participants had obtained unsubsidized employment by that time. It also found that assistance with career planning and the provision of personalized support were particularly effective in helping mature workers with re-employment.[42]

In Australia, technology training is key in removing barriers to workplace participation for mature workers. The government of New South Wales partnered with Telstra, an Australian telecommunications company, to create a technology training programme for seniors. Tech Savvy Seniors provides free or low-cost training on computers, tablets and smart phones to older citizens. The public–private partnership provides funding and training through 35 community colleges as well as a library network focused on rural and regional areas. The programme also provides self-training DVDs available through these libraries as well as online, self-training videos. This programme is a part of the New South Wales Ageing Strategy, which seeks to provide better learning, career and lifestyle opportunities for the ageing Australian population.[43]

In Canada, the government's Targeted Initiative for Older Workers (TIOW) programme, launched in 2007, helps workers between the ages of 55 and 64 who are living in communities of less than 250,000 residents to remain productive participants in the workforce. So far, 402 TIOW projects have been implemented, at a cost of C$ 270 million, giving nearly 32,000 unemployed mature workers in communities across Canada access to training and employment programmes.[44] The results of a programme evaluation reveal that 75% of surveyed participants found employment during or after their participation in a TIOW project and that skills obtained helped them transition into new sectors or occupations. At the same time, employers reportedly appreciated the ability to fill gaps in their workforce with experienced workers.[45]

Combining Multiple Levers for Enhanced Results

Some companies are implementing policies and practices that combine more than one of the three levers described above to close skills gaps, transfer knowledge and enhance productivity – in fact, Central Baptist Hospital in Kentucky uses all three (see Box 5).

CVS/Caremark, a US pharmacy chain and drug retailing company, allows its mature workers to transfer from store to store on a seasonal basis (Lever 1). This Snowbird programme not only reflects the lifestyle needs of the many older folks who migrate to the south from the northeast in winter months but has helped CVS/Caremark fill employment gaps that result from seasonal fluctuations in demand while retaining valuable institutional knowledge.[46] As of 2011, about 1,000 employees had participated in the programme. Overall, CVS/Caremark has enjoyed retention rates for its mature workers that are significantly higher than the industry average, and it is better able to manage the increased business in warmer-climate stores during the winter.[47]

CVS also has recruitment and training programmes (Lever 3) targeting mature workers. Through its Talent is Ageless programme, CVS partners with local agencies to identify potential employees between the ages of 50 and 99 who meet CVS's criteria. Candidates who are hired then go through a four- to six-week CVS "SucceSS Development" programme, during which mature workers are mentored by store associates who determine if they are appropriate for the job. Training is usually done at a slower pace than for younger hires because the process is customized to the mature worker to ensure that all hires are successful. The programme allows mature workers to acquire new skills to obtain a new career.[48] As a result of its efforts across levers, over the past 20 years, CVS has increased the percentage of its employees over the age of 50 from 7 to 22%.[49]

Marriott, a global lodging company recently launched a proactive, multiphase ageing workforce study to identify issues and create a strategic plan to accommodate the changing demographics of its workforce – 43% of its US employees are now older than 45 and 18% are older than 55. Based on this plan, the company implemented several programmes to increase workplace flexibility and, thereby, employee engagement and business results.

- The cross-training programme (Lever 3) lets associates take shifts in other functional areas so mature workers can maximize hours and learn new skills without totally switching careers. It also helps mature workers access formal job rotations so they can alternate days on jobs that require significant physical strain with those that require less.
- The Work Process Design programme (Lever 1) pairs a younger worker with a mature worker and allows them to divide time and tasks while teaming up on other tasks. More physically demanding tasks can be assigned to the younger worker while the mature worker can do other tasks, fostering increased productivity overall.
- Another programme offers at-home agent positions for sales and customer care representatives (Levers 1 and 3). Attractive to both younger workers with children and retirees, this programme allows workers to fill telephone sales and customer service positions on an hourly basis from home. It has led to increased retention, reduced recruiting costs and productivity gains.

For Marriott, the changes have paid off. Of the 90% of the US workforce that completed a satisfaction survey about workplace flexibility and employee engagement in 2011, the majority responded that they have the flexibility they need. Responses from those over age 55 "were above the external [survey] vendor's best employer benchmarks".[50]

The National Institute of Health (NIH) – named number one on AARP's "Best Employers for Workers Over 50" in 2013 – uses multiple levers to effectively leverage mature workers. This is critical to its success given that 47% of the organization's employees are age 50 or over. Two of the ways that NIH actively recruits mature workers (Lever 1) are by participating in an annual 50-plus job fair and doing regular mailings to recent NIH retirees to let them know of current job openings. NIH also promotes the retention of mature workers by offering them flexibility through arrangements like flextime, compressed work schedules, job sharing and telecommuting. As a result, the average tenure of employees age 50-plus at NIH is 18.4 years.

NIH supports continuous learning by offering online training, certification classes and tuition reimbursement (Lever 3). Employees can work on temporary assignments in other departments or participate in mentoring and job rotation programmes to experience different fields. In a recent 12-month period, 100% of employees participated in at least one of the training opportunities offered, spending an average of eight hours in training.[51]

In Canada, Sodexo Canada – part of a global outsourcing company that provides food, housekeeping and facilities management services – launched initiatives across multiple levers to obtain the most value from its mature workers. To attract mature workers with extensive experience, it offers them a generous package of benefits (Lever 1). Although it allots three weeks of vacation time per year to inexperienced new hires, Sodexo offers up to 10 weeks of vacation per year to new hires with substantial experience. The company also offers formal career and succession planning and has extended employee benefits to those up to age 70 in the hope of attracting workers that have the ability to close the skills gap. As a result, 32% of the company's new hires in 2012 were over age 40 and 63% were over age 60.[52]

Sodexo also developed its Spirit of Mentoring Program (Lever 2) to assist in retention and knowledge transfer between the more and less experienced members of its workforce. The programme facilitates knowledge transfer in two directions: mature workers pass their knowledge to younger workers while also gaining insight into what drives and engages younger workers. The programme has three elements: Impact, Peer-to-Peer and Bridge. Impact includes more than 100 formal partnerships, while Peer-to-Peer is more informal and Bridge pairs new hires with frontline mangers to expand professional development opportunities.[53] In 2007, the company's return on investment for the programme was two to one, with most of the gain coming from increased productivity and retention.[54]

Box 5: Central Baptist Hospital Woos Nurses with Flexibility and Career Counseling

Central Baptist Hospital (CBH) in Lexington, Kentucky, was experiencing challenges related to an ageing workforce. Many US hospitals are experiencing a worsening nursing shortage and experienced workers are expensive to replace. CBH's own nursing staff was ageing, with the share of its 1,000 registered nurses (RNs) over age 45 increasing from 20% in 2002 to 34% in 2011. The hospital decided to act by implementing a number of programmes targeting highly skilled, mature individuals.

One component is a flexible scheduling policy (Lever 1) to keep mature, experienced workers on the job longer, although all employees can participate. CBH offers employees part-time, seasonal positions with full healthcare benefits, specific positions with shorter shifts and job or shift sharing. It also enables employees to move from full-time to part-time while remaining in the same position, or transfer to jobs with reduced patient responsibilities. Additionally, employees can request specific schedules and post schedules to an online website to facilitate shift changes.

A second component is the Career Coaching programme (Levers 2 and 3), which helps develop a leadership pipeline and retain talent. The programme facilitates knowledge transfer by providing nurses with support from a retired nurse coach. It also helps nurses develop action plans for attaining career goals, including recareering and continuing education. As a result, many nurses have returned to school to continue their education and develop new skills.

In combination, these programmes have enabled CBH to reduce its turnover and job vacancy rates to a level well below the national benchmark for healthcare. In addition, the percentage of its RNs over age 45 providing positive job satisfaction ratings increased from 65 in 2006 to 88% in 2010.[55]

Moving Forward

As the major demographic and workforce trends converge, an increasing number of mature workers will want and need to remain in the workforce considerably longer than those of past generations. At the same time, employers will need more of them, given the relative lack of younger workers available, to power and grow their businesses. The rapidity of this change – combined with the accelerated pace of technological change in and out of the workplace – makes it imperative that employers and stakeholders in the larger society move quickly to prevent serious economic harm to businesses, communities and individuals. They should:

Act immediately. The global workforce is already substantially older than it was at the start of the new millennium. If stakeholders are going to avoid serious disruptions they must act immediately to effectively recruit, retain and reskill mature workers while also leverageing their knowledge and experience to bring the next generation workforce up to speed.

Combine levers to maximize results. Increasing the productivity of the mature workforce will require the implementation of practices designed to pull all three of the levers described in this chapter. Only by retaining those mature workers with critical skills and experience, developing the means for those workers to transfer their skills and experience to the next generation and cost-effectively recruiting and reskilling mature workers to close talent gaps can employers fully leverage this growing segment of the workforce.

Invest in appropriate training for mature workers. Research into training the mature workforce has pointed to the efficacy of properly designed training in upgrading technology and workplace skills – and the relative lack of training opportunities available. To better leverage mature workers, researchers recommend:[56] (a) targeting those who would most benefit from training; (b) using methods, materials and environments suitable to the ageing workforce; (c) holding multiple sessions rather than concentrating all training into one session and giving mature workers additional time to practice; (d) using mixed formats including self-directed, online and instructor-led training; and (e) linking training to current work.

Collaborate across multiple stakeholders to move the needle. The changing work and demographic landscape threatens not only individual employers but also entire industries and societies.

Yet there are too few examples today of collaborative efforts across multiple stakeholders aimed at fully leverageing the mature workforce. Instead, most employers are taking a piecemeal approach to reskilling and knowledge transfer. For maximum impact, the needs of employers and mature workers should be addressed at the industry or national level with the coordinated involvement of employers, governments and academia.

- *Governments can:* remove disincentives to workforce participation for mature workers. This might include allowing mature workers to make contributions to state pension plans that will increase benefits and removing penalties to employment income; educate employers about the need for and the benefits of utilizing mature workers and retirees; provide incentives to employers to hire mature workers; fund training designed by industry groups in collaboration with academia to give mature workers and retirees industry-specific and technology skills.
- *Employers can:* implement progressive HR policies to reflect the changing demographics of the workforce. These should offer mature workers increased flexibility in terms of their hours, schedules, work location and employment relationship; introduce ergonomic designs and initiatives to improve the health and wellbeing of mature workers to increase productivity; offer better training to upgrade and maintain skills; train managers on the effective utilization of mature workers' skills.
- *Academia can:* study the impact of various methods of training mature workers to identify those most effective; set up training programmes in collaboration with industry. Research the skills needed by growth industries and the job skills of mature workers to identify industries suitable for skills transfer and guide the development of training programmes.

The returns to businesses, nations and the growing number of workers over 50 from these coordinated efforts will be substantial. From enhanced engagement, retention and productivity at the employer level to enhanced competitiveness at the industry and national levels, tapping the potential of the mature workforce will yield substantial economic benefits. At the same time, individuals who want to work both for personal satisfaction and financial security will benefit from holistic efforts to ensure that their work is both valuable and valued.

Endnotes

1. M. Armstrong-Stassen, "Human resource practices for mature workers – And why aren't employers using them?", *Asia Pacific Journal of Human Resources*, 2008, 46, 334–352. doi: 10.1177/1038411108091755
2. F. Tishman, S. Van Looy and S. Bruyere, *Employer Strategies for Responding to an Ageing Workforce*, The NTAR Leadership Center, 2012.
3. J.W. Lim, *Retire or Rehire: Learning from the Singapore Story. Skills Development for Inclusive and Sustainable Growth in Developing Asia-Pacific Technical and Vocational Education and Training: Issues, Concerns and Prospects*, Vol. 19, 2013, 241–251, http://link.springer.com/chapter/10.1007/978-94-007-5937-4_13#.
4. F. Tishman, S. Van Looy and S. Bruyere, *Employer Strategies for Responding to an Ageing Workforce*, The NTAR Leadership Center, 2012.
5. *Population Ageing and Development 2012*, United Nations, 2012.
6. A. Hayutin, M. Beals and E. Borges (eds), *Demographics of the Ageing Workforce – Summary,* Stanford Center on Longevity, 2013.
7. S. Reeves, "An ageing workforce's effect on U.S. employers", Forbes, www.forbes.com/2005/09/28/career-babyboomer-work-cx_sr_0929bizbasics.html, 2005.
8. *Global Population Ageing: Peril or Promise?,* World Economic Forum.
9. *Addressing the Challenges of the Ageing Workforce,* IBM, 2004
10. *Global Ageing and the Future of Emerging Markets,* Center for Strategic and International Studies, 2011.
11. 2013 RCS Fact Sheet #2, *Changing Expectations About Retirement*, Employee Benefit Research Institute
12. Gray Skies Silver Lining, Conference Board, 2007.
13. L. Harrington and M. Heidkamp (eds), *Ageing Workforce: Challenges for the Health Care Industry Workforce*, The NTAR Leadership Center, 2013.
14. J.-M. Rousset, P. Bismuth and O. Soupa, "Technical talent shortage could begin to limit growth", *Talent & Technology,* June 2011.
15. Tracy Barrett, "UK brain drain triggers accounting and finance skills shortage", Press Association National Newswire, 2013.
16. J. Fekete, "Skilled trades workforce facing a 'crunch'; Dire shortage will get worse", http://www2.canada.com/windsorstar/news/business/story.html?id=806bf65d-d392-4ad8-b72c-4e520d8adf6d, 2013.
17. C.C. Lee, S.J. Czaja and J. Sharit, "Training **older workers** for **technology**-based employment", *Educational Gerontology*, 2009, Vol. 35, Issue 1, 15–31.
18. T. Hægeland, D. Rønningen and K.G. Salvanes, "Adapt or withdraw? Evidence on technological changes and early retirement using matched worker-firm data", NHH Dept. of Economics Discussion Paper No. 22/07, August 2007.
19. C.C. Lee, S.J. Czaja and J. Sharit, "Training **older workers** for **technology**-based employment", *Educational Gerontology*, 2009, Vol. 35, Issue 1, 15–31.
20. N. Charness, "Work, older workers, and technology", *Generations*, 2006, 30(2), 25–30.
21. "Training a multigenerational workforce", *Professional Safety*, March 2012.
22. M. Malul, "Older workers' employment in dynamic technology changes", *Journal of Socio-Economics*, 2009, 38(5), 809–813, doi:10.1016/j.socec.2009.05.005.
23. F. Tishman, S. Van Looy and S. Bruyere, *Employer Strategies for Responding to an Ageing Workforce*, The NTAR Leadership Center, 2012.
24. "Job-related training of older workers, Perspectives on labour and income", Summer 2012.
25. C.C. Lee, S.J. Czaja and J. Sharit, "Training **older workers** for **technology**-based employment", *Educational Gerontology*, 2009, Vol. 35, Issue 1, 15–31.
26. *Talent Rising High Impact Accelerators to Global Growth,* Mercer, 2013
27. "Abbott Laboratories Global Citizenship", www.abbott.com/citizenship/culture/workplace/worklife.htm.
28. *Flex Strategies to Attract, Engage & Retain Older Workers,* Boston College Sloan Center on Ageing & Work, 2012.
29. *Fidelity Emerging Strategy*, Boston College Sloan Center on Ageing & Work, 2008.
30. *St Catherine University Master of Arts in Organizational Leadership, 2013–14 custom certificate in collaboration with Wells Fargo,* programme brochure.
31. "2011 Best Employers The Aerospace Corporation", www.aarp.org/work/on-the-job/info-09-2011/the-aerospace-corporation-aarp-best-employers.1.html, AARP, 2011.
32. C. Loch, F. Sting, N. Bauer and H. Mauermann, "How BMW is defusing the demographic time bomb", *Harvard Business Review*, March 2010.
33. *Addressing the Challenges of an Ageing Workforce*, IBM Business Consulting Services, 2004.
34. General Electric's Women's Network, www.ge.com/careers/culture/diversity/womens-network.
35. http://www.kpmg.com/Global/en/careers/CareerNews/advance-your-career/Pages/take-five-mentor.aspx
36. *Making Mentoring Work,* Catalyst, 2010.
37. *Business Boldness and Benefits: How Westpac Tackled the Ageing Workforce,* HC Online, February 2005.
38. http://blip.tv/iir-conferences-australia/ir-interview-ross-miller-on-westpac-s-ageing-workforce-964823.
39. A. Walker and P. Taylor, *Combating Age Barriers in Employment: A European Portfolio of Good Practice,* 1998.
40. A. Walker, "Combating age barriers in employment: Findings from a European research project", http://www.taloustieteellinenyhdistys.fi/esitelmiae/52-walkereng311000.html.
41. *Ageing Worker Initiative: Strategies for Regional Talent Development,* United States Department of Labor.
42. *Evaluation of the Ageing Worker Initiative, Final Report*, Social Policy Research Associates, 29 March 2013.
43. *NSW Ageing Strategy*, Department of Family and Community Services, 2012.
44. Correspondence from programme representative, 26 September 2013.
45. http://www.hrsdc.gc.ca/eng/publications/evaluations/skills_and_employment/2010/june.shtml.
46. *Flex Strategies to Attract, Engage & Retain Older Workers,* Boston College Sloan Center on Ageing & Work, 2012.
47. http://capricorn.bc.edu/ageingandwork/database/browse/case_study/24047.
48. *Talent Management and the Prism of Age*, Boston College Sloan Center on Ageing & Work, 2010.
49. *Flex Strategies to Attract, Engage & Retain Older Workers,* Boston College Sloan Center on Ageing & Work, 2012.
50. *Flex Strategies to Attract, Engage & Retain Older Workers,* Boston College Sloan Center on Ageing & Work, 2012.
51. "AARP Best Employers 2013 National Institute of Health", www.aarp.org/work/2013-aarp-best-employers/national-institutes-health-aarp-best-employers, 2013.
52. *Age of Wisdom*, Brooke Smith, Benefits Canada, May 2013.
53. "Development and training", http://www.sodexousa.com/usen/careers/development-training/spirit-of-mentoring.aspx, Sodexo.
54. *Making Mentoring Work,* Catalyst, 2010.
55. *Flex Strategies to Attract, Engage & Retain Older Workers,* Boston College Sloan Center on Ageing & Work, 2012.
56. F. Tishman, S. Van Looy and S. Bruyere, *Employer Strategies for Responding to an Ageing Workforce*, The NTAR Leadership Center, 2012.

Chapter 10: Reinvigorating Japan's Economy with More Women and Older Workers

Yoko Ishikura

Japan is a major economic power – the third largest in the world after the United States and China – but there are signs it is losing its long-term competitiveness. Granted it placed in the top 10 on the Global Competitiveness Report for the past decade and Japanese auto and precision machinery industries remain competitive in the world. However, once-innovative companies such as Sony, Panasonic and Sharp, have lost positions to rivals both from the United States (such as Apple) and Korea (such as Samsung). In addition, only a few new companies (like Softbank, Rakuten and Fast Retailing) have emerged to grow to world status.

The reality is that after the "lost two decades" (with economic growth stagnant at 0.8%) – and a budding recovery dealt a severe blow by a massive earthquake and nuclear accident – Japan needs to reinvigorate its economy. But major demographic changes under way will complicate matters (see Figure 1 and Box 1).

- While the country's total population decreases from 128 million in 2010 to 117 million in 2030,[1] the size of the working age group (15–64 years of age) will fall from an 87 million peak in 1995 to below 68 million by 2030.
- At the same time the "elderly" (those 65 and older) will increase from 29.5 million in 2010 to over 37 million in 2030.[2] This ageing phenomenon is occurring all over the world, but nowhere is the share as high as in Japan – reflecting a low fertility rate of 1.39 and the longevity of the Japanese people, which at 83 years is one of the highest in the world[3].

What can Japan do to meet the challenge of a shrinking and ageing workforce and the need for a more innovative workforce? Three important changes would seem to be required. First, the elderly should work longer while maintaining high productivity. Second, more women should participate in the labour force, which besides swelling the size of the labour force would bring new and different perspectives. Third, the way the education system and companies approach work and learning needs to be rethought.

Box 1: Key Facts about Japan's Changing Workforce

- The total population of Japan will decrease from 128 million in 2010 to 117 million in 2030.
- The group of 65+ years (the "elderly") will increase from 23.0% (29.5 million) in 2010 to over 31% (37 million) in 2030. Its labour force participation rate has stayed at the same level of around 20%.
- The proportion of the working age population (15–64) will decrease from 63.8% (82 million) in 2010 to 58.1% (68 million) in 2030. Its labour force participation rate has declined – although the 60–64 group has boosted its share following a change in the legal retirement age for corporations.
- The share of women in leadership positions remains low with only 1.4% holding corporate board positions compared with 8% in China, 12% in Turkey, 17% in the United States, 25% in France and 40% in Norway.
- Women earn on average 27% less than their male counterparts.

None of these ideas are new to Japan – they are all being weighed, if not always acted upon. The Abe administration has recognized the need for reinvigorating the economy and, as a part of its growth strategy, is focusing on gender issues, the company approach to work and education.[4] The private sector has recognized the need for an innovative, more diverse workforce, albeit few companies have taken the initiative to implement plans for reskilling older workers. Educational institutions have not begun new initiatives for women or elderly and their focus has been on globalizing the institutions.[5] This chapter explores the status of the elderly and women, along with the education system and the company approach to work. It then describes a variety of solutions for all the stakeholders – with the emphasis on addressing short- and long-term issues as a coherent package.

Progress Report on a Diversifying Workforce

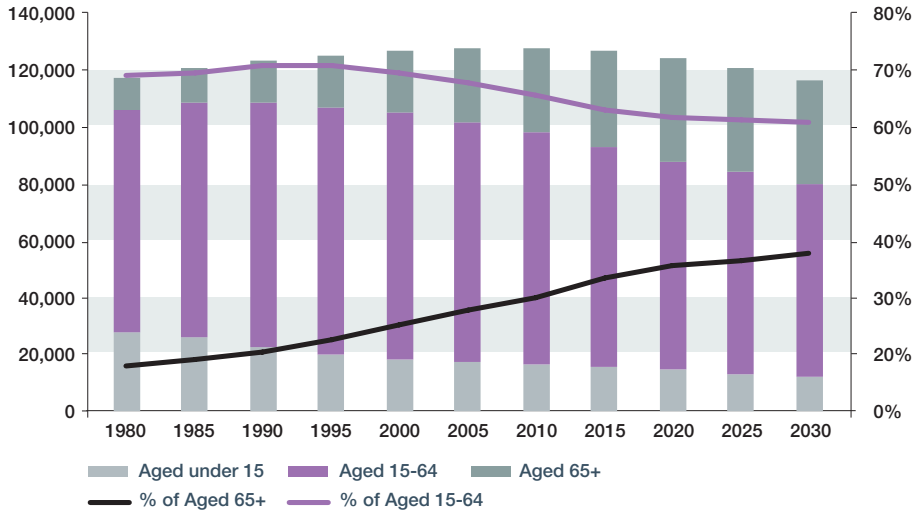
Faced with swelling pension costs in an ageing society – and a strong reluctance to consider higher immigration – Japan has recently passed a law, which took effect in April 2013, to raise the mandatory retirement age to 65 from 60. This means that companies are obliged to keep employees if they want to continue working after they turn 60.

In a way, the law is catching up with a trend already under way as the labour force participation rate of those 60 to 64 years of age has increased from 54.7% in 2005 to 60.5% in 2012, reversing the downward trend since the early 1990s (see Figure 2). At the same time, the labour force participation rate of those 65+ has stayed at around 20%.[6] Overall, both rates are high when compared with other industrial countries, especially those in Europe.[7]

That said, employing the elderly is complex and challenging. Certainly, the elderly workforce is healthy and willing to work, with a recent survey showing that more than 90% of them think that they want to work until more than 65 years old.[8] Their reasons why tend to centre on income, health and society.[9] However, although many Japanese companies are aware that "reactivating the ageing workforce" is a critical management issue, most of them are still searching for solutions. They worry about identifying work for the elderly, along with not causing a disruption to the hierarchical structure and processes based on the seniority system.

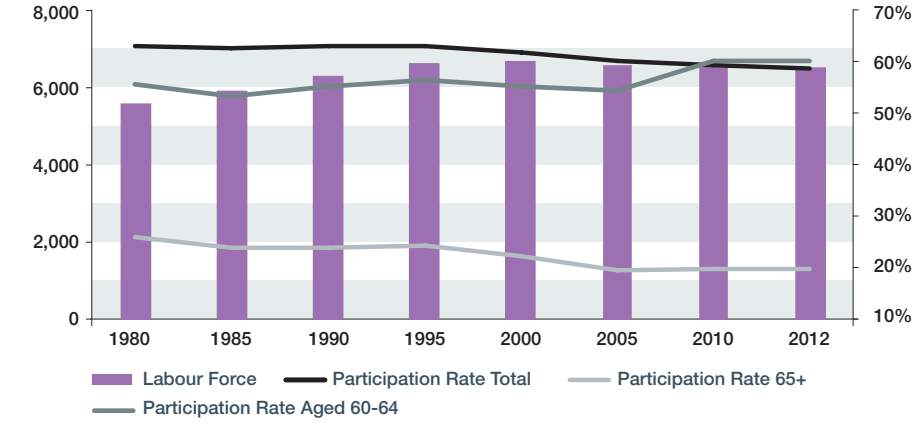
The case for hiring women is equally compelling. The World Economic Forum's 2013 Human Capital Index shows a correlation between the gender gap and GDP per capita,[10] with some studies suggesting that increasing women's participation in the workforce could boost a country's GDP anywhere from 4% to 16%.[11] Other studies indicate that bringing more women into leadership positions could enhance a company's performance,[12] building a case for gender parity being good for business (rather than social reasons). Adding women into the labour force could also be a quick solution to help offset the decline in the working age population and to increase household income and expand domestic demand. Plus it is expected that the birthrate will increase with sufficient support for work–life balance.[13]

Figure 1: Japan's Ageing Society



"Source: "Population Projection for Japan, January 2012" National Institute of Population and Social Security Research

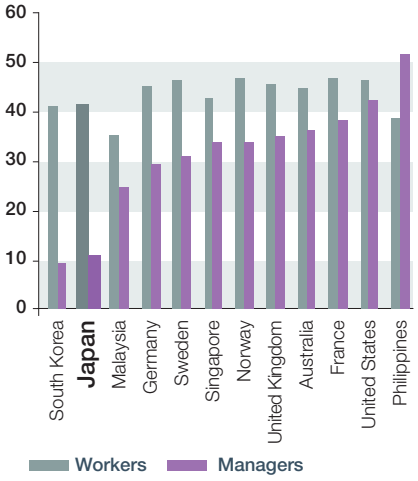
Figure 2: Seniors (60-64) Working Longer in Recent Years



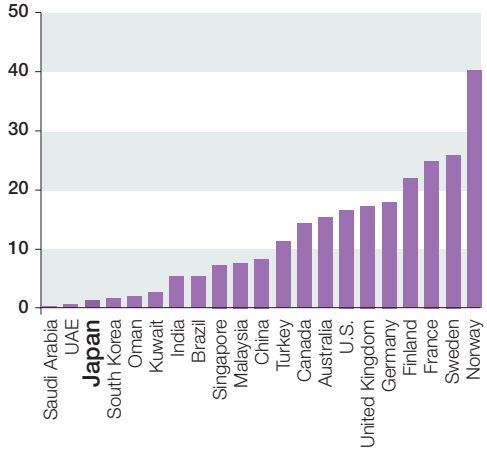
Source:"Labour Force Survey" Ministry of Internal Affairs and Communications, Statistics Bureau, Japan

Figure 3: Far Too Few Women Managers in Japan

The share of women (%)



The share of women board members (%)



Sources: "Labour Force Survey (Basic Tabulation)" by the Ministry of Internal Affairs and Communications (2012) and "Databook of International Labour Statistics 2012" by Japan Institute for Labour Policy and Training.

Notes: 1. 2012 data are used for Japan, 2008 data for Australia and 2010 data for other countries. 2. In Japan's "Labour Force Survey", 'Administrative and Managerial Workers' include company officers, company management staff, and management government officials. Definition of 'Administrative and managerial workers' varies across countries. 3. Japan's "Labour Force Survey" uses the population assumed on the basis of the fixed population according to 2010 census as the base of calculation.

Source: Corporate Women Directors International website (www.globewomen.org)

The progress on this front, however, is not great. Although women represent 42.3% of all workers, which is in line with other developed countries, the ratio of women in managerial positions in Japan is low, even among other Asian countries (see Figure 3). In addition, the ratio of women in areas other than business is quite low in Japan, indicating the difficulty for women to assume professional and leadership positions, regardless of the field.[14]

Moreover, there is a gender gap for the average wage of regular workers of 27% – which has narrowed somewhat in recent years but is still well above the OECD average of around 17%. Yet women are as well educated as men (55% for both gender enrolled at universities including junior college),[15] and in the 25–34 age group young women are more likely (59%) to have a university degree than young men (52%).[16]

The Education–Company–Skill Nexus

Despite the rapid changes in the world driven by technology, the approach of the education system and companies to work and learning has remained the same for the past few decades. In effect, while the notion of lifetime jobs still prevails, that of lifetime learning does not.

Overall the Japanese education system receives mixed reviews. Primary education, in terms of enrolment and quality, is high,[17] as is secondary. Plus the percentage of the population that has attained tertiary education is also high among OECD and other G20 countries. But the entry rate into university programmes is 52%, below the OECD average of 60% in 2011.[18] In addition, although the PIAAC Survey of Adult Skills places the country at the top for literacy and numeracy (but only average for problem-solving in the context of technology-rich environment),[19] the quality of the education system is perceived to be just above average by Japanese executives.[20] Only two universities (Tokyo and Kyoto) are ranked among the top 100 of the World University Rankings.[21] And public expenditure on educational institutions as a percentage of GDP was 3.6% in 2010, the lowest among the OECD countries (which averaged 5.4%).[22]

Continuing education is not a priority. Universities focus on teaching young people while they are undertaking a degree and are not concerned with skills development needs after they graduate.[23] Their efforts to target generations other

than the youth remain "reactive" (a low number of students at graduate school and a limited number of open courses).[24] Plus the ratio of students over 25 years of age at higher education is very low, at 2.0%, compared with the OECD average of 21.1%.[25] The reality is that college education has been and continues to be rated low in relevance and significance for employment by the workforce.[26] Universities are not perceived to be the place for learning after graduation: only 6.7% of all attend college after they start working. Conversely, over 50% of the total workforce does not use educational institutions for their skill development.[27] In addition, a recent survey shows that over 80% of businesses do not think universities are responding to the current requirement for human capital and that of the business community, although 80% of universities believe they are doing the job.[28]

Historically the company approach to recruiting and human resource management has been the one-time hiring of graduates right out of college, and a few mid-career hirings, followed by fixed time for promotion for the first 10 years, rigid assignment without rotation leading to a single career path and assessment based mainly upon tenure and within the department. But this approach has not kept up with the changes in the business environment, with some critics pointing to training young people with basic skills but not providing continuous learning.[29,30]

So what can all the major stakeholders – companies, educational institutes, governments, other organizations and individuals – do to build up the workforce and stimulate innovation? The rest of this chapter focuses on solutions for each group.

What Companies Can Do[31]

To begin with, companies need to *articulate the growth vision and stretch goal to attract and retain the "right" group of people*. Each employee – regardless of age or gender – should be asked to grow to achieve the goals of the company's business. Top management should reinforce the message by redesigning the company's human resource (HR) systems with the aim of encourageing, recognizing and rewarding the growth of individuals.

In fact, this is exactly what a number of companies in Japan are trying to do. Take the case of Daikin Industries, which is ranked 100 in Forbes' World's Most Innovative Companies 2013.[32] The company president repeatedly emphasizes the importance of valuing individual growth and "constant stretch", driving individuals – including older workers – to seek better and higher goals (see Box 1). Similarly, IBM encourages its workforce to acquire the new capabilities needed to implement its business strategy (see Box 2). Doyukai, one of the major business associations, has set a goal for member companies to ensure that women achieve 30% of leadership positions by 2020.[33] In response, companies such as Hitachi have set up clear targets – like increasing female managers from 400 in 2013 to 1,000 in 2020 and having at least one female board member by 2013.[34] Such corporate examples and clear goals, supported by good monitoring of progress, will help engage other resistant associations such as Keidanren.[35]

Box 1: Daikin Encourages Older Workers to Keep Growing

The Japanese air-conditioner manufacturer Daikin has grown rapidly in recent years through foreign market expansion and major acquisitions of competitors such as OYL in 2007 and Goodman in 2012. In the process, it has realized that it needs to rethink its human resource policies to better develop and retain talent on a global basis, regardless of age or experience. The new approach includes: (a) a shift from a seniority-based system to a merit-based system; (b) opportunities for individuals willing to take on challenges; (c) a compensation system to reward employees for not only achieving results but also for challenging themselves; and (d) a "no blame" policy for failure, which aims to encourage employees to take risks.

As a result, sales and profit growth have been impressive. Moreover, older employees are working until a later age, with around 90% of employees over 60 still employed. In 2011 Daikin became the first Japanese company to win the AARP's award for "Best Employers for Workers Over 50". An 81-year-old employee is still actively contributing to the company as a bilingual technical instructor, leverageing both his technical background and his experience of manageing a European subsidiary as its president. At one subsidiary the president and the factory manager, who were in their mid-50s, successfully turned the company around and received awards for providing employment for handicapped individuals.

Box 2: IBM Japan Targets New Skills for a Major Business Transformation

For IBM Japan, a rapidly changing business environment and deteriorating business performance in the 1990s meant the company needed to change its focus from producing hardware to providing knowledge and solutions in software and service. And that in turn meant restructuring the skills of its workforce.

To do so, IBM Japan first defined the skills required to be able to realize the company's business strategies. Next it established HR systems to promote developing the new skills, regardless of age or gender. Skills were identified and sorted by class/function and incorporated into the promotion requirements. A reward programme for both skills and tasks encouraged systematic learning of skills. And a skills committee reporting to the CEO ensured there was continuous design and maintenance of major skills to respond to the market needs.

As a result, staff have developed new skills to handle the switch in focus to software and service provision. Plus the payoff has been enormous, from losses in 1993 to hefty revenues since 2001, with the service business accounting for more than 50% of the profit.

Another strategy for companies should be to base evaluations, promotions and job matches strictly on an individual's skill set. A fair and transparent evaluation system regardless of gender, age and position title, is long overdue in Japan. For example, traditional labour practices such as assessment and performance evaluation based upon tenure and working hours have been identified as major obstacles for diversity promotion, with women citing the difficulty of balancing work and life as a key reason for leaving jobs after having a child.[36] Long working hours have been a norm in many Japanese corporations and changes have been difficult, but reform in this area will not only benefit women but also men and the elderly.

Companies should also seek ways to *facilitate diverse career paths and work styles*. Instead of a single career path and corporate-led assignment system within the narrow field, an open entry system should be established for employees. Orix

has done just that by creating an open entry system and free agent system – trying to make explicit both talent and business requirements, thereby encourageing the ageing workforce to start reskilling (see Box 3). Another way to spur different career paths and attract women and older workers is through job rotations across different fields and flexibility in work style. For women, life-stage events such as marriage and childbirth can make the "full-time" and fixed career pattern almost impossible.[37] But now that tele-work is possible with advanced ICT, the infrastructure exists to experiment with different work styles.

Box 3: Orix Gives Middle-Aged and Older Workers Tools to Redesign Careers

After the Lehman financial shock in 2008, Orix, a finance and property company, became aware of human capital issues – like an ageing workforce, changing job requirements and a mismatch between manager expectations and business needs. In response, the HR department designed a new career programme to cover all companies within the Orix group. First, career design workshops were conducted in 2011 for employees over the age of 50. Then a matching mechanism for people and tasks was launched, involving both an open entry system for those who want to develop expertise and a free agent system where employees register their skills, experience and the type of work they wish to do. Career counseling is also offered as a form of follow-up support.

The uptake of these programmes has been very successful. All 220 members over 50 participated in career design workshops. From the workshops 77 staff members have posted for semi-annual open entry system with 28 moved; 20 members moved in the free agent system.

What Educational Institutions Can Do

There is a major gap that educational institutions can fill by offering opportunities to *bridge education/skill development and employment* – for all groups of people, not just youth. One way to do this is by providing company employees such as middle-level managers with the where-withal to train others. For example, the University of Tokyo has initiated a veteran instructor training school to provide experienced manufacturing employees with the tools to teach others (see Box 4). Another way is offering lifelong learning programmes in collaboration with the private sector and government – perhaps taking advantage of the alumni network to help workers find a better job, earn a higher income or enjoy a better quality of life. So far, these types of activities are very limited, just open courses or anniversary events (at which donations are sought).

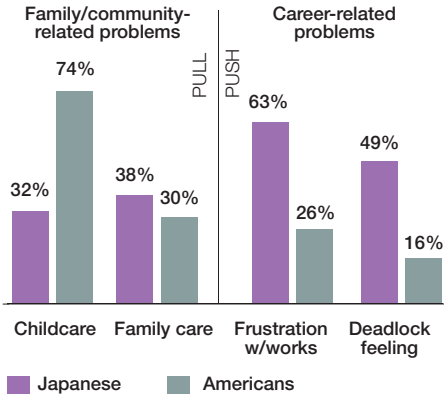
Box 4: University of Tokyo Trains Baby Boomers to Train Others

When Professor T. Fujimoto realized that Japanese manufacturers had few middle managers to train the young workforce, he initiated a programme at the University of Tokyo to reskill retiring baby boomers as instructors. The programme was an experiment to transform the tacit knowledge – which was perceived as proprietary by each company – to a more generic knowledge of manufacturing that would extend beyond specific companies or industries.

The programme began in 2005 with a six-month programme to reskill managers and technicians over 50 years of age. It taught the theory of operations management focused on *Kaizen* ("continuous improvement") and offered participants opportunities to apply the theory backed by their expertise and knowledge outside of their companies. The first intake included 15 members (with an average age of 57) from auto, industrial machinery, electronics, precision, chemical and food industries. To date, some 100 participants have been trained as companies embrace this initiative.

To increase women's participation in the workforce, educational institutions could help by starting early to increase the baseline.[38] This is important because in Japan the ratio of female students motivated to continue learning and have the goal or the will to seek employment decreases sharply at high school. Establishing schemes at the high school level to hire teachers with business experience for short-term rotations and inviting business people to teach classes might be helpful. At the university level, the ratio of female students majoring in social science has decreased since 2002 and is quite low, at 35% compared with an OECD average of 60%. Moreover, female university graduates leave jobs, citing career related problems (such as frustrations with work and a sense of little prospect for promotion) – a bigger concern than the difficulty of work–life balance, unlike in America, where the opposite is true (see Figure 4).

Figure 4: Why University Female Graduates Leaves Jobs



Source: "Off-Ramps and On-Ramps: Keeping Talented Women on the Road to Success" by the US NPO, Center for Work Life Policy (2011)

What the Government Can Do

The government could initiate and support a comprehensive approach involving companies, business organizations, educational institutions and nonprofit organizations. Some specific proposals follow.

The government should *promote clear goal setting* for the relevant stakeholders. For gender issues, the Abe administration has set up a clear goal of attaining 30% of the leadership positions by women by 2020 as one of the important pillars underlying Japan's growth strategy.[39] It has also asked three major business associations to support improving the status of women in the private sector[40] by including at least one woman as a board member by 2020. For lifelong learning (recurrent education), the goal is to double the number of those enrolled at universities and specialized schools in five years.[41]

The government should *set up standards and offer common platforms.* As a starter, the government can initiate and monitor the comprehensive skills standard, which is designed to evaluate the level of competency/knowledge required for a specific job.[42] In fact, the government has begun to do this in the hopes of helping individuals assess their own skills and identify areas for continuous learning. The "Professional Skills Evaluation Standards" developed by the Japan Vocational Ability Development Association[43] is such an example. This type of standard, if utilized extensively by companies, will greatly help women re-enter the labour market after temporary leave.

The government could also help set up a web-based, integrated solution that provides quality assessment of individual skills, generates career options and develops programmes based on individual assessment results, by building a network of institutions in the areas of assessment, career design and skills development. This platform could help individuals consider next career steps, independent of gender or age, and be leveraged as a talent market for employers who might provide immediate job opportunities.

The government could *promote the concept of lifelong learning* and create a friendly environment for the workforce to continue learning by collaborating with the private sector and possibly with educational institutions and nonprofit organizations. In this area, some initiatives have begun. Obstacles often identifed by the workforce to relearn skills include time constraints, course fees and location.[44] The government could also offer direct support by offering scholarships and other subsidies for students and for companies that send employees to outside programmes. Award programmes are also planned by the government to recognize good practices. The government should continue this effort by ensuring collaboration among three ministries – MEXT (Ministry of Education, Culture, Sports, Science and Technology), MHLW (Ministry of Health, Labour and Welfare) and METI (Ministry of Economy, Trade and Industry).

The government should *create the infrastructure to help empower women.* The Abe administration, as a part of empowering women, has proposed three-year parental leave, but it has met with mixed reactions,[45] as there is some evidence that parental leave longer than two years correlates negatively with women's labour force participation.[46] Both parents should be encouraged to take this type of leave, although the ratio of fathers who take parental leave is extremely low at 2% – it is often reported that fathers are reluctant to take parental leave, because of peer pressure and perception at work.

An evaluation system for promotion and open entry system for job rotation might help make such leave more attractive and more childcare facilities would make it easier for more women to return to work and assume more responsible positions. The Abe administration has set a goal to eliminate the number of infants who cannot be accommodated at childcare facilities by 2017, currently estimated at somewhere between 20,000 and 500,000.[47] Local governments and companies have built more facilities. In Yokohama, Mayor Fumiko Hayashi accomplished the goal of zero waiting infants in April 2013 not only by increasing the number of facilities and budgets but also by offering a variety of services (such as counseling for mothers and matching of real estate owners and childcare operators through an information exchange).[48]

What Other Organizations such as Nonprofits Can Do

Nonprofit organizations (NPOs) could *develop a comprehensive and coordinated information sharing platform* on job, skills and learning opportunities. For women, business associations – such as Doyukai, J-Win (http://www.j-win.jp) and the Women Corporate Directors Japan chapter (http://www.womencorporatedirectors.com/) – already have databases on women leaders and candidates for leadership positions. Other organizations such as G1 and ewoman (http://www.ewoman.jp) have their own website or Facebook page and groups. If well coordinated, the platform could serve as the hub for sharing information and for casual and informal networking on a frequent basis. It could also provide a source of role models of women with a satisfying career, which in Japan are scarce.

For the elderly, a similar information-sharing platform could be effective, but to date there are few in existence. A good example of what can be done though is SECURITE, a web-based site for individual investors (see Box 5). As companies accumulate skills and experience, the information-sharing platform could be quite effective in matching jobs and people with a required set of skills. If some skills are missing, the platform could serve as the trigger for reskilling. The platform could also serve as a source of role models for the elderly.

Box 5: SECURITE: An Open Platform for Micro Investment Funds

SECURITE is a micro investment fund management scheme that aims to support local traditional industries as a way to promote small businesses to expand their businesses. It is an open platform for micro investment funds designed and operated by Music Securities Inc., a fund management company in Tokyo. The key idea is to discover business owners with business sense and the potential to appeal to individual investors and then help them improve their marketing skills to expand their businesses. Suitable business owners are found through reliable third parties who have good local knowledge of industries and then matched with a compatible investor.

Since 2009 there have been 187 funds of 99 companies from different industries such as agriculture, forestry and sake brewing. Of these, 71 funds have been redeemed and 80% of those redeemed funds have exceeded the original principal. There are about 5.3 million registered members and more than ¥33 billion has been raised.

NPOs can *set up an informal and open exchange for individuals and jobs.* This would enable individuals to reflect on their own aspirations, identify development areas and find appropriate learning programmes or a job. It would also offer older employees and women the chance to become aware of the need for stretch and growth, expand the applicability of their own skills, review individual motivations and provide role models and promote the matching of latent business opportunities.

By collaborating with companies – as in the case of NEC Craftsman Workshop – NPOs can tap rich experiences and skills accumulated in the elderly workforce of large corporations. NEC, in conjunction with the Japanese Philanthropic Association, has initiated a corporate social responsibility programme of workshops to enable older workers to contribute skills and experience after retirement. Through the workshops, participants identify how they can contribute and they are matched with suitable NPOs in terms of interests and preferences. These participants tend to be former company executives or businessmen engaged in global business. In the first year there were eight participants of which three became active in NPOs; in the second year there were 11 participants of which five are now establishing NPOs.

NPOs and other organizations can *arrange events and awards* to raise awareness and recognize the importance of entrepreneurs and mentors. Recent initiatives include a women business competition by the Development Bank of

Japan, a women's initiative forum by Cartier & McKinsey supported by Nikkei newspaper[49] and a social business award organized by Nikkei. Awards could serve as networking opportunities for motivated applicants and as the source of role models. More skill development programmes need to be in place so that women with good ideas can develop concepts into a business plan. These events could encourage women (and possibly the elderly) who want to create their own job, using technology and their own business acumen.

What Individuals Can Do

Individuals could *set up a vision or stretch goal for themselves*, reflecting their own aspirations and motivations, instead of waiting for companies and the governments to design their career and life for them. And they should set themselves free from any stereotypes based on age, gender or past career track records.[50]

Individuals could seek opportunities to *evaluate the level of their own skills, on a market basis*, outside of the company. Money is not necessarily the best indicator, but comparing one's current salary with the market price of an equivalent job is a useful way to know where one is positioned. If over-valued, think about how to create more value in one's role. If under-valued, explore a new job opportunity to realize the value.

A Comprehensive, Not Piecemeal, Approach to Reform

Japan is now faced with both short-term and long-term problems in the area of human capital, no doubt complicated by a shrinking workforce and an ageing society. It has long been internationally recognized for an intelligent and hard-working workforce made possible by a good educational system at schools and training/skill development programmes offered by companies. But concerns now are surfacing about (a) a "divide" between universities and the business community in responding to the needs for new knowledge and skills required for the contemporary reality of global competition and a digital world; (b) the limited employment opportunities for the educated population (especially women); and (c) the increasing need for reskilling and continuous learning (especially for older workers).

What the country needs now is not another initiative or programme to address separate issues, but a comprehensive and coordinated package to address all of these issues. That will require all stakeholders – namely, educational institutions, private sector companies, government, NPOs and individuals – to interact and collaborate continuously, instead of following the sequential model of education, skill development and employment.

At this stage, several pieces are already in place for gender issues, while little has been done for the elderly. Granted, some measures are difficult to implement. But when it comes to developing human capital for a country with little other resources, the time is now.

Endnotes

1. *Population Census*, Statistics Bureau, Ministry of Internal Affairs and Communications, 2012; *Population Projections for Japan*, National Institute of Population and Social Security Research, January 2012.
2. *Labor Force Survey*, Statistics Bureau, Ministry of Internal Affairs and Communications, 2012.
3. *Vital Statistics*, Ministry of Health, Labor and Welfare, 2012.
4. *Japan Revitalization Strategy – Japan is Back*, Cabinet Office, 2013.
5. *Third Proposal; University Education & Global Human Resource Development for the Future*, Council for the implementation of Education Rebuilding, 2013.
6. *Labor Force Survey*, 2012 op. cit.
7. *Databook International Labor Comparison*, Japan Institute for Labor Policy and Training, 2012.
8. *Survey Concerning the Participation in the Community, Society of Elderly People* Cabinet Office, 2008.
9. *Survey of the Current Status of Employment of the Elderly*, JILPT, 2011.
10. *Human Capital Report 2013*, World Economic Forum, 2013 .
11. *Can Women Save Japan?*, IMF Working Paper, Goldman Sachs Report, 2007.
12. "Gender diversity and corporate performance", Credit Suisse Research Institute, 2012, "Gender diversity & corporate returns" Daiwa Securities Research Institute, 2012, "External pressure for female board member", Nihon Keizai Shimbun, 28 June 2013.
13. *Revitalizing Economy Through Women Power*, Ministry of Industry, Economy and Trade, October 2013.
14. *White Paper on Gender Equality 2013*, Cabinet Office, June 2013.
15. *School Survey*, Ministry of Education and Technology, 2013.
16. "Closing the Gender Gap", www.oecd.org/gender/closingthegap.htm, 2012.
17. UNESCO, *Institute of Statistics through Human Capital Report*, 2013.
18. *OECD Education at a Glance*, OECD Indicators, 2013.
19. "OECD Skills Outlook", http://skills.oecd.org/skillsoutlook.html, 2013.
20. *Global Competitiveness Report, Executive Opinion Survey*, 2013.
21. "World university rankings, 2012–2013", *Times Higher Education*, 2013.
22. *OECD Education at a Glance*, OECD Indicators, 2013.
23. *Third Proposal; University Education & Global Human Resource Development for the Future*, Council for the implementation of Education Rebuilding, May 2013.
24. *School Survey, Educational Reform Third Proposal*, Ministry of Education and Technology,2013 *Japan Revitalization Strategy*, Cabinet Office, 2013 .
25. OECD Education Database 2009, "School Survey", Ministry of Education as reported in *The Third Proposal*, ibid.
26. *Skills for Employment*, JILPT, 2013.
27. *Working Person Survey 2012*, Recruit Works Institute.
28. *Survey of human capital required today*, Sundai Education Institute, Sankei Shimbun, 2012.
29. Satoshi Tsukada, "Characteristics of workplace management and the expansion of women's roles in Japanese Corporations"(in Japanese), Policy and Business Research, http://www.murc.jp/thinktank/rc/quarterly/quarterly_detail/201302_23.pdf. Kanae Sano "Drawbacks of Japanese-Style Personnel Management in Expanding the Role of Women", , Policy and Business Research 2013, http://www.murc.jp/thinktank/rc/quarterly/quarterly_detail/201302_31.pdf.
30. *Japan Revitalization Strategy*, 2013 op. cit.
31. The author wishes to thank the Mercer Japan team, led by Masaki Nakajima, for conducting company interviews and assisting with data analysis related to the reskilling of older workers.
32. http://www.forbes.com/innovative-companies/.
33. Keizai Doyukai, "Toward real diversity at the decision making board" (in Japanese), http://www.doyukai.or.jp/policyproposals/articles/2012/pdf/121016a.pdf, October 2012.
34. "Departure from male-dominated society", Nihon Keizai Shimbun, 11 August 2013.
35. Keidanren was believed to have been instrumental in blocking the disclosure of information related to diversity. "Report by the Committee to reveal women's activities in the capital market" (in Japanese) December 2012.
36. "Drawbacks of Japanese-Style Personnel Management in Expanding the Role of Women" Policy /Business Research", , op.cit.
37. "Comprehensive Study on Issues Concerning Work – Family Life Balance Support", Mitsubishi UFJ Research and Consulting Co Ltd, 2008, "Survey of Diversity Status", Ministry of Health, Labor and Welfare http://www.mhlw.go.jp/toukei/list/dl/71-24b.pdf.
38. "Start early for active female participation in labor market" (in Japanese), Japan Center for Economic Research, 2013.
39. Other policy initiatives such as extension of parental leave, childcare facilities, tax incentives and pensions related to the mechanisms will be discussed later.
40. *White Paper on Gender Equality 2013*, op. cit.
41. "Educational Reform", *Third Proposal*, "University Education and Global Human Resource Development", Ministry of Education, op.cit.
42. The initiative comes under its Growth Strategy in order to promote the shift of the labour forces to growing segments, "Japan Revitalization Strategy".
43. "Skills evaluation standard" (in Japanese), Japan Vocational Ability Development Association, http://www.hyouka.javada.or.jp/user/outline.html.
44. *Survey of workforce for university education 2009* (in Japanese), University of Tokyo, University Management and Policy Research Center.
45. "How about 3-year leave for both parents", interview article with Yoshihisa Aono, CEO of Cybozu, http://www.nikkei.com/article/DGXNASGG2900C_X00C13A5000000/; "3-year parental leave leading to more housewives with no career?", interview article with Kaori Sasaki, ewoman (in Japanese) http://diamond.jp/articles/-/39332.
46. Kotaro Tsuru "Avoid career gap for women" (in Japanese) ,Nihon Keizai Shimbun, 17 September 2013.
47. A huge range given that more mothers try to work as childcare facilities become available and it is almost impossible to estimate the number of infants requiring child care.
48. "Action to eliminate child waiting for child care facilities" (in Japanese), http://www.city.yokohama.lg.jp/kodomo/kinkyu/jidou.html.
49. "Women's Initiative Forum in Tokyo 2013-Women's perspective to start a business" Nihon Keizai Shimbun 7 October 2013, , "
50. *Self management of career*, NRI Report, 2012.

Measuring and Managing Our Assets

Chapter 11: Pay it Forward

Sami Mahroum and Elizabeth Scott[1]

Just who should foot the bill for education remains a hotly debated matter around the world. With both enrolment rates and average years of schooling going up in most countries, the education bill is getting heftier. Education systems are a key driver of human capital development and represent a fundamental pillar on which the future economic and social welfare of nations is built. It is therefore not surprising that the funding of education is a growing problem. Leaders, policy-makers and communities around the globe must work together to develop effective and robust funding models that ensure people have equitable access to quality education and are thus empowered to reach their full potential as productive members of society.

The increasing number of countries seeking to develop knowledge-based economies in which innovation and creativity play a central role is also elevating the importance of investments in human capital[2] and knowledge generation through education. At the same time, many countries are grappling with fiscal challenges unprecedented in recent history that demand close scrutiny of budgets to maximize the efficiency and effectiveness with which governments allocate finite public funds.

Conventional approaches to funding education clearly have limitations in so far as achieving both equity and quality goals for education. As a result, the development of new and innovative education financing models will be critical looking ahead. This is particularly true in developing countries where the demand for education is rapidly exceeding supply and where education is often the only way out of poverty for vast sections of the population. The aim of this chapter is to discuss key challenges in funding education in order to achieve equity goals, to examine past and present funding models, to identify potential options going forward and, most especially, to address the question of who is going to foot the education bill.

The Issue of Parity and How it Matters

Education is widely considered a means to increase workforce productivity, promote social mobility and reduce poverty and inequality. Consequently, primary education is nearly always compulsory in most countries, while many countries also require some level of lower-secondary education. Since 2000 the number of years of compulsory education has been generally rising, with the global average duration of compulsory education being 8.9 years in 2010 (UNESCO, 2012). It is perhaps not surprising that total public and private spending on all levels of education rose from 5.3% to 6.2% of GDP between 2000 and 2009,[3] with growth in private spending outpacing that of public spending (OECD, 2012).4 Moreover, growth in expenditure on all levels of education exceeded GDP growth.

But meeting the funding requirements of increased enrolment at all levels of education has emerged as a major challenge for countries around the globe. Debate surrounds the appropriate minimum level of education that should be provided by governments, with lower levels typically associated with less developed countries.5 This might in part reflect higher opportunity costs of education in countries where children are actively engaged in production and where citizens have short lifespans. Nevertheless, inadequate budget allocations and high growth in the number of school-age children in developing countries are key contributors to compulsory attendance goals going unmet.6 Indeed the young age profile of populations in many developing nations has exacerbated the funding challenges governments face as they tackle the nexus of equity, quality and costs within their education systems. India, for example, has a population of over 1 billion people of which 50% are 25 years of age or younger.7 A similar situation exists across the Arab world and in many other Asian and African countries.[8]

The interplay of social[9] versus private returns on investment in education can also have an important influence on the choices governments make in funding models by level of education, especially when providing equitable access to quality education when students move to noncompulsory levels of study. In an important trend, the OECD indicates participation in education beyond compulsory schooling has grown from a "small minority to the vast majority" (OECD, 2009, 2012). And as we move up the education ladder to secondary, upper-secondary and postsecondary education, the private share of funding tends to increase in most countries. This trend can at least partly be explained by the commonly held view that the social rate of return to investments in education are highest at the primary level, and the private rates of return to both secondary and tertiary education are strongly positive (Boissiere, 2004; Campbell et al., 2003; Kara, 2010; Psacharopoulos, 1994 and 1995; Psacharopoulos and Patrinos, 2002). Nevertheless, recent studies suggest that the returns to primary education might be declining vis-à-vis returns to higher levels of education (Colclough et al., 2009) – meaning that there might be more reason for public investment in higher education.

Certainly, higher education influences social mobility across a population. Furthermore, returns on investments are typically greater for countries at lower levels of economic development with the scarcity of skilled human capital providing a significant premium to tertiary-educated workers. In any event, returns on higher education remain positive in high-income countries for both individuals and society, supporting arguments for cofinancing models[10] (Gropello et al., 2011). Accordingly, the introduction of fees for university students has been justified on the grounds that it apportions at least part of the cost to those who benefit from it most directly and provides an incentive to students to complete their studies efficiently. Public funding of higher education, if not means-tested, redistributes resources away from low-income taxpayers to (future) higher-income taxpayers and may therefore be viewed as regressive (Greenaway and Haynes, 2003).

US Department of Education estimates suggest that 54% of students from the highest-income quartile complete a college degree compared to only 9% of students from the lowest-income quartile.[11] This education attainment gap contributes to a widened gap in levels of income among different groups in society as private returns on investment in higher education include increased earnings potential and greater job opportunities. The social cost might even be higher when taking into account estimates of the lifetime economic consequences of educational attainment in terms of health, crime and welfare. In fact, a recent study by McKinsey and Company (2009) underscores the enormous economic impact of the achievement gap[12] in US schools (see Box 1).

Box 1: How Significant Is the Economic Impact of the Achievement Gap in US schools?

A study by McKinsey and Company (2009) finds that, "avoidable shortfalls in academic achievement impose heavy and often tragic consequences, via lower earnings, poorer health, and higher rates of incarceration". They estimate that if the United States had closed the gap between educational achievement levels and those of better performing countries such as Finland and Korea, its GDP could have been US$ 1.3–2.3 trillion higher in 2008, with the loss representing the equivalent of a permanent national recession.

Besides income considerations, intergenerational legacies can affect the equity and quality of participation in education when families and communities lack a culture of educational attainment. Indeed, studies show that parents' education influences their children's education and subsequent life-course outcomes (like occupational status) (Andrew, 2012). Moreover, if students from low socio-economic backgrounds have low rates of school completion, it exacerbates the situation (Polidano et al., 2012). Thus, a key way to break this vicious circle is by increasing the completion rate of students of low socio-economic status.

Ultimately, the education gap among students results not only from enrolment and drop-out rates but also from variations in the performance of schools and school systems serving similar students. As a result, equity and quality goals often work against each other. Striking the right balance between public and private investment in different levels of education, and the funding mechanisms adopted, demands that policy-makers address concerns of both equity of access and outcomes achieved – including the quantity, quality and content of educational provision and output in meeting a country's labour market and economic needs.

So Who Should Foot the Rising Education Bill?

As early as the 1950s, the eminent free-market economist Milton Friedman (1955) argued that gains from education are a public good and should be funded accordingly, as benefits not only accrue to the individual but to society at large by promoting a stable and democratic society. Policy arguments supporting universal access to education advocate public funding of education on the grounds that it is a social investment necessary to avoid negative externalities such as crime and unemployment. Moreover, education is believed to promote positive externalities such as productivity, civic engagement and equity (Buckingham, 2011). In order to feasibly enforce a minimum level of education, government subsidization is necessary and can be justified by the associated net social welfare gains (Friedman, 1955; Boissiere, 2004).

Many of the social costs associated with education can be easily measured. However, positive externalities, or social benefits, are less easily quantified, which hinders informed debate and decision-making. While arguments advocating universal access to a minimum level of government-funded education are widely supported – with 61 million children of primary school age estimated to be out of school (UNESCO, 2012) – it is clear that this does not always translate into effective education policy on the ground. But as argued by Campbell et al. (2003) in analysing the policy debate surrounding UK education financing, "funding issues cannot be resolved in purely technical terms, but are contingent on ideological perspectives about broader economic and social priorities". Finland is one such an example of an education system that is fully government-funded and where even the establishment and operation of private schools remains tightly regulated. The merits of the Finnish system are evidenced in the performance of its students who consistently rank at the top of OECD international standardized tests (Hancock, 2011).

Besides Finland, many other countries provide free education up to university level – particularly in European countries such as Denmark, Greece, Norway and Sweden (EC, 2012) – while in other countries the privilege of free education is granted only until primary or secondary school levels (e.g. the United Kingdom and the United States). In an interesting policy reversal, Austria and Germany recently abolished tuition fees in higher education as they were considered politically divisive (Redden, 2013).

While financial pressures have seen many countries permit the establishment of private educational institutions to meet excess demand, or a lack of certain skills or expertise, opponents of private schooling – including the likes of US billionaire investor Warren Buffett – argue that it perpetuates inequality and diverts money to elite private schools rather than to the betterment of public schools that are open to all. This has led to calls for the banning of private schools in numerous countries including the United Kingdom and the United States.

Exactly who should foot the education bill is therefore an important question not only in relation to finding the resources needed to finance education but also because of its implications for social cohesion and equity. Passing more of the bill to private households carries the risk of reducing access to education and widening the gap between those who can afford to pay for education and those who cannot. While research suggests the demand for education is inelastic, at least at the tertiary level, Hamadeh and Khoueiri (2010) show that low-income individuals are more sensitive to variations in price and income. This represents an important consideration for policy-makers trying to develop funding models that address equity issues.

Equity Should Not Imply Homogeneity

Quality is an essential dimension in any policy discussion about education where governments try to maximize the value that may be obtained from the funds they have to spend. Where parents perceive insufficient quality in government schools or wish to obtain a competitive advantage for their child, they are often willing to pay the premium required to send their child to a private school. Unfortunately, this can leave the children of families unable to afford private school fees at a disadvantage and compromises equity objectives. Nevertheless, there is a lot governments can do to ensure better equity while not giving up on the quality of education provided.

The challenge within so-called "equitable" public school systems has been that they often seek to homogenize the format and process in which education is delivered. Consequently, they inadvertently risk stifling the autonomy and flexibility of school administrators and teachers to respond to local needs or to innovate in ways that improve outcomes. This takes away a potentially important channel for improving the efficacy of the education system. In countries where education budgets are tight, teachers in public systems also have to contend with insufficient resources and large class sizes that limit what they can hope to achieve. However, Peterson's analysis of US school data shows that even among private schools with fewer financial resources, having more choice, smaller class sizes, greater administrative simplicity and stronger extrinsic learning incentives (such as more homework, greater communications between school and family and higher behavioural and educational expectations) produces better outcomes (Peterson, 2008).

As a result, a number of governments[13] are now looking at ways to empower public schools to operate with more of the autonomy and incentives associated with private schools. School-based management (SBM) is one such policy approach that aims to maximize returns on public spending in education by decentralizing decision-making authority for public school operations and management to principals, teachers, parents, members of the wider community with a vested interest in student outcomes and, in some cases, even students themselves (Barrera-Osorio et al., 2009; OECD, 2013; Polidano et al., 2012). The inclusion on school management boards of members of the business community who can contribute proven credentials in administration especially when overseeing the allocation of school resources can also be beneficial.

The disbursement of public monies has brought with it greater accountability and monitoring of performance, including student and teacher assessment. This requires more effective evidence-based decision-making at a central government planning level, particularly as more nuanced frameworks for student assessment that include multiple sources of evidence (like Finland and New Zealand) and focus on creative thinking and independent problem-solving skills (like Singapore) are being implemented (OECD, 2012).

In 2009, the OECD's PISA study, which investigated the relationship between school performance and school autonomy, found that while the degree and types of school autonomy vary widely, greater autonomy and accountability tended to be associated with better student outcomes (OECD, 2011). PISA tests found that greater freedom in decision-making about curricula (such as courses, content and

textbooks), student assessments, policies and staff recruitment were positively correlated with better school performance. However, greater autonomy in resource allocation decisions was found to have no effect on school performance in terms of PISA test results.

As for the applicability of SBM systems in developing countries, a study by Caldwell (2005) – which looks at the introduction of SBM systems in 79 schools in Indonesia and seven Latin American countries – finds that the introduction of SBM systems was instrumental in bringing about improved learning outcomes for students (see Box 2).

Box 2: School-based Management Systems in Indonesia and Latin America

Are SBM systems a useful tool for developing countries? The answer appears to be yes, according to Caldwell (2005), who examined the impact of a pilot programme that introduced an SBM system in 79 schools in Indonesia (funded by UNESCO, UNICEF and the government). The study determined that the programme resulted in dramatic improvements in both school attendance and test results. However, the outcomes of this programme were also influenced by the concomitant provision of professional development for teachers on new approaches to curriculum and teaching, as well as efforts to improve levels of student and community engagement. Caldwell also highlights the findings of a study of schools in seven Latin American countries that concluded that the introduction of SBM systems was instrumental in bringing about improved learning outcomes for students.

A Shift to Cofunding Arrangements

Many fiscally challenged governments have opted for cofunding solutions that combine both public and private sources of funding in attempts to improve equity of access to quality education across their populations. Policy-makers cite the private benefits of education to justify private contributions from those with the ability to pay, while government subsidies are targeted at those least able to afford the cost of education. However, in low-income countries with young population profiles, such as India, that face strong growth in the demand for education and a marked increase in the share of education funding coming from private sources, achieving equity objectives continues to present a challenge. In an effort to include all sections of the population in the Indian education system, the government has introduced "positive discrimination" or "affirmative action" strategies. While these measures have seen enrolment in primary schools increase, an estimated 2.3 million Indian children of primary school age remain out of school (OECD, 2012).

Since 1978, China's education system has also transitioned from being entirely government funded to one that is significantly financed from private sources. But Chow and Shen (2005) indicate that while the government mandated nine years of compulsory government-funded education, responsibility for providing it was devolved to provincial and local governments, which in turn imposed private tuition fees to meet funding shortfalls. Such privately sourced funding was estimated to be as high as 50% in 2002, with a significant proportion of Chinese children aged 15 years and younger receiving below the compulsory minimum level of education.

It is also inevitable that education systems with both private and public educational institutions will experience some degree of inequity along income lines. Variations in tuition, quality and services among primary-level government-funded public schools in many countries have resulted in an increasing number of parents opting to send their children to privately funded nongovernment schools that are often better equipped and staffed. The consequent effect has been that private households now foot a large part of many national education bills. Meanwhile, families that are less well-off have little choice other than to send their children to publicly funded schools, many of which struggle with stretched budgets and overcrowded classrooms.

A further trend in most countries is for the share of private funding to increase as students move up the education ladder (with the exception of preprimary education). This likely reflects higher private rates of return on investments in tertiary education and has seen the introduction of cofunding mechanisms as well as the establishment of privately funded tertiary institutions in many countries to meet the growing demand for university placements.

School Voucher Schemes

School vouchers represent an increasingly popular cofunding model that provides student-based government funding allocations that can be used at both private and public schools and can be used to address both equity and quality issues. In Sweden, for example, the government funds private schools – including for-profits – to the same level as municipal schools through an unweighted voucher system that allows students to attend their school of choice (Buckingham, 2011). Where governments provide vouchers for use at private schools, this essentially represents a form of public–private partnership. Voucher-based funding generally reflects student enrolments and is typically conditional on schools meeting performance criteria reflecting student outcomes and efficiency gains. As a result, the role of governments in many countries[14] has shifted toward that of policy-maker and administrator rather than provider of educational services (Buckingham, 2011; NEA, 2013).

Voucher schemes can be designed to achieve specific equity objectives by providing student-centred government funding that can be weighted according to socio-economic status and other forms of educational disadvantage (such as race, language proficiency and socio-economic status), irrespective of whether they attend public or private schools (Buckingham, 2011; Gonski et al., 2011). The rationale is that educationally disadvantaged students are more difficult to teach and thus merit the greater level of teacher and school resources typically associated with private schooling.

How have voucher systems fared in developing countries? The positive evidence so far mainly stems from Colombia and Chile (see Box 3), unlike in other developing countries located in Asia, Africa or Europe, where the benefits are less clear (Srur, 2012). Nevertheless, the experiences in both Colombia and Chile would appear to indicate that voucher systems have led to improved attendance and educational outcomes. Benefits, however, have generally been limited to urban areas owing to an absence of private schools in rural areas (thereby limiting school choice and incentives through competition). Furthermore, public schools in rural areas are less likely to be able to participate in voucher schemes where they are also required to partially finance programmes (Srur, 2012).

Box 3: School Voucher Systems in Colombia and Chile

In the early 1980s, Chile decided to reform its school system. The government transferred administration of public schools to local municipalities. It allowed the private sector to participate in publicly financed education by introducing a school voucher scheme that provides student-based subsidies to both municipal-run schools and private schools. The Chilean system also allows private schools that are fully funded through fees paid by parents. Studies of a nationwide voucher program operating in Chile over the years have shown mixed results, although on balance they would appear to indicate student attendance and outcomes have risen. However, research indicates that the Chilean programme has resulted in student sorting, with better performing students within the public sector leaving to attend private schools (Patrinos, 2012).

In 1991, Colombia introduced a government-funded voucher system designed to provide the poorest third of the country's population with access to secondary schooling. Running until 1997, the programme was oversubscribed and vouchers were allocated through a lottery. A recent study suggests that the voucher beneficiaries achieved higher levels of educational attainment than nonvoucher students: they were 6% less likely to repeat a grade; scored 0.2 standard deviations higher in achievement tests; were 20% more likely to sit a college entrance exam; were less likely to be married; and earned higher wages (Patrinos, 2012).

Cofunding Mechanisms at the Tertiary Level

To address the growing demand for tertiary-level education, a broad variety of funding mechanisms exist at the tertiary level. These range from fully funded public universities in Nordic countries to elite private universities and colleges (in countries like India and the United States) that enjoy tax-free status and receive research grants from the government. While the high fees associated with private universities usually preclude the participation of low-income students, most countries also provide some level of government subsidization often based on cofunding models such as income-contingent student loans. In providing student loans, governments use their discretion to tailor the parameters according to employment (like part-time, casual, full-time), level of earnings and interest and repayment rates – as well as to reflect the market realities of supply and demand for different qualifications, reflecting the costs of delivering different degrees.

While the Nordic countries have had a student loan system in place that dates back to the 1940s, in 1989, Australia was the first country to introduce fees repayable in the form of income-contingent loans provided to cover the portion of fees not subsidized by the government. These loans require repayment of fees once students have completed their studies through a tax levied on their income above a threshold level. Low-income students are also granted a student support allowance to cover, at least partially, living expenses while studying. Similar systems have since been introduced elsewhere including in New Zealand and the United Kingdom.

Reports assessing the impact of income-contingent student loans on accessibility to university education have been mixed and, at least in part, reflect the terms and conditions of loan repayments. This suggests that particular attention should be paid to the design of student loan schemes to achieve equity objectives. University participation rates in Australia and New Zealand continued to increase following the introduction of student loans, including the participation of low-income students (Chapman and Ryan, 2002; NZ MOE, 2008), although resulting high debt loads in New Zealand have taken a toll (see Box 4). In contrast, the introduction of student loans in the United Kingdom – offsetting higher tuition fees – is reported to have left university participation rates unaffected (Dearden et al., 2010). These findings align with an OECD study (2012) that determined the relative share of private expenditure had little impact on access to higher education.

Box 4: New Zealand's Student Loan Scheme

In New Zealand, the administration of its student loans scheme has been associated with a number of adverse outcomes. Rising levels of student debt have been attributed as a causal factor in declining birth rates and lower levels of home ownership, wherein graduates have had to spend more of their income servicing this debt – thus being unable to start a family or afford the deposit for a home loan (CFS, 2007). New Zealand's loan scheme comprises a relatively low repayment threshold, high interest rate, and a high level of repayments following graduation (Baxter & Birks, 2004; Maani & Warner, 2000).

The experience in the United Kingdom is interesting also because Denny (2010) similarly reports that when tertiary education in Ireland became free, differences in participation across socio-economic groups corresponded to pre-existing student performance at secondary level – where those students from white-collar backgrounds generally performed better in final exams than those from blue-collar backgrounds. The policy implication is that there are factors beyond affordability of tertiary-level education that enhance or hinder participation and that early intervention and policies that address underperformance at school level are likely to be more effective. Policy responses could include improving equity of access for socio-economically disadvantaged students to pretertiary education and improving secondary school completion rates. Policy options include providing student-based weighted voucher schemes and subsidizing key tools of learning (such as school meals, Internet access, e-textbooks, tablets and laptops) at the pretertiary level.

Achieving Global Equity Through International Cofunding?

Just like within countries, the challenges of equity and quality within education systems manifest themselves at the global level too, albeit through different means. Through the movement of people, the bulk of investments made in education by an entire generation of a developing country can be captured by a more competitive economy elsewhere. As a result, developing countries can lose their most talented people to the developed world where salaries and lifestyles are better. The World Bank (2007) argues that while migration provides an important channel for resolving labour market imbalances in domestic markets, the home countries incur major losses in terms of utility, consumption and competitiveness. Consequently, while remittances help mitigate part of the value capture problem, additional measures are required to ensure equity objectives are achieved at a global level – including possibly introducing international cofunding mechanisms that better reflect both private and social benefits and costs of education across geographies.

The Need for a Paradigm Shift

Around the world, governments are experimenting with a wide range of financing models as well as new mechanisms for education delivery and management – often made possible by emerging technologies – with the aim of meeting access and quality objectives (see Table 1). Innovations in education finance are on the rise, although many reflect the specific circumstances and policy concerns in their countries of origin.

It appears unlikely that conventional public sector funding and delivery mechanisms alone will be sufficient to meet the enormous demand for education, either administratively or financially, in low-income countries as well as in many developed nations. With the demand for education growing rapidly around the globe, many governments are increasingly seeking new and innovative ways to increase private sector investment in education, especially in higher education.

Existing Models

Based on our analysis of existing funding models, we believe several existing models are worthy of consideration for broader application – all of which are discussed in more detail in the previous section.

School voucher schemes. At the primary and secondary levels, vouchers offer a promising option for student-centred cofunding arrangements that can be used to leverage private sector resources, while also targeting funds at children according to socio-economic status and educational disadvantage. Vouchers can also be used to encourage competition among schools to promote effectiveness and efficiency gains. In this way, well-designed voucher schemes may be used to achieve both equity of access and improved educational outcomes, although the design and implementation of such schemes should reflect the context of the education systems and countries in which they are being introduced.

SBM systems. School-based management systems, when coupled with strong accountability and management boards that include a broad mix of skills and experience, provide an effective mechanism for improving educational outcomes through more efficient and timely use of educational resources.

Income-contingent student loans. At the tertiary level, income-contingent student loans that cover university fees can be used to promote greater equity at the tertiary level. Nevertheless, loan repayment terms (including rates of interest, income thresholds for repayments and the terms and rates of repayment) warrant careful consideration.

Emerging Innovative Models

Drawing on our analysis of past experiences, studies of different education systems and alternative funding models, we believe a number of emerging and innovative mechanisms also warrant further investigation (see Table 1).

Massive open online courses (MOOCs). The advent of MOOCs in recent times has introduced open-access online education that breaks down physical and cost barriers to accessing higher education for anyone with a computer and Internet service. Often provided free of charge, or at comparatively low cost, they are currently changing the way higher education is funded. Not-for-profit organizations and universities currently provide most of the financial backing (Lepi, 2013). At this point, MOOCs face a number of challenges, including (a) providing acceptable course accreditation, (b) sourcing revenue to operate while still providing low-cost access, and (c) whether universities will continue to allow MOOCs to use their intellectual property. Even so, the potential exists for governments to develop new funding mechanisms to further develop this model to better target students from low socio-economic and other disadvantaged groups. This in turn requires greater levels of collaboration among government, industry and educators to develop effective digital solutions. While currently focused on higher education, this new delivery model not only has potential applications at the primary and secondary education levels but could also revolutionize the way all levels of education are delivered (Fullan and Donnelly, 2013).

Digitization of educational tools. Advances in the digitization of educational tools (including e-textbooks that can be downloaded to tablets) offer significant opportunities to reduce the cost of delivering educational programmes as well as improving access to education where textbooks, course material and programmes are delivered online across all levels of education.

Table 1: Models for Education Funding

What	Targeted Level of Education	Primary Objective
Existing models		
School voucher schemes	Primary and secondary education	Improving equity of access and education outcomes
Rolling out SBM systems	All levels	Improving education outcomes and more efficient resource utilization
Income-contingent loans	Higher education	Improving equity of access
Emerging innovative models		
MOOCs	All levels	Improving equity of access and more efficient resource utilization
Digitization of education tools	All levels	Improving equity of access and reduced costs
Funding tools for learning	All levels	Improving equity of access and education outcomes
Preferential pricing	Higher education	Improving educational outcomes
Securitization of student loans	Higher education	Improving equity of access
Scholarships and apprenticeships	Higher education (and senior secondary level)	Improving equity of access
Reversible bonds	All levels	Improving global equity of access and education outcomes
Tax incentives to address brain-drain	All levels	Improving global equity of access and education outcomes
Global education credit	All levels	Improving global equity of access and education outcomes
International assistance for developing countries	All levels	Improving global equity of access and education outcomes

Funding tools for learning. Drawing on the Irish model, the provision of "tools of learning", such as providing students with adequate nutrition (like school meals), access to technology (like Internet, tablets and laptops), and access to extra-curricular activities (important for social inclusion) represent important factors in breaking down barriers to accessing education and improving education outcomes for disadvantaged students. In India, the state of Bihar has experimented with giving out bicycles for girls to help them commute to school where transport has been a barrier.[15] The feasibility of developing cofunding opportunities for delivering projects that provide "tools for learning" should be investigated, possibly combining private sector sponsorship (e.g. by technology companies or food manufacturers) with government funding.

Preferential pricing of tertiary education. At the tertiary level, the potential exists for developing preferential pricing mechanisms for degrees and other programmes, whereby governments and higher education institutions (HEIs) collaborate to streamline faculties and courses offered so that the number of students graduating from a specific field aligns with labour market demand and a country's human resource planning goals. For example, fees for university programmes could be set to reflect:

- the demand by students for places in a particular field of study;
- the cost of programme delivery (such as the cost of providing science degrees is generally higher than that of a social science degree);
- labour market demand for graduates;
- relevance of the field of study in terms of national objectives for economic development.

Securitization of student loans. The securitization of student loans for higher education – where student loans are pooled into a trust and sold as asset-backed securities to investors – provides a potential vehicle for tapping into private sources of education funding (Copping, 2004). This in turn can free up public funding for other targeted purposes, including providing financial assistance to low-income students at the primary and secondary levels and crafting initiatives aimed at a better quality of education. Nevertheless, concerns arise regarding pressures graduates may encounter from private creditors should they find themselves unable to meet loan repayments, or should the repayments terms be altered retrospectively. Clearly, safeguards would need to be set to prevent retrospective changes being made by private creditors to the terms of student loan repayments.

Historically, the United States provided a model for the securitization of student loans. However, the collapse of the US subprime mortgage market resulted in a collapse in markets for securitized debt. A major challenge for the recovery of these markets involves overcoming the significant problems of accurately assessing the risks associated with these instruments. This is especially true for student loans, which are not typically tied to creditworthiness or ability to repay. Sabhlok (2012) suggests using a formula comprising students' grade score average, major and academic institution, to assess student creditworthiness as these factors are directly related to future employability and ability to repay. It is worth noting that the United Kingdom recently announced plans to divest a share of the government's student loan portfolio as a first tranche in privatizing a large student loan portfolio that is forecast to rise to close to 7% of GDP by 2033 from just under 2% of GDP in 2011–2012.[16,17,18,19]

Scholarships and apprenticeships. Governments and private sector organizations could make greater use of scholarships to either partially or fully fund the studies of selected students. Students can be targeted based on their socio-economic background, academic ability or a range of other eligibility criteria. Generally offered at the tertiary level, these schemes typically combine paid study with work and include offers of employment upon graduation, subject to results. Governments could encourage greater private sector involvement by offering incentives through a variety of means including (a) the taxation system (tax deductibility of scholarships); (b) preferential access to government contracts; or (c) cofunding scholarships (matching private sector funding dollar-for-dollar). They could also target industry sectors according to labour market needs and national development priorities. Additionally, these programmes could be extended to developing country students in return, for example, for a given period of employment with the sponsoring company or country on the completion of their studies.

As an alternate route to gaining more formal qualifications, governments could also increase the number of people undertaking apprenticeships by offering cofunded programmes that provide "on-the-job" training in vocational skills and qualifications in a variety of trades and potentially nontrade sectors (like office administration or hospitality). Greater funding from the private sector could come from similar mechanisms as those proposed for scholarship schemes.

Reversible bonds. One innovative solution recently proposed by Professor Ann Bradford of Columbia Law School is introducing a system of "reversible bonds". These could act as an insurance mechanism for both source countries as compensation for the cost of lost talent (costs of education and productivity losses), as well as to mitigate the risk to destination countries of potential welfare payments (unemployment benefits and healthcare), or to cover incarceration or deportation costs if the worker commits a crime.

How would it work? The employer in the destination country would post a bond – the amount of which could be agreed by both governments – and so long as the worker stays employed for a specified period, the bond could then be divided between the employer that posted it (as a reward) and the source country (as compensation). If the worker were to return home after a specified period, neither country would need compensation as the destination country would have benefited from the person's labour and tax revenues, while the source country would have benefited from the worker's return, presumably with higher-level skills. The bond could then be released to the worker as an incentive for returning home and, as Professor Bradford explains, as an incentive for "brain circulation" instead of brain drain.

Tax incentives to reduce brain-drain. A longstanding potential initiative is the introduction of a "brain-drain" tax. First proposed by Bhagwati (1972), it would tax income earned abroad by a country's diaspora living in developed countries. The tax could provide governments with a means of reclaiming the cost of investments in education and help to offset costs associated with losing educated citizens to more lucrative overseas labour markets. While politically acceptable because of its perceived fairness, major complications arise owing to administrative and legal difficulties associated with international tax collection, which generally requires bilateral treaties. Significant issues also arise owing to the consequent double-taxation of income by host and source countries (Brauner, 2010).

One possibility, suggested by Wilson (2008), involves asking governments to offer lower tax rates to returning emigrants who have previously paid the brain-drain tax compared with rates paid by citizens who have evaded the brain-drain tax when employed overseas (Wilson, 2008). In an alternative approach, Thailand is proposing a reduction in personal income tax rates to encourage the return of Thailand's diaspora, attract investors and create new jobs (Deboonme, 2012).

Despite the potential challenges of effective implementation, the authors believe changes to tax legislation – including the formation of bilateral and multilateral tax agreements – should be investigated further to encourage greater levels of remittances and investments from citizens living abroad. This could involve the levying of a "migration tax" on destination countries receiving foreign workers and paid to source countries as a means of compensation in recognition of the "global public good" nature of education. The revenue generated could be used to fund higher secondary and tertiary education in countries of origin.

Global education credits. The feasibility of developing a market for the trading of "global mobile talent" could be investigated as an option for raising funds for education in the developing world, or even in poorer communities in the developed world. This funding model could include establishing a global trading market for skills akin to the global carbon market, with each country allocated a certain quota of "mobile talent" depending on the size of its population. This market could work in much the same way as the market for carbon credits (or emissions trading permits) whereby polluters offset their emissions by paying for "green" initiatives (such as reforestation projects and wind farms) by purchasing carbon credits.[20] Thus, countries that exceed their quotas of imported talent would pay into a global fund that would compensate countries most affected by a brain drain.

International assistance for developing countries. Foreign governments, international agencies and foreign HEIs could provide greater levels of assistance to developing nations in formulating and implementing educational policy reforms that encourage local HEIs to be more responsive to a country's economic and social development needs. This could include working with these nations to ensure that clear strategies and effective funding allocation mechanisms are in place, supported by rigorous monitoring of results. Assistance could also be provided to increase levels of collaboration between public and private sector stakeholders at the local level on developing funding models and the curriculum and aligning the skills of graduates to labour market needs.

A Broad Coalition Needed to Foot the Bill

In summary, many countries around the world are struggling to fund universal and quality education objectives through conventional models. Countries facing budget constraints arising from the current global fiscal climate will increasingly require funding approaches that combine greater private sector investment. Governments, private sector stakeholders and not-for-profit organizations must work together to find innovative and scalable solutions that deliver affordable and quality education at all levels while maintaining equity of access. To this end, governments need to target public investment at levels and segments of the population where corresponding improvement aligns with and supports social and economic development objectives. Moreover, governments that move quickly to take advantage of recent advancements in low-cost access to education delivery may make significant inroads into the issues of equity and quality – and see a corresponding boost in socio-economic performance that yields a significant competitive advantage to a country's firms and industries.

References

Andrew, M. Black-white differences in the intergenerational transmission of education and the role of heterogeneous middle class experiences. Session 200: Education and Social Mobility. Population Association of American, 2012 Annual Meeting Program.

Barrera-Osorio, F., Fasih, T. and Patrinos, H. A. *Decentralized Decision-making in Schools: The Theory and Evidence on School-based Management*. The World Bank, 2009.

Baxter, R. and Birks, S. The student debt debate: An economic investigation of the issues. Student Paper, No. 4, Massey University Centre for Public Policy Evaluation, 2004.

Bhagwati, J. N. *The United States in the Nixon Era: The End of Innocence*. Daedalus, 1972.

Boissiere, M. *Rationale for Public Investment in Primary Education in Developing Countries: Background Paper for the Evaluation of the World Bank's Support to Primary Education*. WB Operations Evaluation Dept., World Bank, 2004.

Bradford, A. Insuring immigration. Project Syndicate, 18 June 2013.

Brauner, Y. Brain drain taxation as development policy. Uni of Florida Legal Studies Research Paper No. 2010–17, 2010.

Buckingham, J. *Submission to the Review of Funding for Schooling*. Sydney: The Centre for Independent Studies, 2011.

Buckingham, J. *School Funding, Choice and Equity, Issues Analysis*. No. 126, The Centre for Independent Studies, 26 October 2011.

School-Based Management. The International Institute for Educational Planning and The International Academy of Education, Education Policy Series 3, UNESCO, 2005.

Campbell, C., Carpentier, V. and Whitty, G. Educational financing and improvement: conceptual issues and policy debates in the UK. In *Scheweizerische Zeitschrift fur Bidungswissenschaften*, 2003, 25, 3: 455–480.

CFS, *Study Now, Pay Forever: Income Contingent Repayment Loan Scheme*. Canadian Fed. of Students, 2007.

Chan, K. Education. http://www.kailchan.ca/economics-finance-2/education/, 2013.

Chapman, B. and Ryan, C. Income contingent financing of student charges for higher education: assessing the Australian innovation. Discussion Paper No. 449, Centre for Economic Policy Research, ANU, 2002.

Chow, G. C. and Shen, Y. Demands for education in China. CEPS Working Paper No. 106, April 2005.

Copping, M. Australian student loans – Taking securitization back to school. In *Securitisation News*, Deloitte, 2004.

Dearden, L., Fitzsimons, E. and Wyness, G. The impact of higher education finance on university participation in the UK. BIS Research Paper No. 11, Department for Business Innovation & Skills, 2010.. In *The Nation*, 24 December 2012.

Denny, K. What did abolishing university fees in Ireland do?. UCD Geary Institute Discussion Paper Series, 20 May 2010.

Education Innovation Fund for India. http://www.eifiaurosociety.org/about-the-grant.html, 2011.

European Commission. National Student Fee and Support Systems: 2011–12. EC, September 2012.

Friedman, M. The role of government in education. In Solo, R. (ed.). *Economics and the Public Interest*. Brunswick, 1955, pp 123–144.

Fullan, M. and Donnelly, K. *Alive in the Swamp: Assessing Digital Innovations in Education*. New Schools Venture Fund, Nesta, 2013.

Gonski, D., Boston, K., Griener, K., Lawrence, C., Scales, B. and Tannock, P. Review of funding for schooling: Final Report. Australian Department of Education, Employment and Workplace Relations, December 2011.

Gropello, E., Tandon, P. and Yusuf, S. Putting higher education to work: Skills and research for growth in East Asia. In *World Bank East Asia and Pacific Regional Report*. WB Publications, 2012.

Hamadeh, M. and Khoueiri, R. Demand elasticities for higher education in the United States. In *International Journal of Business and Economics Perspectives*, 2010, Vol. 5, No. 2, Autumn 2010.

Hancock, L. Why are Finland's schools successful?. In *Smithsonian Magazine*, September 2011.

Kara, O. Comparing two approaches to the rate of return to investment in education. In *Education Economics*, 2010, Vol. 18, No. 2: 153–165.

Lepi, K. *Behind-The-Scenes: How MOOCs Are Getting Money*. eduemic, 2013.

Maani, S. and Warner, A. R. *The Economic Implications of Tertiary Fee Rises in Relation to Student Welfare and the Policy Environment*. The University of Auckland, 2000.

McKinsey & Company. *The Economic Impact of the Achievement Gap in Americas Schools*. McKinsey & Company, 2009.

NEA. *Charter Schools*. National Education Association, 2013.

NZ MOE. *Student Loan Scheme Annual Report 2008*. NZ Ministry of Education, 2008.

OECD. On the edge: Securing a sustainable future for higher education. OECD Education WP, No. 7, OECD, 2007.

OECD. *Education at a Glance 2009: OECD Indicators*. OECD Directorate for Education, OECD, 2009.

OECD. *PISA in Focus, Education Policy*. OECD, 2011.

OECD. *Education at a Glance 2012: OECD Indicators*. OECD, 2012.

OECD. *Education Indicators in Focus*. OECD, 2012.

OECD. *OECD Reviews of Evaluation and Assessment in Education – Synergies for Better Learning: An International Perspective on Evaluation and Assessment*. OECD, 2013.

Patrinos, H. A. *How Do School Vouchers Help Improve Education Systems?*. World Bank, 2012.

Peterson, P. E. School vouchers in the United States: Productivity in the public and private sectors. In *ZfE*, 2008, 11 2: 1–15.

Polidano, C., Hanel, B. and Buddelmeyer, H. Explaining the SES school completion gap. Melbourne Institute Working Paper Series, Working Paper No. 16/12, 2012.

Pool, I. The demography of the student loan, transcript of presentation. Student Debt Summit, Auckland, 2002.

Psacharopoulos, G. Returns to investment in education: A global update. In *World Development*, 1994, Vol. 2, No. 9: 1325–1343.

Psacharopoulos, G. The profitability of investment in education: Concepts and methods, human capital development and operations policy. HCO Working Papers, December 1995.

Psacharopoulos, G. Returns to investment in education: A further update. Policy Research Working Paper, Latin America and the Caribbean Region, Education Sector Unit, The World Bank, September 2002.

Sabhlok, R. Student loan crisis solved – next problem?. In *Forbes*, 14 December 2012.

Srur, A. Subsidising education: are school vouchers the solution?. International Initiative for Impact Evaluation, 3ie Enduring Questions Brief Number 16, July 2010.

StateUniversity.com. Measurement economic benefits of education investment – an illustration, private value versus social costs, Empirical Findings, Estimation Issues, undated.

UK Department for Business Innovation & Skills. The impact of higher education finance on university participation in the UK. BIS Research Paper No. 11, UK Department for Business Innovation & Skills, 2010.. *The Future of Higher Education*. UK Department for Education and Skills, 2003.

UNESCO. *Opportunities Lost: The Impact of Grade Repetition and Early School Leaving.* UNESCO Institute of Statistics, 2012.

US Department of Education. *Race to the Top Program: Executive Summary.* Washington DC: US Department of Education, 2009.

World Bank. The road not traveled: Education reform in the Middle East and North Africa. MENA Development Report, The World Bank, 2007.

Wison, J. D. A voluntary brain-drain text. In *Journal of Public Economics*, 2008, Vol. 92: 2385–2391.

WISE. Funding education: New models for our times. World Innovation Summit for Education, Qatar, 2010.

Endnotes

1. The authors wish to thank Dr John Dennehy and Dr Kai Chan for their valuable inputs into the chapter.
2. In the early 1960s, Theodore W. Schultz, professor of economics at the University of Chicago, first developed the concept of human capital. He argued that human capital "consists of the accumulation of all prior investments in education, on-the-job training, health, migration and other factors that increase individual productivity and, therefore, earnings". http://academic.cengage.com/resource_uploads/downloads/0324321457_65782.pdf.
3. Study included OECD countries plus other G20 countries (Argentina, Brazil, China, India, Indonesia, Russian Federation, Saudi Arabia, South Africa).
4. Across all OECD countries for which comparable data are available.
5. Source: http://www.nationmaster.com/red/graph/edu_dur_of_com_edu-education-duration-of-compulsory&b_printable=1.
6. Source: http://www.bmz.de/en/what_we_do/issues/Education/hintergrund/bildungsituation/index.html.
7. Source: http://www.eifiaurosociety.org/about-the-grant.html.
8. Source: http://populationaction.org/Publications2/Data_and_Maps/Shape_of_Things_to_Come/Summary.php.
9. Where "social" returns reflect the benefits and costs of funding education to society. *Social benefits* include having and educated and productive workforce that contributes to economic growth and greater levels of civic engagement, while *social costs* can include unemployment and crime.
10. Source: http://education.stateuniversity.com/pages/1930/Economic-Benefits-Education-Investment-Measurement.html.
11. Source: http://www.ed.gov/ladders.
12. Achievement as measured by the Program for International Student Assessment (PISA) conducted by the OECD that evaluates the knowledge and skills of the world's 15-year-olds through its PISA test, which covers maths, reading and science, with the main focus on maths. The OECD indicates that PISA results reveal what is possible in education by showing what students in the highest-performing and most rapidly improving education systems can do. http://www.oecd.org/pisa/.
13. Including Hong Kong, Mexico, New Zealand, the Netherlands, Spain, Thailand, the United States and the United Kingdom.
14. E.g. Chile, India, Sweden, United States and the United Kingdom.
15. Source: http://www.theigc.org/publications/igc-project/cycling-school-increasing-high-school-enrollment-girls-bihar.
16. http://countryeconomy.com/gdp/uk.
17. http://cdn.budgetresponsibility.independent.gov.uk/2013-FSR_OBR_web.pdf.
18. http://media.efinancialnews.com/digest/2013-10-20/uk-student-loan-portfolio-privatisation-plan?ea9c8a2de0ee111045601ab04d673622.
19. http://uk.reuters.com/article/2013/11/24/uk-britain-loans-selloff-idUKBRE9AN0HX20131124.
20. Source: http://advancedglobaltrading.com/featured/carbon-credits-birth-of-new-commodity/#.UixqgsZmim4.

Chapter 12: The Human Capital Index

Saadia Zahidi

A nation's human capital endowment – the skills and capacities that reside in people and that are put to productive use – can be a more important determinant of its long-term economic success than virtually any other resource. This resource must be invested in and leveraged efficiently to generate returns, for the individuals involved as well as an economy as a whole. Despite high unemployment in many countries, the global economy is entering an era of talent scarcity that, if left unaddressed, will hinder economic growth worldwide. Understanding and addressing challenges related to human capital is thus fundamental to short-term stability as well as the long-term growth, prosperity and competitiveness of nations.

The World Economic Forum's Human Capital Index (HCI), released in October 2013, explores the contributors and inhibitors to the development and deployment of a healthy, educated and productive labour force. The HCI provides country rankings that allow for effective comparisons across regions and income groups. For full details of the HCI and to view 122 individual country profiles, please refer to the World Economic Forum's Human Capital Report.[1] The Report was coauthored by David E. Bloom, Patricia Milligan, Rick Guzzo, Charlotte Harding and Saadia Zahidi. This chapter draws upon the Report's findings.

Methodology

The HCI has three key features. First, the HCI measures a broader set of indicators than the traditional definitions of human capital. Human capital is not a one-dimensional concept, but means different things to different stakeholders. Traditionally, human capital has been viewed as a function of education and experience, the latter reflecting both training and learning by doing. But in recent years, health (including physical capacities, cognitive function and mental health) has come to be seen as a fundamental component of human capital. Additionally, the value of human capital is critically determined by the physical, social and economic context of a society, because that context determines how particular attributes a person possesses may be rewarded. The HCI is thus based on four pillars: three core determinants of human capital (education, health and employment) plus those factors that allow these three core determinants to translate into greater returns.

Second, the HCI takes a long-term approach to human capital. In addition to providing a snapshot of the state of a country's human capital today through measures that reflect the results of a country's past practices, it includes indicators resulting from practices and policy decisions impacting the children of today and that will shape the future workforce. Long-term thinking around human capital often does not fit political cycles or business investment horizons. But a lack of such long-term planning can perpetuate continued wasted potential in a country's population and losses for a nation's growth and productivity.

Third, the HCI aims to take into account the individual life course. For example, the World Health Organization (WHO) states that "early childhood is the most important phase for overall development throughout the lifespan", elaborating that "many challenges faced by adults, such as mental health issues, obesity, heart disease, criminality and poor literacy and numeracy, can be traced back to early childhood". The HCI thus includes measures indicating quality of early childhood. Furthermore, the HCI captures the extent to which investments made in earlier years in health and education are being realized in the working-age population through lifelong learning and training. Finally, at the other end of the continuum, the HCI takes into account the health and productivity of the older population.

The HCI structure contains four pillars:

- The Health and Wellness pillar contains indicators relating to a population's physical and mental well-being, from childhood to adulthood.
- The Education pillar contains indicators relating to quantitative and qualitative aspects of education across primary, secondary and tertiary levels, and contains information on both the present workforce as well as the future workforce.
- The Workforce and Employment pillar is designed to quantify the experience, talent, knowledge and training in a country's working-age population.

Table 1: Structure of the Human Capital Index

Group	Variable	Source
Access	Primary enrolment rate (%)	UNESCO, Institute for Statistics, provided database extraction 22 August 2013, latest available data 2003 - 2012
	Secondary enrolment rate (%)	UNESCO, Institute for Statistics, provided database extraction 22 August 2013, latest available data 2003 - 2012
	Tertiary enrolment ratio (%)	UNESCO, Institute for Statistics, provided database extraction 22 August 2013, latest available data 2003 - 2012
	Education gender gap	World Economic Forum, Global Gender Gap Report, 2012
Quality	Internet access in schools	World Economic Forum, Executive Opinion Survey, 2013-2014
	Quality of the education system	World Economic Forum, Executive Opinion Survey, 2013-2014
	Quality of primary schools	World Economic Forum, Executive Opinion Survey, 2013-2014
	Quality of math and science education	World Economic Forum, Executive Opinion Survey, 2013-2014
	Quality of management schools	World Economic Forum, Executive Opinion Survey, 2013-2014
Attainment	Primary education attainment, age 25+	UNESCO Institute for Statistics, Education Statistics online database, 2011 or latest year available
	Secondary education attainment, age 25+	UNESCO Institute for Statistics, Education Statistics online database, 2011 or latest year available
	Tertiary education attainment, age 25+	UNESCO Institute for Statistics, Education Statistics online database, 2011 or latest year available
Survival	Infant mortality (per 1,000 live births)	World Health Organisation, Global Health Observatory, World Health Statistics, Mortality and Burden of Disease, Child mortality, 2011
	Life expectancy	World Health Organisation, Global Health Observatory, World Health Statistics, Mortality and global health estimates, 2011
	Survival gender gap	World Economic Forum, Global Gender Gap Report, 2012
Health	Stunting and wasting (% in children under 5)	World Health Organisation, Global Health Observatory, World Health Statistics, Nutrition, Child malnutrition, latest available data 2003 - 2011
	Unhealthy life years (% of life expectancy)	Healthy adjusted life expectancy, World Health Organisation data, 2007, taken from Global Gender Gap Report 2012; Life expectancy, as above.
	Deaths under 60 from non-communicable diseases (% of all NCD deaths)	World Health Organisation, Global Health Observatory, World Health Statistics, Non-communicable diseases, 2008
	Obesity (% of adults with BMI ≥ 30)	World Health Organisation, Global Health Observatory, World Health Statistics, Adult risk factors, 2008
	Business impact of non-communicable diseases	World Economic Forum, Executive Opinion Survey, 2013-2014
	Business impact of communicable diseases	World Economic Forum, Executive Opinion Survey, 2013-2014
Well-being	Stress (% of respondents)	Gallup, Worldview database, latest available data 2009 - 2013
	Depression (% of respondents)	Gallup, Worldview database, latest available data 2006 - 2011
Services	Water, sanitation and hygiene	World Health Organisation, Global Health Observatory, World Health Statistics, Environmental Health, latest available data 2005 - 2011
	Healthcare quality	World Economic Forum, Executive Opinion Survey, 2013-2014
	Healthcare accessibility	World Economic Forum, Executive Opinion Survey, 2013-2014
Participation	Labour force participation rate, age 15-64 (%)	ILO, Key Indicators of the Labour Market, (KILM), 2010
	Labour force participation rate, age 65+ (%)	ILO, Key Indicators of the Labour Market, (KILM), 2010
	Economic participation gender gap	World Economic Forum, Global Gender Gap Report, 2012
	Unemployment rate	ILO, ILOstat, latest available data 2003 - 2010
	Youth unemployment rate	ILO, Laborstat, latest available data from 2003 - 2010
Talent	Country capacity to attract talent	World Economic Forum, Executive Opinion Survey, 2013-2014
	Country capacity to retain talent	World Economic Forum, Executive Opinion Survey, 2013-2014
	Ease of finding skilled employees	World Economic Forum, Executive Opinion Survey, 2013-2014
	Pay related to productivity	World Economic Forum, Executive Opinion Survey, 2013-2014
	Capacity for innovation	World Economic Forum, Executive Opinion Survey, 2013-2014
	Index of economic complexity	R Hausmann, CA Hidalgo, S Bustos, M Coscia, S Chung, J Jimenez, A Simoes, M Yildirim. The Atlas of Economic Complexity. Puritan Press. Cambridge MA. (2011)
	Firm level technology absorption	World Economic Forum, Executive Opinion Survey, 2013-2014
	Scientific and technical journal articles	World Bank World Development Indicators online database, 2009 and United Nations, Department of Economic and Social Affairs, World Population Prospects, 2009.
	Median age of the working population	United Nations, Department of Economic and Social Affairs, Population Division: World Population Prospects DEMOBASE 2010
Training	Staff training	World Economic Forum, Executive Opinion Survey, 2013-2014
	Training services	World Economic Forum, Executive Opinion Survey, 2013-2014
Infrastructure	Mobile users	World Bank World Development Indicators online database, 2011
	Internet users	World Bank World Development Indicators online database, 2011
	Quality of domestic transport	World Economic Forum, Executive Opinion Survey, 2013-2014
Collaboration	State of cluster development	World Economic Forum, Executive Opinion Survey, 2013-2014
	Business and University R&D collaboration	World Economic Forum, Executive Opinion Survey, 2013-2014
Legal framework	Ease of Doing Business	World Bank and International Finance Corporation 2012
	Social safety net protection	World Economic Forum, Executive Opinion Survey, 2013-2014
	Intellectual property protection and property rights	World Economic Forum, Executive Opinion Survey, 2013-2014
Social mobility	Social mobility	World Economic Forum, Executive Opinion Survey, 2013-2014

- The Enabling Environment pillar captures the legal framework, infrastructure and other factors that enable returns on human capital.

The HCI contains 51 indicators in total, spread across the four pillars, with 12 indicators in the Education pillar, 14 in the Health and Wellness pillar, 16 in the Workforce and Employment pillar and nine in the Enabling Environment pillar. The values for each of the indicators come from publicly available data produced by international organizations such as the WHO, the United Nations Educational Scientific and Cultural Organization (UNESCO) and the International Labour Organization (ILO). In addition to hard data, the HCI uses qualitative survey data from the World Economic Forum's Executive Opinion Survey and Gallup's wellness perception survey data. A full overview of the HCI indicators and sources is included in Table 1.

The indicators used in the HCI are measured on different scales. To standardize the data, we used the z-score statistic as it preserves the distribution of the data, a feature most relevant for a comparative international composite index. Z-scores are expressed as standard deviations from the mean. The mean is zero and has a standard deviation of one. This means that all data points above the mean are expressed as positive scores and all data below the mean are expressed as negative scores. Once all underlying data is converted to z-scores, a country's score on a given pillar is determined by an unweighted average of all available scores within that pillar. A country's score on the overall HCI is an unweighted average of the four pillar scores.

The criterion for an indicator to be included in the HCI is that it must have nonmissing data for at least 50% of the countries. The criterion for a country to be included in the HCI is that it must have nonmissing data for at least 70% of each of the pillar's indicators. This means a country must have data for at least:

- 8 out of 12 indicators on the Education pillar
- 10 out of 14 indicators in the Health and Wellness pillar
- 11 out of 16 indicators in the Workforce and Employment pillar
- 6 out of 9 indicators in the Enabling Environment pillar.

Table 2: Human Capital Index 2013 Rankings

Country	Final Ave	Final Rank
Switzerland	1.455	1
Finland	1.406	2
Singapore	1.232	3
Netherlands	1.161	4
Sweden	1.111	5
Germany	1.109	6
Norway	1.104	7
United Kingdom	1.042	8
Denmark	1.024	9
Canada	0.987	10
Belgium	0.985	11
New Zealand	0.978	12
Austria	0.977	13
Iceland	0.957	14
Japan	0.948	15
United States	0.920	16
Luxembourg	0.881	17
Qatar	0.834	18
Australia	0.831	19
Ireland	0.824	20
France	0.746	21
Malaysia	0.644	22
Korea, Rep.	0.640	23
United Arab Emirates	0.610	24
Israel	0.587	25
Barbados	0.581	26
Estonia	0.571	27
Malta	0.473	28
Spain	0.465	29
Portugal	0.453	30
Cyprus	0.452	31
Slovenia	0.445	32
Czech Republic	0.387	33
Lithuania	0.360	34
Costa Rica	0.320	35
Chile	0.305	36
Italy	0.266	37
Latvia	0.248	38
Saudi Arabia	0.245	39
Bahrain	0.232	40
Oman	0.220	41
Panama	0.207	42
China	0.186	43
Thailand	0.158	44
Kazakhstan	0.124	45
Croatia	0.099	46
Mauritius	0.099	47
Uruguay	0.096	48
Poland	0.087	49
Sri Lanka	0.020	50
Russian Federation	0.010	51
Jordan	0.005	52
Indonesia	0.001	53
Hungary	0.000	54
Greece	-0.011	55
Bulgaria	-0.048	56
Brazil	-0.054	57
Mexico	-0.057	58
Kuwait	-0.059	59
Turkey	-0.065	60
Ecuador	-0.099	61

Country	Final Ave	Final Rank
Argentina	-0.120	62
Ukraine	-0.124	63
Azerbaijan	-0.157	64
Macedonia, FYR	-0.160	65
Philippines	-0.161	66
Tunisia	-0.165	67
Jamaica	-0.171	68
Romania	-0.176	69
Vietnam	-0.202	70
Colombia	-0.202	71
Albania	-0.216	72
Armenia	-0.218	73
Lebanon	-0.220	74
Peru	-0.227	75
Trinidad and Tobago	-0.233	76
Georgia	-0.258	77
India	-0.270	78
Botswana	-0.291	79
Lao PDR	-0.297	80
Kenya	-0.306	81
Morocco	-0.336	82
Moldova	-0.337	83
Guatemala	-0.341	84
Serbia	-0.343	85
South Africa	-0.361	86
Ghana	-0.363	87
Bhutan	-0.370	88
Mongolia	-0.400	89
El Salvador	-0.405	90
Suriname	-0.420	91
Kyrgyz Republic	-0.440	92
Nicaragua	-0.446	93
Iran, Islamic Rep.	-0.487	94
Dominican Republic	-0.499	95
Cambodia	-0.505	96
Namibia	-0.539	97
Paraguay	-0.546	98
Bolivia	-0.552	99
Honduras	-0.560	100
Venezuela	-0.564	101
Senegal	-0.602	102
Malawi	-0.629	103
Tanzania	-0.680	104
Madagascar	-0.725	105
Uganda	-0.727	106
Cameroon	-0.728	107
Lesotho	-0.751	108
Côte d'Ivoire	-0.759	109
Bangladesh	-0.782	110
Egypt	-0.790	111
Pakistan	-0.837	112
Benin	-0.865	113
Nigeria	-0.878	114
Algeria	-0.954	115
Ethiopia	-0.961	116
Mozambique	-0.966	117
Mali	-1.034	118
Burkina Faso	-1.077	119
Guinea	-1.272	120
Mauritania	-1.297	121
Yemen	-1.395	122

Country Rankings 2013

The final HCI covers 122 countries, with various tables showing global rankings, individual country profiles and regional comparisons. In this section, we would like to highlight some of the key rankings (for the full HCI results, see Table 2).

Top 10

The Report identifies those countries that are leading in investing in their nation's human capital. The top 10 countries are dominated by the European countries, with eight of the top 10 spots occupied by countries from this region. Switzerland (1) tops the rankings for the HCI, demonstrating consistently high scores across all four pillars, with top spots on Health and Wellness and Workforce and Employment, second place on Enabling Environment and fourth on Education.

Within the countries from northern and western Europe in the top 10, four Nordic countries, Finland (2), Sweden (5), Norway (7) and Denmark (9) dominate. Finland's exemplary Education and Enabling Environment scores put it at the top of the rankings for these two pillars and seven ranks ahead of the next highest ranking Nordic country. The overall strength of the Nordic region lies in the Workforce and Employment pillar, with Finland, Norway and Sweden occupying three of the top six ranks in this pillar, while Denmark drops out of the top 10, to 12th position in this pillar and down to 11th position for the Enabling Environment pillar.

Singapore (3) is the only Asian country in the top 10 due to very strong scores on the Education pillar, Workforce and Employment pillar and a strong fifth position on the Enabling Environment pillar. The Netherlands (4) is the third of the European countries in the top 10 due to strong performances for Health and Wellness and for Enabling Environment. Germany (6) edges ahead of the Netherlands on the Enabling Environment rankings in third place but holds ninth position on the Workforce and Employment pillar. Germany's relatively low place on the Education pillar (19) pulls down the country's overall score in the HCI.

The United Kingdom (8) performs well on Enabling Environment but has lower scores on Health and Wellness, holding 17th position. Canada (10) is the first of two North American countries in the HCI and the only one in the top 10. Its overall scores are greatly enhanced by its second position on the Education pillar, while ranks for the remaining three pillars vary between 15th and 20th position.

By National Income Group

While there is a strong correlation between national income and human capital across the 122 countries, there are also variations within each income category and unique experiences that can serve as examples within income groups.

Among the lowest-income countries – those with around US$ 1,000 per capita GNI – countries like Kenya and the Kyrgyz Republic perform far ahead of countries such as Malawi or Burkina Faso. Among lower-middle-income countries – those with US$ 1,000–4,000 per capita income – Nigeria, Pakistan and Egypt rank low, while others such as Sri Lanka, Ukraine and Indonesia rank much higher. Among upper-middle-income countries – those with US$ 4,000–12,000 per capita income – countries such as Malaysia, Costa Rica and China outstrip South Africa, Venezuela and Algeria.

Among the high-income countries – those with US$ 12,000 and above – the variations are the greatest. There are strong performers such as the Nordics and Singapore. There are countries such as Qatar and UAE that are hubs for skilled and unskilled talent and rank in the upper half of this group, while countries like Russia, Greece and Kuwait fall near the bottom.

By Regions

There are also variations within each region.

In Europe, a clear geographical division has emerged in terms of countries' ability to exploit their human capital endowments, with those in southern and eastern Europe faring poorly compared with their neighbours to the north and west. Among these, Spain ranks 29, recording high marks in the Health and Wellness pillar (12) but doing less well in terms of Workforce and Employment (70). Nevertheless, it comes ahead of Italy (37), Greece (55) and Serbia (85). France ranks 21, with strong Health and Wellness (14) rankings followed by lower performance in Education (22), Workforce and Employment (24) and Enabling Environment (25).

In North America, Canada ranks ahead of the United States primarily on account of its excellent rating for Education, where it comes second in the world. The United States' position (16) is earned by its dynamic workforce and capacity to attract talent, as well as its innovation potential and high levels of university-level education. Weaker factors include relatively high levels of noncommunicable diseases (NCDs) during prime working ages and comparatively low levels of mental well-being.

In Asia, while Japan's performance is strong across Health and Wellness, its relative weak spots include gender gap indicators for education and the workforce, the country's ability to attract talent and reported depression in the Well-being sub-pillar. After Singapore and Japan, Asia's highest ranking countries are Malaysia (22) and Korea (23). China's (43) positions across the four pillars vary greatly from the 26th rank on the Workforce and Employment pillar to 65th on the Health and Wellness pillar, the latter due in part to weak scores across the Health and Services sub–pillars. China's overall scores are boosted by good performance on the Talent sub–pillar of indicators, such as the Attraction and Retention of talent. The country's highest scores are from the Labour force participation of the 15–64 age group and Pay relating to productivity measures indicators. India, at 78, scores well for Workforce and Employment (49) but poorly for Health and Wellness (112).

In the Middle East and North Africa, Qatar, the strongest performer at 18, ranks 26 on Education, 7 on Workforce and Employment and 15 on Enabling Environment. However, it fares less well on Health and Wellness (44), due to high levels of NCDs, obesity and years spent in poor health. UAE (24), Israel (25), Saudi Arabia (39) and Bahrain (40) are next. Tunisia (67), Lebanon (74), Morocco (82) and Egypt (111) occupy some of the lowest positions in the rankings. Yemen is in last place.

In Latin America, Costa Rica (35) and Chile (36) are the leaders, while Barbados (26) leads in the Caribbean. Brazil (57) is held back by a relatively weak performance in Education (88). The highest-placed Sub-Saharan African country is Mauritius (47), followed by Botswana (79) and Kenya (81). Nigeria, the most populous nation on the continent, ranks 114, while South Africa, the region's largest economy is in 86th place. Mali (118), Burkina Faso (119) and Guinea (120) occupy the lowest positions in the region.

Among the BRICS economies, China (43) is the highest, followed by Russia (51), Brazil (57), India (78) and South Africa (86).

Trends and Challenges

The HCI reveals several trends and challenges in the current education, skills and jobs agenda. These developments imply that we need to rethink how the world's human capital endowment is invested in and leveraged for social and economic prosperity and stability. Like all global challenges where our existing systems, structures and formal institutions no longer suffice, the world needs a new level of global cooperation on education, skills and jobs.

Many of today's education systems are disconnected from the skills needed to function in today's labour markets and the exponential rate of technological and economic change is further increasing the gap between education and labour markets. The premise of current education systems is on developing cognitive skills, yet behavioural and noncognitive skills that nurture an individual's capacity to collaborate, innovate, self-direct and problem-solve are increasingly important.

Current education systems are time-compressed in a way that may not be suited to current or future labour markets. They force narrow career and expertise decisions in early youth. The lines between academia and the labour market may need to blur or disappear entirely as learning, R&D, knowledge-sharing, retraining and innovation take place simultaneously throughout the work life cycle, regardless of the job, level or industry.

Education delivery mechanisms and financial aspects have gone through little change over the last decades. In many countries, many youth and children may find their paths constrained depending on the type of education they are able to afford, while others may not have access to even basic literacy and learning. On the other hand, many developed world education systems have made enormous increases in spending with little return. Early childhood education and teacher quality remain neglected areas in many developed and developing countries, despite their proven impact on learning outcomes; both areas also suffer from lack of objective, global data.

Many large businesses, as one of the key consumers of human capital, face a skills mismatch between the jobs they need to fill and the people searching for jobs, a gap evident in many countries for which this data was available. This mismatch is partly because education type and institutional affiliation in education or employment are still among the few, imperfect first signals for employers to identify the "skills" of potential candidates. It is also because what people learn in educational institutions today is not necessarily applicable to the demands of the current labour market. Businesses increasingly place a premium on creativity, interaction and collaboration skills, yet the business community does not engage in directly influencing the formation of human capital as it does with other supply chains.

The developments on both the supply and demand side of labour are occurring in an era where technology, mobility and migration mean that both jobs and people can move across national boundaries, relatively quickly. The ability to attract talent can entail prosperity and efficiency in some cases and social stresses in others. Moreover, many countries experience a loss of talent or brain drain.

As the recent economic crisis has revealed, an economic slowdown can have a severe and longlasting impact on employment for people across the experience spectrum – from today's older breadwinners to an entire generation of new entrants to the labour market. Some countries are under the double burden of both the economic crisis as well as the past failures of the education system and the skills it imparted.

Rapid demographic changes and the ability to forecast them offer a valuable opportunity for planning, while creating unprecedented pressures in markets and societies. Ageing economies will face a historical first as more and more of their populations cross the age of 60 and their workforces shrink further, necessitating a better integration of female workers, potentially importing talent and better aligning the state pension age with lifespans. Youth-bulge economies face burdens of a different kind as a very large cohort of the next generation – one that is more connected and globalized than ever before enters the workforce and with very different aspirations, expectations and worldviews than their predecessors.

A Holistic Approach to Measuring Human Capital

The HCI is a diagnostic tool that takes a life cycle approach to provide a deep understanding of the state of a population's talent, skills and capabilities. It may be customized to specific countries and regions. The HCI is a first attempt at measuring human capital holistically and across a large set of countries and we plan to continue to improve methodology in future years.

The HCI aims to bring multiple stakeholders to the same level of understanding on the current state of human capital and demographic trends. We hope that it can help governments, business, universities and civil society institutions identify key areas for focus and investment. All of these entities have a stake in human capital development, whether their primary goal is to power their businesses, strengthen their communities or create a population that is better able to contribute to and share in the rewards of growth and prosperity. We thus hope that the HCI can inspire cross-stakeholder collaboration and partnerships.

Endnotes

1. http://reports.weforum.org/human-capital-index-2013.

Statistical Appendix

David E. Bloom, Ciara Browne, Thierry Geiger, Kenneth O'Friel, Lauren Graybill and Larry Rosenberg

The Statistical Appendix presents an array of data on education, demographic, and economic conditions, as well as the opinions of business leaders about education in their countries. The education, demographic, and economic indicators show data for 1990, 2000, and 2010 for the complete list of countries covered by the World Bank's *World Development Indicators 2013*, which is available online. The Appendix also shows population-weighted averages for World-Bank-defined income groups and the following World-Bank-defined regional groups:

- East Asia & Pacific (all income levels)
- East Asia & Pacific (developing only)
- Europe & Central Asia (all income levels)
- Europe & Central Asia (developing only)
- Latin America and Caribbean (all income levels)
- Latin America and Caribbean (developing only)
- Middle East & North Africa (all income levels)
- Middle East & North Africa (developing only)
- North America
- South Asia
- Sub-Saharan Africa (all income levels)
- Sub-Saharan Africa (developing only)

Please refer to the first table for a list of indicators, definitions and sources. Income groups are defined using the World Bank's annual Gross National Income per capita thresholds in US dollars (measured using the World Bank's Atlas methodology[1]), shown below:

	Low Income	Lower-Middle Income	Upper-Middle Income	High Income
1990	≤$610	$611-$2,465	$2,466-$7,620	≥$7,620
2000	≤$755	$756-$2,995	$2,996-$9,265	≥$9,265
2010	≤$1,005	$1,006-$3,975	$3,976-$12,275	≥$12,275

Note that the developing-only regional groups include all groups other than the high-income group. Population-weighted averages for income groups and regional groups are shown only if more than half of the countries included in the group have data for the respective indicator.

In addition to data on education, demographic and economic conditions, the Appendix includes data collected from the World Economic Forum's Executive Opinion Survey, a business executives' perception survey that is conducted on a yearly basis in over 140 countries collecting the perceptions of over 13,000 executives on their business operating environment. The Survey captures valuable information on a broad range of factors that are critical for a country's competitiveness and sustainable development, and for which data sources are scarce or, frequently, non-existent on a global scale. Applicable to this book are responses to Survey questions regarding the quality of the education system, including training and employee development, math and science education, primary schools and management and business schools.

The administration of the Survey is carried out by partner institutes in each of the countries covered. Partner institutes are recognized research or academic institutes, business organizations, national competitiveness councils, or other professional entities and, in some cases, survey consultancies. They are selected on the basis of their capacity to reach out to the business community, their reputation, and their commitment to the issue of competitiveness. In administering the Survey, partner institutes are asked to follow detailed sampling guidelines to ensure that the sample of respondents is the most representative possible and comparable across the globe and in a specific timeframe. The sampling guidelines are based on best practices in the field of survey administration.[2]

Each education-related question in the Survey asks respondents to evaluate a specific aspect of the education system, with 1 the worst score and 7 the best. Scores of 4 to 7 are shown in the Appendix as "at least moderate satisfaction", scores of 6 to 7 as "great satisfaction".

Endnotes

1. GNI per capita is the gross national income, converted to U.S. dollars using the World Bank Atlas Method, divided by the midyear population. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income from abroad. GNI, calculated in national currency, is usually converted to U.S. dollars at official exchange rates for comparisons across economies, although an alternative rate is used when the official exchange rate is judged to diverge by an exceptionally large margin from the rate actually applied in international transactions. To smooth fluctuations in prices and exchange rates, a special Atlas method of conversion is used by the World Bank. This applies a conversion factor that averages the exchange rate for a given year and the two preceding years, adjusted for differences in rates of inflation between the country and, through 2005, the G-5 countries (France, Germany, Japan, the United Kingdom and the United States). From 2001 onwards, these countries include the Euro area, Japan, the United Kingdom and the United States.

2. Browne C., Geiger T. and Gutknecht T., "The Executive Opinion Survey: The Voice of the Business Community". *The Global Competitiveness Report 2013–2014*, World Economic Forum. 83-93.

Indicators, Sources, and Definitions

Indicator	Source	Definition
GNI per capita (constant 2005 US$)	World Development Indicators	GNI per capita is gross national income divided by midyear population. Gross National Income is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output, plus net recipts of primary income from abroad. Data are in constant 2005 U.S. dollars.
GNI per capita, PPP (constant 2005 international $)	World Development Indicators	GNI per capita based on purchasing power parity (PPP). PPP GNI is gross national income (GNI) converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GNI as a U.S. dollar has in the United States. Data are in constant 2005 international dollars.
GNI per capita, PPP, annual average growth rate	World Development Indicators	Average annual growth rate of PPP GNI per capita was calculated for the periods 1990-2000 and 2000-2010.
Total Population	World Population Prospects	De facto population in a country, area or region as of 1 July of the year indicated.
Youth (0-14) population (% of total)	World Population Prospects	De facto population aged 0 to 14 as of 1 July of the year indicated as a percent of the total population on 1 July of the year indicated.
Adolescent (15 -24) population (% of total)	World Population Prospects	De facto population aged 15 to 24 as of 1 July of the year indicated as a percent of the total population on 1 July of the year indicated.
School-age (primary and secondary) population (6-17) (% of total)	World Population Prospects	De facto population aged 6 to 17 as of 1 July of the year indicated as a percent of the total population on 1 July of the year indicated. Note that the total population in this age group is calculated assuming the distribution of ages is even across each of the five-year age groups provided by the WPP. Thus, the number of children aged 6-9 constitutes 80% of the total population in the WPP age bracket 5-9 for the year indicated.
Growth in School Aged Population (6-17)	World Population Prospects	Absolute growth from 2000 to 2015 and 2015 to 2030 is calculated using the medium fertility estimates published by the WPP.
Gross Enrollment Rate, Primary School (by sex)	World Development Indicators	Gross enrollment rate (GER) for primary school is the total enrollment in primary school, regardless of age, expressed as a percentage of the population of official primary education age. GER can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition.
Gross Enrollment Rate, Secondary School (by sex)	World Development Indicators	Gross enrollment rate (GER) for secondary school is the total enrollment in secondary school, regardless of age, expressed as a percentage of the population of official primary education age. GER can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition.
Gross Enrollment Rate, Tertiary School (by sex)	World Development Indicators	Gross enrollment rate for tertiary school is the total enrollment in tertiary education (ISCED 5 and 6), regardless of age, expressed as a percentage of the total population of the five-year age group following on from secondary school leaving.
Education expenditure per student (% of GDP per capita), Primary	World Development Indicators	Total public expenditure per student in primary education as a percentage of GDP per capita. Public expenditure (current and capital) includes government spending on educational institutions (both public and private), education administration as well as subsidies for private entities (students/ households and other privates entities).
Education expenditure per student (% of GDP per capita), Secondary	World Development Indicators	Total public expenditure per student in secondary education as a percentage of GDP per capita. Public expenditure (current and capital) includes government spending on educational institutions (both public and private), education administration as well as subsidies for private entities (students/ households and other privates entities).
Education expenditure per student (% of GDP per capita), Tertiary	World Development Indicators	Total public expenditure per student in tertiary education as a percentage of GDP per capita. Public expenditure (current and capital) includes government spending on educational institutions (both public and private), education administration as well as subsidies for private entities (students/ households and other privates entities).
Education expenditure per student as share of government budget (% of total)	World Development Indicators	Total public education expenditure (current and capital) expressed as a percentage of total government expenditure for all sectors in a given financial year. Public education expenditure includes government spending on educational institutions (both public and private), education administration, and subsidies for private entities (students/households and other privates entities).
Literacy rate, Adult (15+)	World Development Indicators	The percentage of the population age 15 and above who can, with understanding, read and write a short, simple statement on their everyday life. Generally, 'literacy' also encompasses 'numeracy', the ability to make simple arithmetic calculations. This indicator is calculated by dividing the number of literates aged 15 years and over by the corresponding age group population and multiplying the result by 100.
Literacy rate, Youth (15-24)	World Development Indicators	The number of people age 15 to 24 years who can both read and write with understanding a short simple statement on their everyday life, divided by the population in that age group. Generally, 'literacy' also encompasses 'numeracy', the ability to make simple arithmetic calculations.
School Life Expectancy, Primary to Tertiary (Years)	UNESCO	"Total number of years of schooling which a child of a certain age can expect to receive in the future, assuming that the probability of his or her being enrolled in school at any particular age is equal to the current enrolment ratio for that age. SLE from primary to tertiary is the sum of enrolment ratios by age from primary to tertiary school."
Share of students in private schools (% of Total) (by levels of education)	UNESCO	Total number of pupils or students at a given level of education enrolled in institutions that are not operated by a public authority but controlled and managed, whether for profit or not, by a private body (e.g., non-governmental organization, religious body, special interest group, foundation or business enterprise), expressed as a percentage of total number of pupils or students enrolled at the given level of education.
Gender parity index for gross enrollment ratio (by levels of education)	UNESCO	Ratio of girls to boys (gender parity index) in primary, secondary and tertiary education is the ratio of the number of female students enrolled at primary, secondary and tertiary levels of education to the number of male students in each level.
Pupil-teacher ratio (by levels of education)	UNESCO	The average number of pupils per teacher at a given level of education, based on headcounts of both pupils and teachers.

Table A: Economic Data

	2010 GNI per capita (constant 2005 US$)	2010 GNI per capita, PPP (constant 2005 international $)	GNI per capita, PPP, annual average growth rate, 1990-2000	GNI per capita, PPP, annual average growth rate, 2000-2010
World	7,400	9,772	2	2
Low income	392	1,116	0	4
Lower-middle income	1,121	3,163	1	5
Upper-middle income	3,849	8,216	4	6
High income	30,282	30,831	2	1
East Asia & Pacific (all income levels)	5,624	8,713	3	5
East Asia & Pacific (developing only)	2,464	5,920	7	8
Europe & Central Asia (all income levels)	19,139	20,575	1	2
Europe & Central Asia (developing only)	4,302	8,695	-1	4
Latin America and Caribbean (all income levels)	5,410	9,877	2	2
Latin America and Caribbean (developing only)	5,231	9,509	1	2
Middle East & North Africa (all income levels)				
Middle East & North Africa (developing only)			2	
North America	41,767	41,761	2	1
South Asia	943	2,836	3	6
Sub-Saharan Africa (all income levels)	892	1,850	0	2
Sub-Saharan Africa (developing only)	884	1,835	0	2
Afghanistan				
Albania	3,361	7,693		5
Algeria			0	
American Samoa				
Andorra				
Angola	2,297	4,501		
Antigua and Barbuda				
Argentina			3	
Armenia	2,067	5,298	-2	8
Aruba				
Australia	34,680	33,227	2	1
Austria	38,837	35,232	2	1
Azerbaijan	3,014	8,586		13
Bahamas, The	20,213	26,135	1	-1
Bahrain				
Bangladesh	587	1,595	3	5
Barbados				
Belarus	4,414	12,198	-1	8
Belgium	37,497	33,517	2	1
Belize			3	
Benin	546	1,311	1	1
Bermuda				
Bhutan	1,696	4,752		6
Bolivia	1,121	4,050	2	2
Bosnia and Herzegovina	3,401	7,448		3
Botswana	6,068	12,810	3	4
Brazil	5,513	9,891	1	3
Brunei Darussalam			0	
Bulgaria	4,232	11,119	0	5
Burkina Faso	457	1,204	2	3
Burundi	151	477		0
Cambodia	575	1,840		6
Cameroon	915	1,923	-2	1
Canada	34,653	34,600	2	1
Cape Verde	2,635	3,369	4	5
Cayman Islands				
Central African Republic	357	715		-1
Chad			-1	

	2010 GNI per capita (constant 2005 US$)	2010 GNI per capita, PPP (constant 2005 international $)	GNI per capita, PPP, annual average growth rate, 1990-2000	GNI per capita, PPP, annual average growth rate, 2000-2010
Chile	7,964	13,360	5	2
China	2,857	6,791	9	10
Colombia	3,765	8,078	1	2
Comoros				
Congo, Dem. Rep.	141	312	-8	2
Congo, Rep.	1,381	2,711	-4	1
Costa Rica	5,208	10,165	2	3
Cote d'Ivoire			0	
Croatia	10,078	15,313		2
Cuba	4,829			
Curacao				
Cyprus	22,559	24,548	1	1
Czech Republic	13,084	21,898		3
Denmark	47,480	33,147	2	1
Djibouti				
Dominica				
Dominican Republic	4,627	8,043	4	4
Ecuador	3,193	7,556	0	3
Egypt, Arab Rep.	1,521	5,653	3	3
El Salvador	2,877	5,806	3	1
Equatorial Guinea	9,249	16,973		7
Eritrea	182	444		-3
Estonia	9,863	15,799		4
Ethiopia	230	884	0	5
Faeroe Islands				
Fiji				
Finland	38,602	31,764	2	2
France	34,588	30,123	2	1
French Polynesia				
Gabon			-2	
Gambia, The	452	1,709	1	1
Georgia				
Germany	36,912	34,240	1	1
Ghana				
Greece	20,715	23,328	1	1
Greenland				
Grenada				
Guam				
Guatemala	2,203	4,182	2	1
Guinea				
Guinea-Bissau				
Guyana				
Haiti	433	998		
Honduras	1,453	3,372	1	2
Hong Kong SAR, China	31,996	43,751		4
Hungary	10,411	16,158	0	2
Iceland	42,449	26,984	2	-1
India	1,023	3,088	4	6
Indonesia	1,526	3,764	2	4
Iran, Islamic Rep.			2	
Iraq				
Ireland	38,929	30,987		1
Isle of Man				
Israel	21,107	25,486		2
Italy	29,027	26,932	2	0
Jamaica				
Japan	37,433	31,846	1	1
Jordan	2,819	5,252	2	4
Kazakhstan	4,092	9,439		7
Kenya	572	1,464	-1	1

	2010 GNI per capita (constant 2005 US$)	2010 GNI per capita, PPP (constant 2005 international $)	GNI per capita, PPP, annual average growth rate, 1990-2000	GNI per capita, PPP, annual average growth rate, 2000-2010
Kiribati				
Korea, Dem. Rep.				
Korea, Rep.	20,650	26,806	5	4
Kosovo				
Kuwait				
Kyrgyz Republic	525	1,898		3
Lao PDR	588	2,096		5
Latvia	6,986	13,065		4
Lebanon	6,813	12,119		2
Lesotho	1,050	1,913	-1	2
Liberia	197	400		3
Libya				
Liechtenstein				
Lithuania				
Luxembourg	53,105	44,814	3	-2
Macao SAR, China	34,499	52,448		
Macedonia, FYR	3,351	8,984	-1	2
Madagascar			-1	
Malawi	252	755		
Malaysia	6,087	13,295	4	3
Maldives				
Mali			1	
Malta	14,692	20,852	4	0
Marshall Islands				
Mauritania	767	2,061	1	2
Mauritius	6,390	12,842	4	4
Mexico	7,751	11,853	2	1
Micronesia, Fed. Sts.				
Moldova	1,090	3,097		6
Monaco				
Mongolia	1,141	3,296		
Montenegro	4,320	9,882		2
Morocco	2,293	4,166	1	4
Mozambique	377	798	2	6
Myanmar				
Namibia	3,953	5,894	1	3
Nepal	379	1,214		
Netherlands	40,499	36,339	3	1
New Caledonia				
New Zealand	25,686	23,762	1	1
Nicaragua	1,216	3,163	1	2
Niger				
Nigeria				
Northern Mariana Islands				
Norway	65,374	47,342	3	1
Oman				
Pakistan	802	2,490	1	3
Palau				
Panama	6,874	13,195	3	6
Papua New Guinea				
Paraguay	1,613	4,966		2
Peru	3,540	7,850	2	4
Philippines	1,407	3,562	1	3
Poland	9,623	16,658		4
Portugal	17,893	21,025	3	0
Puerto Rico	11,832			
Qatar				
Romania	5,281	10,813	-1	5
Russian Federation	6,164	13,690	-4	5
Rwanda	350	1,047	-1	5

	2010 GNI per capita (constant 2005 US$)	2010 GNI per capita, PPP (constant 2005 international $)	GNI per capita, PPP, annual average growth rate, 1990-2000	GNI per capita, PPP, annual average growth rate, 2000-2010
Samoa				
San Marino				
Sao Tome and Principe				
Saudi Arabia				
Senegal	788	1,651	0	1
Serbia	3,733	9,376		4
Seychelles				
Sierra Leone	363	977	-2	3
Singapore	33,232	52,080	4	3
Sint Maarten (Dutch part)				
Slovak Republic	13,386	19,019		4
Slovenia	18,751	24,654		2
Solomon Islands				
Somalia				
South Africa	5,673	9,318	0	2
South Sudan				
Spain	25,263	26,558	2	1
Sri Lanka	1,590	4,542	4	4
St. Kitts and Nevis				
St. Lucia				
St. Martin (French part)				
St. Vincent and the Grenadines				
Sudan			3	
Suriname				
Swaziland	2,280	4,404	1	0
Sweden	43,790	34,894	2	2
Switzerland	57,945	41,401	1	1
Syrian Arab Republic	1,648	4,363	2	2
Tajikistan	413	1,730	-11	6
Tanzania	445	1,271	0	4
Thailand	3,023	7,633	3	3
Timor-Leste				
Togo	349	766	0	-1
Tonga				
Trinidad and Tobago			3	
Tunisia	3,619	8,075	3	3
Turkey	7,758	12,549	2	3
Turkmenistan				
Turks and Caicos Islands				
Tuvalu				
Uganda	361	1,039	3	3
Ukraine	1,944	5,935	-8	5
United Arab Emirates	24,239	36,509		
United Kingdom	38,270	33,086	3	1
United States	42,541	42,541	2	1
Uruguay			3	
Uzbekistan	752	2,751		6
Vanuatu				
Venezuela, RB	5,906	10,705	0	1
Vietnam	816	2,747	6	6
Virgin Islands (U.S.)				
West Bank and Gaza				
Yemen, Rep.	854	2,353	1	2
Zambia	649	1,200	-2	1
Zimbabwe	368			

Demographic Data

	Total Population 2010	Youth (0-14) population (% of total) 2010	Adolescent (15 -24) population (% of total) 2010	School-age (primary and secondary) population (6-17) (% of total) 2010	Absolute Growth in School Aged Population (6-17), Thousands (2000-2015)	Projected Absolute Growth in School Aged Population (6-17), Thousands (2015-2030)
World	6,885,217,727	27	18	20	-16,406	927
Low income	809,661,854	40	20	30	5,038	235
Lower-middle income	2,433,689,059	32	19	24	11,968	163
Upper-middle income	2,354,787,559	22	18	17	-67,107	2,355
High income	1,287,079,255	17	13	14	-630	2,112
East Asia & Pacific (all income levels)	2,203,795,204	21	17	17	-60,335	2,312
East Asia & Pacific (developing only)	1,963,596,193	21	18	17	-65,360	2,507
Europe & Central Asia (all income levels)	891,563,968	17	10	10	-1,737	794
Europe & Central Asia (developing only)	268,291,639	22	16	15	-3,624	593
Latin America and Caribbean (all income levels)	595,027,246	28	18	22	-457	-493
Latin America and Caribbean (developing only)	568,168,487	28	18	22	-460	-498
Middle East & North Africa (all income levels)	380,658,269	30	20	24	285	-569
Middle East & North Africa (developing only)	328,123,176	31	21	24	213	-897
North America	343,517,896	20	14	16	-216	
South Asia	1,606,838,890	31	19	24	12,092	-263
Sub-Saharan Africa (all income levels)	863,816,254	43	20	30	6,511	123
Sub-Saharan Africa (developing only)	863,120,087	43	20	30	6,580	153
Afghanistan	28,397,812	49	19	35	4,419	350
Albania	3,150,143	23	18		-252	-72
Algeria	37,062,820	27	21	21	-1,398	2,308
American Samoa	55,636					
Andorra	77,907			6		
Angola	19,549,124	48	19	31	2,979	3,157
Antigua and Barbuda	87,233	26	17	22	0	-1
Argentina	40,374,224	25	17	20	-137	62
Armenia	2,963,496	21	19	14	-242	-56
Aruba	101,597	21	12	17	1	-4
Australia	22,065,300	19	14	17	342	760
Austria	8,389,771	15	12	13	-134	77
Azerbaijan	9,054,332	23	21	18	-502	105
Bahamas, The	360,498	22	18	18	-5	7
Bahrain	1,251,513	20	15		68	11
Bangladesh	151,125,475	32	20	15	121	-2,998
Barbados	280,396	19	15	14	-4	-1
Belarus	9,490,000	15	15	11	-639	13
Belgium	10,895,586	17	12	13	28	95
Belize	308,595	35	20	14	18	9
Benin	9,509,798	43	20	29	1,136	1,002
Bermuda	65,124			16		
Bhutan	716,939	30	22	27	-9	-7
Bolivia	10,156,601	36	20	27	437	
Bosnia and Herzegovina	3,845,929	17	15	15	-139	-99
Botswana	1,969,341	34	23	26	9	9
Brazil	195,210,154	25	17		-2,085	-5,591
Brunei Darussalam	400,569	27	17	21	9	-10
Bulgaria	7,534,289	13	12	11	-388	-36
Burkina Faso	15,540,284	46	20	34	1,940	2,170
Burundi	9,232,753	44	22	28	850	1,852
Cambodia	14,364,931	32	21	27	-528	558

	Total Population 2010	Youth (0-14) population (% of total) 2010	Adolescent (15 -24) population (% of total) 2010	School-age (primary and secondary) population (6-17) (% of total) 2010	Absolute Growth in School Aged Population (6-17), Thousands (2000-2015)	Projected Absolute Growth in School Aged Population (6-17), Thousands (2015-2030)
Cameroon	20,624,343	43	21	29	2,018	2,274
Canada	34,126,547	16	13	14	-216	825
Cape Verde	487,601	32	23	28	-24	-13
Cayman Islands	55,509			15		
Central African Republic	4,349,921	41	21	31	291	291
Chad	11,720,781	49	20	31	1,796	2,034
Chile	17,150,760	22	17	19	-438	-125
China	1,337,705,000	18	18	16	-90,845	3,509
Colombia	46,444,798	29	18	21	479	160
Comoros	683,081	42	19	32	71	26
Congo, Dem. Rep.	62,191,161	45	20	33	7,474	-278
Congo, Rep.	4,111,715	42	19	29	460	58
Costa Rica	4,669,685	25	19	19	-53	547
Cote d'Ivoire	18,976,588	42	20	33	1,428	-72
Croatia	4,417,800	15	12	13	-137	2,108
Cuba	11,281,768	17	14	15	-439	-55
Curacao	143,784	20	14		-1	-369
Cyprus	1,103,685	18	16	11	-15	-1
Czech Republic	10,519,792	14	12	13	-312	5
Denmark	5,547,683	18	12	15	59	186
Djibouti	834,036	34	22		-3	-180
Dominica	71,167			20		
Dominican Republic	10,016,797	31	19	24	140	8,422
Ecuador	15,001,072	31	19	23	420	41,826
Egypt, Arab Rep.	78,075,705	32	20	25	1,175	1,457
El Salvador	6,218,195	32	22	28	-187	1,818
Equatorial Guinea	696,167	39	20	27	69	121
Eritrea	5,741,159	43	21	25	652	2,202
Estonia	1,340,161	15	13	12	-69	-135
Ethiopia	87,095,281	44	20	29	10,070	82
Faeroe Islands	49,581					
Fiji	860,559	29	18	24	-22	1
Finland	5,363,352	17	12	14	-63	5,470
France	65,031,235	18	12	14	155	2,022
French Polynesia	268,065	24	18		-11	41
Gabon	1,556,222	39	20	27	123	321
Gambia, The	1,680,640	46	20	30	231	14
Georgia	4,452,800	17	16	14	-323	3
Germany	81,776,930	13	11	13	-2,175	142
Ghana	24,262,901	39	20	30	1,849	317
Greece	11,307,502	15	10	11	-186	-19
Greenland	56,905					
Grenada	104,677	28	22	23	-9	-371
Guam	159,440	28	17		1	-62
Guatemala	14,341,576	42	20	28	1,266	-1
Guinea	10,876,033	43	20	28	1,040	-9
Guinea-Bissau	1,586,624	42	20	25	133	0
Guyana	786,126	38	18	26	37	1,088
Haiti	9,896,400	36	21	30	194	1,129
Honduras	7,621,204	37	21	26	282	162
Hong Kong SAR, China	7,024,200	12	13	14	-373	-62
Hungary	10,000,023	15	12	13	-328	74
Iceland	318,041	21	15	20	2	210
India	1,205,624,648	30	19	24	15,341	-14
Indonesia	240,676,485	30	17	21	5,503	5
Iran, Islamic Rep.	74,462,314	24	22	19	-6,223	-4,790
Iraq	30,962,380	41	20	30	3,078	-4,568
Ireland	4,474,356	21	12	17	68	1,798
Isle of Man	83,992					
Israel	7,623,600	27	15	19	360	2,835
Italy	60,483,385	14	10	12	75	54

	Total Population 2010	Youth (0-14) population (% of total) 2010	Adolescent (15 -24) population (% of total) 2010	School-age (primary and secondary) population (6-17) (% of total) 2010	Absolute Growth in School Aged Population (6-17), Thousands (2000-2015)	Projected Absolute Growth in School Aged Population (6-17), Thousands (2015-2030)
Jamaica	2,701,200	29	18	23	-36	214
Japan	127,450,459	13	10	11	-2,318	-189
Jordan	6,046,000	35	21	28	460	-69
Kazakhstan	16,323,287	25	18	16	-321	-1,272
Kenya	40,909,194	43	21	29	3,812	309
Kiribati	97,743	34	21	28	2	510
Korea, Dem. Rep.	24,500,520	23	16	17	-269	4,180
Korea, Rep.	49,410,000	16	13	15	-1,861	3
Kosovo	1,775,680	27				
Kuwait	2,991,580	25	16		280	224
Kyrgyz Republic	5,447,900	30	22	22	-146	411
Lao PDR	6,395,713	37	23	26	136	196
Latvia	2,239,008	14	13	12	-169	24
Lebanon	4,341,092	24	20	21	112	-106
Lesotho	2,008,921	38	23	32	16	32
Liberia	3,957,990	43	19	29	499	399
Libya	6,040,612	29	19	23	-17	-18
Liechtenstein	36,120			14		
Lithuania	3,286,820	15	14	14	-261	31
Luxembourg	506,953	18	12	15	13	12
Macao SAR, China	534,626	13	17	8	-32	2,744
Macedonia, FYR	2,102,216	17	15	17	-108	2,221
Madagascar	21,079,532	43	20	30	2,516	262
Malawi	15,013,694	46	20	30	1,973	7
Malaysia	28,275,835	28	20	13	340	3,155
Maldives	325,694	30	23	23	-14	-6
Mali	13,985,961	47	19	32	1,931	-11
Malta	415,995	16	14	15	-21	334
Marshall Islands	52,428			26		
Mauritania	3,609,420	41	20	27	348	2
Mauritius	1,280,924	21	15	12	-39	372
Mexico	117,886,404	30	18	22	997	0
Micronesia, Fed. Sts.	103,619	37	24	32	-4	121
Moldova	3,562,062	17	18	14	-426	6,222
Monaco	36,845					
Mongolia	2,712,738	27	22	20	-125	1,085
Montenegro	620,078	19	14	16	-17	2,965
Morocco	31,642,360	28	20	23	-991	59
Mozambique	23,967,265	45	19	30	3,141	-1,329
Myanmar	51,931,231	26	19	18	-1,614	-150
Namibia	2,178,967	38	22	29	94	4
Nepal	26,846,016	37	20		1,101	55
Netherlands	16,615,394	18	12	15	27	-39
New Caledonia	249,992	24	16		-1	5,121
New Zealand	4,367,800	20	15	18	28	26,852
Nicaragua	5,822,209	35	21	25	-27	8,660
Niger	15,893,746	50	17	31	2,926	4,658
Nigeria	159,707,780	44	19	28	18,292	1,251
Northern Mariana Islands	53,860					
Norway	4,889,252	19	13	17	68	-456
Oman	2,802,768	27	22	21	13	33
Pakistan	173,149,306	35	22	28	4,411	168
Palau	20,470			19		
Panama	3,678,128	29	17	22	122	-119
Papua New Guinea	6,858,945	39	19	28	613	2,572
Paraguay	6,459,721	34	20	26	177	221
Peru	29,262,830	30	19	22	94	-4
Philippines	93,444,322	35	20	23	4,183	-249
Poland	38,183,683	15	14	14	-2,408	-96
Portugal	10,637,346	15	11	12	-150	-449
Puerto Rico	3,721,208	20	16	18	-142	-32

	Total Population 2010	Youth (0-14) population (% of total) 2010	Adolescent (15 -24) population (% of total) 2010	School-age (primary and secondary) population (6-17) (% of total) 2010	Absolute Growth in School Aged Population (6-17), Thousands (2000-2015)	Projected Absolute Growth in School Aged Population (6-17), Thousands (2015-2030)
Qatar	1,749,713	14	14	9	116	-5
Romania	21,438,001	15	14	13	-1,164	1,381
Russian Federation	142,389,000	15	15	11	-8,559	1,044
Rwanda	10,836,732	45	20	27	1,165	-4
Samoa	186,029	38	18	32	4	14
San Marino	30,861			13		
Sao Tome and Principe	178,228	42	21	26	13	-44
Saudi Arabia	27,258,387	31	17	23	674	1,782
Senegal	12,950,564	44	21	30	1,362	-283
Serbia	7,291,436	17	19	13	-525	-1
Seychelles	89,770	22	17	15	-2	286
Sierra Leone	5,751,976	42	20	30	628	17
Singapore	5,076,700	17	14		60	20
Sint Maarten (Dutch part)	37,850					
Slovak Republic	5,430,099	15	14	15	-318	9
Slovenia	2,048,583	14	11	12	-56	27
Solomon Islands	526,447	41	19	31	47	1,619
Somalia	9,636,173	48	19	28	1,328	-49
South Africa	49,991,300	30	21	24	232	-5,443
South Sudan	9,940,929	43	20		1,617	-2,504
Spain	46,070,971	15	10	11	347	-36
Sri Lanka	20,653,000	25	16	21	-50	303
St. Kitts and Nevis	52,352			21		
St. Lucia	177,397	25		21	-4	-4
St. Martin (French part)	30,235					
St. Vincent and the Grenadines	109,316	27		22	-5	-3
Sudan	35,652,002	42	20	32	3,288	-13
Suriname	524,960	29	17	24	8	40
Swaziland	1,193,148	39	25	30	0	268
Sweden	9,378,126	17	13	14	-67	190
Switzerland	7,824,909	15	12	14	-36	429
Syrian Arab Republic	21,532,647	36	21	27	991	853
Tajikistan	7,627,326	36	22	24	154	-35
Tanzania	44,973,330	45	20	31	5,475	-2,408
Thailand	66,402,316	19	14	18	-2,544	93
Timor-Leste	1,142,502	47	20	33	121	674
Togo	6,306,014	42	20	30	559	-2
Tonga	104,098	37	19	29	2	-23
Trinidad and Tobago	1,328,095	21	17	17	-83	122
Tunisia	10,549,100	23	19	21	-468	-1,086
Turkey	72,137,546	27	17	22	38	44
Turkmenistan	5,041,995	29	22	20	-146	6,524
Turks and Caicos Islands	30,993					
Tuvalu	9,827			29		
Uganda	33,987,213	49	20	34	5,258	230
Ukraine	45,870,700	14	14	11	-3,101	335
United Arab Emirates	8,441,537	14	23		423	718
United Kingdom	62,271,177	18	13	15	-295	7,437
United States	309,326,225	20	14	16	1,285	3,835
Uruguay	3,371,982	23	15	18	-41	-1
Uzbekistan	28,562,400	30	22	22	-837	-37
Vanuatu	236,299	38	19	31	16	182
Venezuela, RB	29,043,283	29	19	21	459	11
Vietnam	86,932,500	23	21	21	-5,039	145
Virgin Islands (U.S.)	106,267	21	13		-6	-1,259
West Bank and Gaza	3,811,102	42				
Yemen, Rep.	22,763,008	42	23	33		
Zambia	13,216,985	47	20	30	1,771	2,781
Zimbabwe	13,076,978	41	24	32	227	1,020

Gross Enrolment - Primary

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
World	106	93	100	103	95	99	108	105	107
Low income	78	63	71	86	75	80	108	102	105
Lower-middle income	100	81	91	101	87	94	107	104	106
Upper-middle income	126	117	122	114	113	113	110	110	110
High income	103	102	103	102	101	102	103	102	103
East Asia & Pacific (all income levels)	125	116	120	110	110	110	109	111	110
East Asia & Pacific (developing only)	127	117	122	111	111	111	110	112	111
Europe & Central Asia (all income levels)	104	102	103	104	102	103	103	102	103
Europe & Central Asia (developing only)	104	101	103	103	99	101	101	100	101
Latin America and Caribbean (all income levels)	117	115	116	122	118	120	116	112	114
Latin America and Caribbean (developing only)	117	116	117	123	119	121	116	112	114
Middle East & North Africa (all income levels)	102	85	94	103	92	98	108	102	105
Middle East & North Africa (developing only)	103	86	95	104	92	98	109	101	105
North America	105	104	104	102	101	102	102	101	101
South Asia	99	72	86	97	81	90	110	107	108
Sub-Saharan Africa (all income levels)	78	65	72	88	75	81	103	96	100
Sub-Saharan Africa (developing only)	78	65	72	88	75	81	103	96	100
Afghanistan	37	21	29	38	0	19	114	79	97
Albania	99	99	99	111	109	110			
Algeria	103	86	95	112	103	108	113	107	110
American Samoa									
Andorra									
Angola	88	81	85				137	112	124
Antigua and Barbuda						124	106	97	102
Argentina	107	106	106	115	113	114	119	117	118
Armenia						99	101	104	103
Aruba				113	109	111	116	112	114
Australia	106	106	106	101	101	101	105	105	105
Austria	102	102	102	105	103	104	100	99	99
Azerbaijan			110	98	96	97	94	93	94
Bahamas, The			98	96	93	94	113	115	114
Bahrain	110	113	111	107	107	107			
Bangladesh	88	74	81						
Barbados	116	115	116	99	104	102	119	122	120
Belarus			93	111	110	110	100	100	100
Belgium	99	100	99	110	109	109	104	104	104
Belize			111	115	102	108	127	116	121
Benin	71	35	53	104	69	86	135	117	126
Bermuda							92	92	92
Bhutan				83	72	77	110	112	111
Bolivia	110	102	106	115	114	115	101	99	100
Bosnia and Herzegovina							87	88	88
Botswana	100	108	104	104	104	104			
Brazil			141	155	146	151			
Brunei Darussalam				116	113	114	107	109	108
Bulgaria	96	95	96	106	103	105	103	102	103
Burkina Faso	37	23	30	49	35	42	79	72	76
Burundi	78	63	71	70	56	63	157	155	156
Cambodia			105	113	98	106	130	124	127
Cameroon	104	89	97	94	81	87	129	111	120
Canada	104	103	104	100	100	100			
Cape Verde	123	119	121	127	122	124	114	105	110
Cayman Islands				108	114	111			
Central African Republic	86	54	70				109	78	93

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Chad	69	30	50	84	51	68	107	78	93
Chile	106	104	105	102	99	100	104	101	103
China	139	126	133				110	113	111
Colombia	99	113	106	120	119	119	116	114	115
Comoros	101	71	86	121	103	112			
Congo, Dem. Rep.	67	48	58				100	87	94
Congo, Rep.	130	122	126	90	84	87	118	112	115
Costa Rica	103	102	102	111	109	110	110	109	110
Cote d'Ivoire	79	56	67	85	64	74			
Croatia				94	93	93	93	93	93
Cuba	102	98	100	103	99	101	104	102	103
Curacao									
Cyprus	82	82	82	97	97	97	102	102	102
Czech Republic	92	92	92	103	102	103	106	106	106
Denmark	97	98	97	101	101	101	99	99	99
Djibouti	41	30	36	37	27	32			
Dominica	107	100	103	119	121	120	113	111	112
Dominican Republic				116	112	114	115	102	108
Ecuador			118	116	115	116	119	119	119
Egypt, Arab Rep.	95	79	87	102	94	98	108	104	106
El Salvador				107	103	105	117	111	114
Equatorial Guinea				110	105	108	88	85	87
Eritrea	21	20	20	63	51	57	48	41	45
Estonia	95	93	94	103	99	101	99	98	99
Ethiopia	44	29	37	67	43	55	106	97	102
Faeroe Islands									
Fiji				102	100	101			
Finland	99	98	99	102	101	101	99	99	99
France	112	110	111	105	104	105	111	109	110
French Polynesia	130	125	127						
Gabon									
Gambia, The			53	90	79	84	82	84	83
Georgia				98	96	97	107	111	109
Germany				105	105	105	103	102	102
Ghana	76	65	70	88	82	85			
Greece	99	98	99	96	96	96	101	101	101
Greenland									
Grenada			117	93	90	91	105	102	103
Guam									
Guatemala			77	109	98	104	118	114	116
Guinea	49	23	36	71	48	60	103	86	94
Guinea-Bissau				94	63	79	127	119	123
Guyana				106	103	105	83	86	85
Haiti									
Honduras	107	108	108	107	108	107	116	116	116
Hong Kong SAR, China			104	100	97	99	101	103	102
Hungary	88	87	87	103	101	102	102	101	102
Iceland			102	103	101	102	99	99	99
India	104	77	91	102	85	94	112	112	112
Indonesia	115	110	112	108	105	106	117	119	118
Iran, Islamic Rep.	115	101	108	103	98	101	108	107	108
Iraq				104	86	95			
Ireland	103	104	104	102	101	102	108	108	108
Isle of Man									
Israel	94	97	95	106	105	106	104	105	104
Italy	99	98	99	103	103	103	102	101	102
Jamaica	105	104	104	97	97	97	91	87	89
Japan	102	102	102	101	101	101	103	103	103
Jordan	102	101	101	98	98	98	92	92	92

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Kazakhstan			114	96	97	96	111	111	111
Kenya	102	99	100	96	95	95			
Kiribati	114	116	115	110	107	109			
Korea, Dem. Rep.									
Korea, Rep.	105	107	106	101	102	102	106	105	106
Kosovo									
Kuwait	92	90	91	102	104	103			
Kyrgyz Republic	109	111	110	97	95	96	100	99	100
Lao PDR	112	89	100	119	101	110	131	122	126
Latvia	91	98	95	99	97	98	101	100	101
Lebanon				111	106	108	106	103	105
Lesotho	98	119	108	109	113	111	104	102	103
Liberia				129	95	112			
Libya									
Liechtenstein							109	102	105
Lithuania			90	104	103	104	96	95	96
Luxembourg				100	101	100	96	98	97
Macao SAR, China	109	104	107	104	103	103			
Macedonia, FYR				101	100	101	89	91	90
Madagascar	102	98	100	105	101	103	150	147	149
Malawi	77	66	72	141	136	139	136	141	139
Malaysia	93	92	93	98	98	98			
Maldives				131	132	131	108	104	106
Mali	32	20	26	63	47	55	86	75	80
Malta	105	101	103	100	101	101	101	101	101
Marshall Islands				98	94	96			
Mauritania	54	40	47	86	83	84	99	105	102
Mauritius	117	118	117						
Mexico	116	111	113	111	109	110	115	113	114
Micronesia, Fed. Sts.									
Moldova	90	90	90	102	101	101	94	93	94
Monaco									
Mongolia			101	97	99	98	123	121	122
Montenegro							107	106	107
Morocco	81	55	68	100	85	92	115	108	111
Mozambique	72	54	63	85	64	75	121	109	115
Myanmar	107	101	104	106	105	105	126	126	126
Namibia	113	123	118	114	115	115	108	106	107
Nepal	136	82	110	131	104	118			
Netherlands	102	105	104	110	107	109	108	107	108
New Caledonia									
New Zealand	106	104	105	99	100	99	101	101	101
Nicaragua	85	90	87	101	102	102	119	116	118
Niger	33	20	27	38	26	33	73	60	66
Nigeria	95	75	85	108	88	98	87	79	83
Northern Mariana Islands									
Norway	100	100	100	101	101	101	99	99	99
Oman	83	75	79	91	90	91			
Pakistan	72	38	55	84	56	70	104	85	95
Palau				115	111	113			
Panama	109	104	106	110	107	109	109	106	108
Papua New Guinea	67	57	62	76	66	71			
Paraguay	106	102	104	122	117	120	100	96	98
Peru			120	124	123	123	108	108	108
Philippines	110	108	109			110			
Poland	100	98	99	100	98	99	99	98	99
Portugal	123	118	121	125	119	122	113	110	112
Puerto Rico							91	95	93
Qatar	103	96	100	99	103	101	103	103	103

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Romania	93	92	92	98	96	97	96	95	96
Russian Federation	107	107	107	104	103	103			
Rwanda	76	75	76	106	102	104	141	144	143
Samoa				99	99	99	107	109	108
San Marino							89	101	94
Sao Tome and Principe	144	132	138				131	130	131
Saudi Arabia							106	106	106
Senegal	65	47	56	76	66	71	84	89	87
Serbia				107	106	106	96	96	96
Seychelles				112	113	112	117	117	117
Sierra Leone	63	42	52	75	66	70			
Singapore									
Sint Maarten (Dutch part)									
Slovak Republic				100	98	99	101	101	101
Slovenia			100	96	98	97	99	98	98
Solomon Islands	95	82	89	90	84	87	146	144	145
Somalia									
South Africa	107	106	107	109	103	106			
South Sudan									
Spain	107	105	106	106	105	106	106	105	106
Sri Lanka	112	108	110				99	99	99
St. Kitts and Nevis	116	111	113	112	109	111	93	94	93
St. Lucia	142	136	139	104	101	103	96	92	94
St. Martin (French part)									
St. Vincent and the Grenadines				121	115	118	109	101	105
Sudan				52	44	48			
Suriname	112	123	118						
Swaziland	94	94	94	97	93	95	121	111	116
Sweden	100	100	100	108	111	110	102	101	101
Switzerland	89	90	89	106	106	106	103	102	103
Syrian Arab Republic	113	102	107	113	105	109	119	116	118
Tajikistan				100	93	97	104	100	102
Tanzania	70	69	69	69	68	68	101	103	102
Thailand			98	98	96	97			
Timor-Leste							119	115	117
Togo	117	75	96	133	103	118	147	132	140
Tonga	108	107	107	112	106	109			
Trinidad and Tobago	96	97	97	100	99	100	107	103	105
Tunisia	120	104	112	119	111	115	112	108	110
Turkey	107	98	102	106	97	101	105	104	104
Turkmenistan									
Turks and Caicos Islands									
Tuvalu				103	107	105			
Uganda	77	62	70	137	126	131	120	122	121
Ukraine	107	107	107	108	108	108	99	100	99
United Arab Emirates	110	106	108	90	89	90			
United Kingdom	106	106	106	101	101	101	107	107	107
United States	105	104	105	103	101	102	102	101	102
Uruguay	109	108	109	110	108	109	114	110	112
Uzbekistan	111	110	110	99	99	99	95	93	94
Vanuatu	98	96	97	122	119	120	120	114	117
Venezuela, RB			106	102	100	101	104	101	103
Vietnam			105	111	105	108	109	103	106
Virgin Islands (U.S.)									
West Bank and Gaza				99	98	98	92	90	91
Yemen, Rep.							96	78	87
Zambia			97	87	81	84	115	116	115
Zimbabwe	101	100	101						

Gross Enrolment - Secondary

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
World	54	45	50	63	57	60	71	69	70
Low income	26	17	21	33	28	31	45	39	42
Lower-middle income	48	33	41	52	42	47	63	58	61
Upper-middle income	52	44	48	71	69	70	83	86	84
High income	92	93	92	98	98	98	101	100	100
East Asia & Pacific (all income levels)	48	40	44	64	62	63	78	80	79
East Asia & Pacific (developing only)	44	34	39	61	58	60	76	78	77
Europe & Central Asia (all income levels)	91	90	90	95	93	94	99	97	98
Europe & Central Asia (developing only)	88	82	85	87	81	84	94	90	92
Latin America and Caribbean (all income levels)	60	63	61	80	85	83	87	93	90
Latin America and Caribbean (developing only)	59	62	60	80	85	83	87	94	90
Middle East & North Africa (all income levels)	64	48	56	73	66	69	79	74	77
Middle East & North Africa (developing only)	64	47	56	71	64	68	76	72	74
North America	92	92	92	93	95	94	96	97	97
South Asia	44	26	35	50	37	44	61	56	58
Sub-Saharan Africa (all income levels)	26	19	23	29	23	26	44	36	40
Sub-Saharan Africa (developing only)	26	19	23	29	23	26	44	36	40
Afghanistan			11				60	30	46
Albania	93	85	89	74	70	72			
Algeria	70	54	62	64	67	66	97	101	99
American Samoa									
Andorra							85	89	87
Angola			11	16	13	15	37	25	31
Antigua and Barbuda				82	76	79	105	106	105
Argentina			71	85	89	87	85	95	90
Armenia						90	91	93	92
Aruba				95	99	97	89	90	90
Australia				162	162	162	135	128	131
Austria	105	96	101	100	95	98	101	97	99
Azerbaijan			89				100	98	99
Bahamas, The			86	82	82	82	93	98	96
Bahrain	87	89	88	95	103	99			
Bangladesh	27	14	21	47	49	48	48	55	51
Barbados	91	82	86	100	111	105	96	105	101
Belarus	95	99	97				107	104	106
Belgium	98	99	99	138	152	145	112	109	111
Belize				63	67	65			
Benin				32	14	23			
Bermuda							72	85	79
Bhutan				45	37	41	65	66	66
Bolivia				82	78	80			
Bosnia and Herzegovina							88	91	90
Botswana	38	42	40	73	77	75			
Brazil									
Brunei Darussalam				87	92	89	108	112	110
Bulgaria	99	99	99	94	92	93	91	87	89
Burkina Faso			6	12	8	10	23	18	21
Burundi	6	4	5				29	21	25
Cambodia				21	12	17			
Cameroon	30	20	25			28	51	43	47
Canada	99	100	99	102	103	102			
Cape Verde	20	21	21			68	80	95	88
Cayman Islands				103	102	103			
Central African Republic	16	7	11						

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Chad	11	2	7	17	5	11	35	15	25
Chile	76	80	78	82	84	83	88	91	89
China	43	32	38			62	80	83	81
Colombia				68	75	72	92	101	96
Comoros				32	26	29			
Congo, Dem. Rep.							48	28	38
Congo, Rep.	55	42	49	42	29	36			
Costa Rica	42	45	43	58	63	61	97	103	100
Cote d'Ivoire				31	17	24			
Croatia				84	86	85	93	99	96
Cuba	84	95	89	81	84	83	90	89	89
Curacao									
Cyprus	63	65	64	92	94	93	91	92	91
Czech Republic	97	89	93	87	88	87	90	90	90
Denmark	108	111	109	124	130	127	118	119	119
Djibouti			11	16	11	14			
Dominica	64	77	70	99	112	105	94	103	98
Dominican Republic				53	66	59	72	81	76
Ecuador			57	57	58	57	87	88	88
Egypt, Arab Rep.	77	59	68	86	79	83	74	71	72
El Salvador				54	54	54	65	65	65
Equatorial Guinea				44	19	31			
Eritrea				30	20	25	36	28	32
Estonia			103	92	96	94	107	107	107
Ethiopia				17	12	14	39	32	36
Faeroe Islands									
Fiji				75	82	78			
Finland	105	124	115	119	131	125	105	110	108
France	92	98	95	108	108	108	113	114	113
French Polynesia	57	78	67						
Gabon									
Gambia, The	22	10	16				56	53	54
Georgia				79	78	79			
Germany				99	97	98	106	100	103
Ghana	43	28	36	44	36	41			
Greece	95	93	94	87	92	89	112	107	109
Greenland									
Grenada	86	96	91				106	109	108
Guam									
Guatemala				40	36	38	67	62	64
Guinea	17	6	11						
Guinea-Bissau				24	13	19			
Guyana							87	96	91
Haiti									
Honduras							66	81	73
Hong Kong SAR, China							82	84	83
Hungary	87	88	88	95	95	95	101	99	100
Iceland			98	104	111	107	107	109	108
India				53	37	45	66	60	63
Indonesia	50	41	46	54	51	53	77	77	77
Iran, Islamic Rep.	63	45	54	82	77	80	84	81	82
Iraq				46	29	38			
Ireland	95	104	99	101	109	105	118	124	121
Isle of Man									
Israel	86	91	89	103	103	103	101	103	102
Italy	79	79	79	95	91	93	101	100	100
Jamaica				86	88	87	91	94	93
Japan	95	97	96	101	102	102	102	102	102
Jordan	75	77	76	82	86	84	85	89	87

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Kazakhstan			100	93	95	94	98	96	97
Kenya				40	38	39			
Kiribati	39	36	38	57	72	64			
Korea, Dem. Rep.									
Korea, Rep.	95	90	93	99	99	99	98	96	97
Kosovo									
Kuwait	80	72	76	106	110	108			
Kyrgyz Republic	103	102	102	83	85	84	85	83	84
Lao PDR	28	19	24	41	29	35	51	43	47
Latvia			95	89	92	91	96	94	95
Lebanon				76	82	79	77	86	81
Lesotho	20	29	25	26	34	30	39	54	46
Liberia				40	29	35			
Libya									
Liechtenstein							118	100	109
Lithuania			95	98	98	98	100	98	99
Luxembourg				94	100	97	100	103	101
Macao SAR, China	58	63	61	82	84	83	96	89	92
Macedonia, FYR				85	83	84	84	83	84
Madagascar	19	18	19						
Malawi	20	12	16	37	28	32	35	31	33
Malaysia	53	56	55	63	69	66	67	72	69
Maldives				51	55	53			
Mali	9	4	7	21	12	17	44	31	38
Malta	86	80	83	85	85	85	107	95	101
Marshall Islands									
Mauritania	18	8	13	21	15	18	26	22	24
Mauritius	52	53	52	77	74	75			
Mexico	55	55	55	72	73	73	86	92	89
Micronesia, Fed. Sts.									
Moldova	90	98	94	81	83	82	87	89	88
Monaco									
Mongolia			89	58	72	65	86	92	89
Montenegro							103	105	104
Morocco	44	31	37	42	34	38	68	59	64
Mozambique	9	5	7	7	5	6	28	23	25
Myanmar	22	20	21	39	41	40	53	56	54
Namibia	34	42	38	57	64	60			
Nepal	44	19	32	41	29	35			
Netherlands	120	111	116	126	121	123	122	121	121
New Caledonia									
New Zealand	88	89	89	108	114	111	116	122	119
Nicaragua			37	49	57	53	66	73	69
Niger	9	3	6	9	5	7	16	11	14
Nigeria	27	21	24	26	22	24	47	41	44
Northern Mariana Islands									
Norway	99	103	101	115	118	116	112	110	111
Oman	47	34	40	76	75	75			
Pakistan	29	12	21				39	29	34
Palau				85	88	86			
Panama	59	63	61	65	69	67	72	77	74
Papua New Guinea	13	8	11						
Paraguay	30	31	31	60	62	61	66	70	68
Peru			68	89	83	86	92	91	91
Philippines	71	73	72						
Poland	85	90	88	102	99	101	98	96	97
Portugal	60	60	60	101	108	105	108	110	109
Puerto Rico							80	84	82
Qatar	72	92	81	82	94	88	86	104	94

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Romania	104	101	103	81	83	82	98	97	97
Russian Federation			96						
Rwanda	18	15	16	11	11	11	32	32	32
Samoa				73	83	78	79	91	85
San Marino							96	98	97
Sao Tome and Principe							51	52	51
Saudi Arabia							111	98	104
Senegal	20	10	15	20	13	16	40	35	37
Serbia				89	91	90	91	92	91
Seychelles				102	107	105	114	125	119
Sierra Leone	23	12	17						
Singapore									
Sint Maarten (Dutch part)									
Slovak Republic				84	85	85	90	91	90
Slovenia			88	99	103	101	98	97	97
Solomon Islands	17	11	14	23	18	21	51	45	48
Somalia									
South Africa	61	71	66	81	90	85			
South Sudan									
Spain	99	105	102	108	115	111	123	126	125
Sri Lanka	69	75	72				99	102	100
St. Kitts and Nevis				95	99	97	98	97	98
St. Lucia	39	59	49	64	83	73	97	96	96
St. Martin (French part)									
St. Vincent and the Grenadines				71	95	82	106	109	107
Sudan						25			
Suriname	49	63	56						
Swaziland				42	42	42	58	58	58
Sweden	88	92	90	134	170	152	100	99	99
Switzerland	99	92	96	98	92	95	97	94	95
Syrian Arab Republic	59	43	51	47	43	45	72	73	72
Tajikistan				80	69	74	93	81	87
Tanzania	6	4	5				35	28	32
Thailand	28	29	28				74	80	77
Timor-Leste							56	56	56
Togo	33	11	22	47	21	34			
Tonga	99	98	98	101	113	106			
Trinidad and Tobago	84	86	85	72	79	76			
Tunisia	50	38	44	75	77	76	88	93	90
Turkey	63	37	50	82	60	71	86	79	82
Turkmenistan									
Turks and Caicos Islands									
Tuvalu									
Uganda	14	8	11	19	14	16			
Ukraine	93	97	95	99	99	99	97	94	96
United Arab Emirates	56	69	62	83	88	85			
United Kingdom	82	85	84	101	102	102	105	106	105
United States	91	91	91	92	94	93	96	97	96
Uruguay			81	92	105	98	85	96	90
Uzbekistan			101	89	86	88	105	104	105
Vanuatu				32	37	35	54	55	55
Venezuela, RB			56	55	65	60	79	86	83
Vietnam			36						
Virgin Islands (U.S.)									
West Bank and Gaza				79	82	81	83	89	86
Yemen, Rep.							54	34	44
Zambia			21						
Zimbabwe	50	44	47						

Gross Enrolment - Tertiary

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
World	14	13	14	19	19	19	28	31	30
Low income	5	2	3	5	3	4	10	7	9
Lower-middle income	9	7	8	13	10	12	20	17	18
Upper-middle income	9	7	8	15	15	15	30	35	32
High income	42	45	43	52	60	56	65	82	73
East Asia & Pacific (all income levels)	9	6	7	17	15	16	28	30	29
East Asia & Pacific (developing only)	6	4	5	12	11	12	25	27	26
Europe & Central Asia (all income levels)	32	33	32	42	48	45	54	66	60
Europe & Central Asia (developing only)	25	26	26	30	30	30	46	49	48
Latin America and Caribbean (all income levels)	17	17	17	21	25	23	36	46	41
Latin America and Caribbean (developing only)	17	16	16	20	24	22	35	45	40
Middle East & North Africa (all income levels)	15	10	13	22	19	20	30	31	30
Middle East & North Africa (developing only)	16	10	13	22	18	20	30	30	30
North America	66	81	73	58	78	68	76	107	91
South Asia	7	3	5	10	6	8	18	13	16
Sub-Saharan Africa (all income levels)	4	2	3	5	3	4	9	6	7
Sub-Saharan Africa (developing only)	4	2	3	5	3	4	9	6	7
Afghanistan	3	1	2						
Albania	8	9	8	14	19	17	34	45	39
Algeria			10				25	37	31
American Samoa									
Andorra									
Angola	1	0	1				4	3	4
Antigua and Barbuda							9	23	16
Argentina				42	65	53	60	90	75
Armenia			23	23	24	24	45	58	52
Aruba				24	36	30	27	35	31
Australia	33	38	35	59	72	65	68	92	80
Austria	34	30	32	54	58	56	63	74	68
Azerbaijan			23	18	13	16	19	19	19
Bahamas, The									
Bahrain									
Bangladesh	7	1	4	7	4	6			
Barbados	14	20	17	22	61	41	40	95	66
Belarus			49	46	61	54	64	92	78
Belgium	38	37	37	53	61	57	62	79	71
Belize							17	26	21
Benin			2	6	2	4			
Bermuda							19	41	30
Bhutan							9	5	7
Bolivia						35			
Bosnia and Herzegovina							31	41	36
Botswana				6	6	6			
Brazil	10	11	11	14	18	16			
Brunei Darussalam				9	16	13	12	22	17
Bulgaria	24	28	26	37	52	44	49	65	57
Burkina Faso	1	0	1	2	0	1	4	2	3
Burundi	1	0	1	2	1	1	4	2	3
Cambodia			1	4	1	3	16	10	13
Cameroon			3			4	13	10	11
Canada	81	100	90	51	68	59			
Cape Verde				2	2	2	16	20	18
Cayman Islands						20			
Central African Republic	2	0	1	3	1	2	4	1	3

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Chad				1	0	1	4	1	2
Chile				39	36	37	64	68	66
China			3			8	25	27	26
Colombia			14	23	25	24	37	41	39
Comoros	1	0	1	1	1	1	9	7	8
Congo, Dem. Rep.			2						
Congo, Rep.	8	2	5	8	2	5			
Costa Rica			26						
Cote d'Ivoire									
Croatia			23	29	33	31	46	62	54
Cuba	18	25	21	20	24	22	72	119	95
Curacao									
Cyprus	8	11	9	17	22	20	51	46	48
Czech Republic	18	14	16	28	29	29	53	75	64
Denmark	32	36	34	48	66	57	61	87	74
Djibouti				0	0	0	4	3	3
Dominica									
Dominican Republic									
Ecuador			20						
Egypt, Arab Rep.	18	10	14				34	31	32
El Salvador			15	19	22	21	22	25	23
Equatorial Guinea				5	2	3			
Eritrea				2	0	1	3	1	2
Estonia			25	46	66	56	49	80	64
Ethiopia	1	0	1	2	1	1	10	4	7
Faeroe Islands									
Fiji									
Finland	42	47	45	75	90	82	85	103	94
France	35	40	37	49	59	54	50	64	57
French Polynesia									
Gabon									
Gambia, The				2	0	1			
Georgia				39	37	38	25	31	28
Germany									
Ghana									
Greece	25	25	25	49	53	51			
Greenland									
Grenada									
Guam									
Guatemala									
Guinea	2	0	1				16	6	11
Guinea-Bissau									
Guyana	7	5	6				7	17	12
Haiti									
Honduras	10	8	9	13	17	15	19	22	21
Hong Kong SAR, China							58	61	60
Hungary	14	15	15	33	41	37	52	70	61
Iceland	22	29	25	34	57	45	57	101	79
India	8	4	6	11	7	9	21	15	18
Indonesia			8	16	14	15	24	22	23
Iran, Islamic Rep.				21	18	19	43	43	43
Iraq				15	8	12			
Ireland	30	26	28	45	55	50	62	71	66
Isle of Man									
Israel	34	33	34	41	58	49			
Italy	30	29	29	43	55	49	54	76	65
Jamaica				11	20	15			26
Japan	36	23	30	52	45	49	63	56	60
Jordan	18	23	20	26	30	28	35	41	38

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Kazakhstan			39	26	30	28	32	45	38
Kenya				4	2	3			
Kiribati									
Korea, Dem. Rep.									
Korea, Rep.	49	23	37	96	59	79	119	86	103
Kosovo									
Kuwait	10	14	12						
Kyrgyz Republic			27	35	35	35	37	48	42
Lao PDR	2	1	1	4	2	3	19	14	17
Latvia	21	29	25	41	72	56	44	77	60
Lebanon				33	35	34	49	59	54
Lesotho	1	1	1	2	3	2			
Liberia				24	14	19			
Libya			12	48	46	47			
Liechtenstein							44	27	36
Lithuania	39	27	33	40	61	51	59	90	74
Luxembourg						10	17	19	18
Macao SAR, China	47	18	29	28	25	26	65	64	65
Macedonia, FYR	19	18	19	20	26	23	36	42	39
Madagascar	4	3	4	2	2	2	4	4	4
Malawi	1	0	1	0	0	0	1	1	1
Malaysia			7	25	26	26	36	49	42
Maldives									
Mali	1	0	1	2	1	2	8	3	6
Malta	12	9	11	19	23	21	30	41	35
Marshall Islands									
Mauritania	5	1	3				6	3	4
Mauritius	4	2	3	12	10	11	28	34	31
Mexico			15	21	19	20	28	28	28
Micronesia, Fed. Sts.						14			
Moldova			35	28	37	33	33	44	38
Monaco									
Mongolia			18	22	39	30	42	65	53
Montenegro							43	53	48
Morocco	14	8	11	11	8	9	15	13	14
Mozambique						1			
Myanmar			5						
Namibia									
Nepal	7	2	5	6	2	4			
Netherlands	39	32	35	52	53	53	62	69	65
New Caledonia									
New Zealand	38	41	39	54	79	66	67	99	83
Nicaragua	8	8	8						
Niger	1	0	1				2	1	1
Nigeria									
Northern Mariana Islands									
Norway	35	42	38	57	82	69	57	93	74
Oman	4	4	4				21	29	24
Pakistan	4	2	3						
Palau				25	58	41			
Panama			21	33	55	44	36	56	46
Papua New Guinea									
Paraguay			8	13	18	16	29	40	35
Peru			30				41	45	43
Philippines			25						
Poland	17	24	20	42	59	51	58	87	72
Portugal			20	41	54	47	60	71	65
Puerto Rico							70	103	86
Qatar	10	36	20				5	26	10

	1990			2000			2010		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Romania	8	8	8	22	25	24	50	68	59
Russian Federation			55			55			
Rwanda	1	0	1			1	6	5	5
Samoa				8	7	7			
San Marino							53	77	65
Sao Tome and Principe							5	4	4
Saudi Arabia			10	20	25	23	35	39	37
Senegal							10	6	8
Serbia							43	56	49
Seychelles									
Sierra Leone			1	2	1	2			
Singapore									
Sint Maarten (Dutch part)									
Slovak Republic				28	29	29	43	67	55
Slovenia	22	27	24	47	64	55	74	106	90
Solomon Islands									
Somalia									
South Africa	13	11	12						
South Sudan									
Spain	34	37	36	54	64	59	70	86	78
Sri Lanka							11	20	15
St. Kitts and Nevis									
St. Lucia							6	16	11
St. Martin (French part)									
St. Vincent and the Grenadines	4	8	6						
Sudan	3	2	3	6	6	6			
Suriname	9	11	10						
Swaziland	5	3	4	5	4	4			
Sweden	28	33	31	55	80	67	58	90	74
Switzerland	33	18	26	43	32	38	55	55	55
Syrian Arab Republic	22	14	18						
Tajikistan			22	25	11	18	32	17	24
Tanzania							2	2	2
Thailand			16	32	38	35	40	53	46
Timor-Leste									
Togo	4	1	2						9
Tonga						5			
Trinidad and Tobago				5	7	6			
Tunisia	10	6	8			19	29	43	36
Turkey	17	9	13				61	50	55
Turkmenistan			12						
Turks and Caicos Islands									
Tuvalu									
Uganda	2	1	1	3	2	3			
Ukraine			48	46	53	49	71	89	79
United Arab Emirates	3	13	7						
United Kingdom	28	26	27	53	63	58	50	70	60
United States	64	79	71	59	79	69	79	111	95
Uruguay			30	25	44	34	47	80	63
Uzbekistan			17	14	12	13			
Vanuatu						4			
Venezuela, RB			28	23	34	28			
Vietnam			3	11	8	10	22	22	22
Virgin Islands (U.S.)									
West Bank and Gaza				25	23	24	43	58	50
Yemen, Rep.				16	4	10			
Zambia			2	3	2	2			
Zimbabwe			5				7	5	6

Education Expenditure

	Education expenditure per student, primary schooling (% of GDP per capita)			Education expenditure per student, secondary schooling (% of GDP per capita)			Education expenditure per student, tertiary schooling (% of GDP per capita)			Education expenditure per student as share of government budget (% of total)		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
World											14	
Low income											15	17
Lower-middle income												
Upper-middle income											14	
High income		18			23			29	25		13	
East Asia & Pacific (all income levels)									27			
East Asia & Pacific (developing only)											15	
Europe & Central Asia (all income levels)								30	24		12	
Europe & Central Asia (developing only)											12	
Latin America and Caribbean (all income levels)		13	15		14	15					15	
Latin America and Caribbean (developing only)		13	15		15	16			29		15	
Middle East & North Africa (all income levels)											18	
Middle East & North Africa (developing only)												
North America		19	23		23	25			22			
South Asia					12	14		96	39		13	11
Sub-Saharan Africa (all income levels)			13									16
Sub-Saharan Africa (developing only)			13									16
Afghanistan												
Albania											10	
Algeria		10			17							
American Samoa												
Andorra			17			13						
Angola												9
Antigua and Barbuda												
Argentina		13	16		18	25		18	18		14	
Armenia									7		13	12
Aruba		13	16		19	23		29	41		16	22
Australia		17			14			26			14	
Austria		23			28			44			11	
Azerbaijan								16	20		24	10
Bahamas, The											20	
Bahrain												
Bangladesh					11	15		42			15	
Barbados		17			25	31		51	50		14	14
Belarus									15			17
Belgium			23			38			36			12
Belize		17	19		17	27			27		16	
Benin		11	14		23			199			16	28
Bermuda			12			18			18			13
Bhutan		10	8		73	27		405			14	9
Bolivia		12	21		10			47			16	25
Bosnia and Herzegovina												
Botswana												
Brazil		11	21			22		56	28		12	18
Brunei Darussalam			5			8			32		9	9
Bulgaria			23			25			16			11
Burkina Faso			19			21			233			21
Burundi		9	14			47		772	351		13	25
Cambodia		6	7						27		15	
Cameroon			7			25			28		10	18
Canada												
Cape Verde												14
Cayman Islands												
Central African Republic			4						97		16	12

	Education expenditure per student, primary schooling (% of GDP per capita)			Education expenditure per student, secondary schooling (% of GDP per capita)			Education expenditure per student, tertiary schooling (% of GDP per capita)			Education expenditure per student as share of government budget (% of total)		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
Chad			8			18			248		13	10
Chile		14	15		14	15		18	16		18	18
China												
Colombia		12	16		13	15		30	30		17	
Comoros												
Congo, Dem. Rep.			5			16						9
Congo, Rep.			11									
Costa Rica		15			19							
Cote d'Ivoire		14			33						21	
Croatia								42	23			
Cuba		28	49		41	52		95	63		15	18
Curacao												
Cyprus		16	33		29	39		61	37		14	16
Czech Republic		11	16		20	24		29	23		9	10
Denmark		24			38			70			15	
Djibouti												
Dominica			15			15			0			9
Dominican Republic			8			7						
Ecuador		3	10		6	17					8	14
Egypt, Arab Rep.												
El Salvador		9			7			9	12		19	
Equatorial Guinea												
Eritrea												
Estonia			26			32			24		15	14
Ethiopia			18			10			23		11	25
Faeroe Islands												
Fiji											23	
Finland		17	21		24	37		38	39		12	12
France		18			29			30			11	
French Polynesia	1			2								
Gabon												
Gambia, The			20			14					14	23
Georgia											12	
Germany												
Ghana												24
Greece					20			21			7	
Greenland												
Grenada												
Guam												
Guatemala		7	8		4	6						19
Guinea			10						136			15
Guinea-Bissau												
Guyana			8			11			18		18	17
Haiti												
Honduras			19						41			
Hong Kong SAR, China			15			18			26			20
Hungary		19	22		20	22		35	25		10	10
Iceland		22			19			35			17	
India		15	7		25	14		96	70		13	10
Indonesia			11			9			23			17
Iran, Islamic Rep.			15			23			19		18	20
Iraq												
Ireland		11			16			30			14	
Isle of Man												
Israel		21	23		19	16		29	21		14	
Italy		23	24		26	25		26	26		10	
Jamaica			21			24			58		11	11
Japan		21	24		21	24		17	25		10	
Jordan												

	Education expenditure per student, primary schooling (% of GDP per capita)			Education expenditure per student, secondary schooling (% of GDP per capita)			Education expenditure per student, tertiary schooling (% of GDP per capita)			Education expenditure per student as share of government budget (% of total)		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
Kazakhstan											12	
Kenya		21			14			208			26	17
Kiribati		25										
Korea, Dem. Rep.												
Korea, Rep.												
Kosovo												
Kuwait												
Kyrgyz Republic								16	19		20	19
Lao PDR								70			7	13
Latvia		20	28		23	29		23	16		14	11
Lebanon								10	9		9	7
Lesotho		30			84			918			19	
Liberia												
Libya												
Liechtenstein												
Lithuania			24			23			21			13
Luxembourg												
Macao SAR, China		8			11			60	23		14	15
Macedonia, FYR												
Madagascar											18	
Malawi		11	6		25	22		2,503	1,821		15	12
Malaysia		13	14		22	19		82	47		27	21
Maldives												
Mali			14			31			161		15	16
Malta												
Marshall Islands												
Mauritania			13			31			190			15
Mauritius			11						13		14	14
Mexico		13	14			15			41		24	
Micronesia, Fed. Sts.												
Moldova			41			39			45		17	22
Monaco		3	4		7	6						6
Mongolia			15			18			6		16	
Montenegro												
Morocco		18			45			112			23	
Mozambique												
Myanmar											9	
Namibia		22	18		34						21	
Nepal		10			12			141	39		13	20
Netherlands		15	19		23	27		45	43		11	12
New Caledonia	1			2								
New Zealand		20	22		22	24			31			
Nicaragua			12			8					18	26
Niger			22			42			450		19	17
Nigeria												
Northern Mariana Islands												
Norway			21			28		39	45		16	15
Oman											18	
Pakistan												10
Palau												
Panama		14			22			32				
Papua New Guinea												
Paraguay		14	12		18	17		59	22			11
Peru			8			10			9			17
Philippines		12			10			14			14	
Poland			27			25		18	21		13	11
Portugal		20			28			26			13	
Puerto Rico												
Qatar												

	Education expenditure per student, primary schooling (% of GDP per capita)			Education expenditure per student, secondary schooling (% of GDP per capita)			Education expenditure per student, tertiary schooling (% of GDP per capita)			Education expenditure per student as share of government budget (% of total)		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
Romania											7	
Russian Federation								11			11	
Rwanda		11	8		43	37		1,228	187		21	18
Samoa		8			10			137			13	
San Marino												
Sao Tome and Principe												
Saudi Arabia											23	
Senegal			16			28			187			
Serbia			56			14			44			
Seychelles												
Sierra Leone												14
Singapore			12			19			31			20
Sint Maarten (Dutch part)												
Slovak Republic		11	22		16	20		29	19		8	11
Slovenia			31			31			24			11
Solomon Islands			13									34
Somalia												
South Africa		14	18		18	20					18	19
South Sudan												
Spain		18	21		23	27		21	29		11	11
Sri Lanka			6			9			26			12
St. Kitts and Nevis											14	
St. Lucia		25	16			20			17			11
St. Martin (French part)												
St. Vincent and the Grenadines		22	16		22	18					13	10
Sudan												
Suriname												
Swaziland		9	15		25	31		419				16
Sweden		23	28		26	32		50	42		13	13
Switzerland		21			26			52			15	
Syrian Arab Republic		12			23							
Tajikistan									14			15
Tanzania						16			868			18
Thailand		18				15		37	18		31	22
Timor-Leste												12
Togo		11	11		24				79		23	14
Tonga											17	
Trinidad and Tobago											13	
Tunisia		14			24			71	49		17	22
Turkey												
Turkmenistan												
Turks and Caicos Islands											15	
Tuvalu												
Uganda			6									15
Ukraine								36			15	
United Arab Emirates		5			6						22	
United Kingdom		14			24			23			11	
United States		19	23		23	25			22			
Uruguay		7			10			18			12	
Uzbekistan												
Vanuatu		13			61			146			17	
Venezuela, RB												
Vietnam			28						43			
Virgin Islands (U.S.)												
West Bank and Gaza												
Yemen, Rep.											33	
Zambia		7						160			6	
Zimbabwe									76			8

Other Education Indicators

	Literacy rate, adult			Literacy rate, 15-24			School life expectancy (years) Primary to Tertiary			Share of students in private schools, Primary (% of total)		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
World	76	82	86	83	87	93		11	13		12	10
Low income	51	57	67	60	68	78	8	9				11
Lower-middle income	58	68	77	70	79	86		11				14
Upper-middle income	80	91	95	94	98	99		13	13		8	8
High income							14	16	16	12	11	10
East Asia & Pacific (all income levels)	82	92		95	98							49
East Asia & Pacific (developing only)	80	91		94	98		9	11				
Europe & Central Asia (all income levels)	97	98	99	99	99	100						9
Europe & Central Asia (developing only)	94	97	99	98	99	100	11	13	14			1
Latin America and Caribbean (all income levels)	86	90	93	93	96	98					12	16
Latin America and Caribbean (developing only)	85	90	93	93	96	98			14		12	16
Middle East & North Africa (all income levels)	58	70		78	86		9		11	6	8	13
Middle East & North Africa (developing only)	56	68	75	76	85	88	9		13	5	6	9
North America							15	15	16	11	11	9
South Asia	46	58		58	73		5					26
Sub-Saharan Africa (all income levels)	53	57	66	66	69	75		7				10
Sub-Saharan Africa (developing only)	53	57	66	66	69	75		7				10
Afghanistan							3					
Albania							11	10				5
Algeria							9		14			
American Samoa												
Andorra												2
Angola			70			73	4		10			2
Antigua and Barbuda			99						14		38	52
Argentina			98			99		15	16		21	25
Armenia			100			100		11				2
Aruba		97	97		99	99		13	14		82	74
Australia								20	19	25	27	31
Austria							14	15	16	4	4	6
Azerbaijan							11		12			
Bahamas, The												30
Bahrain			92			100					19	31
Bangladesh			57			77	6			15		
Barbados							13	14	15	8	10	11
Belarus							13		15			
Belgium							14	18	16	56	54	54
Belize									13		87	82
Benin			42			55		7			10	13
Bermuda									13			37
Bhutan									12		2	3
Bolivia								13			21	8
Bosnia and Herzegovina		97	98		100	100						1
Botswana			84			95		12		5	5	
Brazil		86			94						8	14
Brunei Darussalam			95			100		13	14		35	36
Bulgaria							12	13	14			1
Burkina Faso							2	3	7	9	11	14
Burundi	37	59	67	54	73	78	4		10	1		1
Cambodia								8			2	1
Cameroon		68			83		8	7	10	27	27	23
Canada							17	16		4	6	
Cape Verde	63		84	88		98		12	13			
Cayman Islands											37	
Central African Republic		51	56		61	65	5					14
Chad		26	34		38	47		5	7	5		8

Share of students in private schools, Secondary (% of total)			Gender parity index for gross enrollment ratio, Primary			Gender parity index for gross enrollment ratio, Secondary			Gender parity index for gross enrollment ratio, Tertiary			Pupil-teacher ratio, Primary			Pupil-teacher ratio, Secondary		
1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
	28	0.9	0.9	1.0		0.9	1.0		0.9	1.0	28	30	24		22	20	
	15	0.8	0.9	0.9	0.7	0.8	0.9		0.7	0.6	30	38	45		30		
17	15	0.8	1.0	1.0	0.8	1.0	0.9				28	24	28		17		
	45	1.0	1.0	1.0		1.0	1.0		1.2	1.1		26	18		19	16	
	24	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.3		16	15		14		
1			1.0	1.0							24	26	18		17		
	52	0.9	1.0		0.8	1.0	1.0				24	27	17	16	18		
10	14		1.0	1.0		1.0	1.0		1.2	1.2		17	15		13	12	
6	9	1.0	1.0	1.0	0.9	0.9	1.0	1.0	1.2	1.1		18	16		12	12	
	15		1.0	1.0		1.0	1.1					26	24		17	18	
25	15	1.0	1.0	1.0		1.0	1.1			1.2	29	26	24		17	18	
	25	0.8	0.9	0.9	0.8	0.9	0.8	0.7	0.8	0.9	25	25	23	19	17		
	26	0.8	0.9	1.0	0.7	0.9	0.9		0.8	1.1	26	25	26	19			
27		1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.3	1.4		15	14			14	
5	13	0.7	0.8	1.0	0.5	0.7	0.9	0.5			50	39	40	24	34	26	
		0.8	0.8	0.9	0.7	0.8			0.5		42	48	46				
		0.8	0.8	0.9	0.7	0.8	0.8		0.5		42	48	46		27		
		0.6		0.7			0.5	0.5			41		44	25			
		1.0	1.0		0.9	1.0		1.1	1.4	1.3		23	20		16	15	
	6	0.8	0.9	0.9	0.8	1.1	1.0			1.5	28	28	23	18			
							1.0						10				
	2	0.9		0.8		0.8	0.7	0.2		0.8			46		19	39	
	11			0.9		0.9	1.0			2.6		19	15		13	12	
20	18	1.0	1.0	1.0		1.0	1.1		1.6	1.5		19			11		
27	28			1.0			1.0		1.1	1.3						7	
	1		1.0	1.0		1.0	1.0		1.5	1.3		19	17		15	14	
	92	1.0	1.0	1.0		1.0	1.0	1.2	1.2	1.4							
24	33	1.0	1.0	1.0	0.9	1.0	1.0	0.9	1.1	1.2	11		11	10		10	
8	10		1.0	1.0			1.0		0.7	1.0		19	11				
	13		1.0	1.0		1.0	1.1					15	14			12	
	30	1.0	1.0		1.0	1.1					21	18		15	14		
14	21	0.8			0.5	1.0	1.1	0.2	0.5		63		43	27	38	28	
96	95	1.0	1.0	1.0	0.9	1.1	1.1	1.5	2.8	2.4	18	18	13	20	17		
6	6		1.0	1.0	1.0		1.0		1.3	1.4		18	15				
	1	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.1	1.3		12	11	7	10		
59	69		0.9	0.9		1.1				1.6		23	22		23	17	
77	63	0.5	0.7	0.9		0.4			0.2		31	53	46		23		
16				1.0			1.2			2.1			7			5	
	45		0.9	1.0		0.8	1.0			0.6		41	26		32	21	
	11	0.9	1.0	1.0		1.0						25			22		
29				1.0			1.0			1.3							
	2	1.1	1.0		1.1	1.1			1.0		32	27		17	17		
4			0.9					1.1	1.3			25	22			17	
	14		1.0	1.0		1.1	1.0		1.8	1.8		14	11		11		
11	14	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.4	1.3		17	17		12	12	
1	1	0.6	0.7	0.9		0.7	0.8	0.3	0.3	0.5	55	49	52			30	
34	42	0.8	0.8	1.0	0.6		0.7	0.4	0.4	0.5	66	55	51	18		30	
	9		0.9	1.0		0.5			0.3	0.6	35	50	48		18		
1		0.9	0.9	0.9	0.7		0.8			0.8	51		46	26	24		
32		1.0	1.0		1.0	1.0		1.2	1.3		16	17		14			
7		1.0	1.0	0.9	1.1		1.2		1.0	1.3	33	29	24			18	
	13		1.1			1.0						14			9		
25		0.6		0.7	0.4			0.2	0.2	0.3	90		84	37			
		0.4	0.6	0.7	0.2	0.3	0.4		0.2	0.2	67	69	62		32	32	

	Literacy rate, adult			Literacy rate, 15-24			School life expectancy (years) Primary to Tertiary			Share of students in private schools, Primary (% of total)		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
Chile								13	15			58
China	78	91	94	94	99	99	9		13			5
Colombia			93			98		11	14	15	19	18
Comoros		68	75		80	86		9			11	
Congo, Dem. Rep.			67			65						
Congo, Rep.							11	8			15	36
Costa Rica		95	96		98	98	10			5	7	8
Cote d'Ivoire		49	56		61	67				11	12	
Croatia			99			100		12	14			
Cuba			100			100	12	12	16			
Curacao												
Cyprus			98			100				4	4	8
Czech Republic							12	14	16		1	2
Denmark							14	16	17	10	11	14
Djibouti								3		11	7	
Dominica											26	35
Dominican Republic			90			97					14	23
Ecuador	88		92	96		99	12				22	26
Egypt, Arab Rep.			72			88	10		13	6		
El Salvador			84			96		11	12		11	10
Equatorial Guinea		88	94		97	98		8				50
Eritrea			68			89		4	4	29	10	8
Estonia		100	100		100	100	13	15	16		1	4
Ethiopia								4	8	11		11
Faeroe Islands												
Fiji												
Finland							15	18	17	1	1	1
France							14	16	16	15	15	15
French Polynesia												
Gabon			88			98						
Gambia, The		37	50		53	67					14	26
Georgia			100			100		12			2	9
Germany											2	4
Ghana		58	67		71	81		8			17	
Greece			97			99	13	14		7	7	7
Greenland												
Grenada										7		77
Guam												
Guatemala			75			87					13	10
Guinea			41			63	3			3	16	27
Guinea-Bissau		41	54		59	72					19	28
Guyana									11		1	5
Haiti												
Honduras			85			95			12	6		9
Hong Kong SAR, China									15	10		16
Hungary			99			99	11	14	15		5	9
Iceland							14	17	19		1	2
India								8	11		17	
Indonesia	82			96			10	11	13	17	16	17
Iran, Islamic Rep.								12	13		3	7
Iraq		74	78		85	83		9				
Ireland							13	17	19		1	1
Isle of Man												
Israel							13	15				22
Italy			99			100	13	15	16	7	7	7
Jamaica			87			95		11		5	5	11
Japan							13	15	15	1	1	1
Jordan			93			99	12	13	13	34	30	33
Kazakhstan			100			100	13	13	15			1

Share of students in private schools, Secondary (% of total)			Gender parity index for gross enrollment ratio, Primary			Gender parity index for gross enrollment ratio, Secondary			Gender parity index for gross enrollment ratio, Tertiary			Pupil-teacher ratio, Primary			Pupil-teacher ratio, Secondary		
1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
15	15	1.0	1.0	1.0	1.1	1.0	1.0		0.9	1.1		32	23		29	22	
	58	0.9		1.0	0.7		1.0			1.1	22		17	15	17	15	
	10	1.1	1.0	1.0		1.1	1.1		1.1	1.1	30	26	28		19	27	
30	21	0.7	0.9			0.8		0.2	0.7	0.7	36	37					
45		0.7		0.9			0.6						37			16	
	16	0.9	0.9	1.0	0.8	0.7		0.2	0.3		64	60	49	27			
		1.0	1.0	1.0	1.1	1.1	1.1				32	25	18	19	19	16	
13	10	0.7	0.7			0.5					36	45					
			1.0	1.0		1.0	1.1		1.2	1.3		19	14		12	8	
1	1	1.0	1.0	1.0	1.1	1.0	1.0	1.4	1.2	1.7	12	11	9	10	12	9	
		1.0	1.0	1.0	1.0	1.0	1.0	1.4	1.3	0.9	21	18	14	12	14	10	
10	17	1.0	1.0	1.0	0.9	1.0	1.0	0.8	1.0	1.4	24	17	19	13		11	
6		1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.4	1.4	11	10			10		
11	14	0.7	0.7			0.7			0.9	0.7	44			28			
9		0.9	1.0	1.0	1.2	1.1	1.1					20	16		21	13	
	29		1.0	0.9		1.2	1.1					31	26			28	
23	22		1.0	1.0		1.0	1.0				30	23	19		14	11	
24	33	0.8	0.9	1.0	0.8	0.9	1.0	0.5		0.9	25	23	28	21	17		
			1.0	1.0		1.0	1.0		1.1	1.2							
23	16		1.0	1.0		0.4			0.4			43	27		23		
		0.9	0.8	0.8		0.7	0.8		0.2	0.4	38	48	38		54	39	
6	5	1.0	1.0	1.0		1.0	1.0		1.4	1.6		14	12		10	9	
1	3	0.7	0.6	0.9		0.7	0.8	0.2	0.3	0.4	41	67	54			43	
	14																
			1.0			1.1						28			20		
		1.0	1.0	1.0	1.2	1.1	1.0	1.1	1.2	1.2		17	14		13	10	
8	8	1.0	1.0	1.0	1.1	1.0	1.0	1.1	1.2	1.3		19	18	12	12	13	
25	26																
			0.9	1.0	0.5		0.9		0.3		31	37					
			1.0	1.0		1.0			1.0	1.3		17	8		7		
			1.0	1.0		1.0	0.9					15	13		14	13	
7	8	0.8	0.9		0.7	0.8					27	34		18	19		
10		1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.1		20	13		15	10		
6	5																
			1.0	1.0	1.1		1.0				25	20	16			15	
	62																
			0.9	1.0		0.9	0.9					33	27		14	14	
	62	0.5	0.7	0.8	0.3			0.1		0.3	38	46	42				
			0.7	0.9		0.6						44	52		15		
13			1.0	1.0			1.1	0.7		2.5		26	25			21	
	6																
		1.0	1.0	1.0			1.2	0.8	1.3	1.1	35	34					
	25		1.0	1.0			1.0			1.0		22	15				
	17	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.3		11	11		10	10	
7	13		1.0	1.0		1.1	1.0	1.3	1.7	1.8							
4	12	0.7	0.8	1.0		0.7	0.9	0.5	0.7	0.7		40			34	25	
42		1.0	1.0	1.0	0.8	1.0	1.0		0.9	0.9	23	22	16	13	16	12	
43	42	0.9	0.9	1.0	0.7	0.9	1.0		0.9	1.0		26					
	11		0.8			0.6			0.5			21			20		
		1.0	1.0	1.0	1.1	1.1	1.0	0.9	1.2	1.2	27		16	17			
1	1																
		1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.4		14	14	13	11	11		
	11	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.3	1.4	12	11		9	10		
5	8	1.0	1.0	1.0		1.0	1.0		1.8		34	34	21		19	15	
	6	1.0	1.0	1.0	1.0	1.0	1.0	0.7	0.9	0.9	21	21	18	17	14	12	
18	19	1.0	1.0	1.0	1.0	1.0	1.1	1.3	1.2	1.2							
16	19		1.0	1.0		1.0	1.0		1.2	1.4	22	19	16		11	9	

	Literacy rate, adult			Literacy rate, 15-24			School life expectancy (years) Primary to Tertiary			Share of students in private schools, Primary (% of total)		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
Kenya		82	87		93	93		8				
Kiribati							11	11				
Korea, Dem. Rep.												
Korea, Rep.							14	16	17	1	1	1
Kosovo												
Kuwait							10			37	31	39
Kyrgyz Republic							12	12	12			1
Lao PDR		70			81		7	8	10		2	3
Latvia		100	100		100	100	13	14	16			1
Lebanon								15	13		67	73
Lesotho		86	90		91	92	10	10		100		1
Liberia			61			77		11				
Libya			89			100						
Liechtenstein									15			4
Lithuania			100			100	13	15	17			1
Luxembourg								13	14		7	9
Macao SAR, China							12	13			94	97
Macedonia, FYR			97			99		12	13			
Madagascar		71			70		6			17	23	18
Malawi			75			87	5	10	11			
Malaysia		89	93		97	98	10	12				1
Maldives	96	96		98	98			12			2	4
Mali			31			44	2	5	8	4		40
Malta							12	13	15	29	36	41
Marshall Islands												
Mauritania		51	58		61	68	4		8		3	11
Mauritius	80	84	89	91	95	97	10	12	15		24	28
Mexico	88	91	93	95	97	98	11	12	13	6	7	8
Micronesia, Fed. Sts.												
Moldova		97	99		100	99	12	11	12			1
Monaco											30	22
Mongolia		98	97		98	96	10	9	15		1	5
Montenegro			98			99			15			
Morocco							6	8	11	4	5	11
Mozambique			56			72		6				2
Myanmar		90	92		95	96	6					
Namibia			89			93		12			4	5
Nepal			60			83	8	9	12			13
Netherlands							15	17	17	69	69	
New Caledonia			96			100						
New Zealand							14	17	20	3		2
Nicaragua							8			13	16	16
Niger							2		5	3	4	4
Nigeria			61			72		8			6	8
Northern Mariana Islands												
Norway							14	18	18	1	2	2
Oman							8			2	5	
Pakistan							4					31
Palau								14			18	
Panama	89	92	94	95	96	98	11	12	13	8	10	11
Papua New Guinea		57	61		67	68				2		
Paraguay			94			99	9	12	12	15		18
Peru							12		13	13	13	22
Philippines	94	93		97	95		11			7	7	
Poland			100			100	12	15	15			3
Portugal			95			100	12	16	16	6	10	12
Puerto Rico	90		90	93		87			16			23
Qatar			96			97	12			25	38	55
Romania			98			97	12	12	14			

Share of students in private schools, Secondary (% of total)			Gender parity index for gross enrollment ratio, Primary			Gender parity index for gross enrollment ratio, Secondary			Gender parity index for gross enrollment ratio, Tertiary			Pupil-teacher ratio, Primary			Pupil-teacher ratio, Secondary		
1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
1	1	1.0	1.0			1.0			0.5			34					
		1.0	1.0		0.9	1.3					29	32		12			
		1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.6	0.7	36	32	21	28	21	18	
40	32																
		1.0	1.0		0.9	1.0		1.3			18	14	8	13	11	8	
27	32	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.3	16	24	24		13	15	
	1	0.8	0.9	0.9	0.7	0.7	0.8	0.5	0.5	0.8	28	30	29	12	21	20	
1	3	1.1	1.0	1.0		1.0	1.0	1.4	1.8	1.7	15	15	12	10	11	9	
	1		1.0	1.0		1.1	1.1		1.0	1.2		14	14			9	
55	60	1.2	1.0	1.0	1.5	1.3	1.4	1.3	1.6		55	48	34		22	24	
	1		0.7			0.7			0.6			38			26		
									1.0								
				0.9			0.9			0.6			6				
	4		1.0	1.0		1.0	1.0	0.7	1.5	1.5	19	16	13		11	9	
	1		1.0	1.0		1.1	1.0			1.1			9		11	8	
18	18	1.0	1.0		1.1	1.0	0.9	0.4	0.9	1.0		30	16		24	16	
93	95																
		1.0	1.0	1.0	0.9			0.8	0.9	0.9	40	48	40	22			
		0.9	1.0	1.0	0.6	0.8	0.9	0.3	0.4	0.6			79			43	
		1.0	1.0		1.1	1.1	1.1		1.1	1.3	20	20	13	19	18	14	
6	4		1.0	1.0		1.1						23	12		15		
17		0.6	0.8	0.9	0.5	0.6	0.7	0.2	0.5	0.4	45	65	50		29		
	32	1.0	1.0	1.0	0.9	1.0	0.9	0.8	1.2	1.4	21	19	14	12	10	9	
27	29		1.0														
		0.7	1.0	1.1	0.5	0.7	0.8	0.1		0.4	44	45	37		26		
	27	1.0			1.0	1.0		0.6	0.9	1.2	21	26	21		19		
68		1.0	1.0	1.0	1.0	1.0	1.1		0.9	1.0	31	27	28	17	17	18	
16	14																
		1.0	1.0	1.0	1.1	1.0	1.0		1.3	1.3	24	21	15	13	13	10	
	1																
24	22		1.0	1.0		1.2	1.1		1.8	1.5	30	33	30	19	20	14	
	7			1.0			1.0			1.2							
		0.7	0.8	0.9	0.7	0.8	0.9	0.6	0.7	0.9	25	29	26	18	17		
5		0.8	0.8	0.9	0.6	0.6	0.8				55	64	58	34		34	
	12	0.9	1.0	1.0	0.9	1.1	1.1				45	33	28	12	32	34	
		1.1	1.0	1.0	1.3	1.1						32	30		24		
4		0.6	0.8		0.4	0.7		0.3	0.4		39	38	32	31	30	32	
		1.0	1.0	1.0	0.9	1.0	1.0	0.8	1.0	1.1	17			16		14	
83																	
		1.0	1.0	1.0	1.0	1.1	1.0	1.1	1.5	1.5	18	18	14		16	15	
10	19	1.1	1.0	1.0		1.2	1.1	1.1			33	36	30		32	31	
30	22	0.6	0.7	0.8	0.4	0.6	0.7	0.1		0.4	41	41	39	26	23	31	
		0.8	0.8	0.9	0.8	0.8	0.9				41	43	36	22	31	33	
	22																
		1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.5	1.6							
7	8	0.9	1.0		0.7	1.0		0.9		1.4	28	25		15	18		
1		0.5	0.7	0.8	0.4		0.8	0.4			41	33	40	19			
	31		1.0			1.0			2.4			16			15		
29		1.0	1.0	1.0	1.1	1.1	1.1		1.7	1.5	23	25	23	20	16	15	
16	16	0.8	0.9		0.7						32	35					
		1.0	1.0	1.0	1.0	1.0	1.0		1.4	1.4	25				12		
28	22		1.0	1.0		0.9	1.0			1.1	29	29	20	20	20	16	
17	24	1.0			1.0						33	35		33			
		1.0	1.0	1.0	1.1	1.0	1.0	1.5	1.4	1.5			9			10	
5	4	1.0	1.0	1.0	1.0	1.1	1.0		1.3	1.2	15	13	11		10	7	
12	16			1.0			1.1			1.5			12			11	
	21	0.9	1.0	1.0	1.3	1.2	1.2	3.6		5.4	12	13	12	9	10	10	
	39	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.3		19	16		13	12	

	Literacy rate, adult			Literacy rate, 15-24			School life expectancy (years) Primary to Tertiary			Share of students in private schools, Primary (% of total)		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
Russian Federation			100			100	13					
Rwanda		65	71		78	77	6	7	10	1		2
Samoa			99			99		12			16	16
San Marino												
Sao Tome and Principe			89			95			11			
Saudi Arabia		79	87		96	98			15			9
Senegal									8	9	11	14
Serbia			98			99			14			
Seychelles			92			99		13	13		4	9
Sierra Leone			42			59	5					
Singapore	89	93	96	99	100	100				24		
Sint Maarten (Dutch part)												
Slovak Republic								13	15		4	6
Slovenia			100			100	12	15	17			
Solomon Islands							6	7		12		25
Somalia												
South Africa							11			1	2	
South Sudan												
Spain			98			100	14	16	17	35	33	33
Sri Lanka			91			98			14	1		3
St. Kitts and Nevis										15	15	22
St. Lucia									13	2		5
St. Martin (French part)												
St. Vincent and the Grenadines								13			4	5
Sudan		61	71		78	87					2	
Suriname			95			98	12					
Swaziland		82	87		92	94		9				
Sweden							13	19	16	1	3	9
Switzerland							13	15	16	2	3	5
Syrian Arab Republic			83			95	10		12	4	4	4
Tajikistan		99	100		100	100		10	11			
Tanzania			73			77			9			2
Thailand		93			98		8			9	13	
Timor-Leste			58			80			12			13
Togo		53			74		8	9		24	37	34
Tonga								13		7		
Trinidad and Tobago	97		99	99		100					72	72
Tunisia							10	13	15	1	1	2
Turkey	79			93			9		14	1		
Turkmenistan			100			100						
Turks and Caicos Islands											18	
Tuvalu												
Uganda			73			87	6	11				14
Ukraine			100			100	12	13	15			1
United Arab Emirates							11			31	45	72
United Kingdom							14	16	17	5	5	5
United States							15	15	16	12	12	9
Uruguay			98			99	13	14	16	16	14	16
Uzbekistan		99	99		100	100	11	11				
Vanuatu			83			94		10		22	3	
Venezuela, RB	90			95			11	10			14	17
Vietnam		90	93		95	97	8					1
Virgin Islands (U.S.)												
West Bank and Gaza			95			99						
Yemen, Rep.			64			85			9			4
Zambia	65		71	66		74	8					3
Zimbabwe			92			99	10	10		88		

Share of students in private schools, Secondary (% of total)			Gender parity index for gross enrollment ratio, Primary			Gender parity index for gross enrollment ratio, Secondary			Gender parity index for gross enrollment ratio, Tertiary			Pupil-teacher ratio, Primary			Pupil-teacher ratio, Secondary		
1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
1	2	1.0	1.0								23	18					
		1.0	1.0	1.0	0.8	0.9	1.0	0.2		0.8	50	54	65		23		
44	24		1.0	1.0		1.1	1.1		0.9			24	30		21	21	
32				1.1			1.0			1.5	6	5	6			14	
		0.9		1.0			1.0			1.0	35		26				
				1.0			0.9		1.3	1.1			11				
		0.7	0.9	1.1	0.5	0.7	0.9			0.6	58	51	34		27		
26	21		1.0	1.0		1.0	1.0			1.3			16			10	
			1.0	1.0		1.1	1.1					15	13		14	12	
3	7	0.7	0.9		0.5				0.8		35			19			
											26						
			1.0	1.0		1.0	1.0		1.1	1.5		18	15		12	12	
6	10		1.0	1.0		1.0	1.0	1.3	1.4	1.4		13	17		13		
1	1	0.9	0.9	1.0	0.6	0.8	0.9				19		25		10	28	
	34																
		1.0	1.0		1.2	1.1		0.8				33			28		
2																	
		1.0	1.0	1.0	1.1	1.1	1.0	1.1	1.2	1.2	23	15	12	17	11	11	
29	28	1.0		1.0	1.1		1.0			1.9			24	19			
	6	0.9	1.0	1.0		1.0	1.0				22	19	14		14	9	
	4	1.0	1.0	1.0	1.5	1.3	1.0			2.6	29	23	19	19	18	16	
	3																
			0.9	0.9		1.3	1.0	2.2				19	16		24	17	
	24		0.9					0.7	0.9								
9		1.1			1.3			1.2			22			13			
		1.0	1.0	0.9		1.0	1.0	0.6	0.9		33	31	32		17	18	
	2	1.0	1.0	1.0	1.0	1.3	1.0	1.2	1.5	1.5		12	10		14	10	
2	17	1.0	1.0	1.0	0.9	0.9	1.0	0.5	0.8	1.0							
8	7	0.9	0.9	1.0	0.7	0.9	1.0	0.6			26	25		18	18		
5	4		0.9	1.0		0.9	0.9		0.4	0.5		22	25		16	17	
		1.0	1.0	1.0	0.7		0.8			0.8	35	41	51	21			
			1.0		1.0		1.1		1.2	1.3	20	21		16			
	16			1.0			1.0						30			23	
	26	0.6	0.8	0.9	0.3	0.4		0.2			56	37	41	28	32		
		1.0	0.9		1.0	1.1					24	22		18	15		
		1.0	1.0	1.0	1.0	1.1			1.5			21	18		21		
8		0.9	0.9	1.0	0.8	1.0	1.1	0.6		1.5	30	23	17	17	19	13	
8	5	0.9	0.9	1.0	0.6	0.7	0.9	0.5		0.8	30			23			
												18			8		
8			1.0									20					
		0.8	0.9	1.0	0.6	0.8		0.4	0.5		29	59	49		18		
		1.0	1.0	1.0	1.0	1.0	1.0		1.1	1.2		20	16		13		
		1.0	1.0		1.2	1.1		4.1			18	16	17	13	13		
32	56	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.2	1.4	20	19	18		15		
26	29	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.3	1.4		15	14		15	14	
10	8	1.0	1.0	1.0		1.1	1.1		1.8	1.7	22	21	14		15	11	
12	15	1.0	1.0	1.0		1.0	1.0		0.8		24	21	18	11	12	13	
		1.0	1.0	1.0		1.1	1.0					23	22		25		
27			1.0	1.0		1.2	1.1		1.5								
27	29		0.9	0.9					0.7	1.0	34	30	20	18			
				0.8			0.6		0.3				31				
	3		0.9	1.0					0.5		44	58	59				
		1.0			0.9					0.8	36						

EOS Eductation Survey Sample Size

	2011	2012	2013
World	12,537	13,259	12,589
Afghanistan			
Albania	79	81	81
Algeria	39	32	64
American Samoa			
Andorra			
Angola	31		34
Antigua and Barbuda			
Argentina	79	90	112
Armenia	82	80	74
Aruba			
Australia	71	64	56
Austria	45	104	94
Azerbaijan	94	95	81
Bahamas, The			
Bahrain	76	64	36
Bangladesh	68	84	70
Barbados	37	70	50
Belarus			
Belgium	62	79	74
Belize	30		
Benin	105	84	100
Bermuda			
Bhutan			76
Bolivia	78	72	72
Bosnia and Herzegovina		100	97
Botswana	113	79	85
Brazil	181	140	94
Brunei Darussalam	89	43	
Bulgaria	126	119	79
Burkina Faso	39	40	54
Burundi	76	91	110
Cambodia	99	76	85
Cameroon	79	60	80
Canada	92	98	126
Cape Verde	83	103	79
Cayman Islands			
Central African Republic			
Chad	113	105	98
Chile	75	77	126
China	368	371	362
Colombia	137	283	195
Comoros			
Congo, Dem. Rep.			
Congo, Rep.			
Costa Rica	98	89	103
Cote d'Ivoire			
Croatia	97	106	79
Cuba			
Curacao			
Cyprus	99	78	62
Czech Republic	149	156	47

	2011	2012	2013
Denmark	32	123	155
Djibouti			
Dominica			
Dominican Republic	54	90	56
Ecuador	133		115
Egypt, Arab Rep.			
El Salvador	89	32	41
Equatorial Guinea			
Eritrea			
Estonia	93	82	88
Ethiopia	98	58	93
Faeroe Islands			
Fiji			
Finland	31	35	37
France	108	129	78
French Polynesia			
Gabon		48	56
Gambia, The	88	85	72
Georgia	92		73
Germany	94	123	162
Ghana	83	79	66
Greece	84	83	89
Greenland			
Grenada			
Guam			
Guatemala	78	82	85
Guinea		58	53
Guinea-Bissau			
Guyana	83	87	91
Haiti	142	65	114
Honduras	83	86	54
Hong Kong SAR, China			
Hungary	50	98	85
Iceland	76	85	84
India	244	121	84
Indonesia	86	88	81
Iran, Islamic Rep.	314	565	
Iraq			
Ireland	45	55	50
Isle of Man			
Israel	45	48	54
Italy	91	87	85
Jamaica	52	74	61
Japan	104	111	114
Jordan	93	154	121
Kazakhstan		99	105
Kenya	103	110	98
Kiribati			
Korea, Dem. Rep.			
Korea, Rep.	112	98	
Kosovo			
Kuwait	49	38	35
Kyrgyz Republic	99	98	98

	2011	2012	2013
Lao PDR			60
Latvia	176	97	91
Lebanon	46	33	35
Lesotho	79	86	93
Liberia		85	96
Libya		68	61
Liechtenstein			
Lithuania	175	150	136
Luxembourg	32	43	56
Macao SAR, China			
Macedonia, FYR	115	89	80
Madagascar	86	92	154
Malawi	64	59	55
Malaysia	87	79	100
Maldives			
Mali	128	99	93
Malta	51	57	37
Marshall Islands			
Mauritania	66	76	80
Mauritius	92	88	75
Mexico	350	267	306
Micronesia, Fed. Sts.			
Moldova	108	110	121
Monaco			
Mongolia	84	83	86
Montenegro	78	76	78
Morocco		38	79
Mozambique	112	89	82
Myanmar			77
Namibia	73	81	78
Nepal	102	91	93
Netherlands	85	80	86
New Caledonia			
New Zealand	51	54	36
Nicaragua	91	77	68
Niger			
Nigeria	105	103	105
Northern Mariana Islands			
Norway	45	71	60
Oman	69	74	105
Pakistan	126	109	123
Palau			
Panama	134	133	129
Papua New Guinea			
Paraguay	91	79	58
Peru	88	82	78
Philippines	91	132	93
Poland	198	204	205
Portugal	134	113	91
Puerto Rico	59	66	57
Qatar		120	90
Romania	94	96	101
Russian Federation	375	414	
Rwanda	39		79
Samoa			

	2011	2012	2013
San Marino			
Sao Tome and Principe			
Saudi Arabia		87	125
Senegal	88	91	96
Serbia	81	99	100
Seychelles		31	29
Sierra Leone		99	98
Singapore	150	172	143
Sint Maarten (Dutch part)			
Slovak Republic	76	67	109
Slovenia		110	95
Solomon Islands			
Somalia			
South Africa	54	45	44
South Sudan			
Spain	100	89	79
Sri Lanka	105		99
St. Kitts and Nevis			
St. Lucia			
St. Martin (French part)			
St. Vincent and the Grenadines			
Sudan			
Suriname	34	36	49
Swaziland	40	49	31
Sweden	30	68	45
Switzerland	82	72	58
Syrian Arab Republic			
Tajikistan	101	97	
Tanzania	90	96	89
Thailand	55	72	85
Timor-Leste	31	35	33
Togo			
Tonga			
Trinidad and Tobago	115	149	126
Tunisia	99		76
Turkey	77	84	93
Turkmenistan			
Turks and Caicos Islands			
Tuvalu			
Uganda	93	90	92
Ukraine	104	109	108
United Arab Emirates	107	167	149
United Kingdom	90	94	107
United States	417	385	569
Uruguay	81	81	89
Uzbekistan			
Vanuatu			
Venezuela, RB			
Vietnam			
Virgin Islands (U.S.)			
West Bank and Gaza			
Yemen, Rep.			
Zambia	85	92	83
Zimbabwe	56	63	56

EOS Education Survey, Question 1

How well does the educational system in your country meet the needs of a competitive economy?

	Percent of Sample Responding to EOS Survey Question 1			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
World	98%	98%	96%	51%	51%	51%	16%	16%	14%
Afghanistan									
Albania	100%	100%	100%	81%	57%	83%	11%	2%	6%
Algeria	100%	97%	98%	21%	22%	20%	3%	6%	6%
American Samoa									
Andorra									
Angola	100%		97%	10%		12%			
Antigua and Barbuda									
Argentina	92%	91%	92%	46%	43%	41%	9%	8%	2%
Armenia	99%	100%	97%	41%	46%	43%	2%	10%	7%
Aruba									
Australia	99%	94%	98%	83%	83%	79%	45%	45%	25%
Austria	98%	99%	95%	73%	78%	80%	22%	30%	27%
Azerbaijan	98%	100%	95%	38%	26%	43%	13%	4%	7%
Bahamas, The									
Bahrain	95%	98%	88%	76%	58%	67%	26%	16%	28%
Bangladesh	99%	98%	99%	40%	39%	37%	6%	12%	9%
Barbados	100%	97%	98%	86%	97%	94%	46%	47%	40%
Belarus									
Belgium	91%	95%	86%	89%	94%	89%	47%	59%	46%
Belize	100%			23%			10%		
Benin	100%	93%	99%	61%	36%	40%	20%	13%	7%
Bermuda									
Bhutan			89%			71%			18%
Bolivia	99%	100%	97%	47%	53%	44%		3%	8%
Bosnia and Herzegovina		100%	97%		18%	4%		4%	
Botswana	99%	99%	98%	58%	63%	53%	9%	8%	8%
Brazil	98%	98%	96%	29%	27%	24%	1%	1%	1%
Brunei Darussalam	98%	98%		85%	84%		31%	35%	
Bulgaria	100%	99%	98%	37%	41%	49%	4%	8%	9%
Burkina Faso	98%	98%	95%	28%	25%	22%		3%	9%
Burundi	99%	99%	100%	17%	14%	25%	5%		1%
Cambodia	99%	99%	91%	57%	57%	42%	10%	13%	8%
Cameroon	95%	97%	99%	43%	47%	53%	9%	5%	16%
Canada	94%	95%	95%	95%	94%	90%	49%	54%	41%
Cape Verde	100%	95%	99%	58%	52%	67%	7%	10%	10%
Cayman Islands									
Central African Republic									
Chad	100%	100%	96%	36%	24%	22%	12%	7%	11%
Chile	100%	99%	97%	45%	36%	57%	3%	4%	6%
China	99%	100%	99%	57%	62%	65%	15%	12%	14%
Colombia	100%	99%	96%	53%	44%	46%	14%	9%	5%
Comoros									
Congo, Dem. Rep.									
Congo, Rep.									
Costa Rica	99%	95%	94%	81%	87%	87%	28%	30%	20%
Cote d'Ivoire			100%			47%			5%
Croatia	100%	99%	99%	35%	42%	47%	8%	8%	8%
Cuba									
Curacao									
Cyprus	100%	99%	98%	54%	95%	95%	26%	42%	47%

	Percent of Sample Responding to EOS Survey Question 1			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Czech Republic	97%	96%	94%	60%	58%	47%	20%	17%	13%
Denmark	97%	96%	90%	91%	85%	83%	34%	33%	36%
Djibouti									
Dominica									
Dominican Republic	100%	99%	100%	11%	14%	16%	4%	2%	
Ecuador	99%		97%	44%		72%	9%		20%
Egypt, Arab Rep.									
El Salvador	99%	94%	93%	22%	9%	78%	2%		
Equatorial Guinea									
Eritrea									
Estonia	100%	96%	96%	67%	60%	75%	13%	10%	13%
Ethiopia	98%	97%	95%	53%	33%	45%	5%	10%	5%
Faeroe Islands									
Fiji									
Finland	94%	97%	93%	94%	91%	100%	72%	71%	73%
France	99%	100%	98%	69%	63%	72%	23%	16%	15%
French Polynesia									
Gabon		100%	95%		25%	25%		2%	2%
Gambia, The	97%	98%	95%	76%	80%	74%	30%	26%	19%
Georgia	97%		99%	33%		36%	4%		8%
Germany	99%	97%	95%	81%	89%	92%	28%	48%	44%
Ghana	99%	100%	94%	46%	61%	76%	6%	11%	5%
Greece	99%	100%	98%	25%	36%	34%	1%	5%	2%
Greenland									
Grenada									
Guam									
Guatemala	100%	99%	99%	17%	27%	14%	3%	1%	2%
Guinea		97%	95%		24%	25%		5%	6%
Guinea-Bissau									
Guyana	99%	98%	99%	58%	59%	75%	13%	11%	4%
Haiti	97%	97%	97%	11%	14%	16%			
Honduras	98%	100%	98%	20%	14%	17%			2%
Hong Kong SAR, China									
Hungary	100%	95%	97%	42%	43%	40%	6%	8%	6%
Iceland	94%	91%	92%	99%	92%	89%	54%	47%	29%
India	98%	99%	99%	70%	71%	70%	27%	27%	25%
Indonesia	100%	100%	93%	71%	66%	73%	8%	11%	21%
Iran, Islamic Rep.	96%	97%		41%	40%		7%	6%	
Iraq									
Ireland	92%	89%	91%	93%	95%	96%	44%	53%	58%
Isle of Man									
Israel	96%	94%	90%	58%	67%	59%	16%	8%	11%
Italy	99%	100%	100%	40%	41%	58%	8%	7%	7%
Jamaica	98%	99%	100%	42%	53%	52%	12%	9%	13%
Japan	99%	100%	99%	78%	59%	69%	13%	7%	19%
Jordan	97%	99%	97%	67%	78%	70%	20%	29%	22%
Kazakhstan		96%	98%		45%	44%		12%	12%
Kenya	99%	98%	98%	83%	56%	76%	30%	18%	18%
Kiribati									
Korea, Dem. Rep.									
Korea, Rep.	100%	100%		70%	63%		18%	13%	
Kosovo									
Kuwait	100%	100%	97%	35%	42%	37%	4%	11%	9%
Kyrgyz Republic	100%	99%	97%	32%	24%	26%	3%	1%	2%
Lao PDR			97%			55%			18%

	Percent of Sample Responding to EOS Survey Question 1			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Latvia	100%	99%	94%	52%	42%	55%	18%	6%	11%
Lebanon	96%	87%	90%	87%	97%	89%	52%	55%	43%
Lesotho	100%	97%	96%	33%	37%	67%	10%	6%	10%
Liberia		100%	96%		64%	26%		9%	4%
Libya		94%	97%		12%	7%		1%	
Liechtenstein									
Lithuania	98%	98%	96%	59%	66%	61%	11%	14%	13%
Luxembourg	91%	96%	98%	75%	79%	79%	28%	21%	32%
Macao SAR, China									
Macedonia, FYR	100%	100%	98%	46%	43%	55%	12%	9%	18%
Madagascar	100%	100%	98%	34%	37%	32%	3%	9%	1%
Malawi	100%	97%	100%	59%	49%	42%	11%	12%	15%
Malaysia	100%	100%	94%	87%	82%	88%	48%	41%	39%
Maldives									
Mali	99%	97%	99%	37%	25%	35%	11%	7%	12%
Malta	98%	98%	88%	84%	84%	92%	35%	42%	51%
Marshall Islands									
Mauritania	93%	93%	91%	15%	33%	9%	3%	20%	3%
Mauritius	97%	97%	97%	55%	61%	73%	13%	22%	13%
Mexico	99%	96%	96%	40%	37%	27%	5%	6%	2%
Micronesia, Fed. Sts.									
Moldova	100%	98%	99%	36%	35%	29%	5%	5%	1%
Monaco									
Mongolia	100%	98%	100%	17%	18%	26%			1%
Montenegro	100%	100%	100%	62%	68%	73%	24%	21%	14%
Morocco		95%	96%		26%	42%		5%	8%
Mozambique	100%	98%	94%	34%	22%	30%	4%	2%	4%
Myanmar			97%			30%			3%
Namibia	97%	99%	99%	26%	30%	40%	1%	5%	5%
Nepal	100%	98%	100%	34%	37%	47%	8%	4%	6%
Netherlands	98%	98%	99%	98%	91%	91%	35%	45%	37%
New Caledonia									
New Zealand	100%	98%	97%	90%	91%	94%	52%	33%	42%
Nicaragua	98%	100%	99%	18%	31%	40%		1%	
Niger									
Nigeria	95%	99%	96%	53%	41%	22%	16%	6%	6%
Northern Mariana Islands									
Norway	96%	95%	88%	80%	93%	88%	33%	35%	22%
Oman	99%	95%	91%	36%	51%	40%	16%	16%	10%
Pakistan	97%	99%	95%	43%	42%	45%	5%	11%	8%
Palau									
Panama	100%	100%	99%	23%	52%	62%	1%	4%	8%
Papua New Guinea									
Paraguay	97%	99%	100%	11%	18%	7%		4%	
Peru	100%	99%	99%	15%	17%	26%		4%	1%
Philippines	98%	100%	98%	57%	72%	76%	18%	23%	25%
Poland	100%	99%	99%	52%	53%	42%	7%	6%	3%
Portugal	99%	98%	91%	52%	58%	62%	4%	12%	5%
Puerto Rico	94%	93%	100%	58%	70%	46%	15%	20%	9%
Qatar		98%	85%		93%	96%		69%	71%
Romania	100%	98%	98%	42%	25%	46%	4%	5%	6%
Russian Federation	99%	100%		40%	45%		7%	8%	
Rwanda	98%		98%	59%		68%	8%		20%
Samoa									
San Marino									

	Percent of Sample Responding to EOS Survey Question 1			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Sao Tome and Principe									
Saudi Arabia		92%	90%		68%	69%		22%	29%
Senegal	98%	97%	98%	56%	40%	51%	26%	20%	14%
Serbia	100%	100%	100%	26%	32%	33%	7%	12%	10%
Seychelles		97%	94%		68%	72%		10%	41%
Sierra Leone		100%	99%		41%	38%		2%	4%
Singapore	99%	97%	95%	100%	100%	100%	75%	72%	69%
Sint Maarten (Dutch part)									
Slovak Republic	97%	99%	96%	26%	25%	23%	3%	1%	1%
Slovenia		100%	97%		55%	68%		14%	17%
Solomon Islands									
Somalia									
South Africa	95%	100%	94%	11%	7%	16%			
South Sudan									
Spain	97%	98%	94%	44%	44%	52%	9%	13%	5%
Sri Lanka	100%		99%	70%		78%	25%		30%
St. Kitts and Nevis									
St. Lucia									
St. Martin (French part)									
St. Vincent and the Grenadines									
Sudan									
Suriname	100%	97%	98%	47%	42%	35%	3%		2%
Swaziland	100%	96%	97%	33%	43%	71%	5%	8%	6%
Sweden	94%	88%	100%	97%	94%	87%	47%	41%	27%
Switzerland	91%	91%	82%	99%	100%	97%	71%	76%	79%
Syrian Arab Republic									
Tajikistan	100%	100%		44%	63%		13%	13%	
Tanzania	98%	97%	97%	57%	40%	35%	10%	13%	7%
Thailand	100%	96%	99%	42%	46%	45%	4%	6%	6%
Timor-Leste	100%	100%	97%	32%	37%	27%	3%	9%	3%
Togo									
Tonga									
Trinidad and Tobago	99%	99%	95%	66%	66%	71%	16%	19%	15%
Tunisia	98%		90%	53%		64%	14%		11%
Turkey	97%	99%	99%	40%	45%	44%	12%	4%	5%
Turkmenistan									
Turks and Caicos Islands									
Tuvalu									
Uganda	99%	100%	99%	52%	51%	41%	13%	9%	10%
Ukraine	100%	100%	100%	56%	58%	58%	6%	12%	10%
United Arab Emirates	99%	99%	94%	80%	88%	97%	52%	51%	66%
United Kingdom	97%	92%	91%	78%	81%	79%	29%	27%	25%
United States	99%	97%	95%	73%	83%	79%	27%	30%	25%
Uruguay	99%	100%	97%	36%	32%	28%	6%	2%	4%
Uzbekistan									
Vanuatu									
Venezuela, RB									
Vietnam	100%	100%	98%	49%	56%	42%	10%	6%	4%
Virgin Islands (U.S.)									
West Bank and Gaza									
Yemen, Rep.									
Zambia	97%	98%	98%	60%	64%	71%	15%	35%	22%
Zimbabwe	100%	98%	98%	71%	60%	64%	34%	19%	23%

EOS Education Survey, Question 2

How would you assess the quality of primary schools in your country?

	Percent of Sample Responding to EOS Survey Question 2			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
World	98%	97%	96%	53%	54%	55%	18%	19%	19%
Afghanistan									
Albania	100%	100%	100%	85%	77%	85%	20%	7%	7%
Algeria	100%	94%	95%	26%	10%	21%	3%		5%
American Samoa									
Andorra									
Angola	97%		94%	3%		6%			
Antigua and Barbuda									
Argentina	92%	92%	93%	35%	35%	42%	6%	5%	
Armenia	96%	100%	96%	41%	49%	59%	8%	10%	7%
Aruba									
Australia	94%	93%	95%	100%	86%	81%	51%	52%	35%
Austria	98%	99%	96%	71%	77%	86%	24%	29%	37%
Azerbaijan	98%	99%	98%	34%	30%	31%	9%	1%	6%
Bahamas, The									
Bahrain	90%	97%	85%	78%	57%	63%	31%	14%	37%
Bangladesh	99%	98%	100%	21%	27%	35%		5%	6%
Barbados	100%	96%	98%	100%	100%	96%	73%	78%	76%
Belarus									
Belgium	91%	94%	86%	100%	100%	100%	89%	88%	82%
Belize	100%			50%			20%		
Benin	99%	93%	96%	46%	36%	41%	15%	14%	10%
Bermuda									
Bhutan			87%			76%			27%
Bolivia	99%	100%	95%	46%	51%	44%		1%	6%
Bosnia and Herzegovina		99%	100%		95%	98%		46%	45%
Botswana	99%	100%	100%	70%	79%	68%	11%	15%	6%
Brazil	97%	99%	95%	13%	13%	16%			
Brunei Darussalam	100%	93%		91%	93%		40%	41%	
Bulgaria	99%	100%	98%	52%	64%	67%	9%	16%	29%
Burkina Faso	95%	100%	95%	32%	34%	28%	3%		9%
Burundi	100%	96%	95%	12%	14%	19%			1%
Cambodia	99%	100%	89%	44%	49%	34%	3%	6%	5%
Cameroon	95%	97%	96%	52%	48%	42%	9%	8%	5%
Canada	95%	94%	98%	95%	92%	92%	51%	59%	53%
Cape Verde	100%	95%	98%	60%	57%	67%	11%	5%	4%
Cayman Islands									
Central African Republic									
Chad	97%	97%	91%	26%	17%	12%	9%	2%	2%
Chile	100%	99%	98%	17%	26%	46%			2%
China	99%	100%	99%	78%	75%	61%	33%	20%	24%
Colombia	100%	99%	96%	53%	30%	47%	14%	3%	2%
Comoros									
Congo, Dem. Rep.									
Congo, Rep.									
Costa Rica	98%	97%	95%	86%	90%	90%	24%	27%	26%
Cote d'Ivoire			100%			47%			2%
Croatia	100%	99%	100%	67%	78%	84%	22%	25%	39%
Cuba									
Curacao									
Cyprus	100%	100%	100%	93%	99%	98%	40%	57%	44%

	Percent of Sample Responding to EOS Survey Question 2			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Czech Republic	97%	96%	96%	62%	72%	69%	21%	24%	23%
Denmark	97%	98%	97%	91%	73%	88%	31%	20%	27%
Djibouti									
Dominica									
Dominican Republic	98%	98%	98%	6%	1%	5%			
Ecuador	99%		98%	43%		71%	13%		18%
Egypt, Arab Rep.									
El Salvador	99%	100%	98%	17%	18%	26%	2%		
Equatorial Guinea									
Eritrea									
Estonia	99%	98%	96%	95%	83%	94%	51%	41%	44%
Ethiopia	97%	98%	96%	34%	37%	32%	2%	5%	4%
Faeroe Islands									
Fiji									
Finland	97%	94%	88%	100%	100%	100%	91%	100%	100%
France	98%	99%	96%	76%	66%	81%	32%	31%	36%
French Polynesia									
Gabon		96%	95%		24%	32%		2%	4%
Gambia, The	99%	98%	96%	83%	82%	63%	18%	28%	10%
Georgia	98%		99%	40%		44%	5%		4%
Germany	96%	97%	96%	78%	89%	91%	25%	43%	40%
Ghana	99%	99%	100%	39%	50%	39%	5%	12%	6%
Greece	99%	100%	98%	46%	57%	65%	12%	12%	8%
Greenland									
Grenada									
Guam									
Guatemala	100%	96%	98%	9%	4%	13%			
Guinea		95%	86%		16%	15%			
Guinea-Bissau									
Guyana	99%	97%	98%	55%	59%	81%	13%	17%	17%
Haiti	100%	99%	99%	17%	11%	27%	1%		2%
Honduras	100%	100%	95%	21%	9%	15%	1%		
Hong Kong SAR, China									
Hungary	100%	95%	94%	64%	66%	73%	26%	16%	28%
Iceland	96%	92%	93%	96%	95%	98%	58%	51%	45%
India	99%	99%	96%	52%	53%	59%	13%	7%	18%
Indonesia	100%	100%	97%	68%	63%	77%	13%	9%	18%
Iran, Islamic Rep.	98%	98%		64%	64%		22%	18%	
Iraq									
Ireland	92%	89%	93%	100%	95%	100%	62%	62%	61%
Isle of Man									
Israel	96%	94%	87%	56%	63%	67%	7%	6%	4%
Italy	100%	98%	100%	72%	71%	78%	32%	36%	40%
Jamaica	96%	97%	98%	25%	32%	48%	10%	3%	12%
Japan	99%	100%	98%	94%	81%	91%	39%	37%	48%
Jordan	97%	99%	98%	73%	80%	52%	22%	31%	10%
Kazakhstan		93%	97%		56%	65%		14%	17%
Kenya	99%	99%	98%	54%	54%	64%	20%	13%	10%
Kiribati									
Korea, Dem. Rep.									
Korea, Rep.	97%	99%		88%	95%		52%	63%	
Kosovo									
Kuwait	100%	97%	97%	39%	51%	43%	6%	11%	14%
Kyrgyz Republic	99%	100%	98%	41%	32%	33%	2%	3%	1%
Lao PDR			97%			53%			12%

	Percent of Sample Responding to EOS Survey Question 2			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Latvia	99%	99%	92%	74%	74%	88%	25%	16%	44%
Lebanon	94%	87%	92%	100%	100%	94%	64%	76%	56%
Lesotho	99%	98%	95%	36%	36%	53%	8%	1%	3%
Liberia		100%	99%		64%	11%		9%	5%
Libya		93%	97%		15%	23%			
Liechtenstein									
Lithuania	97%	95%	96%	83%	86%	87%	33%	39%	37%
Luxembourg	89%	93%	95%	87%	76%	85%	39%	26%	30%
Macao SAR, China									
Macedonia, FYR	100%	98%	99%	49%	56%	62%	10%	16%	20%
Madagascar	100%	99%	97%	31%	27%	18%	2%		2%
Malawi	100%	98%	98%	33%	33%	22%	2%	7%	6%
Malaysia	100%	100%	96%	87%	78%	91%	36%	39%	30%
Maldives									
Mali	99%	94%	85%	27%	17%	39%	11%	3%	15%
Malta	98%	97%	88%	92%	91%	100%	43%	50%	68%
Marshall Islands									
Mauritania	94%	93%	94%	15%	18%	10%		1%	7%
Mauritius	96%	96%	96%	54%	72%	80%	13%	20%	18%
Mexico	99%	96%	95%	28%	22%	25%	2%	3%	1%
Micronesia, Fed. Sts.									
Moldova	100%	98%	99%	58%	55%	57%	13%	10%	7%
Monaco									
Mongolia	100%	99%	100%	44%	39%	59%	8%	8%	12%
Montenegro	100%	100%	96%	63%	79%	87%	24%	22%	48%
Morocco		93%	91%		24%	24%		8%	3%
Mozambique	99%	99%	94%	13%	10%	9%			
Myanmar			95%			12%			
Namibia	100%	99%	96%	29%	30%	36%		1%	9%
Nepal	100%	98%	95%	33%	41%	49%	2%	7%	5%
Netherlands	99%	95%	99%	97%	97%	95%	58%	60%	66%
New Caledonia									
New Zealand	100%	98%	97%	98%	94%	100%	65%	63%	58%
Nicaragua	98%	100%	97%	20%	34%	31%			
Niger									
Nigeria	95%	99%	96%	38%	38%	24%	6%	8%	3%
Northern Mariana Islands									
Norway	96%	95%	88%	71%	87%	93%	24%	27%	28%
Oman	96%	94%	90%	48%	58%	42%	18%	21%	8%
Pakistan	98%	97%	95%	35%	33%	32%	9%	7%	5%
Palau									
Panama	98%	100%	100%	23%	41%	55%	2%	5%	4%
Papua New Guinea									
Paraguay	98%	98%	100%	5%	6%	7%			
Peru	99%	98%	100%	5%	9%	13%			
Philippines	98%	100%	98%	32%	65%	59%	2%	9%	14%
Poland	100%	100%	98%	76%	68%	74%	16%	16%	12%
Portugal	99%	97%	93%	65%	68%	87%	10%	19%	13%
Puerto Rico	94%	93%	98%	51%	58%	48%	10%	8%	7%
Qatar		95%	94%		92%	95%		64%	66%
Romania	99%	98%	96%	63%	30%	54%	14%	6%	14%
Russian Federation	99%	100%		61%	65%		20%	16%	
Rwanda	98%		94%	64%		58%	10%		20%
Samoa									

	Percent of Sample Responding to EOS Survey Question 2			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
San Marino									
Sao Tome and Principe									
Saudi Arabia		94%	91%		65%	65%		24%	21%
Senegal	96%	98%	97%	42%	33%	48%	23%	18%	5%
Serbia	100%	100%	100%	43%	48%	55%	12%	15%	14%
Seychelles		100%	87%		78%	81%		16%	15%
Sierra Leone		100%	99%		34%	27%		2%	2%
Singapore	96%	97%	97%	100%	100%	100%	81%	80%	77%
Sint Maarten (Dutch part)									
Slovak Republic	97%	99%	97%	66%	69%	76%	17%	22%	17%
Slovenia		99%	100%		83%	90%		32%	49%
Solomon Islands									
Somalia									
South Africa	96%	100%	98%	13%	11%	11%			
South Sudan									
Spain	97%	98%	94%	49%	47%	73%	10%	12%	14%
Sri Lanka	99%		100%	81%		81%	14%		32%
St. Kitts and Nevis									
St. Lucia									
St. Martin (French part)									
St. Vincent and the Grenadines									
Sudan									
Suriname	97%	100%	92%	52%	59%	63%	9%	5%	9%
Swaziland	100%	96%	97%	43%	51%	87%	5%	14%	32%
Sweden	97%	90%	100%	90%	91%	89%	26%	35%	38%
Switzerland	90%	87%	82%	98%	100%	98%	75%	80%	72%
Syrian Arab Republic									
Tajikistan	100%	100%		38%	52%		9%	9%	
Tanzania	100%	98%	97%	41%	30%	17%	9%	5%	2%
Thailand	98%	96%	97%	39%	53%	43%	2%	13%	4%
Timor-Leste	97%	100%	97%	33%	29%	9%		6%	
Togo									
Tonga									
Trinidad and Tobago	99%	99%	97%	78%	79%	80%	22%	23%	18%
Tunisia	98%		92%	59%		68%	18%		19%
Turkey	97%	99%	98%	48%	36%	51%	4%	5%	9%
Turkmenistan									
Turks and Caicos Islands									
Tuvalu									
Uganda	99%	100%	97%	44%	31%	27%	9%	4%	7%
Ukraine	100%	99%	97%	64%	85%	90%	18%	38%	25%
United Arab Emirates	98%	97%	96%	89%	91%	96%	52%	51%	64%
United Kingdom	96%	92%	89%	87%	82%	88%	38%	32%	36%
United States	99%	98%	96%	69%	83%	84%	25%	28%	27%
Uruguay	99%	100%	95%	46%	36%	38%	9%	1%	1%
Uzbekistan									
Vanuatu									
Venezuela, RB									
Vietnam	100%	100%	98%	42%	51%	42%	6%	5%	4%
Virgin Islands (U.S.)									
West Bank and Gaza									
Yemen, Rep.									
Zambia	97%	99%	96%	49%	49%	61%	11%	14%	15%
Zimbabwe	100%	98%	95%	59%	57%	67%	27%	13%	20%

EOS Education Survey, Question 3

How would you assess the quality of math and science education in your country's schools?

	Percent of Sample Responding to EOS Survey Question 3			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
World	98%	97%	96%	57%	57%	58%	19%	19%	19%
Afghanistan									
Albania	99%	100%	100%	89%	75%	85%	24%	5%	6%
Algeria	97%	97%	95%	37%	19%	26%	5%	3%	6%
American Samoa									
Andorra									
Angola	97%		94%	3%		6%			
Antigua and Barbuda									
Argentina	92%	92%	93%	40%	34%	40%	6%	3%	4%
Armenia	99%	99%	96%	48%	68%	67%	20%	23%	18%
Aruba									
Australia	94%	93%	95%	94%	81%	76%	40%	30%	24%
Austria	98%	97%	98%	73%	75%	81%	18%	22%	24%
Azerbaijan	96%	99%	98%	48%	45%	30%	10%	4%	6%
Bahamas, The									
Bahrain	93%	97%	88%	81%	62%	67%	27%	10%	36%
Bangladesh	100%	98%	100%	28%	38%	37%	6%	8%	8%
Barbados	100%	99%	98%	95%	96%	94%	49%	58%	52%
Belarus									
Belgium	90%	95%	87%	100%	97%	96%	82%	80%	76%
Belize	93%			46%			4%		
Benin	98%	92%	96%	60%	71%	56%	18%	37%	14%
Bermuda									
Bhutan			87%			64%			11%
Bolivia	97%	97%	95%	49%	61%	50%			10%
Bosnia and Herzegovina		98%	100%		95%	97%		49%	44%
Botswana	99%	100%	99%	68%	74%	52%	12%	15%	9%
Brazil	97%	97%	95%	23%	14%	18%	1%		
Brunei Darussalam	99%	95%		88%	86%		33%	38%	
Bulgaria	99%	100%	96%	60%	73%	73%	13%	23%	28%
Burkina Faso	98%	100%	93%	54%	61%	57%	10%	12%	6%
Burundi	100%	99%	95%	31%	51%	44%	4%	11%	18%
Cambodia	99%	100%	90%	48%	62%	38%	6%	3%	5%
Cameroon	95%	97%	96%	58%	55%	71%	14%	18%	15%
Canada	93%	95%	95%	95%	91%	90%	43%	48%	37%
Cape Verde	99%	95%	96%	43%	45%	53%	5%	2%	5%
Cayman Islands									
Central African Republic									
Chad	99%	100%	90%	42%	37%	28%	14%	10%	12%
Chile	100%	99%	98%	27%	35%	49%			2%
China	99%	100%	99%	77%	78%	70%	33%	22%	20%
Colombia	100%	99%	96%	53%	35%	45%	15%	6%	4%
Comoros									
Congo, Dem. Rep.									
Congo, Rep.									
Costa Rica	99%	98%	95%	77%	80%	81%	22%	17%	19%
Cote d'Ivoire			100%			78%			15%
Croatia	100%	97%	100%	78%	86%	89%	31%	33%	49%
Cuba									
Curacao									
Cyprus	100%	99%	100%	93%	97%	95%	34%	56%	56%

	Percent of Sample Responding to EOS Survey Question 3			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Czech Republic	97%	96%	96%	57%	60%	60%	20%	17%	21%
Denmark	97%	98%	97%	88%	74%	84%	22%	17%	22%
Djibouti									
Dominica									
Dominican Republic	98%	100%	100%	9%	11%	9%			
Ecuador	98%		98%	48%		72%	14%		19%
Egypt, Arab Rep.									
El Salvador	99%	100%	95%	25%	18%	26%	1%		
Equatorial Guinea									
Eritrea									
Estonia	99%	95%	96%	87%	77%	85%	41%	40%	34%
Ethiopia	95%	97%	96%	54%	45%	38%	6%	7%	3%
Faeroe Islands									
Fiji									
Finland	94%	94%	90%	100%	100%	100%	81%	74%	89%
France	99%	100%	94%	81%	77%	93%	43%	40%	61%
French Polynesia									
Gabon		98%	95%		34%	32%		2%	2%
Gambia, The	98%	98%	96%	55%	69%	33%	11%	9%	4%
Georgia	99%		99%	46%		40%	6%		4%
Germany	100%	98%	95%	71%	92%	91%	15%	40%	39%
Ghana	95%	100%	100%	41%	65%	83%	4%	6%	20%
Greece	99%	99%	98%	70%	70%	75%	18%	26%	19%
Greenland									
Grenada									
Guam									
Guatemala	100%	98%	98%	18%	15%	15%			
Guinea		97%	86%		48%	40%		10%	10%
Guinea-Bissau									
Guyana	99%	97%	98%	53%	53%	71%	12%	16%	12%
Haiti	100%	99%	98%	27%	23%	41%	3%	3%	3%
Honduras	100%	100%	95%	19%	14%	15%	2%		
Hong Kong SAR, China									
Hungary	100%	95%	93%	68%	72%	82%	34%	22%	30%
Iceland	98%	90%	93%	90%	89%	89%	35%	30%	24%
India	99%	99%	94%	85%	77%	91%	40%	35%	40%
Indonesia	100%	100%	97%	68%	77%	80%	16%	23%	29%
Iran, Islamic Rep.	98%	97%		78%	77%		34%	35%	
Iraq									
Ireland	94%	94%	93%	76%	81%	90%	15%	21%	33%
Isle of Man									
Israel	96%	94%	88%	53%	56%	68%		6%	9%
Italy	100%	100%	100%	63%	67%	79%	20%	18%	22%
Jamaica	98%	99%	97%	33%	32%	42%	6%	5%	7%
Japan	98%	100%	98%	89%	78%	79%	39%	22%	35%
Jordan	97%	99%	97%	78%	82%	60%	28%	34%	15%
Kazakhstan		94%	96%		57%	68%		16%	17%
Kenya	98%	99%	98%	70%	55%	66%	25%	9%	13%
Kiribati									
Korea, Dem. Rep.									
Korea, Rep.	98%	97%		91%	97%		61%	60%	
Kosovo									
Kuwait	100%	97%	100%	45%	51%	61%	12%	14%	8%
Kyrgyz Republic	99%	99%	96%	43%	38%	34%	2%	4%	
Lao PDR			95%			54%			12%

	Percent of Sample Responding to EOS Survey Question 3			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Latvia	99%	99%	93%	77%	66%	84%	18%	14%	42%
Lebanon	92%	87%	92%	100%	100%	97%	70%	73%	58%
Lesotho	99%	98%	95%	37%	39%	68%	9%	2%	3%
Liberia		100%	98%		66%	11%		7%	3%
Libya		93%	97%		24%	34%		4%	3%
Liechtenstein									
Lithuania	95%	93%	96%	90%	95%	88%	41%	45%	39%
Luxembourg	89%	89%	93%	77%	73%	77%	32%	25%	30%
Macao SAR, China									
Macedonia, FYR	100%	94%	99%	52%	71%	67%	18%	29%	23%
Madagascar	99%	98%	97%	55%	59%	55%	15%	21%	13%
Malawi	100%	95%	98%	58%	36%	35%	8%	9%	7%
Malaysia	100%	100%	96%	91%	82%	91%	39%	38%	33%
Maldives									
Mali	99%	95%	85%	33%	20%	46%	11%	2%	11%
Malta	98%	93%	88%	88%	93%	100%	41%	48%	62%
Marshall Islands									
Mauritania	97%	94%	97%	26%	36%	14%	6%	5%	5%
Mauritius	96%	96%	97%	63%	79%	80%	13%	18%	16%
Mexico	98%	95%	95%	30%	20%	24%	3%	3%	
Micronesia, Fed. Sts.									
Moldova	98%	98%	98%	62%	61%	68%	15%	14%	13%
Monaco									
Mongolia	100%	99%	100%	68%	65%	70%	24%	20%	22%
Montenegro	99%	100%	96%	66%	76%	93%	23%	18%	51%
Morocco		95%	90%		66%	72%		29%	12%
Mozambique	99%	99%	90%	26%	20%	21%	1%	1%	1%
Myanmar			95%			28%			1%
Namibia	100%	98%	96%	26%	29%	32%	1%	3%	7%
Nepal	100%	98%	94%	42%	57%	56%	8%	11%	11%
Netherlands	100%	99%	100%	97%	90%	91%	49%	44%	47%
New Caledonia									
New Zealand	98%	98%	97%	100%	94%	100%	61%	48%	36%
Nicaragua	98%	97%	94%	21%	28%	40%	1%		
Niger									
Nigeria	95%	98%	97%	45%	43%	24%	12%	9%	6%
Northern Mariana Islands									
Norway	96%	95%	88%	62%	75%	80%	9%	17%	8%
Oman	94%	94%	90%	35%	53%	38%	15%	12%	5%
Pakistan	98%	95%	96%	48%	47%	38%	8%	13%	9%
Palau									
Panama	99%	98%	100%	23%	35%	48%	1%	3%	3%
Papua New Guinea									
Paraguay	95%	96%	100%	9%	6%	12%			
Peru	98%	96%	100%	5%	11%	22%			1%
Philippines	98%	100%	98%	40%	63%	59%	5%	11%	12%
Poland	99%	100%	97%	69%	65%	69%	15%	14%	16%
Portugal	98%	98%	93%	39%	54%	77%	4%	11%	11%
Puerto Rico	94%	93%	98%	51%	61%	43%	14%	14%	7%
Qatar		95%	93%		93%	93%		68%	59%
Romania	100%	97%	95%	73%	64%	76%	26%	12%	30%
Russian Federation	99%	100%		69%	70%		24%	24%	
Rwanda	98%		93%	69%		69%	18%		21%
Samoa									

	Percent of Sample Responding to EOS Survey Question 3			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
San Marino									
Sao Tome and Principe									
Saudi Arabia		91%	91%		69%	66%		23%	23%
Senegal	98%	84%	96%	50%	47%	77%	24%	23%	16%
Serbia	100%	100%	100%	58%	63%	70%	19%	28%	28%
Seychelles		97%	84%		71%	81%		16%	15%
Sierra Leone		100%	99%		21%	22%			5%
Singapore	97%	97%	97%	100%	100%	100%	89%	90%	90%
Sint Maarten (Dutch part)									
Slovak Republic	97%	97%	98%	59%	58%	62%	17%	11%	16%
Slovenia		98%	100%		88%	92%		36%	48%
Solomon Islands									
Somalia									
South Africa	96%	100%	98%	13%	7%	7%	2%		
South Sudan									
Spain	97%	98%	92%	46%	45%	61%	9%	11%	9%
Sri Lanka	99%		100%	74%		82%	11%		38%
St. Kitts and Nevis									
St. Lucia									
St. Martin (French part)									
St. Vincent and the Grenadines									
Sudan									
Suriname	100%	97%	88%	50%	53%	64%	9%	11%	9%
Swaziland	100%	96%	97%	35%	49%	71%	5%	8%	10%
Sweden	97%	92%	98%	84%	79%	80%	19%	24%	18%
Switzerland	91%	91%	80%	96%	100%	100%	72%	65%	65%
Syrian Arab Republic									
Tajikistan	100%	100%		38%	56%		10%	10%	
Tanzania	99%	96%	98%	33%	23%	13%	1%		4%
Thailand	98%	95%	97%	59%	63%	52%	13%	27%	7%
Timor-Leste	100%	100%	97%	35%	23%	12%		9%	
Togo									
Tonga									
Trinidad and Tobago	99%	99%	95%	74%	72%	80%	25%	26%	21%
Tunisia	98%		92%	79%		81%	33%		38%
Turkey	97%	99%	98%	55%	40%	52%	10%	7%	12%
Turkmenistan									
Turks and Caicos Islands									
Tuvalu									
Uganda	98%	100%	97%	42%	38%	33%	8%	7%	4%
Ukraine	99%	100%	99%	76%	87%	93%	25%	46%	28%
United Arab Emirates	98%	97%	96%	90%	91%	97%	51%	51%	59%
United Kingdom	95%	93%	89%	76%	76%	79%	24%	26%	20%
United States	99%	97%	96%	65%	78%	78%	20%	22%	18%
Uruguay	98%	100%	92%	34%	19%	28%	6%	2%	
Uzbekistan									
Vanuatu									
Venezuela, RB									
Vietnam	100%	100%	98%	63%	69%	59%	15%	17%	7%
Virgin Islands (U.S.)									
West Bank and Gaza									
Yemen, Rep.									
Zambia	97%	99%	96%	54%	60%	67%	16%	25%	20%
Zimbabwe	100%	98%	95%	70%	62%	67%	25%	22%	24%

EOS Education Survey, Question 4

How would you assess the quality of management or business schools in your country?

	Percent of Sample Responding to EOS Survey Question 4			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
World	98%	97%	95%	65%	65%	65%	20%	21%	21%
Afghanistan									
Albania	98%	100%	99%	78%	75%	81%	4%	10%	5%
Algeria	97%	97%	94%	53%	34%	41%	8%		8%
American Samoa									
Andorra									
Angola	94%		91%	10%		6%			
Antigua and Barbuda									
Argentina	91%	92%	91%	84%	86%	87%	46%	33%	33%
Armenia	99%	100%	95%	35%	38%	44%	5%	5%	8%
Aruba									
Australia	97%	91%	93%	96%	90%	87%	49%	50%	40%
Austria	98%	99%	98%	82%	83%	81%	29%	37%	27%
Azerbaijan	98%	99%	92%	44%	43%	24%	11%	6%	4%
Bahamas, The									
Bahrain	91%	95%	88%	73%	60%	72%	21%	15%	22%
Bangladesh	100%	98%	100%	58%	55%	54%	6%	7%	10%
Barbados	100%	99%	98%	92%	90%	92%	41%	41%	36%
Belarus									
Belgium	91%	95%	87%	100%	97%	100%	79%	70%	75%
Belize	100%			47%			3%		
Benin	98%	99%	96%	70%	67%	60%	20%	38%	15%
Bermuda									
Bhutan			82%			54%			10%
Bolivia	96%	97%	95%	58%	44%	41%			10%
Bosnia and Herzegovina		99%	100%		95%	94%		17%	42%
Botswana	99%	100%	99%	59%	76%	62%	4%	9%	9%
Brazil	97%	99%	96%	76%	77%	80%	17%	19%	26%
Brunei Darussalam	98%	95%		80%	79%		10%	21%	
Bulgaria	100%	97%	98%	59%	64%	56%	10%	12%	5%
Burkina Faso	98%	100%	91%	44%	59%	52%	5%	5%	12%
Burundi	100%	99%	95%	26%	31%	21%		4%	2%
Cambodia	99%	100%	90%	52%	62%	44%	3%	5%	10%
Cameroon	95%	97%	96%	76%	72%	68%	22%	33%	23%
Canada	94%	96%	95%	97%	96%	97%	65%	66%	62%
Cape Verde	93%	92%	96%	44%	49%	56%	4%	5%	5%
Cayman Islands									
Central African Republic									
Chad	98%	99%	89%	38%	30%	24%	7%	8%	11%
Chile	99%	97%	95%	95%	95%	93%	61%	45%	50%
China	99%	100%	99%	69%	72%	66%	18%	14%	13%
Colombia	100%	100%	96%	72%	66%	77%	15%	12%	22%
Comoros									
Congo, Dem. Rep.									
Congo, Rep.									
Costa Rica	99%	96%	96%	88%	96%	97%	38%	46%	42%
Cote d'Ivoire			100%			67%			12%
Croatia	100%	98%	99%	55%	66%	76%	14%	11%	22%
Cuba									
Curacao									
Cyprus	99%	97%	100%	68%	96%	90%	13%	48%	37%

	Percent of Sample Responding to EOS Survey Question 4			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Czech Republic	97%	94%	92%	61%	63%	70%	10%	12%	9%
Denmark	97%	95%	95%	94%	93%	97%	44%	36%	42%
Djibouti									
Dominica									
Dominican Republic	100%	100%	100%	67%	59%	48%	22%	7%	5%
Ecuador	99%		98%	59%		83%	17%		22%
Egypt, Arab Rep.									
El Salvador	99%	100%	98%	61%	59%	81%	9%	6%	2%
Equatorial Guinea									
Eritrea									
Estonia	99%	98%	92%	79%	81%	86%	21%	19%	12%
Ethiopia	97%	98%	96%	65%	46%	49%	7%	8%	7%
Faeroe Islands									
Fiji									
Finland	94%	94%	90%	94%	94%	100%	53%	65%	53%
France	97%	98%	95%	98%	91%	100%	65%	59%	67%
French Polynesia									
Gabon		96%	95%		37%	38%		2%	2%
Gambia, The	99%	98%	96%	88%	86%	68%	30%	33%	15%
Georgia	98%		99%	53%		53%	8%		10%
Germany	97%	98%	96%	83%	90%	94%	22%	40%	33%
Ghana	99%	99%	100%	78%	77%	89%	16%	21%	21%
Greece	98%	100%	98%	54%	57%	61%	2%	7%	10%
Greenland									
Grenada									
Guam									
Guatemala	99%	99%	98%	82%	84%	81%	14%	24%	30%
Guinea		95%	84%		28%	15%		2%	
Guinea-Bissau									
Guyana	98%	97%	97%	67%	74%	85%	13%	14%	19%
Haiti	100%	99%	97%	24%	27%	48%	1%		6%
Honduras	99%	100%	95%	55%	49%	40%	6%	7%	4%
Hong Kong SAR, China									
Hungary	100%	94%	92%	64%	70%	75%	12%	11%	17%
Iceland	95%	90%	90%	96%	93%	98%	49%	40%	44%
India	98%	98%	98%	88%	90%	90%	41%	34%	46%
Indonesia	100%	100%	97%	67%	72%	79%	13%	13%	27%
Iran, Islamic Rep.	98%	97%		56%	61%		11%	13%	
Iraq									
Ireland	94%	90%	91%	87%	93%	94%	37%	46%	44%
Isle of Man									
Israel	94%	94%	90%	93%	77%	87%	41%	23%	30%
Italy	100%	99%	95%	84%	79%	95%	34%	33%	41%
Jamaica	96%	99%	100%	76%	76%	77%	14%	11%	25%
Japan	99%	100%	98%	80%	66%	70%	14%	9%	12%
Jordan	97%	98%	95%	61%	79%	76%	15%	27%	32%
Kazakhstan		94%	93%		60%	53%		12%	13%
Kenya	99%	99%	98%	80%	73%	91%	31%	14%	30%
Kiribati									
Korea, Dem. Rep.									
Korea, Rep.	100%	100%		79%	81%		29%	32%	
Kosovo									
Kuwait	100%	97%	100%	59%	57%	64%	8%	11%	22%
Kyrgyz Republic	98%	98%	90%	23%	21%	27%		3%	
Lao PDR			97%			68%			20%

	Percent of Sample Responding to EOS Survey Question 4			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Latvia	99%	99%	95%	71%	65%	72%	20%	14%	24%
Lebanon	96%	89%	92%	93%	94%	97%	54%	53%	47%
Lesotho	99%	97%	94%	24%	37%	57%	5%	1%	11%
Liberia		99%	99%		80%	31%		11%	7%
Libya		89%	97%		16%	20%		2%	
Liechtenstein									
Lithuania	96%	98%	96%	73%	77%	74%	14%	20%	19%
Luxembourg	77%	87%	79%	74%	82%	84%	26%	23%	22%
Macao SAR, China									
Macedonia, FYR	99%	97%	99%	49%	67%	56%	11%	10%	9%
Madagascar	100%	100%	97%	60%	72%	59%	3%	15%	9%
Malawi	100%	98%	98%	61%	50%	33%	6%	8%	6%
Malaysia	98%	99%	98%	94%	86%	85%	41%	35%	33%
Maldives									
Mali	99%	96%	84%	53%	30%	52%	16%	8%	11%
Malta	96%	97%	88%	88%	86%	92%	30%	38%	43%
Marshall Islands									
Mauritania	99%	91%	95%	29%	27%	15%	6%	4%	5%
Mauritius	95%	98%	95%	59%	73%	81%	6%	13%	12%
Mexico	99%	96%	95%	80%	71%	73%	26%	24%	18%
Micronesia, Fed. Sts.									
Moldova	100%	97%	96%	39%	41%	42%	5%	4%	
Monaco									
Mongolia	100%	99%	100%	23%	26%	29%	1%		1%
Montenegro	99%	100%	96%	66%	72%	89%	29%	21%	44%
Morocco		95%	93%		79%	84%		26%	17%
Mozambique	99%	99%	91%	43%	28%	32%	3%	1%	1%
Myanmar			94%			23%			1%
Namibia	100%	98%	92%	37%	39%	52%		6%	10%
Nepal	100%	98%	94%	46%	54%	51%		8%	10%
Netherlands	99%	95%	95%	99%	100%	100%	57%	59%	63%
New Caledonia									
New Zealand	98%	95%	95%	96%	98%	100%	43%	33%	31%
Nicaragua	97%	100%	94%	54%	52%	68%	11%	6%	5%
Niger									
Nigeria	95%	99%	95%	64%	58%	63%	17%	11%	9%
Northern Mariana Islands									
Norway	96%	93%	88%	91%	97%	97%	31%	37%	35%
Oman	97%	92%	90%	31%	57%	43%	9%	17%	
Pakistan	97%	98%	95%	70%	69%	70%	14%	19%	16%
Palau									
Panama	99%	100%	99%	55%	76%	75%	18%	21%	19%
Papua New Guinea									
Paraguay	98%	100%	98%	39%	36%	33%	2%	3%	2%
Peru	98%	99%	100%	84%	70%	78%	14%	20%	14%
Philippines	97%	99%	97%	84%	89%	89%	23%	31%	32%
Poland	100%	99%	98%	62%	69%	66%	9%	5%	9%
Portugal	98%	97%	91%	90%	88%	100%	37%	43%	69%
Puerto Rico	94%	93%	100%	68%	85%	79%	27%	30%	21%
Qatar		92%	92%		93%	96%		70%	65%
Romania	100%	97%	96%	60%	39%	64%	14%	4%	12%
Russian Federation	98%	99%		43%	49%		5%	7%	
Rwanda	98%		91%	69%		65%	10%		24%
Samoa									

	Percent of Sample Responding to EOS Survey Question 4			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
San Marino									
Sao Tome and Principe									
Saudi Arabia		89%	90%		72%	69%		28%	28%
Senegal	97%	95%	97%	76%	71%	85%	31%	35%	32%
Serbia	100%	100%	100%	37%	46%	55%	10%	12%	12%
Seychelles		97%	90%		65%	68%		10%	32%
Sierra Leone		100%	100%		35%	37%		4%	5%
Singapore	97%	97%	97%	100%	100%	100%	63%	63%	67%
Sint Maarten (Dutch part)									
Slovak Republic	96%	99%	96%	52%	51%	54%	9%	10%	14%
Slovenia		100%	99%		67%	75%		19%	18%
Solomon Islands									
Somalia									
South Africa	96%	100%	94%	95%	87%	93%	56%	47%	59%
South Sudan									
Spain	96%	97%	94%	95%	91%	94%	73%	74%	75%
Sri Lanka	98%		98%	87%		85%	24%		29%
St. Kitts and Nevis									
St. Lucia									
St. Martin (French part)									
St. Vincent and the Grenadines									
Sudan									
Suriname	97%	100%	88%	67%	78%	66%	3%	8%	9%
Swaziland	100%	94%	91%	18%	46%	66%	3%	8%	
Sweden	94%	91%	100%	100%	94%	96%	50%	53%	51%
Switzerland	91%	90%	82%	96%	100%	100%	73%	76%	76%
Syrian Arab Republic									
Tajikistan	100%	100%		41%	46%		6%	3%	
Tanzania	98%	97%	99%	57%	47%	35%	16%	5%	3%
Thailand	98%	95%	97%	70%	73%	76%	6%	28%	19%
Timor-Leste	100%	97%	97%	35%	24%	9%	10%	3%	
Togo									
Tonga									
Trinidad and Tobago	98%	96%	95%	84%	87%	88%	19%	26%	22%
Tunisia	97%		92%	77%		75%	19%		17%
Turkey	97%	99%	98%	62%	51%	60%	6%	10%	4%
Turkmenistan									
Turks and Caicos Islands									
Tuvalu									
Uganda	100%	100%	96%	60%	61%	54%	12%	11%	9%
Ukraine	97%	98%	100%	52%	41%	57%	6%	6%	9%
United Arab Emirates	98%	98%	97%	84%	89%	93%	52%	47%	60%
United Kingdom	95%	93%	89%	97%	97%	93%	88%	68%	72%
United States	99%	97%	94%	86%	92%	96%	49%	59%	58%
Uruguay	100%	100%	93%	87%	69%	81%	22%	11%	9%
Uzbekistan									
Vanuatu									
Venezuela, RB									
Vietnam	100%	100%	98%	35%	39%	51%	1%	2%	4%
Virgin Islands (U.S.)									
West Bank and Gaza									
Yemen, Rep.									
Zambia	97%	99%	96%	69%	67%	78%	11%	24%	16%
Zimbabwe	100%	97%	95%	64%	61%	67%	20%	13%	17%

EOS Education Survey, Question 12

To what extent do companies in your country invest in training and employee development?

	Percent of Sample Responding to EOS Survey Question 12			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
World	98%	97%	97%	59%	60%	62%	14%	14%	14%
Afghanistan									
Albania	96%	99%	99%	82%	84%	80%	12%	3%	4%
Algeria	100%	94%	100%	18%	23%	32%	3%	6%	14%
American Samoa									
Andorra									
Angola	100%		97%	32%		38%	6%		15%
Antigua and Barbuda									
Argentina	91%	92%	93%	66%	63%	55%	13%	8%	4%
Armenia	100%	100%	99%	54%	54%	60%	5%	6%	3%
Aruba									
Australia	99%	93%	100%	92%	78%	86%	25%	24%	14%
Austria	98%	99%	98%	93%	90%	87%	27%	34%	30%
Azerbaijan	94%	93%	98%	67%	59%	58%	26%	32%	10%
Bahamas, The									
Bahrain	96%	95%	85%	83%	73%	71%	40%	26%	31%
Bangladesh	99%	98%	97%	29%	32%	29%	7%	4%	1%
Barbados	100%	99%	98%	84%	83%	80%	16%	17%	14%
Belarus									
Belgium	91%	95%	86%	92%	82%	96%	31%	30%	30%
Belize	100%			43%			3%		
Benin	99%	90%	99%	39%	28%	38%	7%	6%	8%
Bermuda									
Bhutan			99%			46%			8%
Bolivia	99%	97%	97%	55%	57%	47%	1%		10%
Bosnia and Herzegovina		100%	100%		78%	100%		12%	42%
Botswana	98%	99%	99%	64%	67%	64%	16%	8%	12%
Brazil	98%	98%	96%	73%	79%	76%	16%	17%	17%
Brunei Darussalam	99%	98%		76%	77%		13%	14%	
Bulgaria	100%	99%	100%	40%	43%	40%	10%	5%	7%
Burkina Faso	100%	100%	98%	20%	32%	29%	5%		5%
Burundi	94%	95%	98%	14%	11%	24%		5%	
Cambodia	98%	99%	98%	47%	68%	60%	7%	14%	10%
Cameroon	96%	94%	99%	43%	48%	49%	1%	12%	10%
Canada	95%	95%	96%	87%	84%	71%	28%	22%	16%
Cape Verde	96%	94%	98%	44%	31%	47%	4%	1%	6%
Cayman Islands									
Central African Republic									
Chad	100%	98%	95%	36%	27%	37%	9%	5%	14%
Chile	99%	99%	98%	82%	75%	80%	9%	5%	9%
China	100%	100%	100%	70%	70%	73%	19%	14%	18%
Colombia	99%	100%	95%	55%	47%	59%	10%	8%	7%
Comoros									
Congo, Dem. Rep.									
Congo, Rep.									
Costa Rica	99%	98%	96%	77%	85%	86%	17%	23%	23%
Cote d'Ivoire			100%			79%			14%
Croatia	100%	99%	100%	38%	36%	41%	4%	3%	8%
Cuba									
Curacao									
Cyprus	100%	100%	100%	46%	63%	71%	7%	10%	13%

	Percent of Sample Responding to EOS Survey Question 12			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Czech Republic	97%	94%	92%	73%	66%	65%	15%	12%	9%
Denmark	97%	96%	99%	100%	92%	88%	53%	25%	34%
Djibouti									
Dominica									
Dominican Republic	100%	99%	100%	50%	59%	66%	9%	11%	9%
Ecuador	100%		99%	54%		69%	18%		19%
Egypt, Arab Rep.									
El Salvador	100%	100%	95%	60%	62%	81%	11%	9%	
Equatorial Guinea									
Eritrea									
Estonia	100%	96%	96%	72%	72%	85%	6%	4%	13%
Ethiopia	97%	98%	97%	19%	44%	34%		2%	2%
Faeroe Islands									
Fiji									
Finland	97%	97%	90%	100%	94%	100%	30%	60%	56%
France	98%	98%	99%	76%	72%	76%	23%	19%	25%
French Polynesia									
Gabon		98%	97%		55%	51%		9%	5%
Gambia, The	98%	98%	99%	80%	86%	68%	29%	25%	24%
Georgia	97%		95%	57%		50%	9%		7%
Germany	100%	97%	96%	85%	95%	89%	26%	46%	34%
Ghana	99%	99%	99%	53%	55%	72%	5%	4%	9%
Greece	99%	100%	99%	45%	51%	53%	2%	5%	4%
Greenland									
Grenada									
Guam									
Guatemala	100%	99%	98%	63%	76%	77%	17%	20%	15%
Guinea		92%	96%		40%	33%		9%	9%
Guinea-Bissau									
Guyana	99%	98%	95%	54%	64%	89%	12%	8%	2%
Haiti	97%	91%	99%	13%	13%	30%			3%
Honduras	100%	100%	98%	68%	58%	54%	13%	10%	17%
Hong Kong SAR, China									
Hungary	100%	94%	97%	44%	46%	49%	8%	9%	7%
Iceland	96%	92%	93%	87%	87%	79%	17%	26%	13%
India	98%	99%	98%	66%	70%	69%	16%	21%	16%
Indonesia	100%	100%	100%	69%	76%	84%	9%	19%	25%
Iran, Islamic Rep.	98%	97%		35%	30%		4%	3%	
Iraq									
Ireland	92%	92%	93%	93%	93%	80%	16%	19%	22%
Isle of Man									
Israel	96%	94%	83%	93%	75%	68%	18%	17%	8%
Italy	100%	99%	100%	39%	33%	47%	1%	1%	1%
Jamaica	98%	100%	97%	75%	60%	73%	13%	7%	12%
Japan	100%	99%	97%	91%	94%	97%	49%	46%	46%
Jordan	96%	97%	98%	57%	59%	46%	9%	13%	3%
Kazakhstan		99%	96%		65%	60%		21%	20%
Kenya	99%	98%	100%	65%	58%	77%	19%	11%	22%
Kiribati									
Korea, Dem. Rep.									
Korea, Rep.	100%	100%		73%	67%		18%	14%	
Kosovo									
Kuwait	98%	100%	100%	50%	61%	56%		13%	3%
Kyrgyz Republic	99%	97%	98%	21%	35%	42%	3%	4%	2%
Lao PDR			98%			69%			21%

	Percent of Sample Responding to EOS Survey Question 12			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Latvia	99%	98%	97%	66%	66%	72%	13%	9%	15%
Lebanon	96%	89%	92%	54%	56%	44%	4%	3%	6%
Lesotho	99%	96%	100%	44%	40%	67%	9%	6%	8%
Liberia		100%	100%		61%	44%		11%	9%
Libya		96%	98%		35%	27%		4%	8%
Liechtenstein									
Lithuania	97%	99%	98%	64%	66%	73%	10%	11%	18%
Luxembourg	91%	91%	98%	94%	98%	98%	41%	46%	45%
Macao SAR, China									
Macedonia, FYR	100%	98%	100%	37%	37%	60%	8%	8%	20%
Madagascar	98%	98%	97%	39%	49%	49%	2%	1%	12%
Malawi	98%	95%	98%	43%	48%	63%	8%	10%	13%
Malaysia	100%	99%	97%	94%	94%	89%	47%	40%	36%
Maldives									
Mali	99%	94%	98%	40%	27%	52%	14%	11%	25%
Malta	98%	97%	90%	65%	71%	71%	8%	25%	18%
Marshall Islands									
Mauritania	92%	93%	98%	22%	37%	13%	5%	16%	6%
Mauritius	98%	98%	96%	74%	74%	76%	10%	17%	16%
Mexico	99%	95%	97%	62%	69%	64%	11%	12%	12%
Micronesia, Fed. Sts.									
Moldova	100%	99%	98%	35%	38%	34%	6%	5%	4%
Monaco									
Mongolia	100%	99%	100%	60%	63%	65%	11%	13%	19%
Montenegro	100%	97%	100%	60%	70%	60%	21%	16%	6%
Morocco		93%	98%		51%	49%		14%	8%
Mozambique	98%	100%	98%	35%	38%	41%	5%	5%	7%
Myanmar			91%			22%			3%
Namibia	100%	99%	100%	62%	63%	61%	16%	10%	13%
Nepal	99%	98%	100%	24%	27%	31%	4%	3%	
Netherlands	99%	95%	98%	93%	97%	92%	36%	40%	29%
New Caledonia									
New Zealand	100%	96%	95%	87%	92%	100%	15%	21%	17%
Nicaragua	97%	99%	91%	47%	70%	78%	6%	1%	
Niger									
Nigeria	93%	94%	98%	54%	65%	71%	12%	12%	13%
Northern Mariana Islands									
Norway	96%	91%	88%	91%	99%	93%	36%	35%	35%
Oman	100%	94%	93%	54%	67%	57%	16%	18%	11%
Pakistan	97%	97%	98%	52%	43%	44%	4%	5%	6%
Palau									
Panama	99%	100%	99%	72%	69%	78%	10%	14%	16%
Papua New Guinea									
Paraguay	99%	100%	100%	51%	46%	52%	4%	5%	10%
Peru	100%	99%	99%	52%	56%	59%	7%	5%	8%
Philippines	98%	100%	99%	77%	82%	84%	21%	25%	17%
Poland	100%	100%	99%	67%	66%	67%	10%	7%	9%
Portugal	99%	99%	94%	60%	63%	72%	8%	9%	10%
Puerto Rico	92%	92%	100%	79%	86%	81%	28%	34%	35%
Qatar		96%	96%		93%	89%		51%	56%
Romania	100%	98%	97%	54%	31%	33%	6%	4%	2%
Russian Federation	99%	100%		55%	56%		8%	10%	
Rwanda	98%		98%	64%		66%	15%		18%
Samoa									

	Percent of Sample Responding to EOS Survey Question 12			Percent Responding "At Least Moderate Satisfaction"			Percent Responding "Great Satisfaction"		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
San Marino									
Sao Tome and Principe									
Saudi Arabia		88%	89%		63%	67%		27%	21%
Senegal	94%	99%	99%	35%	22%	45%	8%	4%	8%
Serbia	99%	100%	100%	23%	28%	33%	4%	7%	2%
Seychelles		97%	97%		58%	87%		13%	17%
Sierra Leone		100%	99%		44%	59%		3%	11%
Singapore	99%	97%	99%	99%	97%	97%	49%	49%	43%
Sint Maarten (Dutch part)									
Slovak Republic	97%	99%	92%	54%	51%	62%	1%	4%	5%
Slovenia		99%	100%		55%	56%		5%	5%
Solomon Islands									
Somalia									
South Africa	98%	100%	96%	82%	84%	96%	20%	24%	44%
South Sudan									
Spain	97%	98%	93%	53%	46%	59%	7%	3%	6%
Sri Lanka	99%		98%	57%		79%	8%		12%
St. Kitts and Nevis									
St. Lucia									
St. Martin (French part)									
St. Vincent and the Grenadines									
Sudan									
Suriname	100%	97%	98%	71%	69%	55%	3%	8%	
Swaziland	100%	96%	97%	55%	65%	77%	8%	10%	3%
Sweden	97%	88%	100%	97%	94%	96%	48%	40%	47%
Switzerland	90%	91%	85%	99%	97%	100%	63%	57%	53%
Syrian Arab Republic									
Tajikistan	100%	100%		46%	61%		10%	23%	
Tanzania	98%	96%	100%	60%	54%	50%	9%	7%	11%
Thailand	100%	96%	99%	67%	65%	72%	13%	11%	15%
Timor-Leste	100%	100%	100%	42%	37%	38%		6%	3%
Togo									
Tonga									
Trinidad and Tobago	99%	98%	94%	67%	66%	69%	7%	10%	10%
Tunisia	97%		92%	53%		55%	16%		6%
Turkey	99%	96%	99%	58%	65%	59%	6%	7%	8%
Turkmenistan									
Turks and Caicos Islands									
Tuvalu									
Uganda	99%	100%	97%	46%	46%	44%	13%	13%	9%
Ukraine	99%	97%	99%	39%	48%	59%	6%	15%	7%
United Arab Emirates	100%	98%	100%	83%	87%	90%	48%	33%	51%
United Kingdom	97%	89%	89%	89%	91%	82%	32%	26%	20%
United States	98%	97%	95%	86%	88%	92%	34%	35%	33%
Uruguay	99%	99%	96%	64%	51%	61%	5%	4%	3%
Uzbekistan									
Vanuatu									
Venezuela, RB									
Vietnam	99%	99%	99%	36%	49%	63%	7%	4%	11%
Virgin Islands (U.S.)									
West Bank and Gaza									
Yemen, Rep.									
Zambia	95%	98%	99%	51%	49%	65%	10%	12%	12%
Zimbabwe	100%	98%	96%	50%	48%	58%	14%	8%	5%

Co-Editors and Authors

David E. Bloom is Clarence James Gamble Professor of Economics and Demography at the Harvard School of Public Health. He earned his PhD in Economics and Demography from Princeton University in 1981. Bloom is a Fellow of the American Academy of Arts and Sciences, Faculty Research Associate at the National Bureau of Economic Research, and Research Fellow at IZA in Bonn. He directs Harvard's Program on the Global Demography of Aging, was co-director of the World Bank/UNESCO-sponsored Task Force on Higher Education, and was co-director of the American Academy of Arts and Sciences' research program on universal basic and secondary education. Bloom currently serves as Chair of the Forum's Global Agenda Council on Education and Skills.

Ayla Goksel is Chief Executive Officer of ACEV, a Turkish NGO working in early childhood, female literacy, and parent training. ACEV has provided education services for over 800,000 individuals and trained 9,000 teachers and volunteers. Goksel is also Chief Executive Officer of the Hüsnü M. Özyeðin Foundation, Trustee of Ozyegin University, and a board member of the Education Reform Initiative and TOHUM Foundation for Autism. She is a Young Global Leader of the World Economic Forum, a Senior Fellow of the Synergos Institute, a Qatar Foundation WISE Laureate, and a World Economic Forum Global Agenda Council member. Goksel holds a BSc from the University of Bath, an MSc from the London School of Economics, and has conducted fellowships at Johns Hopkins University and Harvard University.

Jody Heymann is Dean and Distinguished Professor of Epidemiology at the UCLA Fielding School of Public Health, Distinguished Professor of Public Policy at the Luskin School of Public Affairs, and Distinguished Professor of Medicine at the Geffen School of Medicine. Heymann is founding director of the World Policy Analysis Center (WPAC). WPAC is the largest global data centre of quantitative indicators of law and policy, including over 1,000 aspects of social policy for 193 UN countries. Author of *Children's Chances: How Countries Can Move from Surviving to Thriving* (Harvard University Press), Heymann served as past chair of the Forum's Global Agenda Council on Education. She is an elected member of the U.S. Institute of Medicine and a Fellow of the Canadian Academy of Health Sciences.

Yoko Ishikura is a Professor at Keio University's Graduate School of Media Design. Prior to her current position, Ishikura was a manager at McKinsey & Company Inc., a professor at the School of International Politics, Economics and Business at Aoyama Gakuin University, and a professor at the Graduate School of International Corporate Strategy at Hitotsubashi University. She has also served as a non-executive director for companies in Japan, the United States, and the United Kingdom, as well as vice president of the Science Council of Japan. She received a BA from Sophia University in Tokyo, Japan, MBA from the University of Virginia Darden School of Business, and a Doctor of Business Administration from Harvard Business School.

Brij Kothari conceived Same Language Subtitling (SLS) on mainstream television for mass literacy and continues to research and advocate for its implementation in India and other low-literacy countries. He is a Schwab Social Entrepreneur, Ashoka Fellow, and on the faculty of the Indian Institute of Management, Ahmedabad. Kothari founded PlanetRead, a non-profit, and BookBox, a social enterprise company. These organizations leverage SLS for reading and language learning via popular entertainment, mass media, and ICTs. He has a PhD in Education from Cornell University and currently serves as Vice-Chair of the World Economic Forum's Global Agenda Council on Education and Skills.

Patricia A. Milligan is the President of Mercer's North America Region. Over her 25-year career, she has held various leadership positions including the President of Mercer's Talent business and Chief Markets Officer. She has been a pioneer in innovative work in the area of human capital, including HR function, talent management, and rewards strategy. Milligan is widely recognized as a thought leader in solving global human capital challenges. She is also a strong advocate for the development and mentorship of women, serving as executive sponsor for Women@Mercer. She currently serves as the Co-Vice Chair of the World Economic Forum's Global Agenda Council on Education and Skills. Milligan earned her MBA at the Kellogg Graduate School of Management at Northwestern University and is a graduate of Georgetown University's School of Foreign Service.

Chip Paucek is an education entrepreneur and Co-Founder and Chief Executive Officer of 2U, Inc. Prior to 2U, Paucek served as Chief Executive Officer of Hooked on Phonics, founded Cerebellum Corporation, the company behind the award-winning educational Standard Deviants television program, and also co-managed the re-election campaign of Senator Barbara Mikulski of Maryland.He also serves on the World Economic Forum's Global Agenda Council on Education and Skills and won Ernst & Young's Entrepreneur Of The Year Award™ in Maryland.

Other Authors

Mehnaz Aziz is the Founding Director of Children's Global Network Pakistan, a leading non-profit educational institution, implementing education reforms in Pakistan. She has served as a senior member of the Education Task Force under the Prime Minister of Pakistan and is also a member of Punjab Compulsory Education Commission. She initiated the Early Childhood Care and Development Centre of Excellence at CGN-P and currently serves on the Board of Directors for 'Zara Sochiyay', National Media Campaign on Education. She is also a member of the World Economic Forum's Global Agenda Council on Pakistan. Aziz holds an M.Sc. in Anthropology from Quaid-e-Azam University, Pakistan and an M.A. in Gender and Development from the Institute of Development Studies at Sussex University, UK.

Arup Banerji is Director and Head of the Global Practice on Social Protection and Labor at the World Bank. He is a Research Fellow at the Institute for Labour Economics (IZA), co-chairs the Social Protection Inter-Agency Coordination Board and the Youth Employment Network, and serves as a member of the G20 Task Force on Employment. He has co-authored two *World Development Reports* and overseen a third. Banerji has written books and academic papers on topics including employment and labour markets, skills, aging, social protection systems, and institutions and governance. He earned his PhD in Economics from the University of Pennsylvania in 1991, and has taught at the University of Pennsylvania and the Center for Development Economics at Williams College. He is currently a member of the Global Economic Forum's Global Agenda Council on Youth Unemployment.

Pia Rebello Britto is the Senior Advisor and Global Chief for Early Childhood Development at UNICEF. She earned her PhD in Developmental Psychology from Columbia University in 1999. Prior to her position at UNICEF, she was an Assistant Professor at Yale University and the Associate Director of the Edward Zigler Center for Child Development and Social Policy at Yale. Britto is known internationally for her work on creating evidence-based early childhood programs and policies, primarily in low- and middle-income countries.

Gordon Brown is the United Nations Special Envoy for Global Education and Member of Parliament for Kirkcaldy and Cowdenbeath in the United Kingdom. He served as Prime Minister of the United Kingdom and Leader of the Labour Party from 2007 to 2010 and is widely credited with preventing a second Great Depression through his stewardship of the 2009 London G20 summit. Previously, he served as Chancellor of the Exchequer from 1997 to 2007, making him the longest-serving Chancellor in modern history. Brown is the author of several books, including *Beyond the Crash: Overcoming the First Crisis of Globalisation*, and a forthcoming work *2025: Shaping a New Future.*

Ciara Browne is Associate Director of The Global Competitiveness Network, where her responsibilities include managing the network of Partner Institutes worldwide and coordinating the Executive Opinion Survey process. Browne is also involved in the production of the Global Competitiveness Report and the Network's other benchmarking studies. She works closely with the World Economic Forum's media team in conveying the findings of the various competitiveness reports to the media and the public. She is also responsible for the organization and management of a series of competitiveness workshops in Sub-Saharan Africa.

Jose Ferreira is the founder and Chief Executive Officer of Knewton, the world's leading adaptive learning company. Knewton was named a Technology Pioneer by the World Economic Forum at Davos, where Ferreira is a member of the Global Agenda Council on Education. He graduated from Carleton College with a BA in Philosophy and received his MBA from Harvard Business School. Before founding Knewton, he worked as a Kaplan executive, derivatives trader, venture capitalist, and strategist for John Kerry's presidential campaign.

Thierry Geiger is an Economist and Associate Director with The Global Competitiveness Network at the World Economic Forum. He leads the competitiveness research on Asia, supervises the development and computation of a wide range of composite indicators, and is responsible for the Network's technical assistance and capacity building activities. His areas of expertise are private sector development, international trade, and applied economics. Geiger is a co-author of the Forum's flagship publications *The Global Competitiveness Report*, *The Global Information Technology Report*, and *The Global Enabling Trade Report*. He is the lead author of several regional and country studies.

Martina Gmür is Senior Director at the World Economic Forum. She currently heads the Global Knowledge Networks, which includes the Network of Global Agenda Councils, a braintrust of over 1,000 global experts across multi-disciplinary fields, and the Global Academic Networks, the foremost global community of universities, think tanks and other research based organizations. She is also the editor of the Outlook on the Global Agenda, which provides a top-of-mind perspective from the Global Agenda Councils on the challenges and opportunities ahead. Previously, she oversaw the development of the Forum of Young Global Leaders, a community of exceptional young leaders around the world. Prior to joining the World Economic Forum, she was associate vice-president with Lazar & Company, a New York-based investment bank, and she has held positions in marketing and sales at Nestlé Switzerland. Larkin holds an MBA and a BS in Finance, and is a member of a number of non-profit boards and a Yale World Fellow 2011.

Lauren Graybill is a current student at Harvard School of Public Health working toward her Master of Science in Global Health and Population. She graduated from Northeastern University with a BS in economics in 2013, and worked at Pathfinder International and John Snow Incorporated as a co-op student on projects based in Uganda, Ethiopia, Pakistan, Papua New Guinea, and South Africa. Her research is currently focused on the effect of macroeconomic policies on infant mortality rates; however, she is also pursuing opportunities in the field of global health epidemiology.

Salal Humair is a Research Scientist in the Department of Global Health and Population, Harvard School of Public Health. Previously, he has served as an Associate Professor and as Associate Dean at the School of Science and Engineering, established in 2008 at the Lahore University of Management Sciences in Pakistan; and as a Principal Software Engineer at Optiant, Inc., a start-up company that focused on supply chain optimization software. He obtained his doctorate in Operations Research from the Massachusetts Institute of Technology in 2001. His current work spans a range of public health policy questions, as well as traditional operations areas such as supply chain optimization theory and practice.

Emmanuel Jimenez is Director of Public Sector Evaluations at the World Bank Group. Prior to holding this position, he was responsible for the Bank's operational programme in Human Development for the Asia regions and, before that, served in its research department. Jimenez led the core team that prepared *The World Development Report 2007: Development and the Next Generation* and is editor of the journal, *The World Bank Research Observer*. Before joining the Bank, Jimenez was on the economics faculty at the University of Western Ontario. He received his PhD from Brown University and currently serves as vice-chair of the World Economic Forum's Global Agenda Council on Population Growth.

Omobola Johnson is the Honourable Minister for Communication Technology of the Federal Republic of Nigeria. Prior to her appointment, she was Country Managing Director of Accenture, Nigeria. Johnson holds a Bachelor's Degree in Electrical and Electronic Engineering from the University of Manchester and a Master's degree in Digital Electronics from King's College, London. She is also nearing completion of a doctorate at Cranfield University, focused on corporate leadership practices in emerging markets. Johnson currently serves as Vice-Chair of the World Economic Forum's Global Agenda Council on Africa and is a member of the United Nations' Broadband Commission Working Group on Gender and Broadband. Johnson is also a member of the International Telecommunications Union's m-Powering Development Advisory Board.

Jeremy Johnson is Co-Founder of 2U. A lifelong entrepreneur, he founded his first company at 15 and his second, a social network around the college admissions process, at 21 while a student at Princeton University. He has been named to both Forbes' and Inc. Magazine's 30 Under 30 lists and was named "one of the 30 Most Influential Entrepreneurs" in 2011 and 2012 by Under30 Chief Executive Officer. Johnson has spoken on education and innovation at the White House, in front of Congress, and at conferences and universities around the world. He serves on a handful of boards including the Young Entrepreneur Council and PENCIL, and has been a mentor for both the TechStars and the TechStars EdTech Accelerators.

Vivian Lopez is UNICEF's Middle East and North Africa Regional Adviser for Adolescent Development in New York, and serves on the Global Agenda Council on Youth Unemployment. Previously, she was a member of UNICEF's Latin America and Caribbean HIV/AIDS team. Lopez serves as a consultant with various organizations: UNAIDS, World Health Organization, Inter-American Development Bank, Pan American Health Organization, and UN Secretariat's Youth Unit. In the past, Lopez was a Medical Faculty Research Fellow at Catholic University of Chile, a Rotary Ambassadorial Scholar and a researcher at Yale Center for Interdisciplinary Research on AIDS. Lopez holds an MS in Public Health from Yale University, and a BSc in Biology and Community Health from Tufts University.

Leslie Maasdorp is the President for the Southern Africa region at Bank of America-Merrill Lynch. Prior to this role he served as Vice Chairman of Barclays Capital and Absa Capital. He is a former International Adviser to Goldman Sachs. In 1994, after the transition to democracy in South Africa he was appointed Special Adviser to the Minister of Labour. In 1999, he was appointed as Deputy Director General in the Department of Public Enterprises leading the restructuring and privatisation programme in the South African Government. He holds a BA in Economics and Psychology and an MSc in Economics from the School of Oriental and African Studies at the University of London. In 2007 he was appointed a Young Global Leader by the World Economic Forum.

Jamie McAuliffe is President and Chief Executive Officer of Education for Employment (EFE), a non-profit dedicated to creating jobs for Arab youth in the Middle East and North Africa. Prior to EFE, Jamie was at the Edna McConnell Clark Foundation (EMCF) where he helped bring proven youth-serving organizations to national scale. He has worked with Ashoka where he launched new programs to support leading social entrepreneurs globally. A graduate of Johns Hopkins School of Advanced International Studies, Jamie is also a graduate of Teach for America and the Coro Fellows program for Public Affairs. He is a Schwab Foundation Global Social Entrepreneur and Chairs the World Economic Forum's Global Agenda Council on Youth Unemployment.

Colin McElwee is Co-Founder of not-for-profit Worldreader, which aims to eradicate illiteracy across the globe. He has a degree in economics from the University of Manchester and began his career as an economist for several Brussels-based lobbies to the European Commission. He later worked in global marketing in the consumer goods sector for Scottish & Newcastle PLC before joining ESADE Business School as their first director of marketing. He has an MBA from ESADE and is an invited member of the World Economic Forum's Global Agenda Council on Africa.

Sami Mahroum is Founding Director of INSEAD's Innovation and Policy Initiative. Previously, Mahroum was a Senior Analyst with the OECD, a Visiting Reader at Birkbeck College, University of London, and Research Director at NESTA. He has contributed to the UK Innovation White Paper, the OECD Innovation Strategy, and the Europe 2010 Futures project. He is a member of the World Economic Forum's Global Agenda Councils on Education and Skills, and a former member of the London-based RSA. He has been a Visiting Reader at the University of London and a Visiting Professor at the EPFL in Lausanne, and AUB in Beirut. Mahroum holds a PhD in the Social Studies of Science, Technology, and Innovation from the German Armed Forces University, an MSc in Science and Technology Dynamics from the University of Amsterdam, and a BA in Political Science and Economic Development from the University of Oslo, Norway.

Amina J. Mohammed is Special Adviser on Post-2015 Development Planning for the United Nations, a post to which she was appointed in 2012 by the Secretary General. Mohammed has more than 30 years' experience as a development practitioner in the public and private sectors, as well as civil society. Prior to her UN role, she served as Senior Special Assistant to the President of Nigeria on the Millennium Development Goals, serving three Presidents over a period of six years. Mohammed has served on numerous international advisory panels and boards. She is a recipient of the Nigerian 'National Honours Award of the Order of the Federal Republic' and was inducted in the Nigerian Women's Hall of Fame in 2007.

Kenneth M. O'Friel is a sophomore at Bates College in Maine. He is currently studying to be a double major in Economics and East Asian Studies with a concentration in Applied Mathematics.

Amy Rosen is Chief Executive Officer and President of the Network for Teaching Entrepreneurship (NFTE), which has educated more than 500,000 young people from low-income communities from around the world. She is passionate about providing all young people with the knowledge and skills necessary to pursue successful futures. A recognized expert in education and systemic change, she brings to this work a deep belief in the entrepreneurial mindset and empowering young people to seek education and opportunity. She serves as the Vice Chair of President Obama's Advisory Council on Financial Capability and is Vice Chair of the World Economic Forum's Youth Unemployment Council. Rosen spent 20 years as an effective, entrepreneurial leader of transportation systems and start-up companies. She has lectured, written, and received numerous public recognitions of her work.

Larry Rosenberg is recently retired from a position as Senior Research Associate in the Department of Global Health and Population at the Harvard School of Public Health. A graduate of Harvard's Kennedy School of Government, he has worked on projects relating to health, education, demographic change, economic growth, poverty alleviation, social protection, tax policy, the Israeli-Palestinian conflict, and wind energy. His research interests center on economic inequality, the effects of climate change, and political and economic development in Latin America and Asia.

Jose Manuel Salazar-Xirinachs is Assistant-Director General for Policy at the International Labour Organization (ILO). Before that, he was Executive Director for Employment at the ILO. Previously he has served as Director of the Office of Trade, Growth and Competitiveness at the Organization of American States; Minister of Foreign Trade of Costa Rica; Chief economist and later Executive Director of the Federation of Private Entities of Central America and Panama, the main regional private sector think-tank at the time; member of the Board of Directors of the Central Bank of Costa Rica; and Executive President of the Costa Rican Development Corporation. He has authored numerous journal articles on development, trade, and competitiveness policies, and has written and edited several books, including *Towards Free Trade in the Americas*, *Promoting Sustainable Enterprises*, *Trade and Employment: From Myths to Facts*. He holds a PhD from Cambridge University.

Zeba Sathar is the Country Director of the Population Council Pakistan Office. She has worked at the Pakistan Institute of Development Economics, the World Bank, the World Fertility Survey and London School of Hygiene and Tropical Medicine. She has authored several articles and papers and recently co-authored a book on "*Capturing the Demographic Dividend in Pakistan.*" Sathar was awarded the Tamgha-*i*-Imtiaz in 2006 in recognition of meritorious services to the development sector in Pakistan. She holds a doctorate in Medical Demography from the London School of Hygiene and Tropical Medicine, and a MSc. in Demography from the London School of Economics.

Elizabeth Scott is a research associate for INSEAD's Innovation and Policy Initiative at the Abu Dhabi Campus. She has written on economic development, innovation policy, business management, and leadership development. She has also worked as Coordinator of INSEAD's Case Development Centre. Previously, Scott worked with the Abu Dhabi Department of Economic Development's Centre for Economic Knowledge where she researched areas of best practice in government leadership and economic policy issues and supported the Department's leadership development programme. She has also worked as an economist with IMS Health and the Reserve Bank of Australia, as a management consultant at KPMG, and in strategic and business planning at the University of Technology Sydney and Greater Union Group of Companies. Scott holds an undergraduate degree in Economics from the University of Adelaide, and post-graduate diplomas in Health Economics from Curtin University of Technology and Applied Finance and Investment (Securities Institute of Australia).

Patty P. Sung is the Innovation Team Leader at Mercer. She has been at the forefront of Mercer's innovation effort and was recently appointed to co-lead new business and product development. Sung also has had extensive experience working with senior executives on developing and executing firm-wide strategic initiatives and transformational plans. And she worked in Singapore to help expand Mercer's business in the South East Asia market. Prior to Mercer, she held various research positions in the field of Biotechnology. She holds a Master's degree in Biotechnology from Columbia University, and a Bachelor's degree in Biochemistry from the University of California, Berkeley.

Tae Yoo is Senior Vice President of Cisco's corporate social responsibility practice. A 20-year veteran of Cisco, her insight and business acumen have enabled Cisco to collaborate across government, business, and NGO sectors for tangible social benefit. Her leadership has helped make Cisco Networking Academy one of the largest education programs in the world, recognized globally for its innovative approach to providing ICT education. Yoo is a trustee of the Cisco Foundation, sits on the board of Business for Social Responsibility and the Leadership Council for The Franklin Project at the Aspen Institute. She was Co-Chair of the World Economic Forum's Global Agenda Council on Education Systems. She has also served on the City Year National board and the Smithsonian National Museum of the American History board, as well as the advisory boards of the Global Philanthropy Forum and the Women's Technology Cluster.

Christina Yu is a Marketing Manager at Knewton and a part-time MBA candidate at the NYU Stern School of Business, where she is specializing in Marketing, Media and Entertainment. She holds an AB in English and Creative Writing from Dartmouth College and an MFA in Creative Writing from Notre Dame, where she was the Diversity Fellow and the Nicholas Sparks Fellow at Hachette Book Group. Prior to Knewton, she worked as a lecturer in English literature and composition at Kean University and Southern Connecticut State University. In recent years, her fiction has appeared in literary magazines nationwide and has been nominated and cited in several Best American anthologies.

Saadia Zahidi is a Senior Director at the World Economic Forum. With the World Economic Forum, she started as Economist, Global Competitiveness Programme, responsible for economic analysis for the Global Competitiveness reports and other topical and regional studies. She currently heads the Women Leaders and Gender Parity Programme; the Human Capital Project; and Constituents. She is the founder and co-author of the Global Gender Gap Report series, which benchmarks countries according to the size of their gender gaps on health, education, economic participation, and political empowerment. Zahidi holds a BA (with Honors) in Economics from Smith College, a Masters in International Economics from the Graduate Institute of International Studies, and Masters of Public Administration from Harvard University.

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- Ayla Göksel, Chief Executive Officer, ACEV, Turkey
- Jody Heymann, Dean of Public Health, University of California, United States
- Yoko Ishikura, Professor, Graduate School of Media Design, Keio University
- Brij Kothari, Director, PlanetRead, India
- Rolf Landua, Head, Education Group, European Organization for Nuclear Research (CERN), Switzerland (2013-2014
- Sami Mahroum, Academic and Executive Director, Innovation and Policy Initiative, INSEAD, United Arab Emirates,
- Patricia A. Milligan, President, North America Region Mercer (MMC), United States
- Chip Paucek, Chief Executive Officer, 2U, United States
- Christopher Pissarides, Regius Professor of Economics, London School of Economics and Political Science, United Kingdom
- Soraya Salti, Senior Vice-President, Middle East and North Africa, INJAZ Al-Arab - Junior Achievement Worldwide, Jordan
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World Economic Forum
91-93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel +41 (0) 22 869 1212
Fax +41 (0) 22 786 2744

contact@weforum.org
www.weforum.org