



RESULTS FOR
DEVELOPMENT




Innovative Secondary Education For Skills Enhancement

Phase I Synthesis Reports

Results for Development Institute

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Results for Development Institute (R4D) is a non-profit organization whose mission is to unlock solutions to tough development challenges that prevent people in low- and middle-income countries from realizing their full potential. Using multiple approaches in multiple sectors, including Global Education, Global Health, Governance and Market Dynamics, R4D supports the discovery and implementation of new ideas for reducing poverty and improving lives around the world.

This paper was prepared for the Innovative Secondary Education for Skills Enhancement (ISESE) project, led by R4D with support from the Rockefeller Foundation. For more information on the ISESE project, please contact Shubha Jayaram: sjayaram@r4d.org.

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Foreword

Over the course of 2012, Results for Development Institute (R4D) worked with regional partners in Africa and Asia to examine employer needs, explore existing curricula systems, and identify existing innovative skills delivery models under the Innovative Secondary Education for Skills Enhancement (ISESE) project. The resulting twelve background studies include a broad reviews of issues related to skills, education, and economic development in our 12 focus countries across Africa and Asia¹. The two reports presented here are a synthesis of key findings from this background research.

By 2030, the global labor force will reach 3.5 billion, and unless secondary education enrollment doubles or triples, one billion of these workers will lack secondary education, with 60 percent of these in South Asia and Africa.² While many countries in these regions have raised secondary education as a priority, the explicit link between secondary education and skills for employment is still absent in many national education systems—a significant problem given the fact that most youth entering the workforce will not obtain any education beyond the secondary level. In addition, an increasingly interconnected global economy and rapid evolution of traditional labor roles means that conventional ways of delivering skills for employment—for example, traditional vocational training models—are becoming less relevant and responsive to workforce demands. There is therefore an urgent need to reevaluate the skills needed for employability in the 21st century economy, and to find innovative models to deliver these skills to students.

Our research reveals that while technical and basic cognitive skills are still important in the workplace, transferrable and non-cognitive skills such as communication, problem-solving, punctuality, and flexibility are increasingly important, particularly for the informal economy. Improving pedagogy is also central to increasing youth employability in developing countries. Key features of models that successfully deliver these critical skills include an emphasis on multi-stakeholder partnerships, updated pedagogy, and innovative financing mechanisms to improve access, quality and relevance of skills at the secondary level.

Effective skills development policies and approaches can be instrumental in equipping youth with the skills and competencies needed to find and maintain employment in today's dynamic labor environment. However, questions remain about how to methodically classify these new and important sets of skills, identify successful ways of imparting them, and most importantly, what resources are needed to scale-up these models to create the most impact on youth employability in the developing world today.



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Managing Director
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¹The ISESE background studies can be found on R4D's website: <http://resultsfordevelopment.org/knowledge-center/innovative-secondary-education-skills-enhancement-ise-se-phase-i-research>

²*The world at work: Jobs, pay, and skills for 3.5 billion people*. McKinsey Global Institute, June 2012.

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Innovative Secondary Education For Skills
Enhancement (ISESE)

Skills for Employability in Africa and Asia

ISESE Skills Synthesis Paper

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Executive Summary

The Innovative Secondary Education for Skills Enhancement (ISESE) project, supported by the Rockefeller Foundation, seeks to identify the skills required for work in the 21st-century economies of Africa and Asia, and to explore innovative models of delivering those skills to youth of secondary school age. The Results for Development Institute (R4D) worked with regional partners in both regions to uncover new findings, and also scanned existing research and work in this area. This synthesis paper summarizes the background studies on skills for employability that were produced as part of this research, and is complementary to a parallel synthesis paper exploring innovative models for skills enhancement at the secondary level.

Secondary education is now the level of education from which most people enter the labor force (the exception is Africa, where secondary school enrollment rates are growing rapidly but still remain at less than 40 percent). Yet secondary education remains largely conceptualized as an interim step for the elite en route to higher education. Three aspects of secondary education skills are exam-

ined: the link between skills and individual livelihoods and economic growth; employer expectations regarding skills; and the specification of skills in the curriculum. Broadly speaking, three different types of skill are important: cognitive, non-cognitive (behavioral and attitudinal), and technical. The economic research evidence is increasing that cognitive skills are directly related to individual earnings and broader economic growth; there is not as yet much evidence about non-cognitive skills; and technical skills only seem to make a difference for initial employment but not thereafter, an important finding as technical education is so much more expensive per student than general academic secondary education. Employers are as concerned about non-cognitive skills as they are about cognitive and technical ones, and while there are some regional and sectoral differences, those are not as important as this broader finding. Non-cognitive skills are much more important for the informal sector than previously realized. Curricula rarely specify non-cognitive skills; where they are included, it is not in a way that is helpful to teachers in understanding what employers are looking for.

Glossary

21st-century skills: These are the skills that are particularly important for work in today's global, 21st-century economy. They include core subjects, life and career skills, learning and innovation skills, and information technology skills. Many of these skills are also often collected together into various packages of life skills that are considered important.

Cognitive skills: These are the basic mental abilities we use to think, study, and learn, and include numeracy and literacy.

Informal economy: The International Labor Organization definition is used in this paper. It refers to all economic activities by workers and economic units that are—either in law or in practice—not covered or insufficiently covered by formal arrangements.

Non-cognitive skills: Non-cognitive skills refer to personality traits and behaviors, and include leadership, communication, and reliability. These are also called soft skills, or behavioral skills.

Technical skills: These are the skills geared toward a specific occupation. They include electrical wiring, plumbing, and diesel machinery.

Background

This paper focuses on two key questions for sustainable livelihoods: What skills are needed for employability in developing countries, especially in Africa and Asia? What skills do students and secondary school leavers currently possess? It synthesizes a series of research studies commissioned by the Results for Development Institute (R4D), supported by the Rockefeller Foundation, that focused on Africa, South Asia, and Southeast Asia and complements them with other research material on skills issues in other regions.

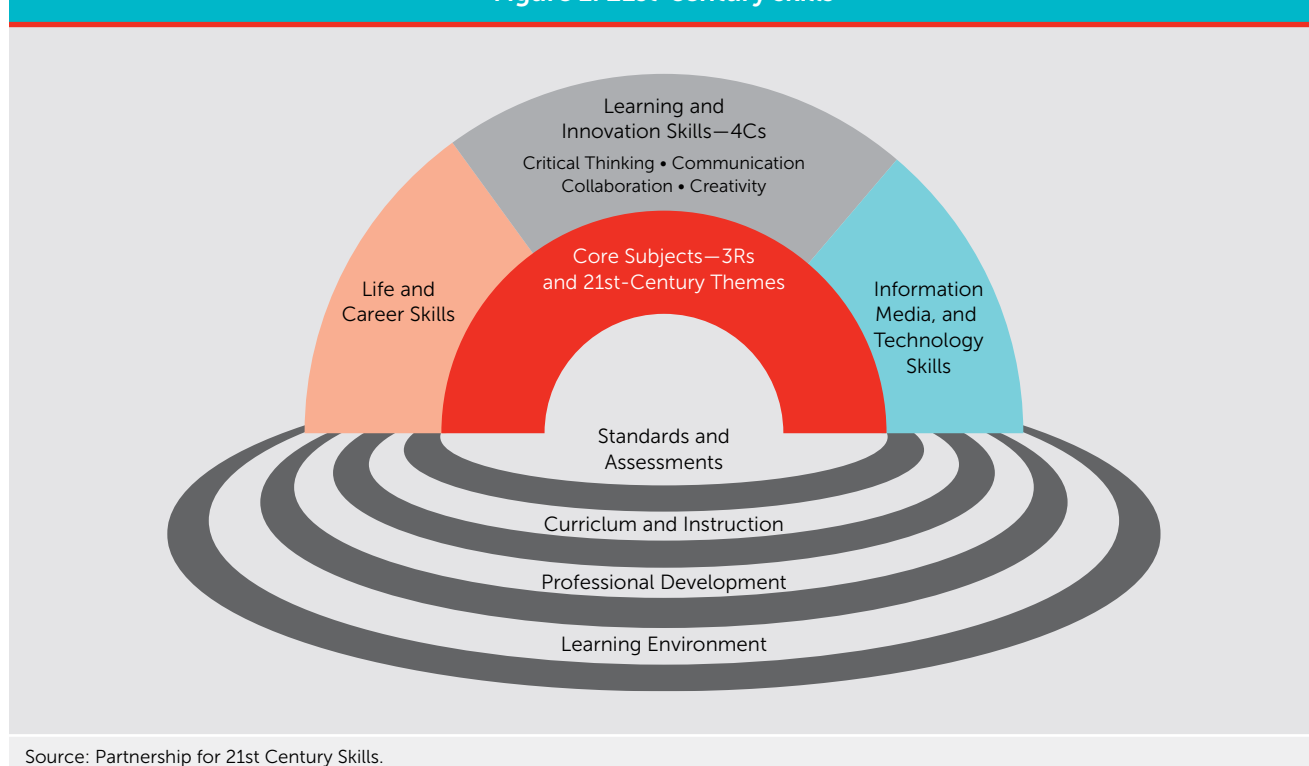
The paper is in five sections. “Background” and “Introduction” define terms, then briefly discuss the global labor market, and, most significantly, also establish why secondary education skills are important, both for individual livelihoods and for overall economic growth. Section 1 examines the skills needed for employability, from the perspective of employers in the formal economy and more broadly in the informal economy, noting also regional differences. The inclusion of the informal economy is important. Most other work on skills has been restricted to the formal economy. Yet, in many developing countries, as many as nine out of 10 workers are employed in the informal economy. Section 2 then reviews the skills that students currently do or do

not have, based on various assessments and on what is included in their curricula. The final section draws some preliminary conclusions, particularly identifying the gap between what is needed for employment and current skills of secondary school leavers.

Definitions

The terms “skills,” “key competencies,” “formal economy,” and “informal economy” are all in very common usage, but an analytical approach requires their precise definition. There are usually acknowledged to be three dimensions of skill development: (i) cognitive; (ii) non-cognitive; and (iii) technical; and these are the dimensions discussed in this paper. Cognitive skills are the basic mental abilities we use to think, study, and learn. They are the tools with which technical and “life” skills are acquired; as such cognitive skills are essential for everyone. Non-cognitive skills refer to personality traits and behaviors. The term “skill” is closely linked with but different from the term “key competency”—which the Organisation for Economic Co-operation and

Figure 1: 21st-century skills



There is much overlap between [21st-century skills] and what employers seek from school leavers in developing countries.

Development (OECD) defines as the ability to apply skills in a specific context (OECD 2005).

In recent years, much attention has been given to so-called 21st-century skills, especially in OECD countries. These have been variously described in different documents, as developed by different institutions including the World Bank, the Partnership for 21st Century Skills in the United States, and corporate collaborations like ATC21S (the Assessment and Teaching of 21st Century Skills project at the University of Melbourne in Australia). This has stemmed from two factors: the growing prevalence of information and communications technology (ICT) throughout all economies and rising youth unemployment. These skills generally fall into four categories:

- core subjects (the three Rs [3Rs], or basic literacy and numeracy plus 21st-century themes such as global awareness and health literacy);
- life and career skills (flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership and responsibility);
- learning and innovation skills (critical thinking, communication, collaboration, creativity); and
- information, media, and technology skills.

This paper does not use this list of skills as such, but, as will be apparent, there is much overlap between them and what employers seek from school leavers in developing countries. Many of the skills on the 21st-century list are also often collected together into various packages of “life skills” that are considered important. In Thailand, for example, life skills include creativity, industriousness, problem-solving, and workplace discipline. There is thus a significant convergence, though not a complete one, between the skills considered important in OECD countries and those in developing ones.

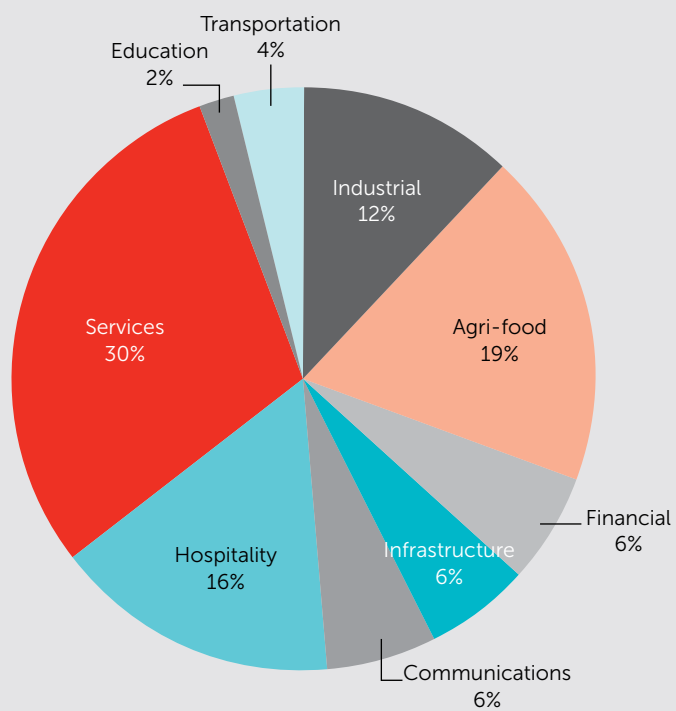
The term “informal economy” is used in this paper to refer to all economic activities by workers and economic units that are—either in law or in practice—not covered or insufficiently covered by formal arrangements (ILO 2002). The relative size of the informal economy roughly correlates inversely with country per capita incomes. At the regional

level, therefore, sub-Saharan African countries tend to have the largest informal economies, followed by Europe and Central Asia, Latin America and the Caribbean, the Middle East and North Africa, and South Asia, whereas OECD countries have the smallest informal economies. Globally speaking the share of the informal sector in total gross domestic product has decreased in most economies over recent decades, while its absolute size has grown substantially. Informal workers make up 49 percent, or half, of non-agricultural workers in 33 developing countries with available data (ILO 2011). Unfortunately most countries exclude agriculture from their measurements of informal economic activities, despite agriculture dominating employment in low-income countries (54 percent in India and 70 percent in Senegal, for instance).

Methodology

R4D worked closely with five partners in Africa and Asia to understand the demand and supply side of the employability issue, exploring both the skills needed for employability in both the formal and informal sector and the skills students currently possess via the secondary education system. Answering both questions permitted a better understanding of the skills mismatch and a clearer idea of what is needed to close the gap. Twelve focus countries were selected in each region for the research, covering Francophone Africa, East Africa, South Asia, and Southeast Asia. Eighty-three enterprises in a mix of sectors were surveyed across sub-Saharan Africa (Figure 2), with two-thirds being small and medium-sized enterprises (SMEs). In Southeast Asia, 21 employers were directly surveyed in Vietnam, while 2008 employer survey data were obtained from the Cambodian Federation of Employers and Business Associations and the Thailand Labor Demand of Establishment Survey. The former surveyed 220 enterprises while the latter covered 190,024 enterprises. Meanwhile, 87 leaders from high-growth sectors were interviewed in focus groups across five cities in South Asia (specifically, Dhaka, Delhi, Bhopal, Mumbai, and Lahore). In addition, R4D, with support from the Rockefeller Foundation, convened a meeting in Bellagio, Italy, in July 2012 with 20 experts from multilateral banks, United Nations agencies, the private sector, and foundations to discuss preliminary findings. Based on those discussions, the research was further refined.

Figure 2: Profile of enterprises surveyed in sub-Saharan Africa



Introduction: The Global Employment Picture

By 2030 the global labor force will be 3.5 billion, an increase of 600 million from today. Sixty percent of this net increase will be in South Asia and Africa. Unless secondary education trends double or triple, one billion of the 3.5 billion will lack secondary education, one-third in India and another quarter in Africa and the rest of South Asia. A recent overview suggests that the 2030 global workforce will contain a potential surplus of 90 to 95 million low-skilled workers, 58 million of them in developing countries. By contrast, there will likely be a shortage of 45 million medium-skilled workers in developing countries, as industrialization raises demand but secondary education does not keep pace (McKinsey, June 2012).

These long-term trends assume slower job growth in the past than in recent years, and come on top of a serious current youth unemployment situation. Everywhere, youth unemployment is higher than overall unemployment, and because youth make up such a large proportion of the population and labor force, the numbers of unemployed youth often exceed those of adults. In South Asia, for example, youth unemployment rates are three to four times as high as adult rates (Srivastava and Khare 2012). Globally, youth unemployment in 2012 is about 75 million, or a rate of 12.7 percent, varying from 28 percent in the Middle East to 13.5 percent in South Asia. Skills mismatches are one important cause of unemployment in general—and of youth unemployment in particular. They are not the only cause, of course, with macroeconomic demand being a major factor. Persisting unemployment in the face of job vacancies, however, does indicate that there is some mismatch due to labor force entrants having inadequate skills.

In Africa and Asia, the focus regions of this study, several trends are apparent. First, the proportion of workers in agriculture has fallen, but absolute numbers in agriculture remain roughly constant. Sixty-seven million non-farm jobs have been created in India, for example, since 2000, but the number employed in agriculture has remained constant at 240 million. Second, the demographic advantage countries in these regions have had could in the future become instead a major disadvantage, resulting in too many low-skilled workers.

If education systems fail to respond more rapidly to changing economies, to expand sufficiently, and to become more relevant to employment, these skills mismatches seem likely to increase because of broader trends. Advances in technol-

ogy are reducing the demand for low-skill and even some medium-skill jobs and certainly increase the frequency with which skills need to be upgraded.

Skills and Individual Livelihoods³

Education and skills have strong economic benefits for people. Studies have looked at number of years in school, cognitive skills, and at non-cognitive skills. They have found an average 10 percent private return on individual earnings for each additional year of schooling and that the returns to education overall have evolved depending on the education level and have especially increased for postprimary education in growing economies, as schooling levels have increased overall. Beyond just years of education, there is increasing evidence that cognitive skills (as measured by standardized literacy tests) are strongly and significantly associated with individual earnings in both developed and developing countries. Similarly non-cognitive skills are also highly positively associated with productivity and earnings in developing countries on the whole. Private returns to both years of schooling and to cognitive skills are generally higher in developing than in developed countries, partly reflecting the greater scarcity of schooling and of skills in the developing world.

Similarly these returns in developing countries tend to be higher for women than for men, again reflecting relatively lower school attendance and so learning by women. This is in part because women may need only basic literacy skills to obtain high-paid employment whereas men need higher levels of literacy. One important study in Pakistan showed that, for women, the returns to skills were stronger than those to schooling, but with the opposite result for men, implying that for men school provides a credentialing that is missing for women. No long-term trend data are available for developing countries, but data for OECD countries does show that the effect of cognitive (literacy) skills on individual earnings has increased in the last three decades.

Other important findings about specific cognitive skills include that numeracy skills have particularly high returns as do computing skills, both across different levels of development. The evidence on non-cognitive skills is still scarce (mainly confined to the United States and Canada),

³This section and the one that follows draw heavily on Guison-Dowdy (2012).

but non-cognitive skills do appear to have a positive effect on earnings, independent of cognitive skills. It is sometimes suggested that non-cognitive skills can have an effect on cognitive ones: this seems to be so for effort and conscientiousness but not at all the case for work habits, pro-social behavior, leadership, and locus of control.

The evidence on technical and vocational skills is extremely interesting and important in light of the current tendency by many countries to think that their skills problem is one of a shortage of technical skills and to increase technical and vocational schooling. Acquiring technical skills does pay off in terms of the immediate transition to work, so long as such skills are in the right sectors and so long as the right conditions are in place for this to happen (for example, links to the world of work, job expansion, tight alignment of the curriculum with short-term labor market demand). But overall, technical skills do not have any systematic positive effect on earnings when comparing individuals with and without such skills.

It is interesting (and important) that these findings from economic analysis correspond also with survey results: Gallup polls from 2009 through 2011 in 38 countries in sub-Saharan Africa show that only 62 percent of adults with a secondary education live on less than \$2 per day, compared with 85 percent of adults with a primary education. Less than half of those with secondary education also said that they did not have enough money to buy food, compared with fully two-thirds of those with primary education. Those with secondary education are twice as likely as those with a primary education to work full-time for an employer, though emphasizing the importance of the informal economy, this proportion is still only 16 percent for those with secondary education (Gallup 2012).

Skills and Economic Growth

Across countries and across regions, the quantity of education or schooling is generally associated with long-term economic growth, and generally this association is higher for developing than for OECD countries. It is important to note, however, that one year of schooling does not deliver the same increase in knowledge and skills across education and cultural systems—for example, in Papua New Guinea and in Japan (Hanushek and Woessman 2007). Furthermore, the association is less after controlling for the influence of openness, property rights, fertility, political stability, and investment. It is also important to note that there are some studies that show no association between quantity of schooling and economic growth.

The evidence on school years and growth is suggestive, if not certain, that the correlation between cognitive achievement and growth is significantly positive across time, countries, and statistical models. Moreover this effect has been increasing, having doubled by 1980–2000 compared with 1960–1980. Adding cognitive skills to econometric models helps explain a larger variance in cross-country growth gaps versus simply using the quantity of schooling. “The returns to increased years of schooling increase with the quality of the education. Once there is a high-quality school system, it pays to keep children longer in school—but it does not if the school system does not produce skills” (Hanushek and Woessman 2008). Importantly, the effects of skills on overall growth do not appear to be linked to the per capita income and the development level of the country.

Whether technical skills affect national growth depends on the type of such skills. Their positive effect seems to be generally limited to situations in which they very specifically match on the supply side with skill needs in demand. More generally, technical and vocational education and training (TVET) is much more expensive per student than more general secondary education, with in general little overall impact on growth, making the cost–benefit calculation favor general secondary except in situations of specific skill shortages. Even here, general TVET will not suffice. It is also worth noting that much TVET is of relatively low quality, as well as expensive. None of this should imply that there should not be TVET, but rather that it must be of quality and linked as much as possible to labor market demand, in part through the involvement of employers. This finding holds for both the formal (Guison-Dowdy 2012) and informal economies (Adams 2011). Very importantly, TVET offers no guarantee as a solution to youth unemployment, and countries that have set targets for the share of TVET in secondary education (like Indonesia at 70 percent and China at 50 percent) should be aware that there is no correlation between the share in secondary enrollments and the subsequent integration of youth into the labor market (Adams 2011).

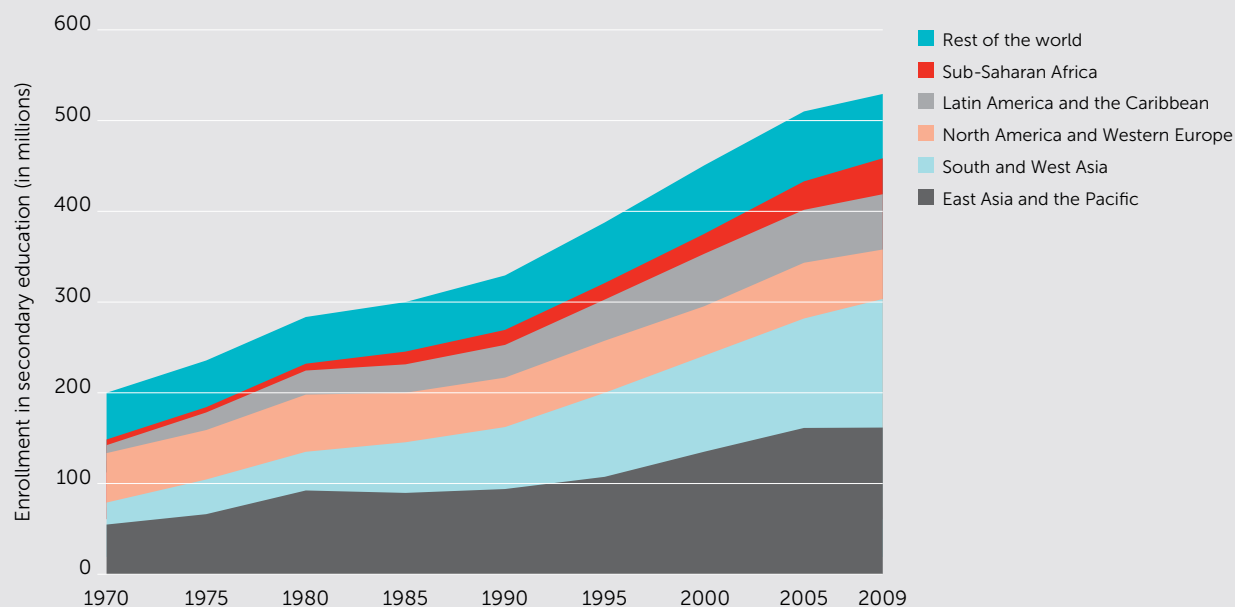
Generally speaking, in all types of economies, all skill levels above the basic level have a positive economic impact; indeed some studies show that this is more pronounced for non-OECD than for OECD countries. Studies have, however, had different findings on the levels of skills needed to maximize economic benefits, probably related to countries’ different levels of development. Overall, however, as seen in the preceding section, the level of skill requirements is rising in all economies.

Expanding Secondary Education

Secondary education has expanded rapidly in recent years. Globally the gross secondary enrollment rate reached 68 percent by 2009, up from only 43 percent in 1970. This

global figure conceals enormous regional variations, however, with enrollment rates in East Asia and the Pacific now close to 80 percent, in South and West Asia close to 60 percent, but still below 40 percent in sub-Saharan Africa, now the only region in the world where less than half the relevant age group is enrolled in secondary education.

Figure 3: Secondary school enrollment growth



Source: UIS (2011, 16).

Section 1: What Skills Are Needed for Employability?

Broad definitions of the three key categories of skill were introduced in the previous sections, and the concept of 21st-century skills was also mentioned. This section summarizes and makes more explicit what employers are looking for in the different regions. The background research for each region provided both a general overview and an in-depth look at several countries, with a focus on the formal economy. In addition, a cross-country assessment was conducted of the skill requirements of the informal economy.

Africa⁴

The major skill gaps in Africa are cognitive (especially numeracy and critical thinking), non-cognitive (especially communication, leadership, and decision making), and technical (depends on the industry). Non-cognitive skills are becoming increasingly important as economies change. Eighty-three employers in Benin, Burkina Faso, Kenya, Senegal, and Uganda were interviewed.⁵

Table 1: Employers surveyed in sub-Saharan Africa	
Country	Details of interviewees
Benin	40 companies (5 large, 35 SMEs) 140 employees at the SMEs
Burkina Faso	15 companies
Kenya	1 large company: Mumias Sugar Company
Senegal	8 companies (5 large, 3 SMEs)
Uganda	19 companies (7 large, 12 SMEs)

In Benin, employers prefer employees with some university education. Employers seem to primarily prioritize non-cognitive or “social” skills, and the principal issue at the secondary level is the excessively general education of school leavers. Employers outside the public sector (which, along with the informal economy, attracts the majority of Baccalaureate [exam taken at the end of secondary school] graduates) attribute this to the fact that the bulk of those who complete secondary school to the Bac-

calaureate level take the general Baccalaureate exam (80 percent compared with only 20 percent for the technical Baccalaureate exam). Most fail the exam, as the success rate is only around 30 percent. This lack of technical skills is as much as an issue in Benin as non-cognitive factors.

In Senegal, employers from SMEs tend to focus on the need for cognitive skills, while in larger enterprises, emphasis is laid on both cognitive as well as non-cognitive skills. Cumulative survey results showed that 75 percent of employers prioritized theoretical knowledge and an understanding of procedures, methods, structures, or models, while 25 percent focused on the practical or non-cognitive skills.

In Burkina Faso, non-cognitive skills (motivation, discipline, and drive to work) and cognitive skills (reading and writing) are prioritized by employers. Meanwhile, in both Burkina and Uganda, technical and vocational skills are needed in sectors like finance and construction. Similarly, in Kenya, employers are concerned with cognitive skills (basic knowledge, the level of educational attainment, and critical thinking) and non-cognitive skills (attitudes, communication skills, flexibility, and adaptability).

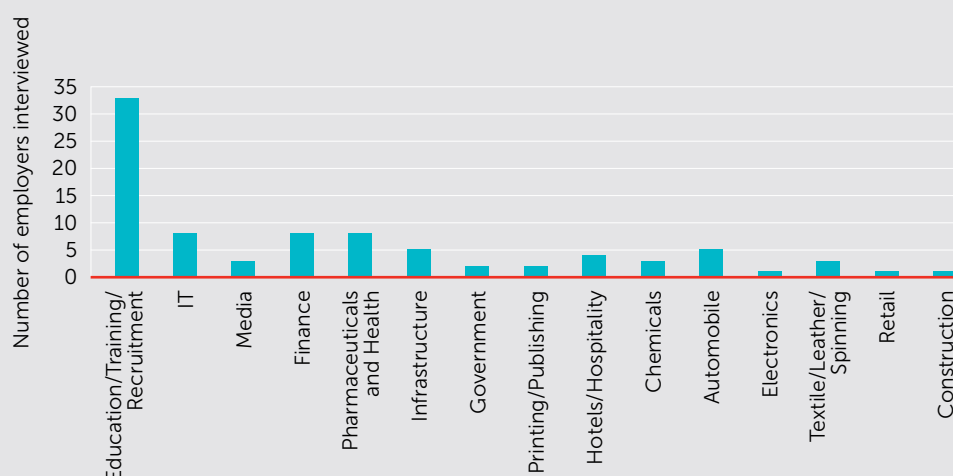
Overwhelmingly, employers believe that the theoretical knowledge acquired in the classroom is just the “tip of the iceberg,” and that it is insufficient by itself. All employers look for a varying mix of non-cognitive or technical skills (depending on the sector). Interestingly, employers felt that schooling should deliver the fundamental skills for employability to youth, so that employers can then conduct on-the-job training that is specific to their needs.

The Association for the Development of Education in Africa’s (ADEA’s) 2012 Triennale on Education and Training in Africa highlighted similar skill needs, and described three basic capacities or common core skills needed for sustainable development in Africa. First, communication skills and “learning to learn” are crucial. These capacities include literacy, numeracy, and cognitive skills. Second, youth need to acquire social or citizenship skills (for instance, being able to cooperate with others and to manage conflicts) and work-related skills for being able to function in the workplace. Lastly, life skills, personal development skills, and being able to contribute to a pan-African identity are key.

⁴This section draws on Lututala (2012).

⁵See Appendix for full list of interviewees.

Figure 4: Employers surveyed in India, by sector



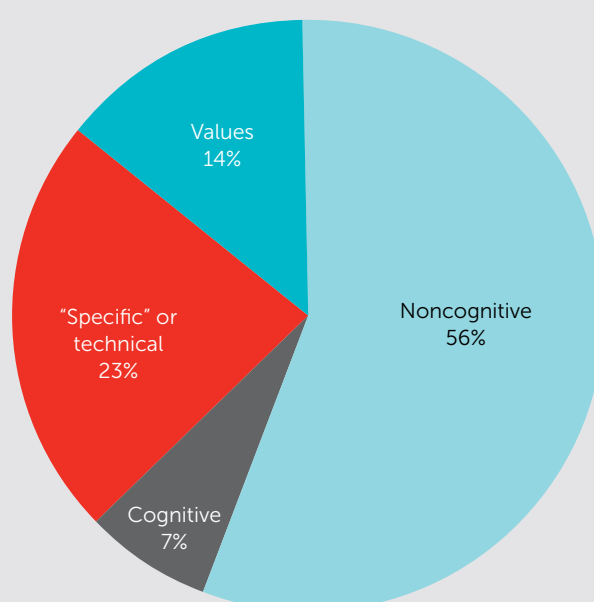
South Asia⁶

Focus groups with 87 employers were conducted in five cities: New Delhi, Mumbai, and Bhopal in India, Lahore in Pakistan, and Dhaka in Bangladesh. In total, 49 employers were interviewed in India, while 19 were interviewed in the remaining two cities. The participants represented the high-growth sectors in the region, and many were directly involved in recruiting and training youth (Figure 4). The focus groups focused on four areas: perception of skills,

requirement of general skills, possibility of acquiring skills at school, and sector-specific skills gaps.

The key skill gaps identified are listed in Table 2. At first glance, they appear to be very different, and also to reflect the different economic character of each city, its population, and its surrounding region. Delhi has a better-educated population than the other cities and a people with strong interpersonal skills—hence its requirements are a mix of the advanced cognitive (critical thinking, analytical) and certain non-cognitive skills. Mumbai and Bhopal have

Figure 5: Skills prioritized by employers in South Asia



⁶This section draws on Srivastava and Khare (2012).

Table 2: Skill needs in South Asia

Delhi	Mumbai	Bhopal	Lahore	Dhaka
Non cognitive				
Communication	Aptitude	Quest for knowledge	Voluntarism	Diligence
Leadership	Willingness to learn	Good communication skill	Leadership	Interpersonal skills
	Appearance and personality	Teamwork and social interaction	Career planning	Behavioral skills
	Diligence and hard working	Quick responsiveness	Communication	Adaptability
	Influencing skills	Time management	Entrepreneurial skills	Time management
	Multitasking	Positive thinking and attitude	Attitude	Attitude
				Dignity of labor
Cognitive				
Critical thinking	3Rs		Conceptual understanding	
"Specific" and technical skills				
	Problem solving	Flexibility and adaptability	Hands-on experience	Secretarial skills
		Physical fitness and stamina		Language
				ICT
				Business acumen
				Negotiations skill
				Secretarial skills
				Accounting skills
				Kaizen method
Values				
		Values and ethics	Loyalty	Understanding
		Honesty	Respect for seniors	Commitment
		Commitment and dedication		Sincerity

lower average levels of education and tougher environments, and hence a requirement for both basic skills (3Rs) and some key non-cognitive skills (honesty, hard work, etc.). Lahore shows a similar pattern.

Though apparently very different, there are perhaps two clear common themes emerging from the employer interviews across the three South Asian countries. The first is the importance of non-cognitive skills, especially communication, leadership, honesty/ethics, teamwork, and flexibility (Figure 5). The second is the importance of being

able to learn, whether explicit as in the case of Mumbai or implicit in many of the others (Delhi: critical thinking and analytical skills; Bhopal: quest for knowledge; Lahore: conceptual understanding).

Another theme that emerged from the employer focus groups in South Asia was the poor quality of teachers in secondary schools, both general and technical/vocational, and their lack of understanding of what is relevant to employers.

Table 3: Skill needs in a sample of high-growth sectors in India

Sector	Skill gaps
Automobiles	<p>Three subsectors of the automobile industry experience very different skill issues:</p> <ul style="list-style-type: none"> • Service: The biggest skill gaps are the inability to understand how a small task such as tightening a bolt fits into the bigger picture; inadequate knowledge of automobile machinery trade knowledge, or poor application of available knowledge; absenteeism; and the lack of skill standardization across employees trained in the same functions at different training institutes. • Manufacturing: No particular skill gaps. Mainly technical skills are required and available. • Mechanics: Even more technical skills are required than in manufacturing and these are seriously lacking, especially an understanding of the functions of and differences between automobile parts, a tendency to rely on judgment rather than on instructions and manuals, and so forth.
Information technology	<p>Major skill gaps can be divided into two types:</p> <ul style="list-style-type: none"> • Functional skills: Weak analytical ability, lack of attention to detail, lack of understanding of information security and privacy issues. • Soft skills: Weak communications, multitasking, perseverance, problem solving.
Finance (especially that which is outsourced to India)	<p>Non-cognitive skills such as communication, perseverance, emotional intelligence, aptitude for repetitive work, knowledge of the industry and of such things as asset classes, basic finance.</p>
Tourism	<p>Inadequate knowledge of geography, communications, and safety measures. Many employers even cite a gap for basic skills such as reading, writing, and math.</p>
Construction and real estate	<p>Inadequate knowledge of construction and of basic machine operations, and inability to understand instructions. Problems attributed to the excessively theoretical vocational training in Indian institutions with insufficient practical work.</p>
Textiles	<p>For machine operators, technical skills gaps, especially lack of understanding of machines plus non-cognitive inability to multitask. For supervisors, both the same technical skills gaps and also management skills.</p>

In addition to these results from the focus groups, the South Asian work in India also included some analysis of the skill requirements of 11 high-growth sectors as identified by the Planning Commission. That analysis underscores the critical importance of cognitive, non-cognitive and technical skills. Every sector has some basic skills requirements including basic literacy, some specific skills sets which are industry-specific and non-cognitive skills that are common across sectors.

Southeast Asia⁷

Three countries were studied in depth: Cambodia and Thailand through a secondary analysis of large-scale surveys conducted in 2008 and Vietnam using primary data from a newly conducted survey covering 21 employers.⁸

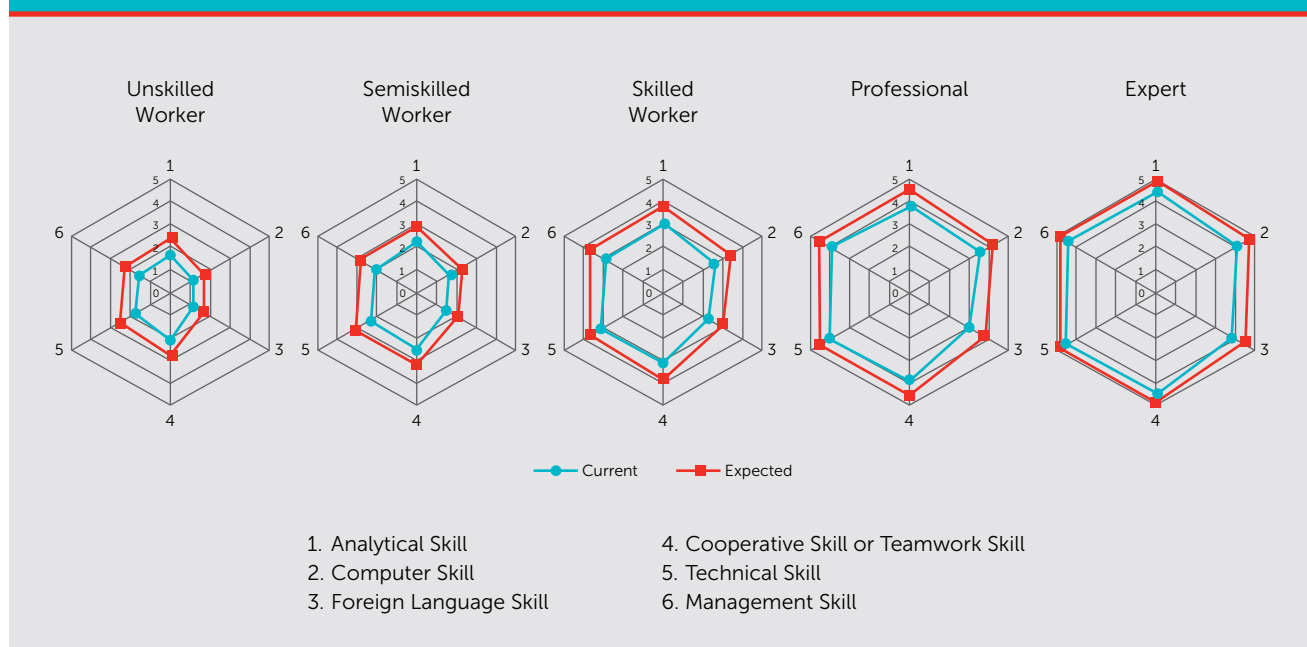
In all three, employers generally consider that the skills acquired in formal secondary schooling do not meet their demand as the schooling is too supply driven and insufficiently linked to demand from employers. Neither general nor vocational secondary education is equipping school leavers with the key skills needed: basic subject knowledge, analytical skills, management skills, technical skills, teamwork, foreign languages, computer and ICT skills, problem-solving skills, and interpersonal skills.

In Thailand, six skills are considered crucial: analytical skills, management, technical skills, teamwork, computer skills, and foreign language skills. Of those, the first four are considered more important than the last two. At all levels, from unskilled workers to experts, employers generally demand higher levels of skill than workers and school leavers can offer (Figure 6).

⁷This section draws on Chalamwong, Hongprayoon, et al (2012).

⁸We obtained 2008 employer survey data from the Cambodian Federation of Employers and Business Associations and the Thailand Labor Demand of Establishment Survey. The former surveyed 220 enterprises while the latter covered 190,024 enterprises.

Figure 6: Current and expected skills in Thailand in 2011



Source: Office of the Permanent Secretary, Ministry of Labor Database

In Cambodia, survey data reveal that only 13 percent of employers believe graduates have all or most of the skills needed for the labor market. Particularly missing are appropriate attitudes to work among unskilled workers, problem-solving skills among skilled workers, and analytical skills among professionals. These findings have been confirmed by three separate surveys by different institutions in 2009, 2009, and 2010. The mismatch is caused largely by the limited capacity of the secondary education system to provide the needed skills at an adequate level of quality and relevant to employers' needs.

Employers in Vietnam are more concerned with some skills than with others. Highest on their list are information skills (particularly information interpretation and communication and computer processing of information), resource-related skills (such as money and time management), and interpersonal skills (like teamwork and negotiation). Vietnamese employers seem less interested in leadership skills than those in other Southeast Asian countries. Formal education is expected to provide many of these skills, although its role may vary depending on the particular skill. Employers' expectations for information skills are largely met, but those for resource-related and interpersonal skills are rarely so, and these are considered particularly weak areas.

Other Regions⁹

A literature review of four other regions outside Africa and Asia shows that employers are increasingly looking for non-cognitive skills in addition to cognitive and technical ones. These regions are Latin America, Eastern Europe and Central Asia, the Middle East and North Africa, and OECD Europe and North America. In all four, corporations cite behavioral skills such as teamwork, communication, and problem solving as key for work in today's economies. Yet they also perceive that these are the skills that are not taught in school.

Despite youth unemployment in Latin America of 13 percent, nearly half of companies surveyed reported difficulty in finding qualified candidates (Inter-American Development Bank 2012). The Business Environment and Enterprise Performance Survey shows that employers believe workers' education and skills are one of the top constraints to growth in the Eastern Europe and Central Asia region (Sondergard and Murthi 2012). The skills taught in the Middle East and North Africa are not the ones that employers want (Bloomberg Businessweek 2011); employers in this region are looking for technical and vocational skills that are in inadequate supply (UNDP 2009). The increasing focus of OECD countries on 21st-century skills was discussed in "Background."

⁹See Jayaram (2012).

The Informal Economy¹⁰

The informal economy cannot be considered a temporary phenomenon, having grown steadily in most developing countries in both rural and urban areas. It is particularly important for women, who overwhelmingly work in it. A review of skill needs for the informal economy was conducted, including a detailed look at four countries (Cambodia, India, Kenya, and Senegal). All four are transitioning from agriculture to manufacturing and service-based economies, both of which remain largely informal, although at very different paces. In India, for example, street vendors, home-based workers producing and packaging for small retailers, and construction workers are among the most common informal economy jobs. All four countries are also increasingly globalized and as such require improved technical and second-language education.

In the informal economy, cognitive, non-cognitive and technical skills are all important. However, non-cognitive skills may be even more important in the informal than in the formal economy—most informal workers are self-employed and thus need to be able to work along the entire value chain, running their own businesses. This requires non-cognitive skills such as discipline, confidence, negotiation, communication, and decision making. It also requires entrepreneurial and business skills, such as financial management, market research, and marketing. Informal economy workers need to be more self-reliant than formal economy ones. Detailed analyses of construction workers in India and expert interviews in Kenya particularly confirm this. Compare, for example, skilled and unskilled construction workers in India.

In Kenya, as one expert put it when interviewed, “there is a competency gap between what employers look for and what skills youth have; the skills most needed by the informal economy are life skills and business skills.” In Kenya’s informal agricultural and manufacturing sectors, there is a

need for more technical skills, while street vendors need more business skills.

In general, informal workers have low education levels and therefore weak cognitive skills. Most informal workers do not have a secondary education; those who do have not acquired the crucial non-cognitive skills. In general, indeed, countries have made little progress promoting programs to develop non-cognitive skills.

The primary training available to informal workers is through apprenticeships that are not connected to the school system and are much more significant. In Senegal, for instance, in 2007 some 10,000 young people were enrolled in TVET programs while the motor repair sector alone had 440,000 apprentices. However, apprenticeships have major limitations as they may be too practical (whereas TVET programs may be too theoretical); an appropriate integration of theory and practice is required in both. Apprenticeships may also insufficiently address non-cognitive skills, as the apprentice masters may or may not themselves have such skills and are certainly not likely to teach them automatically. Indeed, the 2012 Triennale on Education and Training in Africa stressed that priority must be given to raising the skill levels of master craftsmen in the informal sector, as it is estimated that they train 90 percent of youth who enter the labor market.

An important question beyond skills for the informal economy has to do with skills needed to transform the informal economy into the formal one. This is relatively unexplored territory and of course involves many topics that are beyond this paper’s focus on skills. Nonetheless, the premium on non-cognitive skills for the informal economy does raise intriguing questions with regard to recruitment for the formal economy. Typically this happens by recruiting school leavers, but formal economy employers might possibly do better to engage those who have first worked in the informal economy.

Figure 7: Skills needed by construction workers in India

	Technical	Cognitive	Noncognitive
Skilled	++	++	++
Unskilled	+	+	+++

Source: Dalberg (2012)

¹⁰This section is based on Pina, Kotin, et al (2012).

Comparisons and Conclusions

Prior to beginning this work, the project team anticipated that the skills sought by employers would differ by region or by per capita income. We also thought that there might be important differences between the skills required by large employers and those sought by SMEs.

And indeed there are some minor regional and level-of-development differences. What is striking, however, is the convergence across Africa and Asia of the importance of basic cognitive skills, of non-cognitive or “soft” or “life” skills, and of technical skills. What is also striking is the crucial importance of non-cognitive skills for the informal economy, an area that has been generally neglected in all

the attention given to skills in recent years. Clearly, given that women are more likely than men to be employed in the informal economy, even more attention should be devoted to non-cognitive skills education for girls than for boys in secondary school.

The background research papers do not throw any light on possible differences between large employers and SMEs or between urban and rural areas, except that informal employment is more pervasive in rural zones. These topics will be developed in the final version of this paper, depending on the availability of information.

While the ISESE project is not trying to draw up a precise blueprint of what should be done, the research reported in this section does indicate that the skill set required by employers, both formal and informal, should now likely include something like those shown in Figure 8.

Figure 8: Skills required by employers in the formal and informal sectors

Cognitive skills	Non-cognitive skills	Specific and technical skills
<ul style="list-style-type: none">• Basic cognitive skills• Analytical and critical thinking	<ul style="list-style-type: none">• Openness to learning• Communication: oral and written• Work habits: punctuality, application, etc• Teamwork• Personal integrity• Leadership• Entrepreneurialism	<ul style="list-style-type: none">• Language (mainly English)• Basic business skills• ICT skills• Often specific to context, but with both a practical and a theoretical perspective

Section 2: What Skills Do Students Currently Acquire?

Secondary education suffers from being thought of as a route to higher education rather than itself being a terminal stage in education. Yet secondary education is increasingly the level from which youth enter the labor force, as secondary enrollments increase in the wake of massive enrollment advances at the primary level. As secondary education moves from an elite to a mass sector, therefore, a major rethink is needed of the skills acquired at this level.

Students acquire skills in school and outside school. In secondary school they acquire both general academic and, for some, vocational skills. With exceptions, vocational education has been relatively neglected compared with academic secondary education. There are some good reasons for this, such as the relative returns reported in the “Introduction” and the high unit costs. But this relative neglect does not make sense in the face of specific skills shortages. The problem has not been the existence of vocational education but rather that it has not been targeted toward specific short-term skills needs and that it has not been practical enough. To exaggerate only very slightly, there is not a strong argument for the current norm of general TVET, which is more expensive per student than general academic secondary education. There is, however, a very strong argument for practically oriented TVET aimed at specific skill shortages. For example, Cummins (which employs about 44,000 workers around the world) has recognized the challenges that arise from the lack of coordination between TVET institutions and industry, and notes that vocational systems do not meet the market’s needs and do not incorporate the much needed “soft skills.” To counter this, Cummins is working with a trade school near its plant in India to incorporate new, relevant courses in both technical areas as well as in soft skills (Cummins 2012).

This report does not go into basic cognitive skills, but we know from much other work, such as that carried out by ASER in India and Uwezo in Africa and summarized for the Global Compact on Learning (Brookings Institution 2011), that there are very, very serious problems with basic skills acquisition at the primary level throughout Africa and South Asia. These problems are slightly less pronounced at the secondary level due to the selectivity currently exercised in permitting students to make the transition from primary to secondary school. Even at the secondary level, however, international comparisons—such as the Pro-

gram for International Student Assessment and Trends in International Mathematics and Science Study—indicate that low-income countries generally fall far behind OECD and middle-income ones in terms of learning. Even by countries’ own standards, there are problems at the secondary level. In Nigeria, for example, 90 percent of students failed the recent secondary-school-leaving exams. As countries increase their secondary education enrollments, the continuing problems at the primary level are likely to further affect secondary education.

Africa¹¹

The secondary curricula in the four African study countries of Benin, Ghana, Kenya, and Senegal emphasize cognitive skills (literacy, numeracy, scientific literacy), some non-cognitive skills (creativity, persistence, reliability, communication), and specific technological or technical skills. Central and Southern African countries have not been included thus far in the ISESE project.

With some slight variations, the skills acquired by African youth appear to be the same in both West and East Africa. The education systems, both general and vocational, are undergoing reform in many countries, which makes for some differences between skills students currently have and those that future students will likely have. Behind some of these reforms are two themes—reducing the total load of a curriculum that has grown too heavy in many countries (notably Kenya) and trying to orient learning more toward employment (notably Ghana).

The most important of these reforms are in vocational education. TVET curricula have traditionally been driven more by academic progression than by future employment. Current reforms are designed to do two things: include some compulsory core skills and make them more practical. This move was aided by the ADEA 2008 Biennial, which highlighted the need for a move away from traditional TVET to a broader concept of technical and vocational skills development that is more responsive to market demand. In Ghana, for example, TVET curricula now insist also on compulsory English, mathematics, social studies, and integrated science. In Mali, Senegal, and Togo, for example, TVET courses are being restructured to now include apprenticeships. In Ghana the TVET program

¹¹This section is based on Anarfi and Appiah (2012).

National requirements for both academic and vocational programs [include] mother tongue language, foreign languages, mathematics, science, and social science. Particularly important are English language, life skills, and ICT skills.

is not confined to the Ministry of Education but is run by eight other ministries and several private entities with a single body, COTVET, overseeing all delivery. In Kenya, some secondary schools have been vocationalized to include agriculture, business, computing, home science, and industrial education, but with the maintenance of compulsory core skills. Still generally absent, however, are direct links between schools and employers and a role for employers in the governance of education.

Many of these reforms also go some way to add what might be called generic vocational skills to academic secondary education (ICT, for example, is now being emphasized in Ghana's secondary schools) in addition to adding core courses to vocational education. There is thus some convergence emerging between general and vocational secondary schools or streams, although there remains a perception that vocational education is somehow inferior and most suitable for those who do not do well in academic education. Vocational education is not generally seen as potentially leading to higher education, unlike academic secondary education.

Both general secondary and TVET courses remain fairly differentiated by gender. Female students remain more inclined toward non-scientific general secondary education and toward life skills and commercial courses, whereas males are more inclined toward scientific, mathematic, technical, and industrial subjects.

Because the private sector often is involved in the delivery of TVET, there is much more variation in TVET curricula than in general secondary ones. Some of the private technical institutes in Ghana, for example, use curricula and certification that are different from the Ghana Education Service curricula or certification.

A particular issue in Africa is that of extracurricular activities. These can often provide a vehicle for acquiring non-cognitive skills. Extracurricular activities receive very

little attention from teachers, however, even when they are formally part of the curriculum.

Asia¹²

Separation into general academic and vocational secondary education occurs at different stages in Asia, most commonly after completion of junior secondary school. And, as in Africa, most countries are currently implementing curricular reforms to better articulate skills.

Vocational education carries less of a stigma in Asia than in Africa and in Southeast Asia than in South Asia. The effective use of vocational education is often said to be one of the factors behind the economic success of the "Asian Tigers" in Southeast Asia. All countries in South Asia are moving toward a skills development orientation, including Afghanistan (starting in 2007), Bangladesh (2011), Nepal (2007), Pakistan (2009), Sri Lanka (2009), and India (2009). The creation of skills qualification frameworks has been important, such as the National Qualifications Framework for Vocational Education recently adopted in India. A key reason for having these frameworks is to ensure that those who do pursue vocational education do not become immobile within the education system and can still have the possibility to go on to higher technical education, a first important step in moving toward lifelong learning. For the same purpose, Thailand has systems of credit transfer and recognition between different types of educational qualifications and institutions.

All countries are moving toward more cooperation with the private sector to deliver vocational education.

Countries that have permitted very early vocational specialization, like Pakistan and Vietnam, have ended up with more segmented education systems and with shortages of medium-skilled and technical workers, reflecting both the excessively young age for streaming (before basic cognitive skills are mastered) and the poor quality of vocational education at all levels. This is much more of an issue for Pakistan than for Vietnam as the quality of Vietnam's vocational education is better.

Analysis of Asian countries' curricula shows that all have at least some national requirements for secondary schools for both academic and vocational programs, including mother tongue language, foreign languages, mathematics, science, and social science. Particularly important are English language, life skills, and ICT skills. This includes vocational schools as well as general academic ones, so there is considerably more convergence between the streams than there is currently in Africa. All countries have moved or are moving to articulate the skills to be imparted

¹²This section is based on Sirohi and Singh (2012).

in both academic and vocational streams—this is the case in Thailand, Malaysia, and Indonesia and is coming more slowly in South Asia, especially in Bangladesh and India. In all these countries, however, these curricula are largely defined in terms of cognitive and technical skills; largely missing are the non-cognitive skills so sought by employers. Even where there has been some attempt to modify the curriculum in the non-cognitive direction, it has been relatively limited and has tended to focus most on non-traditional skills specific to a context (e.g., Sri Lanka's attempt to introduce entrepreneurship).

Although the curricula can be—and are being—reformed and improved, the curriculum itself is not the major reason that students in all the Asian countries fall short of employers' skill expectations. The real problem in Asia is that the teachers who teach the curriculum are not sufficiently effective. Most teachers take a "direct transmission" view of student learning, seeing their job as to impart specific knowledge, rather than the constructivist view now common to most Asian curricula that implies that teachers should be much more enablers of learning. Math and sci-

ence subjects, for example, are taught more for examinations using rote learning than for practical applications. Grammar is considered more important than communication. No Asian developing country uses a framework for assessing teacher effectiveness in the way that the Teaching and Learning International Survey, or TALIS, for example, is used in some OECD countries like Australia.

Detailed interviews with educators and administrators were carried out in India. They reveal three main reasons advanced by teachers for their inability to teach the curriculum sufficiently effectively:

- a. Indian syllabi do not clearly articulate skills.
- b. The language of the 2005 National Curriculum Framework does include skills but in too complicated a way to provide practical help to teachers.
- c. The curriculum is mainly focused on cognitive skills and insufficiently on non-cognitive ones.

Conclusions and Discussion¹³

Some of the findings of the ISESE project's research confirm those already known from other studies or other countries. Some are importantly new, especially those having to do with the informal economy, with teacher attitudes, and with convergence between general and vocational secondary education.

Major conclusions of this study relevant to skills are as follows:

Secondary education is vital.

- a. Secondary education is increasingly important as it is now the level of education from which most students now enter the labor force (the exception being Africa where this remains the primary level but where the situation is changing rapidly).
- b. Yet secondary education has largely been designed for a past period, in which it was limited to the elite (sometimes social and economic elites, sometimes academic ones) and seen as a path to higher education, not a final level of education in itself.
- c. Secondary education is increasingly important—and seen to be important—for individual livelihoods and economic growth. There is increasing evidence that it is not so much the number of years of education that determines such outcomes but the specific skills acquired.

Employers seek cognitive, non-cognitive and technical skills.

- a. With minor differences, employers in both Africa and Asia are largely looking for the same set of skills in those they hire: basic cognitive skills, advanced skills like critical thinking and problem solving, non-cognitive skills, and technical skills.
- b. All these skills are important in both the formal and the informal economies, but non-cognitive skills are relatively even more important in the informal economy as most workers are self-employed and have to carry out a very wide range of tasks.
- c. Technical skills are only useful at the secondary level if they are very closely related to short-term demand in the labor market. General technical

skills cost more to provide than general academic secondary ones with no higher returns to individuals or the economy.

- d. Even where technical skills are important, vocational education is still largely considered a second-class option and one that can limit students' futures.
- e. Transferable skills and being able to apply existing skills in a new context is particularly important in today's dynamic and fast-changing job market.

There remains a gender dimension to employment.

- a. Proportionally more women are employed in the informal than in the formal sector.
- b. Girls tend less than boys to pursue science, mathematics, and technical skills.

Significant curricular reform is under way.

- a. The general learning crisis that pervades primary education in Africa and South Asia, though less so in Southeast Asia, applies also to secondary education, where low-income countries do relatively poorly on international assessments compared with OECD and middle-income countries.
- b. There is significant curricular reform in both general secondary and vocational secondary education, designed to make both more relevant to employers. Vocational education increasingly has a skills development policy behind it.
- c. Mechanisms are being put in place in some, but not all, countries to provide better articulation between the general and vocational streams to permit much more flexibility across them and to avoid the vocational stream becoming one that cannot lead on to higher education.
- d. Although curricular reform is useful, it takes time and is also not the key obstacle to improving skills.
- e. Curricular reform is particularly crucial, however, to incorporate non-cognitive skills.
- f. The focus should be on providing students with relevant skills for employability, not solely skills

¹³This section is also based on discussions from the Bellagio review meeting in July 2012.

for employment. Entrepreneurial skills are also becoming increasingly important as the informal economy continues to represent a large part of the workforce.

Strengthening pedagogy is crucial for skill acquisition.

- a. Teachers' inability to think of teaching as enabling learning rather than as imparting factual knowledge and also to understand the skills that students should have is one of the major obstacles to improving secondary skill acquisition, especially for non-cognitive skills.
- b. Assessment methods should be modified to assess a wider range of skills; this shift may also then encourage a change in teaching methods.
- c. Extracurricular activities can be very important for acquiring non-cognitive skills, yet these activities are relatively downplayed by teachers, especially in Africa.

- d. Especially in Africa and South Asia, vocational education is insufficiently practical.

Although policy reforms in many developing countries now emphasize skills development, questions remain on the most important skills that result in employability, and how they lead to increased earnings (USAID 2012). Our study helps shed further light on this issue: we see that ensuring that youth are equipped with skills for employability will mean closer linkages between employers, educators, and policymakers, shifts in pedagogy, and a greater focus on nurturing non-cognitive skills such as communication, leadership, and entrepreneurialism. Where technical skills are necessary for employment, a close connection between educational institutions and employers is vital. Ultimately, employers seek graduates who can thrive in the workforce, and an effective skills program will prepare youth for this transition.

Appendix

Partner Organizations

Council for the Development of Social Science Research
in Africa (CODESRIA), Senegal

Dalberg Global Development Advisors

Institute of Statistical, Social, and Economic Research
(ISSER), University of Ghana

National University of Educational Planning and Adminis-
tration (NUEPA), India

Thailand Development Research Institute (TDRI)

ISESE Reference Group

Bob Adamson
Hong Kong Institute of Education

Gopinathan Saravanan
National Institute of Education, Singapore

Katherine Namuddu
Makerere University Council

Mmantsetsa Marope
UNESCO

Rose Musau
Preferred Personnel Africa

Shanti Jagannathan
Asian Development Bank

Experts Consulted

Anne Guison-Dowdy
Higher Education for Development

Arvil Van Adams
World Bank

Charles Cofie
Unilever Ghana Limited

Christina Olenik
JBS International

Dilshad Ashraf
Aga Khan University

Ferdinand Gunn
Ernst & Young

Jacob Bregman
World Bank

Jee Peng Tan
World Bank

Keiko Inoue
World Bank

Mary Chandler
Cummins

Michel Welmond
World Bank

Rachel Blum
USAID

Rebecca Winthrop
Brookings Institute Center for Universal Education

Sarabecka Mullen
International Youth Foundation

Tony Oteng-Gyasi
Association of Ghana Industries

Enterprises Selected for Interviews in Africa

Burkina Faso

Sector	Enterprises studied and interviewed
Agrifood industries	Brakina*; Fan Milk; Ucobam*
Trade and transportation	Total Burkina; Marina Market; Burkina Scell
Bank, insurance, and other financial institutions	R.C.P.B*; Ecobank*; Sonar
Buildings and public works	Satom; Faso Baara Agence*; Cogeb –International SA*
Other industries	Semafo SA; Hage Industrie*; Sofitex
Other services	ZAIN BURKINA*; Diacfa High Tech; Telmob
* = enterprises interviewed.	

Senegal

Sector	Enterprise
Packaging	SIMPA
Paper	SIPS
Fish meal	AFRIC AZOTE
Dairy products	NESTLE
Chemistry	SENCHEM
Telecom	SONATEL
Electricity distribution	SENELEC
Building and civil engineering works (BTP)	CSE

Uganda

Sector	Industry
Manufacturing	Mukwano Group of Companies
Manufacturing	Sadolin Paints (U) Ltd.
Manufacturing	Madhvani Group
Manufacturing	Uganda Baati Limited
Manufacturing	Phenix Logistics Uganda Limited
Manufacturing	Roofings Ltd.
Communications/marketing	Shree Enterprises Ltd.
Communications/marketing	Fountain Publishers
Agrifood	Uganda Dairies Cooperation Ltd.
Agrifood	Good African Coffee Industry
Agrifood	Anik Industries (U) Ltd.
Hospitality	Colline Hotel
Hospitality	Sam's Restaurant
Hospitality	Faze 2 Restaurant
Hospitality	Good African Coffee Shop
Hospitality	Namugongo Hotel
Hospitality	Acacia Hotel
Hospitality	Lake View Hotel
Hospitality	Classic Hotel

Participants Selected for Interviews in Asia

India: New Delhi

Name	Organization
Dr. Er Alok Gupta	Institution of Young Engineers
Prof. A. K. Pathak	Institute for Excellence in Higher Education
Manish Rajoria	Career Institute of Medical Sciences
N. K. Chibbar	BHEL
Dr. Manisha Srivastava	Bhopal Memorial Hospital and Research Centre
M. Isadore	BHEL
Dr. Ajay Narang	VASK Eng. and Electronics Pvt. Ltd.
Smita Pillai	Aadarsh Pvt. Ltd.
Mahesh Pant	Railway Recruitment Board
R. S. Athreye	Service Selection Board
M. N. Aspeque	CBNC Bhopal
R. K. Jain	M Plus
Dr. Anjali Jain	Sn. Govt. Girls College
Mahesh Shukla	BSNL
Jasdev Uppal	ICCI Lombard
P. P. Khare	BMA
Aparna Mishra	Education Edge

India: Bhopal

Name	Organization
Ms. Anjali Sinha M.A	Project Manager, iMOVE
D. Vasudevan	Executive Director, Albion InfoTel Pvt. Ltd.
Dr. Poonam Agrawal	Professional Head, Educational Research Division, NCERT
Ms. Simi Suri	HCL Technologies
Ms. Riyaz Khan	Director, Tranzition Institute for Excellence
Mr. Abhishek Kumar	Intern, CEE
Mr. Pradip Das	Project Officer
Mr. Ashok B. Pillai	Director, NFDC
Mr. Alok Mohan	Project Manager
Gajendra Rai	Project Manager, Centre for Media Studies
Dr. K. C. Tiwari	BVCOE

India: Mumbai

Name	Organization
Lakshman Seturaman	TISS
Amir Sultan	TISS
Ratan Vishwanathan	Four Seasons Hotel
Mihir Sheth	Springboard
Revathi Roy	VIIRA Cabs
Ms. Suvrata Gharge	Mahindra
Rupesh Jadhav	Four Fountains Spa
Supriya Kamble	L & T Pub. Charitable, supriya.kamble@larsentoubro.com
Maj. (Dr.) Chetna Garg	Tata Chemicals Ltd.
Hemangi Apte	Keswa
Karon Shaiva	MD Idobro
Ajay Khare	Independent industrialist
Pearna Langa	Yes Bank
Suresh Lulle	Kherwadi
Dr. Vivekanand Sawant	Kherwadi
Keshav Kher	Kherwadi
Mrinalini Kher	Kherwadi
Neeraj Agarwal	Kherwadi
Mayur Satyavrat	VIACOM 18
Abha Anand	Union Bank of India, abhaanand@unionbankofindia.com
M. Anand	TATA AIG Life

Pakistan: Lahore

Name	Organization
Sumaira Bashi	PSS Asia Pakistan
Irfan Shoukat	PSS Asia Pakistan
Hammad A. Badar	PSS Asia Pakistan
Awais Salman	Techliance Pvt. Ltd.
Atif Shehzad	Daily Nai Baat
Farhan U. L. Haq	Orient Energy Systems (Pvt.) Ltd.
Adil Siskandar	Cure MD
Naila Hashmat	Cure MD
Nisar Muhi U. D. Din	Diamond Jumbolon
Abbas Haidar	The Resource Management
Arshad Munnir Rana	The Resource Management
Faraz Haider	The Resource Management
Rakhshanda Jabbar	R. J. Business Consultants
Manzoor Hussain	Infogistic (Pvt.) Ltd.
Dr. Arshad Hussain Hashmi	University of Veterinary and Animal Sciences
Hassan Raza	HKB
Muhammad Ljaz Khan	Eastern Group of Companies
Tanveer Rasheed Seyana	A2Z Solutions
Awais Mahmood	ALM Human Resources Int'l.

Name	Company and designation
Abdul Matlub Ahmad	Chairman, Nitol – Niloy Group, Dhaka
Dewan Sultan Ahmad	M.D., Bangladesh System Technology Ltd., Dhaka
Prasanta Das	National Sales Manager, Sun Pharmaceuticals (B) Ltd.
S. Hedayet Ullah	M.D., Vincent Impex Ltd., Bangladesh
S. M. Mahbubul	M.D., Nitol Insurance Company Ltd.
Sudhir Chandra Sarker	Nitol – Niloy Group
M. J. Sheikh	COO, Ion Exchange Environment Management (BD) Ltd.
K. B. Ahmed	President, BMCCI
Md. Mofiz Uddin Chowdhury	M.D. and CEO, FAS Finance and Investment Ltd.
Alamgir Kabir Chowdhury	Mng. and Fiscal Partner, Hoda Vasi Chowdhury and Co.
K. Z. Islam	M.D., Nirman Int'l. Ltd.
J. P. Victoria	Country Manager, Dabur
M. R. A. Taha	Chairman, Remex Corporation Ltd.
Abdul Mannan Ahmed	Director, NITA Co.
Abdul Halim	Exec. Vice President, FAS Finance and Investment Ltd.
Nasim-ul Haque Chowdhury	Sales Manager, Bengal Inn, Delta Hospitality Mgt. Services
Sk. Md. Samiul Islam	M.D., Union Textiles Ltd.
Brig. Gen. Kazi Anwar ul Islam	Advisor HR, Nitol Motors Ltd.
Jahangir Bin Alam	Secretary, India-Bangladesh Chamber of Commerce and Industry

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Innovative Secondary Education For Skills
Enhancement (ISESE)

Innovative Models for Employability in Africa and Asia

ISESE Models Synthesis Paper

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Executive Summary

The Innovative Secondary Education for Skills Enhancement (ISESE) project, supported by the Rockefeller Foundation, seeks to identify the skills required for work in the 21st-century economies of Africa and Asia and to explore innovative models of delivering those skills to youth of secondary school age. The Results for Development Institute (R4D) worked with regional partners in both regions to uncover new findings, and also scanned existing research and work in this area. This synthesis paper summarizes the background studies on innovative models for secondary education produced as part of this research; it is complementary to a parallel synthesis paper exploring skills for employability.

The paper provides a detailed analysis of the most promising innovations in low- and middle-income countries (LMICs) in Sub-Saharan Africa, South Asia, and Southeast Asia identified in the commissioned background papers. The paper also presents selected innovations from Europe and North America that may offer transferrable lessons for LMICs, and in addition highlights the winners of the ISESE competition run to identify further promising models in the project's focus countries. The innovations were assessed using a range of criteria including approach, impact, cost, and potential for sustainability, scale-up, and replication. In broad terms the innovations identified fall into five general categories:

- Innovations to improve the current system by improving the quality of teaching, providing access to better learning materials (including through the use of technology), or changing the curriculum and assessment systems.
- Innovations to transform the existing system by providing alternative methods of learning in school, out of school, or through various forms of open and distance learning.

- Innovations to increase the resources available to the secondary education system through various forms of multi-stakeholder partnership (including public–private partnerships).
- Innovations to reach young people that are excluded from the current system—for example, because they cannot afford to pay school fees, they live in remote rural areas, or they are members of marginalized communities.
- Innovations to provide 21st-century skills, or non-cognitive or entrepreneurial skills and knowledge not available in existing educational programs.

Some core guiding principles appear to be keys to success from the models profiled across the three regions:

- Multi-stakeholder partnerships are critical to quality and sustainability, including strong public–private sector partnerships for financial viability.
- Innovative financing mechanisms can counter demand-side constraints.
- Open and distance learning models can expand access to education and training.
- Effective use of information and communications technology (ICT) can modernize pedagogy and complement mainstream teaching.
- Non-cognitive skills development can enhance traditional cognitive and technical education.

Index of Profiled Models

Model	Type of Innovation	Country
SUB-SAHARAN AFRICA		
Improving the Quality and Relevance of Middle School in Senegal	Improve existing systems	Senegal
Science Resource Centers (SRCs)	Improve existing systems	Ghana
Ghana Education Trust Fund	Improve existing systems	Ghana
Open and Distance Learning in Namibia and Botswana	Transform existing systems	Namibia; Botswana
Jua Kali Voucher Program	Target excluded populations	Kenya
Science, Technology, and Mathematics (STEM) Clinic for Girls	Target excluded populations	Ghana
Emusoi Center	Target excluded populations	Tanzania
Educate!	Provide 21st-century skills	Uganda

SOUTH ASIA		
Rashtriya Madhyamik Shiksha Abhiyan (RMSA)	Improve existing systems	India
Jawahar Novodaya Vidyalayas (JNVs)	Improve existing systems	India
Education e-Governance in Gujarat State	Improve existing systems	India
Smart Schools	Improve existing systems	India
India's National Skill Development Corporation (NSDC)	Multi-stakeholder partnership	India
Foundation Partnership Programs	Multi-stakeholder partnership	Pakistan; Bangladesh
Female Secondary School Stipend Program (FSSSP)	Target excluded populations	Bangladesh
Yuwa: Kicking It New School	Target excluded populations	India
Training and Empowering Out-of-School Youth	Target excluded populations	Bangladesh; Pakistan
Intel Education Initiative	Provide 21st-century skills	India
Youth for Development Empowered with Basic Rural Agro-Biogenic Technologies (Y4DEBRAT)	Provide 21st-century skills	India
Passport to Success	Provide 21st-century skills	India
Multi-Skill Vocational Training and Entrepreneurship Development as Part of Secondary Education	Provide 21st-century skills	India

Model	Type of Innovation	Country
SOUTHEAST ASIA		
Agricultural Education for Life Program	Improve existing systems	Thailand
Vocational Education in General Secondary Schools	Improve existing systems	Thailand
e-Learning in Vocational Training	Improve existing systems	Cambodia
Giving Online Access to Learning (GOAL)	Improve existing systems	Cambodia
Secondary Teacher Training Project in Science and Mathematics (STEPSAM)	Improve existing systems	Cambodia
Cooperative Teaching Methods for Science and Technology	Improve existing systems	Vietnam
Curriculum Reform: Streaming ICT, Science, and Technology	Improve existing systems	Vietnam
Distance Learning for Vocational Training in Rural Areas	Transform existing systems	Thailand
Business Adopted-School Program	Multi-stakeholder partnership	Thailand
Industrial Owner-Led Program	Multi-stakeholder partnership	Thailand
ICT Skills for Youth with Disabilities	Target excluded populations	Vietnam

GLOBAL		
Academy Schools	Improve existing systems	United Kingdom
Teach for America, Teach for All, Teach First	Improve existing systems	United States
Blended-Learning Technologies	Improve existing systems	Global
Changing Expected Outcomes to Include 21st-Century Skills	Provide 21st-century skills	Global
Open and Distance Learning	Transform existing systems	Global

Glossary

21st-century skills: These are the skills that are particularly important for work in today's global, 21st-century economy. They include core subjects, life and career skills, learning and innovation skills, and information technology skills. Many of these skills are also often collected together into various packages of life skills that are considered important.

Cognitive skills: These are the basic mental abilities we use to think, study, and learn, and include numeracy and literacy.

Informal economy: The International Labor Organization definition is used in this paper. It refers to all economic activities by workers and economic units that are—either in law or in practice—not covered or insufficiently covered by formal arrangements.

Multi-stakeholder partnerships: This paper uses multi-stakeholder partnership to describe projects that are funded or managed by a combination of state and non-state stakeholders, including any combination of government, private sector, civil society, community-based organizations, and academia.

Non-cognitive skills: Non-cognitive skills refer to personality traits and behaviors, and include leadership, communication, and reliability. These are also called soft skills or behavioral skills.

Technical skills: These are the skills geared toward a specific occupation. They include electrical wiring, plumbing, and diesel machinery.

Introduction

Background

In most low- and middle-income countries (LMICs), the four-decade rapid growth in youth population is ending and a period of stability is starting. This has important implications for the economic and education futures of all countries, and provides LMICs with an opportunity to deliver secondary education to most of their population.

The exception is in Sub-Saharan Africa, where the number of young people is projected to continue to rise to 391 million by 2050 and could reach more than 500 million by 2100 (Mason 2012). This poses a huge challenge to African countries—to educate and provide decent work opportunities for this growing youth population. But it also offers a significant opportunity—as it will be the only major region in the world with a growing and youthful workforce.

One of the keys to unlocking this opportunity, and to ensuring that all LMICs are able to harness the potential of the youth workforce, will be providing good-quality education and training for young people so that they acquire the skills and knowledge they need to thrive in the local, regional, and global economies. Because most workers enter the workforce straight from secondary-level education, it is that level that should be strengthened to ensure that students are receiving the best possible tools for success.

While most developing countries have succeeded in establishing compulsory basic education laws, the acquisition of some level of upper secondary schooling is increasingly regarded as the distinguishing factor for young people seeking jobs in the formal economy in either the private or the public sector. Indeed, a review of the literature on the economic benefits of education as a whole shows a clear correlation between increased levels of educational achievement, higher individual earnings, and stronger economic growth (Guison-Dowdy 2012). A paper commissioned for this study found that higher levels of skills and knowledge have also brought benefits to individuals working in the informal economy (Pina and Kotin 2012). The higher-level thinking skills and communication competencies that are developed in secondary schools and beyond appear to bring higher returns than basic literacy and numeracy skills instilled in primary schools (Guison-Dowdy 2012).

This increased demand for post-basic education has led to a significant increase in the number of young people enrolled in secondary school education in all regions of the world. Globally, more than 500 million youth were enrolled in secondary schools in 2009 compared with 196 mil-

lion in 1970. However, while gross enrollment rates have risen significantly, the quality and relevance of secondary education curricula and delivery are not keeping pace with demand, in particular with regard to the ability to prepare youth for demands of the workforce. In particular, the complementary ISESE synthesis paper on skills for employability (hereafter referred to as “skills synthesis”) illustrates that non-cognitive or “life” skills are significantly lacking in current traditional secondary school curricula.

There is extensive research evidence to confirm the value of secondary education both to the individual and to society in terms of economic benefits and improved health outcomes (especially for young women), as well as helping to establish more stable and open societies. There is also evidence to show that at the household level, parents are willing to make sacrifices to secure the benefits that secondary education provides for their children.

However, while many LMICs have raised secondary education as a priority, the explicit link between secondary education and skills for employment is still absent in many national education systems. The lack of preparation for employment at this level is a problem given that most youth entering the workforce will not obtain any education beyond the secondary level.

The biggest challenge for most countries is the lack of financial and human resources—especially trained and qualified teachers—to respond to the growing demand for secondary education and effective skills training. It will not be possible to provide a good-quality education for the majority of young people in developing countries if they continue to rely on traditional models of secondary schooling and skills training. Unit costs are high; trained and qualified teachers are scarce; and resources are wasted in inefficient schools with small class sizes and out-of-date education materials.

There is an urgent need to find innovative models to deliver high-quality secondary education to students to ensure that young people are given the skills and knowledge they need to thrive in the local, regional, and global economies. This paper identifies some of these successful models, and begins to consider how they might be scaled up or replicated across different contexts.

Methodology

The Results for Development Institute (R4D) worked closely with regional research partners in Africa and Asia to identify promising innovative models for skills enhancement in 12 focus countries covering Francophone Africa, East Africa, South Asia, and Southeast Asia.

The research was designed to answer four core investigation questions:

- What innovative models for secondary education currently exist?
- Which models are effective in delivering high-quality, relevant skills?
- Which models are best suited for populations in poor and marginalized communities?
- What are the costs of delivering these models?

Partners examined the existing literature on innovative models for secondary education, as well as identified and documented lesser-known models in Sub-Saharan Africa and South and Southeast Asia and recent developments in North Africa, South America, North America, and Europe. The research studies were supplemented by promising early-stage innovations in secondary education identified through the ISESE competition.

The innovations profiled in this paper were assessed on the basis of four key criteria:

- Approach to skills enhancement (for example: curriculum or pedagogy reform, innovative use of information and communications technology [ICT], multi-stakeholder partnership, or marginalized population targeted)
- Impact or effectiveness in enhancing skills delivery
- Cost and sustainability
- Potential for scale up and/or replication in other parts of the country or other countries

Section 1: Innovative Models of Secondary Education In Sub-Saharan Africa¹⁴

Many countries in Sub-Saharan Africa face huge challenges as they seek to provide access to a good-quality secondary education for all students. Secondary gross enrollment rates rose to just under 40 percent in 2009–10, but there is wide variation between countries as well as between rural and urban areas within a country. There is also widespread concern in many countries in the region that increased investment has not brought returns in terms of improved learning outcomes, and even relatively wealthy countries are struggling to recruit and retain high-quality teachers. Secondary schools are limited, and selection for secondary schooling is highly competitive. The majority of poor students do not proceed to any form of secondary education, and the gap between the number of boys

and girls completing secondary education remains high in almost all countries in the region.

Increasingly, governments in Africa have recognized that secondary education is an important priority in the development of their education systems. Most countries have expanded their definition of basic education to include nine years—six years of primary plus three years of lower secondary—which is generally provided free of fees. However, though improvements have been made in increasing access to basic education for African students, education quality remains a critical challenge and many innovations identified in Africa (see Table 1) are geared toward improving student performance.

Table 1: Summary of profiled innovations in Africa

Model	Key Features	Country
Innovations to improve existing system		
Improving the Quality and Relevance of Middle School in Senegal. Multi-stakeholder partnership between NGO, government, and the private sector to improve quality of curriculum and pedagogy in Senegalese secondary schools.	Curriculum reform; enhancing pedagogy; multi-stakeholder approach; non-cognitive skill development	Senegal
Science Resource Centers. IT resource sharing program implemented by Ghana government to reduce inequality of resources between schools.	Innovative use of ICT	Ghana
Ghana Education Trust Fund. Government fund to support innovation in the education sector.	Innovative financing	Ghana
Innovations to transform existing system		
Open and Distance Learning. Alternative schooling system offered by Namibia College of Open Learning and Botswana College of Open and Distance Learning.	Alternative schooling model; targets excluded populations	Namibia; Botswana
Innovations to reach excluded populations		
Jua Kali Voucher Program. Demand-side financing program to increase access to education for marginalized populations.	Innovative financing targets excluded populations;	Kenya
Science, Technology, and Mathematics (STEM) Clinic for Girls. Provides additional support for girls to study math and science.	Targets excluded populations	Ghana
Emusoi Center. Provides educational improvement and empowerment services to girls from Maasai communities.	Targets excluded populations; non-cognitive skill development	Tanzania
Innovations to provide 21st-century skills		
Educate! Student mentorship scheme to develop non-cognitive and entrepreneurial skills in upper secondary students in Uganda.	Non-cognitive skill development; multi-stakeholder approach	Uganda

¹⁴This section draws heavily on Appiah and Anarfi (2012).

Innovations to Improve Existing Systems

Some of the most innovative models to improve systems in Africa focus on reforming curricula through multi-stakeholder partnerships, enhancing teaching methods, and using innovative funding mechanisms to test these systemic improvements. Like the rest of the world, Africa is also increasingly exploring the use of ICT as a way to enhance current education systems. However, the availability and use of such technologies is still severely constrained by high costs and lack of connectivity. In Francophone countries in particular, the use of technology has remained low. For example, in Burkina Faso, only 2 percent of the country's 662 secondary schools had any form of computer equipment during the 2007–08 academic year. There are also challenges in recruiting and retaining teachers with the requisite skills and confidence in the use of ICT tools.

Although costs still remain restrictive, many Anglophone countries in the region are finding innovative ways to use ICT to improve education and skills delivery, including enhancing the effectiveness of education management and information systems. For example, Ghana has introduced the Computerized Schools Selection and Placement System, which allows candidates seeking admission to senior high schools to apply online. The program uses raw scores as the basis for admission instead of grades obtained during junior high school exams. Because placement is systematized and performance-based, and avoids the inherent bias of the former subjective selection process, the system ensures fairness and equity in student access to “grade-A” schools. The program partners with mobile phone companies, which facilitate an SMS retrieval of selection results.

Science Resource Centers (Ghana)

To circumvent high costs of equipment, the government of Ghana is facilitating communal ICT usage arrangements to help improve education quality in the Ghana Science Resource Centers (SRCs) program. Ghana has to date established 108 SRCs to promote the study of natural sciences at the secondary level, and to mitigate the disparity in science and technology resources among schools caused by budgetary constraints.

Scale and Impact. The impact of the centers can be seen in the performance of students in mathematics and integrated science on the West Africa School Certificate Examination. There was an appreciable improvement in the percentage of candidates that passed the examination between 2005 and 2010 (with a dip in 2006 and 2007), and performance of candidates in mathematics improved very significantly for both girls and boys in 2008 and 2010. In the next phase,

200 further senior high schools have been selected for allocation of science laboratory equipment at the cost of 15 million pounds sterling. This will help to bring the senior high schools with modern science laboratory equipment to 308 out of 527 public senior high schools in Ghana, representing nearly 60 percent of the total.

Cost and Sustainability. One of the main challenges to replication is cost. The centers were re-equipped in 2008 at the cost of six million pounds sterling. There were also challenges ensuring coordination among schools in the cluster, and this led to the problem of delivering lessons according to the approved timetable. Smooth operation of the SRCs has also been hampered by transfer of the specially trained science teachers from the host schools. The Ministry of Education has accepted that the satellite concept needs to be refined.

Improving the Quality and Relevance of Middle School in Senegal (Senegal)

Through this program, FHI 360 worked with the minister of education, civil society, and the business sector to reform the middle school curriculum in Senegal. To improve teaching quality, the program also created program guides for each discipline to provide instructors with teaching and learning strategies, and sample lesson plans to help students develop critical thinking skills, create the link between their community and school, and orient them to their life goals and futures.

Approach. To promote relevance, active learning approaches are used to deliver two thematic areas to students: the world of work and good governance. Students learn about the world of work through career awareness events where local business leaders visit schools and student visits to local businesses. The good governance curriculum is built around student participation in student government. To enhance teaching and learning, schools are equipped with computer labs so teachers and students can have access to new content and create their own content.

Cost and Sustainability. The FHI 360 program couples its curriculum reform with provision of ICT materials to support teaching and learning, at an average of US\$25 per student one-off cost. Through public–private partnership, cost-share agreements with ICT vendors contribute to higher value and reduced costs for training, pedagogical materials, and other peripheral supports. To date, \$2.5 million has been raised through public–private partnerships and another \$2 to \$4 million is in negotiation. Energy and connectivity costs are offered to schools by utility companies at 50 percent reduction through a ministry agreement with the companies.

Sustainability remains in question as funding from USAID will end with new agency program priorities, and despite the government's commitment to the approach, a funding partner is needed for the continued implementation of the program. The project is developing a private sector foundation that will be dedicated to sustaining the public-private partnerships established in support of pre-K-through-12 education in Senegal.

Scale and Impact. The program has to date reached 233 schools and affected more than 93,000 students in 10 of 14 regions in Senegal. Results from a rigorous impact evaluation, including student testing, will be available in fall 2012. However, early qualitative results show that teachers report spending more time planning their lessons using the curriculum guides, researching new materials on the Internet, and introducing more interactive teaching strategies in their classrooms.

Ghana Education Trust Fund (Ghana)

To meet the growing needs of the education sector, governments in Africa are exploring innovative financing mechanisms for state-led education initiatives. For example, the Ghana Education Trust (GET) Fund, established in 2001, is financed by a 2.5 percent additional levy on VAT as well as returns on investments and voluntary contributions. The objectives of the fund include raising enrollment rates in all cycles of the education system; increasing demand for education at all levels; redressing the declining public sector spending on education; and improving overcrowded and decrepit infrastructure, as well as replacing obsolete textbooks and equipment.

The GET Fund has supported a number of infrastructure projects in the tertiary and upper secondary sectors—with a particular emphasis on improving skills training polytechnics and teacher training colleges. It has also funded scholarships for students to assist their participation in university and upper secondary schools.

Innovations to Transform Existing Systems

Many innovative models in Africa are working to transform the system by providing complementary or alternative educational opportunities that improve student access and learning outcomes. Complementary approaches include the Ghana President's Special Initiative on Distance Learning (PSI-DL), which was established in 2002 to bridge gaps in access by broadcasting secondary school lessons through the Ghana Broadcasting Corporation's (GBC's) television network. The PSI-DL has also recently established a stream dedicated to technical and vocational

education and training (TVET) programs, providing both technical skill lessons and remedial courses in general education to ensure students are capable of participating in advanced courses. Also in Ghana, television and radio programs such as the GBC's Everyday English program and the JoyFM Read 100 Project aim to improve language and literacy levels at the secondary level. These programs are free, open-access programs that are not linked to formal examination schedules and instead aim to augment existing educational programs.

Open and Distance Learning Schools (Namibia And Botswana)

In addition to complementary approaches, many countries in Sub-Saharan Africa have introduced a range of open schooling and distance learning programs to provide alternative delivery of secondary education and skills training to students in remote rural areas or to students who wish to continue their studies in a more flexible program. Some of these programs are now well established and delivering at scale. For example, the Namibia College of Open Learning (NAMCOL) was established in 1997 and now graduates 28,000 students annually, accounting for 40 percent of the country's secondary school students. The Botswana College of Distance and Open Learning (BOCODOL) adopted a similar model in 1998 and now has an annual enrollment of more than 6,000 students, accounting for approximately 17 percent of secondary examination graduates nationally (Daniel 2010).

Approach. NAMCOL uses a blended-learning approach that combines self-instruction materials with face-to-face support in weekly tutorials. BOCODOL teaches the national curriculum, and students sit the same examinations as their counterparts in the mainstream school system. Pass rates at the senior secondary level are similar to those of full-time students at more than 90 percent.

Impact. Pass rates at both NAMCOL and BOCODOL are comparable to those of the conventional schooling systems in each country. However, examination grades at NAMCOL are lower than the equivalents in full-time schooling, with only 9 percent of part-time grade 12 candidates achieving grade C or above compared with 21 percent in the mainstream system. The government of Namibia has put in place a quality improvement program to address this issue. The main constraint on student completion of examinations at BOCODOL is the very high level of the examination fee rate, which amounts to 10 times the cost of tuition.

Cost. NAMCOL currently receives a government grant that covers 65 percent of the mainstream per capita allocation. Students at NAMCOL are required to pay 20 percent of the course costs to cover books and other learning materials.

Similarly, BOCODOL's costs per learner are about one-fifth of the cost in conventional schools, although this does not take account of the cost of using conventional school facilities, which are often used in the evenings or school holidays for face-to-face tutoring sessions.

Replication. As demonstrated by its replication in Botswana, the NAMCOL model is cost effective, replicable, and can be applied at scale. However, it takes investment and commitment from government to establish and support these open schooling institutions, both financially and from a policy perspective.

Innovations Targeting Excluded Populations

In addition to open schooling and distance learning programs designed to reach rural populations that are excluded from traditional schooling systems, innovative models in Africa exist to target other populations that may be excluded from traditional schooling due to economic or social factors. Those include particularly poor populations, many of whom are most likely destined for employment in the informal sector, and female populations who may not receive equal education opportunities due to lack of economic or familial support. In particular, entrants in the ISESE competition focused on the latter group, including the Africa region runner-up.

Jua Kali (Kenya)

The Jua Kali ("hot sun") pilot voucher program was an initiative launched by the Kenyan government in 1994 to provide training to entrepreneurs in Kenya, under the larger Kenya Micro and Small Enterprise Training and Technology Project. The long-term goal of this project was to support skills development, and particularly to subsidize the cost of this training to those in the informal sector.

Approach. Under the Jua Kali initiative, which targeted the informal sector and small businesses, vouchers were provided to micro- and small entrepreneurs, who could use them to obtain management or technical training. This demand-side financing mechanism was designed to both increase the productivity of small-scale workers and boost the supply of training providers. Importantly, women were specifically targeted in the initiative: although the voucher program required that entrepreneurs applying already have an established business, women were exempt from this rule. This exemption meant that about 57 percent of the enterprises were women-run, in contrast to the initial target of only 20 percent (World Bank 2005).

Impact. The World Bank project assessment report notes that over the six-year project period, about 35,000 enter-

Even with increased training, entrepreneurs in many developing countries may still face financial and regulatory constraints to scaling up their enterprises, and market reforms need to go hand in hand with any financing mechanism.

prises received training (World Bank 2005). The six-year project ended in 2002, and although the pilot assessment noted that the program had a positive impact on productivity and earnings, the final report rated the project outcome "moderately unsatisfactory," taking into account relevance, efficacy, and efficiency.

Notably, institutional factors likely played a significant role in determining the growth of businesses, and this facet of the market needs to be appropriately addressed. Even with increased training, entrepreneurs in many developing countries may still face financial and regulatory constraints to scaling up their enterprises, and market reforms need to go hand in hand with any financing mechanism.

Cost and Sustainability. The voucher component of the six-year project was estimated to be US\$12 million, provided via the World Bank's International Development Association credit facility (Adams 1997). Vouchers were given to those in the informal sector from allocation agencies in the country, with applicants required to pay 10 percent of the voucher value. Unfortunately, while there was a positive impact on productivity and 80 percent of trainees were very positive about the quality of training received, the World Bank concedes that the program itself was not very cost effective or sustainable. The supply of training providers remained inelastic, and so providers were able to raise their prices in response to the increased demand (World Bank 2005). The Bank acknowledges that subsidies were a relatively higher-cost method of providing training, and that there may have been some level of oversubsidization.

Science, Technology, and Mathematics Clinics (Ghana)

Upon the realization in the late 1980s and early 1990s that there was low participation of females in science, technology, and mathematical education and professions in Ghana, policies and projects to motivate and facilitate increased participation of girls in the study of sciences at the

secondary level were put into effect. One of such project involved setting up science, technology, and mathematics (STEM) clinics for girls in the secondary level.

Approach. These clinics selected promising female students to participate in a special STEM study program, for which they were provided lodging and tuition. Lessons are facilitated by female scientists to encourage students to dispel the notion that sciences are not a possible study and career path for girls. The goal of the STEM program was to increase female enrollment in STEM programs in tertiary institutions to 30 percent.

Scale and Impact. The Ministry of Women's and Children's Affairs reported that 40,908 girls participated in the STEM clinics and camps between 1986 and 2010, and that the STEM program has helped increase the females' study of science and mathematics in the tertiary institutions from 12 to 25 percent. The program has now begun to include students at the junior high school level.

Cost and Sustainability. The STEM program is funded by the government through budgetary allocation from the Ministry of Education, and administered by the Ghana Science Association. Tuition is covered by the program and requires no additional payment by families. Because it is funded by the government and has shown promising results, the program is likely sustainable. However, costs per student are high enough that the program's participation covers only a small percentage of girls in senior high school, and does not reach a significant portion of the population.

Emusoi Center (Tanzania)

Emusoi Center seeks to provide opportunities for education, both academic and vocational, for secondary-school-aged girls from traditional Maasai pastoralist and hunter-gatherer communities. The center targets this particularly marginalized population by providing holistic mentorship and support services to young women enrolled in lower and upper secondary, technical, and vocational schools who would likely not have the financial or family support to do otherwise.

Approach. Emusoi provides support in the form of scholarships, remedial presecondary education, preparation for interviews and entrance examinations for private secondary schools, tracking academic progress of students when necessary, and provision of hostel facilities in Arusha for out-of-town students. In addition to traditional academic support, the center provides life-skills seminars and workshops to its students, including training on self-awareness and self-worth, employment, and community involvement.

Impact and Scale. Emusoi is currently supporting 600 students, and more than 1,000 girls have been or are be-

ing educated through the sponsorship of Emusoi since its inception in 2000. Through the end of 2011, 437 girls had finished four years of secondary school and many of them have continued their education. Emusoi students have gone on to careers as social workers, lawyers, accountants, administrators, IT technicians, primary school teachers, community development workers, journalists, nurses, laboratory technologists, secretaries, tour guides, nursery school teachers, secondary school teachers, hotel personnel, tailors, and veterinary workers.

Cost and Sustainability. The current cost per student is approximately US\$600 per year for presecondary students and US\$1,000 per year for secondary and postsecondary students. Emusoi is funded largely by donations, including from parents and through sponsorship from local nongovernmental organizations (NGOs), but primarily from international donors. However, it does maintain some income through royalties from a book that chronicles the stories of several Maasai women whose lives were transformed by the education and cultural support they obtained through the center.

Innovations to Provide 21st-Century Skills

While many of the above education innovations include elements of non-cognitive skill development, some particularly innovative models in Africa focus specifically on the development of this skill set as complementary to traditional education. These programs work to develop skills such as communications, teamwork, reliability, and learning how to learn—skills that are transferrable between jobs and can mean the difference between employment and employability.

Educate! (Uganda)

Educate! is a student mentorship scheme to empower secondary school students in Uganda by developing their leadership and business skills so that they can become effective entrepreneurs in their own communities. The program targets students in their last two years of secondary schools (roughly 16-to-17-year-olds), and is implemented at schools within the existing school system. Educate! currently has a diverse mix of about 52 partner schools located across the country, and includes religious, public, and private schools. About 30 students are selected from each school based on their commitment and motivation.

Mentors are recent graduates from local universities who receive training before being placed at partner schools. Each mentor works directly with students to help build non-cognitive skills such as self-confidence, communi-

cation, and leadership. The mentors also teach a more formal, two-year entrepreneurship and leadership course to students, where practical business skills are developed. Scholars continue to receive mentorship and guidance after they graduate, and Educate! has developed a strong alumni program that sustains ties between the mentors and scholars.

Approach. The program is unique in that it focuses on both non-cognitive and practical skills, and the curriculum emphasizes experiential learning (youth are encouraged to develop and “test” an enterprise in their community). The emphasis is to provide youth with a relevant skill set to become leaders and to empower them to reach out and influence others. Although not all students go on to become entrepreneurs after they graduate from secondary school, the mentorship and business knowledge they receive are likely to be assets as they seek employment. Educate! has also developed a Teaching as Mentorship program to help teachers and administrators at partner schools further support youth and entrepreneurs. The organization believes that this in-school support is necessary for the sustainability and effectiveness of its programs.

Impact and Scale. With the support of the Ugandan government and the International Labour Organization, Educate!’s entrepreneurship curriculum has now been integrated into Uganda’s national entrepreneurship curriculum. The ultimate goal is to reach 100,000 youth and scale up to all 1,000 schools offering entrepreneurship in the country. The 2010 annual report notes that to date, the Educate!-supported youth have started 284 enterprises

that have earned thousands of dollars in revenue and have created more than 50 jobs. Educate! has received numerous accolades: recognitions include being a winner in the 2009 Hewlett Foundation’s Champions of Quality Education in Africa competition, and its founder, Eric Glustrom, was a 2009 Echoing Green Fellow.

Educate! is now working to analyze its impact and measure its cost-effectiveness, with assistance from the Youth Employment Network. Given that Uganda has adopted the social entrepreneurship curriculum nationally, the ongoing impact assessment will be able to showcase the value of the full Educate! program, by comparing the impact at schools where both the mentor and curriculum exists against schools that are only implementing the curriculum. Such data will allow the organization to accurately calculate the impact and effectiveness of its mentors.

Replication. The Educate! model has already been adapted and replicated by AfricAid’s Kisa Project in Tanzania, and Educate!’s goal is to one day expand its model to other neighboring countries such as Kenya and Rwanda. Successful replication of the model will depend on the ability to adapt the curriculum to the local language and culture, while taking the structure of the education system into account. In Uganda, the national curriculum is standardized, and so it was relatively easy to scale up the model across the country. Additionally, Educate! was fortunate to be able to gain the support of several stakeholders and ensure that the government was a key ally; this external stakeholder support will likely also be crucial for success in other countries.

Section 2: Innovative Models of Secondary Education In South Asia¹⁵

Education systems in South Asia still face huge challenges in providing high-quality education to millions of secondary school students, many of whom live in remote rural areas or areas frequently affected by natural disasters. In this paper's focus countries—India, Pakistan, and Bangladesh—the scale of the challenge far exceeds anything faced by any other region of the world.

In India, secondary school enrollment now exceeds 100 million students. India stands far above most other countries in the region with gross secondary enrollment rates reaching 58 percent in 2009–10. But India, like the other countries in the region, faces continuing problems in raising the standard of learning in secondary schools; ensuring a steady supply of high-quality and well-trained teachers; and finding programs that provide secondary education to large numbers of the urban and rural poor and other marginalized communities such as scheduled castes and tribes. India has recognized the need to stimulate innovation in the sector by establishing an innovation fund that provides incentives to state governments and public and private education providers.

In Pakistan, there are more than 24,000 high schools, of which nearly 60 percent are in the private sector. The government of Pakistan made a major shift in education policy in the mid-1990s and started involving the private sector and civil society organizations in the financing, management, and delivery of education services. This move was officially recognized by the Education Sector Reform Action Plan, 2001–2005, which stated that the government was unable to singlehandedly manage the education sector and thus actively encouraged public–private partnerships as a critical innovative strategy for expansion and effective delivery of education in Pakistan.

Bangladesh, like other South Asian countries, has seen the number of teachers in secondary school significantly increase over the past decade, to 210,000 in 2010. However, only just over half of those teachers are formally trained. In its education policy, Bangladesh is committed to improving the management and quality of education administration at all levels, and puts particular emphasis on public–private partnership and the role of non-state providers in improving access, participation, and excellence in secondary education.

This section summarizes a selection of promising innovations in the South Asia region that are improving education delivery at the secondary level (see Table 2), and that may also offer lessons for other countries struggling to deal with similar demographic challenges.

Innovations to Improve Existing Systems

The government of India has embarked on a massive program of expanding and strengthening secondary education in India, pioneered by the Rashtriya Madhyamik Shiksha Abhiyan (“Secondary Education for All”) program. Building on a similar program at the elementary level, the government aims to universalize access to secondary education by opening additional schools, appointing more teachers, and upgrading elementary schools.

To achieve this ambitious goal, the government has acknowledged that it will need to work in partnership with a range of private and nongovernment providers to promote innovative approaches to delivering high-quality secondary education and skills development, in particular to the poor and scheduled tribes. Many of the programs working to improve existing systems in India, therefore, are either run by or in close consultation with the Indian government. Programs include innovative financing mechanisms, reimagined schooling models, creative use of technology for educational administration, and teaching.

Rashtriya Madhyamik Shiksha Abhiyan (India)

The Rashtriya Madhyamik Shiksha Abhiyan (RMSA) (“Secondary Education for All”) program, a country-wide secondary education development program, is implemented in partnership with states and union territories and aims to make secondary education of good quality available, accessible, and affordable to all young persons aged 15 to 16 years, while also removing gender, socioeconomic, and other barriers by 2017. It also aims to make all secondary schools conform to the prescribed norms relating to infrastructure, teaching and nonteaching staff, and the teaching–learning environment.

¹⁵This section draws heavily on Mohanty and Zaidi (2012).

Table 2: Summary of profiled innovations in South Asia

Model	Key Features	Country
Innovations to improve existing systems		
Rashtriya Madhyamik Shiksha Abhiyan (RMSA). A country-wide education development program aimed at universal secondary education in India.	Innovative financing	India
Jawahar Novodaya Vidyalayas (JNVs). Network of schools targeting talented rural children to provide culturally relevant education.	Innovative curriculum; non-cognitive skill development; targets excluded populations	India
Education e-Governance in Gujarat State. Indian state government using technology to modernize education management and administration.	Innovative use of ICT	India
Smart Schools. Content development initiative for innovative and experiential learning in schools.	Innovative use of ICT	India
Innovations through multi-stakeholder partnership		
India's National Skill Development Corporation (NSDC). Public–private partnership to support research and skills development in the informal and formal sectors across India.	Public–private partnership; innovative financing	India
Foundation Partnership Programs. Foundations in Pakistan and Bangladesh work with governments and NGOs to support schools, teachers, and students.	Multi-stakeholder approach; targets excluded populations; innovative financing	Pakistan; Bangladesh
Innovations targeting excluded populations		
Female Secondary School Stipend Program (FSSSP). Demand-side financing model to increase girls' participation and retention in secondary education.	Innovative financing model; targeting excluded population	Bangladesh
Yuwa: Kicking It New School. Educating and empowering girls through soccer team structure and peer-to-peer tutoring and mentorship.	Targets excluded populations; non-cognitive skill development	India
Training and Empowering Out-of-School Youth. Ganokendra and Yuva Parivartan programs providing skills training and economic empowerment opportunities.	Targeting excluded populations; non-cognitive skill development	Bangladesh; Pakistan
Innovations to provide 21st-century skills		
Intel Education Initiative. Complementary curriculum designed to promote development of IT skills alongside analytical and creative project design and implementation.	Innovative use of ICT; non-cognitive skill development	India
Youth for Development Empowered with Basic Rural Agro-Biogenic Technologies (Y4DEBRAT). Delivering analytical and entrepreneurial skills to rural youth.	Innovative use of ICT; non-cognitive skill development; targets excluded population	India
Passport to Success. Large-scale skills program that targets out-of-school youth or those at risk of dropping out and provides support for work skills and social competencies.	Innovative curriculum; non-cognitive skill development; targets excluded populations	India
Multi-Skill Vocational Training and Entrepreneurship Development as Part of Secondary Education. Drawing on community resources to couple traditional academic education with entrepreneurship training for rural youth in government schools.	Innovative curriculum; non-cognitive skill development; targets excluded populations; multi-stakeholder approach	India

Approach. RMSA is an umbrella program with united funding for innovation. The program puts relatively more emphasis on design and implementation of school-level innovative interventions, and, accordingly, places a lot of emphasis on the formulation of the school improvement plan with a whole school approach. School autonomy and accountability, therefore, assumes greater importance for promoting innovations at the school level.

The critical role of the states and union territories in promoting innovation in secondary education under RMSA cannot be undermined. To facilitate greater roles for states/union territories, NGOs, and private education providers, creation of a separate Innovation Fund is being envisaged during the 12th Plan period with funding support from donors, such as the World Bank, the Department for International Development, and the European Commis-

sion. As such, innovation under RMSA has been envisaged as a demand-driven initiative to support the development of secondary education in India. Under the Innovation Fund, RMSA calls for out-of-the-box proposals that can be implemented in classrooms, calling for unique ideas for improving access, quality, equity, and governance in secondary education.

Replication. This use of a specific fund to promote innovation within the mainstream education system—effectively acting as a social venture capital fund—offers high potential for replication in other countries in Asia and Africa. It is too early to assess the impact of the India Innovation Fund but the government’s strong commitment and the partnerships with the private sector are promising. We recommend that the approach should be evaluated as it moves into implementation with a particular focus on the approaches taken to manage risk and support social entrepreneurs in the formal and informal education systems.

Jawahar Navodaya Vidyalayas (India)

Jawahar Navodaya Vidyalayas (JNVs) are boarding schools established and run by the Navodaya Vidyalaya Samiti, an autonomous agency under the Ministry of Human Resource Development, Department of Secondary and Higher Education, with the main objective of providing good-quality modern education to talented children predominantly from rural areas, without regard to their family’s socioeconomic condition.

Approach. The JNVs are designed to promote national integration by providing opportunities to talented children from different parts of the country to live and learn together and develop their full potential. Efforts are made to promote the idea of unity in diversity and cultural heritage through various activities. The JNV curriculum includes a strong component of culture, inculcation of values, awareness of the environment, adventure activities, and physical education. The program also seeks to ensure that all students attain a reasonable level of competence in three languages: the community language of instruction plus English and Hindi. The JNVs also serve as focal points for improvements in quality of school education in general through the sharing of experiences and facilities.

Impact and Scale. There are currently 565 JNVs across the country, with 75 percent of seats reserved for rural children. Seats are also reserved for children from the scheduled caste and scheduled tribe communities in proportion to their population in the district, and one-third and 3 percent of the seats are reserved for girls and disabled children, respectively. Students attending JNVs have been remarkably successful in examination, with a pass rate 12 percent above the national average in lower secondary levels, and 10 percent above the national average for upper secondary levels.

Cost and Sustainability. The JNVs provide all courses, lodging, meals, materials, and transport largely free of charge. A nominal fee of 2,000 rupees per month is charged for students at the upper secondary level, but exemption is awarded to families from scheduled castes and tribes, female and disabled students, and students below the poverty line. The state government provides free land and rent-free temporary buildings for the JNVs. The Navodaya Vidyalaya Samiti has also worked in partnership with Intel to train 3,486 teachers across all schools on integration of technology in the teaching and learning process. The Navodaya Vidyalaya Samiti has also collaborated with an NGO, the Dakshana Foundation, to provide free coaching to selected students for the India Institute of Technology entrance exam.

The strong partnership between national and local governments and the focus on rural communities are important features of the JNV model, as is the partnership with the private sector to provide training and materials, both of which have the potential to support sustainability. However, in the India context, the scale is still quite limited and the potential for the approach to be applied at scale across the whole country remains unproven.

Educational E-Governance in Gujarat State (India)

As found in sub-Saharan Africa, governments in South Asia are using ICT to improve the governance and administration of public education systems. For example, the Indian state of Gujarat is developing an educational e-governance program including computer literacy education; e-learning through multimedia teaching; online transactions by students, teachers, parents, and employers; and online management and monitoring of schools and colleges. The state has also developed a proposal for all examinations, from the senior secondary examination onward, to be taken online.

The proposal aims at digitization of the Gujarat’s entire education management system from primary education to college and university education. It proposes complete transparency in educational provisions and arrangements. This will require a complete overhaul of the system of education on the principles of e-commerce and e-governance, and the integration of digital databases from schools to university. All admission, completion, transition, recruitment, and examination data are planned to be collated to maintain quality and check against the malfunctioning of the educational institutions.

Smart Schools (India)

Educomp’s Smart School is a technology-based content development initiative for supporting innovative and

experiential learning in schools (see Figure 1). It comprises high-definition 3D educational content along with a host of e-learning applications to harness the latest in the technology. In India, a small number of (mostly private) schools have deployed this digital initiative. Doon Public School in New Delhi has become the first school in India to have computer-aided teaching and learning through smart classes using plasma screens with smart assessment systems. Initially, the smart class program was implemented in schools by Educomp completely on a turnkey basis for a nominal fee paid by the schools on a per-student, per-month basis, for an agreed contract duration. The exact cost of implementation is not available, even though the investment in school infrastructure and the digitization of classrooms and maintenance of a knowledge center would be a large fixed investment for any school or organization in India.

Innovations through Multi-Stakeholder Partnership

All three focus countries have examples of successful public-private or multi-stakeholder partnerships working to improve the access and quality of education. Some, such as India's National Skill Development Corporation (NSDC), are government-led and court industry inputs from both a financial and organizational standpoint. Others in Bangladesh and Pakistan are partnerships formed by

private foundations in cooperation with the government to enhance existing government schooling or provide low-cost alternatives.

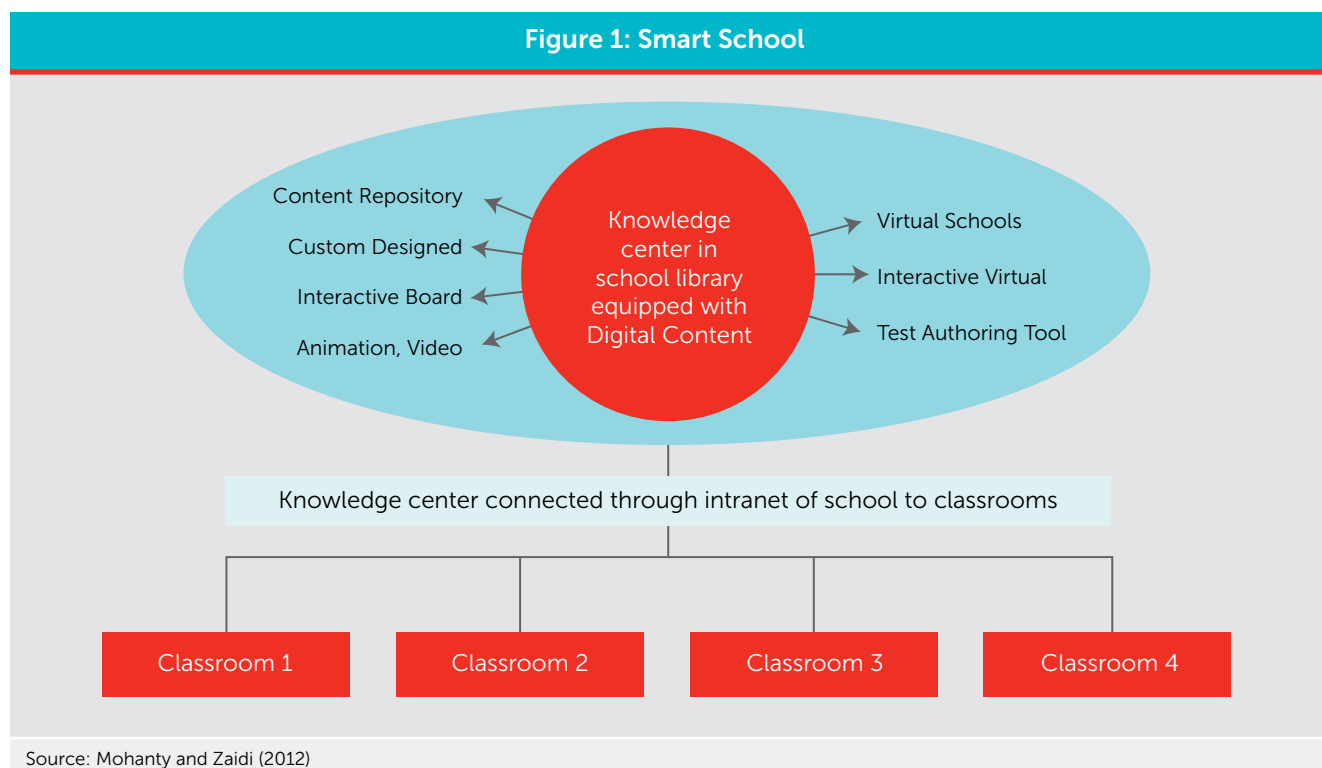
India's National Skill Development Corporation

A public-private corporation, the NSDC was launched in 2008 by the government of India under its 11th Five-Year Plan. The goal of the corporation is to correct the growing gap between the skills employers are demanding and the skills workers actually have. The NSDC is particularly focused on increasing the participation of the private sector and industries in the skill development process, and its target audience is marginalized populations (for instance, women and those in rural areas) and workers in the informal sector.

Approach. The NSDC provides loans, equity, and grants to encourage private sector organizations, entrepreneurs, and industries to support skills training and development. To encourage the financial sustainability of the training centers, the NSDC has a preference for providing loans or equity.

The NSDC is also involved in supporting the broader skills policy environment through Sector Skill Councils (SSCs) and ensuring that course articulation is refined, with youth allowed to accredit their knowledge and skills gained through on-the-job schemes. The tasks of the SSCs will include developing skill competency standards, updating training delivery methods, and helping to standardize the

Figure 1: Smart School



Source: Mohanty and Zaidi (2012)

accreditation and certification process. In doing so, the SSCs will help create a clear National Vocational Qualification Framework (NVQF), which will allow for more flexibility and movement between the academic and vocational streams. The SSC concept has already been implemented in countries like Canada and the United Kingdom, and India hopes to replicate its success.

Since its inception, the NSDC has received positive support from both local stakeholders and multilateral agencies. The NSDC's approach is unique in that it has mapped the skills mismatch in different regions of the country and is using that research to inform its skill development strategy. Given the vast amount of funds that the NSDC is disbursing, it is also taking steps to ensure that quality standards are met: for instance, partners are required to ensure that the employability of the workers they train is above 70 percent, and if that is not met, funding for the next year is cut.

Sustainability. The NSDC seems to have the support of a number of different stakeholders, and the fact that it is a public-private partnership makes the initiative more likely to succeed in the long term. The NSDC's work in developing a clear accreditation process and increasing the flexibility between the academic and vocational streams will also be especially valuable in encouraging the take-up of vocational courses, something that is especially important in middle- and low-income countries with a large unmet demand for technical skills.

Replication. The NSDC could be a model for a comprehensive framework in other South Asian countries, and some of the lessons learned from the accreditation and NVQF process could be applied to Bangladesh and Pakistan in particular. Both countries have some form of national skills development body already in place (for instance, in Pakistan, the National Vocational and Technical Training Commission is the body responsible for supporting TVET and for developing accreditation, curricula, and a national qualification framework), but they do not necessarily provide financing to private sector partners or other organizations to create a holistic, value-chain approach like the SSCs in India.

Foundation Partnership Programs (Pakistan and Bangladesh)

The Aga Khan Foundation supports a number of school improvement programs run by multistakeholder partnerships to promote student-centered education and strengthen the capacity of low-cost private schools. For example, the Adopt-a-School program enables the government to transfer underused or failed schools to the NGO Itara-e-Taleem-o-Agahi (ITA), which takes them and provides free schooling. ITA's role is also to provide teacher training and infrastructure. The arrangement is under a

public-private partnership between the Department of Education, Punjab, and ITA. Another important initiative with regard to school management is in the form of a public-private partnership between government schools in the cities of Lahore and Sarghoda and Cooperation for Advancement, Rehabilitation, and Education (CARE), a local NGO that takes over the management of these public schools by hiring external academic coordinators who work with school staff and monitor teacher attendance, performance, and test administration.

The strength of the ongoing partnership with the Aga Khan Foundation and its local partners, and the expansion of its operations in secondary education to other countries in Asia and Africa, makes it extremely well placed to replicate successful approaches to delivering skills to young people.

The Punjab Education Foundation, an autonomous institution funded by the government of Pakistan's Punjab province, also works to promote high-quality education for the poor through partnership with the private sector. The program has three components: vouchers, teacher training, and monetary incentives to schools for improved academic performance. The foundation pays a subsidy to participating private schools on a per pupil basis; the schools must meet the eligibility criteria in terms of enrollment, physical infrastructure, and so forth. Subsidies are paid directly to the schools.

Another project of the foundation, the Pilot Education Voucher Program, gives vouchers to children from urban slums in Lahore to encourage girls' enrollment in schools. The Urban Girls Fellowship was a pilot program launched in 1995 in the Balochistan province, where the government paid a declining subsidy to private schools over a period of three years to enroll girls from low-income families, as well as tuition fees per girl per year for 100 girls in each school. These pilot programs have not only improved access and school choices but also contributed to reducing gender disparity in participation in secondary education in Pakistan.

NGOs and other private sector organizations also play a major role in education in Bangladesh. The largest private provider of education in the country, the Bangladesh Rural Advancement Committee (BRAC), started its Non-Formal Primary Education Program in 1985 in 22 one-room schools; it has since grown to more than 32,000 primary schools enrolling 11 percent of primary school children. BRAC has recently begun to expand this program to secondary schools. BRAC schools teach the same competencies as government schools and they are able to have a higher rate of retention among the hard-to-reach segments of the population, especially girls.

In another type of multi-stakeholder partnership, the government subsidizes teachers at 90 percent of the gov-

ernment base teachers' salaries in community-managed, nongovernment schools. Subsidies increase with increases in enrollment by paying for additional teachers, provided that other conditions are met. These models have demonstrated that they can deliver a good-quality education at scale and with unit costs that are comparable with those of government schools. It is likely that the expansion of secondary school provision in Bangladesh will be achieved at least in part through wider use of partnerships with NGOs and the private sector.

Innovations Targeting Excluded Populations

Models in South Asia use a combination of innovative financing, skills training, and community outreach methods to increase secondary education access and quality for poor and other marginalized populations, including girls and out-of-school youth.

Female Secondary School Stipend Program (Bangladesh)

Bangladesh has introduced a targeted scholarship scheme to tackle the issue of low enrollment of girls in secondary schools. The Female Secondary School Stipend Program (FSSSP) is a successful demand-side financing model designed to increase participation and retention of girls in secondary education. The program was intended also to challenge social norms and practices such as early marriage and the exploitation of adolescent girls, which have an adverse impact on girls' participation in secondary education.

Approach. The FSSSP emphasizes targeted access in order to improve gender equity and address regional and rural/urban inequities in girls' secondary education access. The program awards equal and universal stipends; the only eligibility requirements are that an awardee must achieve at least 75 percent attendance, achieve at least 45 percent success in exams, and must remain unmarried. Finally, stipend payments are made directly to the girls through their own bank accounts, providing an empowering experience for girls in a male-dominated financial domain and also reducing chances of corruption as money does not pass through the school institutions.

Scale and Impact. The FSSSP was started as an experiment by a local NGO in one upzila (sub-district) with USAID financial assistance. By 1992, seven upzilas were included in the program, and in 1994, the government of Bangladesh launched a nationwide program in all 460 upzilas. Further, a demand-side financing strategy was adopted in the program and stipends were extended up to higher

secondary grades. The program has helped to achieve a significant improvement in girls' secondary enrollment and completion.

An impact assessment study performed by Pathmark Associates in 2001 suggests a wide range of positive impacts of the stipend program on girls' lives, such as the increase in age at marriage, greater birth spacing, positive attitude to smaller family size, and higher employment and earning levels. The evaluation found, however, that stipends alone may not be sufficient to generate demand for girls' secondary schooling. Linking stipends to broader structural change and efficiency of delivery will be necessary to achieve sustainable social change.

Yuwa: Kicking It New School (India)

In Jharkhand, educational attainment is low overall, but especially low for girls. Yuwa empowers young girls in Jharkhand communities to increase their school attendance, excel in their studies, and take control of their future by creating an environment of support and encouragement through soccer teams. Yuwa's new Kicking It New School program will extend this peer support model to the classroom by providing peer-to-peer tutoring.

Approach. Through participation in team sport, Yuwa brings girls out of isolation and into a positive environment, building confidence, a strong sense of community, and a model for self-improvement. Through positive peer pressure from teammates, captains, and coaches, girls are encouraged to keep up attendance in school, and low-cost tutoring and peer mentorship improves academic performance and confidence levels.

The Kicking It New School program will use tablets and Khan Academy software to establish a student-managed, peer-led tutoring program for Yuwa students. The program is being piloted with five tablets for 25 students, with four of Yuwa's current community sports leaders trained in the Khan Academy curriculum and pedagogy to lead tutoring sessions. The goal is to reach three villages (125 students) in six months, and 3,000 students in three years.

Cost and Sustainability. The Kicking It New School model will provide one tablet per five students. Assuming a three-year lifetime for each tablet and an approximate cost of US\$200, this amounts to approximately US\$13 per student per year, or US\$1 per month. Reliance on peer learning will mean only a nominal increase in cost for instructors. This cost is lower than the average tuition fees charged by a low-quality Hindi private school in the area, where fees are approximately US\$2 to US\$4 per student per month.

Yuwa is currently supported through grassroots fundraising initiatives, and grants from individual and corporate donors. However, each Yuwa soccer team is its own savings

cooperative, and most girls save 5 to 10 rupees per week, making this program sustainable without much outside financial assistance.

Replication. The Yuwa program is still at a relatively small scale, but the low-cost, community-driven model could easily be scaled and replicated in other parts of India and other countries and regions. A further impact and cost evaluation would need to be undertaken to assess the effectiveness of the program at a larger scale.

Skills Training and Economic Empowerment for Out-of-School Youth (Bangladesh and Pakistan)

In Bangladesh, the Ganokendra program is a large-scale community initiative to reduce poverty and improve literacy rates. Ganokendras use a combination of approaches to improve social awareness of the importance of education, health- and literacy-linked programs, and ICT-based programs to improve literacy skills. The program also supports income-generating activities, skills training, and microcredit schemes. The program is financed by the Dhaka Ahsania Mission, and, at present, the number of effective Ganokendras stands at 807 spread over seven districts of the country with a membership of 8,070 and more than 400,000 direct beneficiaries.

Although it focuses on literacy, continuing education, training, and skills development, the Ganokendra program does not focus on secondary education in any formal context. However, it has helped in promoting awareness of the benefits of education, particularly education of girls for socioeconomic empowerment, and has influenced households' decisions to send their children, particularly girls, to secondary school. The model has been widely recognized in various forums and has won the Japanese Award for the Most Innovative Development Project.

In Pakistan, the Yuva Parivartan project has been operating since 1928 to empower out-of-school youth. Run by the Kherwadi Social Welfare Association, Yuva Parivartan has emerged as the largest livelihood NGO in the country, training more than 85,000 students in 2011–12 alone. Yuva Parivartan works with out-of-school youth who have little livelihood opportunities, destined to end up as casual laborers in urban or rural areas. It focuses on interventions for the economic and social development of these forgotten and deprived youth in an equitable manner by providing short-term employment-oriented courses, with the goal of mainstreaming them and helping them to become contributing members of society.

The program provides these youth both theoretical and practical skills training in a variety of occupational and life-skills streams, and supplementary support through expo-

sure to market realities, courses on interview preparation, curriculum vita writing skills, and other job preparedness skills. Yuva Parivartan has also been working with police departments and prisons to rehabilitate and train first-time offenders with the goal of reducing repeat criminal activity.

Both the Ganokendra and Yuva Parivartan models appear to have demonstrated that they can have a positive impact on education and social outcomes either by providing incentives to individuals and households for youth (in particular girls) to remain in formal education or by providing alternative education for those who cannot continue schooling.

Innovations to Provide 21st-Century Skills

India is one of the world leaders in the use of ICT to support the acquisition of 21st-century skills. It has made a major investment in education technology and is the only country to have launched a satellite especially dedicated to education broadcasting. Proponents of ICT argue that it will transform teaching and learning processes and will create opportunities for learners to develop their creativity, problem-solving abilities, informational reasoning skills, communication skills, and other higher-order thinking skills.

India also hosts a number of complementary skills development programs to increase employability of vulnerable youth in urban and rural areas, two of which are profiled here. The first uses a standard life-skills curriculum to complement traditional schooling, which shows promise for replication in other countries and regions. The second, an Asia region runner-up in the ISESE competition, draws on community resources and expertise to provide complementary job skills and entrepreneurship training to rural youth.

Whether they are complementary or alternative to traditional school systems, these programs either provide the ICT, non-cognitive, and life skills desired by employers or help develop the entrepreneurial skills that youth need to succeed in self-employment endeavors.

Intel Education Initiative (India)

The mission of the Intel Education Initiative is to accelerate 21st-century education for the knowledge economy as a trusted partner to governments and educators. In India, Intel's educational support program is known as the Intel Learn Program. It was launched in November 2004, as part of the Akshaya Project in rural Mallapuram district in collaboration with the Kerala IT Mission. The Intel Learn Program is a 60-hour, hands-on, after-school-project-based curriculum built around two core modules for learners

from communities that have no access to technology. It taps into children's interest in their own communities while developing their skills and nourishing their curiosity with creative, technology-driven projects. This project has been implemented through 100 community technology centers in Kerala. The program has been expanded to other states and has benefited 48,000 youths across 14 states and union territories of India.

The program's impact is illustrated by students of the project in the Akshaya center in Kerala. Students used technology to gather and analyze information from their community and identified that the lack of playgrounds was a high-priority problem in the Technology and Community Module. This program has helped many students, ages 8 to 16 years old, develop computer skills such as Internet use, word processing, multimedia, graphics, and spreadsheets; collaborating skills by working together on projects, sharing ideas, and solving community problems; critical thinking and problem-solving skills by building projects that contribute to their community.

The Intel Education Initiative also organizes other ICT-based programs such as the Intel Tech Program for improving teaching and learning (which is very different from traditional learning) and the Intel Computer Clubhouse Network Program, along with the Intel Higher Education Program. Intel organizes International Olympiads and promotes other educational activities. The Intel Teach program provides teachers with the knowledge and skills that they need to create continuously innovative schools.

Youth for Development Empowered with Basic Rural Agro-Biogenic Technologies (India)

The Youth for Development Empowered with Basic Rural Agro-Biogenic Technologies (Y4DEBRAT) model offers an education program based on the assumption that current models of secondary education in India have not successfully controlled high dropout rates, controlled migration of unskilled rural youth, or ensured the educational aspirations of rural students for completing secondary education. It further assesses that most of the current secondary education programs are not based on the true spirit of education designed to provoke and catalyze independent thinking to cultivate indigenous ideas for wealth generation through rural development, and that secondary education is not teaching rural youth applied science and technical skills.

With a desire to promote positive change in the rural economy, this model aims for rural industrialization on the premise that rural youth are potential agents of change. The three components of the program are based on youth empowerment, basic rural technology training, and train-

The Intel Learn Program taps into children's interest in their own communities while developing their skills and nourishing their curiosity with creative, technology-driven projects.

ing for agro-biogenic technology. Overall, the program focuses on creating sustainable livelihoods for rural youth through empowerment, life skills and entrepreneurship development, and ICT training. It serves as an alternative to traditional secondary education.

Passport to Success (India)

The International Youth Foundation and Youthreach have collaborated since 2003 on implementing the Passport to Success (PTS) model for Indian youth aged 14 to 24 years to equip them with a range of skills that help them stay in school and get the education, professional skills, and confidence they need to succeed in life.

Approach. The program, which was renamed the Udaan Life Skills Program in India, provides vulnerable youth with a life-skills education that is complementary to traditional schooling. The curriculum provides students with skills related to communication, leadership, reliability, productivity, and learning, equipping them with the confidence and motivation to seek and obtain employment after school. The program also provides job training programs for leprosy patients and their dependents and vocational training courses for out-of-school youth, such as street children, child laborers, and children affected by HIV/AIDS.

Scale and Impact. PTS was launched in 2004 in India and Mexico with a grant from the GE Foundation, and was expanded to Poland and Hungary in 2006. The PTS life skills curriculum is currently available in 12 languages and has been successfully tested in a variety of venues, including both public and private secondary schools, vocational-technical institutes, teacher training colleges, and youth-serving nonprofit organizations.

A key measure of success of the program is the extent to which young people are either in school or employed six months after participating in the program. To date, more than 40,000 young people have completed the program in eight countries. Evaluations of the PTS program have shown it to have a significant impact among participating

young people in four essential life-skills categories: personal development, problem solving, healthy lifestyles, and workplace success, as well as in reducing school dropout rates and increasing employment, and in helping at-risk youth increase their levels of self-confidence and hope for the future.

Youthreach conducted a follow-up survey with 374 youth participants six months after they graduated from the program to track their progression. This survey found that 58 percent of respondents were continuing with their vocational skills training after attending the PTS program, and 38 percent had either found a job/internship or started their own enterprise. The majority of youth who found employment after graduating from the program indicated that they are performing better at their job, working more effectively in teams, and better understand how to behave in an office setting as a result of the PTS training.

Multi-Skill Vocational Training and Entrepreneurship Development As Part of Secondary Education (India)

Lend-a-Hand India implements a program in government-aided schools that is a blend of traditional academic work and hands-on projects that emphasize relevant skills students need in rural areas.

Approach. The Lend-a-Hand program works to make the secondary school curriculum more relevant to the rural environment. Subjects such as basic engineering, energy, the environment, agriculture, animal husbandry, and home and health science are introduced, complementing existing curriculum subjects such as mathematics and science. Students are also trained in practical business skills such as timeliness, calculating costs, marketing and selling their products locally, and ascertaining profits.

For these vocational and entrepreneurship courses, instructors are recruited from within the local community workforce. Lend-a-Hand works with the school management to identify and train instructors, who are typically

local microentrepreneurs in the identified fields. In addition to monetary incentives, these microentrepreneurs also receive an opportunity to undertake additional work orders received by the school from the community, appear for open school diploma examinations, and access networks to expand their business.

Scale and Impact. Lend-a-Hand has been so successful that it has been recognized formally as a full credit course by the government of Maharashtra. Attendance levels in schools where the program is implemented have reached almost 100 percent. In a recent survey conducted with 1,200 students who graduated, more than 20 percent stated they would like to start their own venture after they complete their further studies. The program is currently planning to expand to Gujarat and Orissa states in 2012, but it remains to be seen if the quality of the program can be maintained as the program is brought to scale.

Cost and Sustainability. Lend-a-Hand India has established a sustainable grassroots model that capitalizes on existing infrastructure and resources to achieve scale and sustainability, partnering with government schools, pervasive in rural India, to implement this approach. It contributes to approximately 80 percent of the initial costs, and the schools are required to invest the remaining 20 percent. Pursuant to such commitment, the school management makes arrangements for space and infrastructure necessary to launch the program. By integrating skills-based education within the mainstream regular education, using local resources (local microentrepreneurs as trainers), customizing the curriculum to local conditions, and having the program largely implemented and run by the local schools, the model is relatively low cost.

The program is currently supported by individual and corporate donations, marathon teams, and fundraising in international chapters. However, self-sustaining financing methods are being introduced in the form of monthly fees from students, income-generating activities carried out by students, in-kind contributions from local private enterprise, government grant schemes, and fundraising from the alumni network.

Section 3: Innovative Models of Secondary Education In Southeast Asia¹⁶

According to the Association of Southeast Asian Nations (ASEAN) Vision 2020, ASEAN is committed to providing all citizens with equitable access to human development opportunities, including education, to ensure protection from the possible negative impacts of globalization.

Unfortunately, Southeast Asia is a region of contrast. While some countries such as Singapore have high-performing education systems, others still have difficulties offering their citizens equitable access and high-quality education.

Table 3: Summary of profiled innovations in Southeast Asia

Model	Key Features	Country
Innovations to improve existing systems		
Agricultural Education for Life Program. Enhanced training program for young future farmers.	Innovative curriculum; entrepreneurship training	Thailand
Vocational Education in General Secondary Schools. Mixed-mode delivery of vocation education with partnerships between general secondary schools and vocational colleges.	Innovative curriculum	Thailand
e-Learning in Vocational Training. Online materials to complement/ supplement face-to-face skills training.	Innovative use of ICT; Non-cognitive skill development	Cambodia
Giving Online Access to Learning (GOAL). Online training materials in vocational skills for students in rural areas.	Innovative use of ICT; targeting excluded populations; Non-cognitive skill development	Cambodia
Secondary Teacher Training Project in Science and Mathematics (STEPSAM). Training and materials provided to improve the teaching of science and math.	Enhancing pedagogy	Cambodia
Cooperative Teaching Methods for Science and Technology. Training teachers in cooperative teaching methods and experimental methodologies to teach science and technology in secondary schools.	Enhancing pedagogy; innovative curriculum	Vietnam
Curriculum Reform—Streaming ICT, Science, and Technology for All Students. Dividing students into streams but making math and basic science compulsory for all.	Reforming curriculum	Vietnam
Innovations to transform existing systems		
Distance Learning for Vocational Training in Rural Areas. A variety of multimedia distance learning courses to provide skills training at affordable cost for students in remote rural areas.	Innovative use of ICT; targeting excluded populations	Thailand
Innovations through multistakeholder partnership		
Business Adopted-School Program. Public–private partnership to build strong relationships between schools and local businesses to support skills training and provide better job opportunities.	Public–private partnership; employment generating	Thailand
Industrial Owner-Led Program. Public–private partnership with 7-Eleven stores to provide vocational skills training and workplace experience.	Public–private partnership; employment generating	Thailand
Innovations targeting excluded populations		
ICT Skills for Youth with Disabilities. Providing advanced ICT skills and job placement assistance to students with disabilities.	Targets excluded population; multi-stakeholder approach; non-cognitive skill development; employment generating	Vietnam

¹⁶This section draws heavily on Choomnoom, Doung et al (2012).

The quality of the education systems in Thailand, Cambodia, and Vietnam, the three focus countries in this study, were ranked at the bottom compared with their ASEAN counterparts. Furthermore, gross secondary education enrollment rates in these countries are relatively uncompetitive, ranging from 40 percent in Cambodia to 66 percent and 77 percent in Vietnam and Thailand, respectively.

In keeping with the ASEAN Vision, the governments of these three countries are committed to improving education access and opportunity, and show a clear orientation toward making skills for employment in secondary education a priority. The national curricula of all three countries include some mix of academic, technical, and vocational training at the secondary level. However, the lagging quality of these education systems suggests that insufficient learning materials, poor instruction, or insufficient funding may prevent these policies from bearing fruit on a large scale. It will therefore be important for these countries to find innovative ways of improving education delivery to keep pace with national goals for education quality.

The study identified a variety of approaches to skills development (see Table 3), with many focused on improving existing systems from within by way of new technology, funding mechanisms, and teacher training. All of the models appear to have strong partnerships with key stakeholders; they are responsive to the needs of the local and regional economies for skills in key areas such as ICT, science, and mathematics; and they are closely aligned with government education and economic development policies. However, further analysis is needed to assess the programs' cost-effectiveness, sustainable impact, and potential for scaling up.

Innovations to Improve Existing Systems

There are a variety of models in Southeast Asia that work to improve existing education systems from within. These models included hybrid vocational–academic training programs, innovative use of technology to improve learning outcomes, and curriculum reform and teacher training improvements.

Agricultural Education for Life Program (Thailand)

The objectives of this program were to produce good-quality future farmers, and provide them with practical experiences in self-employment activities. Innovative strategies of this program included community involvement in the student recruitment process, free room and meals, availability of a revolving fund for investment in self-

employment agrobusiness, and project-based learning, and teachers were assigned to facilitate students' learning. Key success factors of this program were free boarding school, learning by doing and earning, and willingness for hard work by both teachers and students. A limitation of this program was the time the teachers spent with students that prevented them from academic advancement. However, it was solved by making the teachers learn and explore new knowledge and technology with students.

Vocational Education in General Secondary Schools (Thailand)

In Thailand, three innovative models were identified for introducing vocational education into general secondary school. In the first model, vocational education institutions work cooperatively with secondary schools, all learning activities and resources are vocational institutions' responsibilities, and students are enrolled as partner institution students. In this case, secondary schools serve as an extension of vocational institutions. In the second model, the general secondary school offers vocational education with the assistance of a vocational institution, and resource sharing is also offered. Students also enroll directly with the general secondary school. In the third model, a secondary vocational program is provided directly by secondary schools if those schools have qualified staff and substantial equipment and local experts. These do not need assistance from vocational education institutions.

For all three programs, key success factors included these: the demand for vocational education from students; qualified staff; strong relationships with relevant institutions and agencies; and full usage of local resources and experts. One constraint was the attitude of school administration and teachers who see vocational education as a complicated management process requiring staff and equipment that was hard for them to obtain.

E-Learning in Vocational Training (Cambodia)

The Centre for Information Systems Training (CIST) is a not-for-profit vocational training center in Cambodia. CIST has been working to provide digital opportunities to disadvantaged young people by providing IT courses to poor students. Recently, it also launched a pilot e-learning project to help and encourage students to learn by providing self-access online materials to complement face-to-face class activities. It is free and easy to use. Students can retrieve classroom lessons, other documents, and quizzes through access to a database. Students can also chat with their teachers online if they have any questions.

The program has three modules: company knowledge, general/social knowledge, and professional life. The

professional life module includes debating and negotiating skills. Although there has been no formal assessment on its impact on students' performance, it is a promising model that can expose students to ICT technology and more interactive learning. The major constraints include the cost of setting up the network and the lack of power supply and connectivity in rural areas.

Giving Online Access to Learning (Cambodia)

The Giving Online Access to Learning (GOAL) project—also developed at CIST—is an innovative distance learning project to help rural students in vocational training centers access content and courses that are not provided locally by teachers and also to help teachers in these rural training centers upgrade their skills. The distance learning course includes professional trainings, basic computer skills, business life, English language, and other subjects (i.e., geography, physics, chemistry, and mathematics). GOAL is a joint project by CIST and an NGO called Connected School. Other NGOs such as Don Bosco are also involved in this project. GOAL also receives assistance and sponsorship from Smart Mobile, a telecom operator in Cambodia.

Through GOAL, the skills trainings are delivered by two complementary methods: offline and online. With the offline method, teachers and students have access to different types of content and learning materials stored in a database located in Phnom Penh through the computer from their classroom. With the online method, a teacher located in Phnom Penh conducts an online classroom session equipped with a laptop, a microphone, and an interactive whiteboard. At the same time, the remote classrooms located outside Phnom Penh are equipped with a laptop, beamer, microphone, and speakers. The students in the rural schools can follow the lecture in real time as if they were in Phnom Penh—looking at the same whiteboard, listening to the same teacher, and asking questions. The fixed setup cost to equip a remote classroom is between US\$1,500 and \$3,000, depending on the need to provide electricity via a solar panel.

Secondary Teacher Training Project in Science and Mathematics (Cambodia)

To help address the lack of competent teachers in Cambodia's education system, the Secondary Teacher Training Project in Science and Mathematics (STEPSAM) (2000–2004) was developed with assistance from the Japanese government to improve the quality of science classes through the enhancement of teachers' skills and knowledge. STEPSAM was an attempt to change the learning style of students from passive to active by helping teachers develop practical activities, providing teaching materials, and enhancing teachers' ability.

The materials and equipment used were inexpensive and easily obtained from local markets. In addition, the topics were related to the curricula while the procedures were simple for less experienced teachers and students. Finally, the content was designed to encourage learners to become engaged in the scientific method. To counter the lack of teaching and learning materials, STEPSAM also developed a "Science Experiment Guide" for all upper secondary science teachers. The evaluation of the project indicated that the teaching materials and activities contributed to improve learners' knowledge and provided teaching staff with activities and materials that were feasible in secondary classroom settings in many parts of Cambodia.

Cooperative Teaching Methods for Science and Technology in Secondary Schools (Vietnam)

Vietnam has made a concerted effort to accelerate innovation in the national curriculum and textbooks in all its secondary schools. Schools are also streamed into different categories, namely (i) basic, (ii) natural sciences, and (iii) social sciences and foreign languages. The curriculum is delivered through teaching methods that promote cooperative learning. ICT is also being gradually incorporated into the national curriculum. Research found that the achievement scores of classes with cooperative learning were found to be higher than those of non-experimental classes, with smaller dispersion.

Curriculum Reform—Streaming ICT, Science, and Technology (Vietnam)

The introduction of a streamed upper secondary curriculum constitutes one of the most important parts of the education reform in Vietnam. Since 2006–07, the upper secondary curriculum has been divided into three streams: (i) basic, (ii) natural sciences (and mathematics), and (iii) social sciences and foreign languages. The requirements for the three key streams are knowledge and skill standards (i.e., minimum and essential requirements) in all subjects in the curriculum. The natural sciences stream requires an advanced level for four subjects: mathematics, physics, chemistry, and biology. The social sciences and foreign languages stream requires an advanced level for four subjects: literature, history, geography, and foreign languages.

For a school, the principal/school council can make a choice on how many streams and which stream(s) to be applied after reporting and getting approval from the director of the Provincial Department of Education and Training. For those schools operating the basic stream, they may also organize teaching advanced subjects in the two other streams of natural sciences (and mathematics) and social sciences and foreign languages in order to widen the

students' subject selection options. In addition, the government has set a target to provide Internet access to more than 90 percent of upper secondary schools during the next planning period.

Innovations to Transform Existing Systems

Distance Learning for Vocational Training (Thailand)

Vocational education and skills development were carried out in many parts of Thailand through distance learning programs, especially for schools in rural areas that do not have qualified teachers. Innovative elements of this model include the following: the best teachers are selected; teacher manuals and student workbooks are provided in advance; students can repeat each module when they want; and cost saving. Key success factors included attitude toward distance learning of school administrators and teachers; readiness of teachers and students; well-maintained equipment and technical system; and 24-hour TV programming and Internet. Limitations of the distance learning programs included problems with electrical power and the technical system that were not always able to be resolved promptly.

Innovations through Multi-Stakeholder Partnership

Thailand hosts two public-private partnership models that draw upon industry expertise to enhance youth learning and increase employment outcomes. The programs bring together training institutes and local enterprises to incorporate on-the-job training into traditional class-based training, which enhances existing curricula, provides youth with practical experience, and ultimately creates opportunity for employment upon completion.

Business Adopted-School Program (Thailand)

This program supports skills delivery at secondary schools through cooperation and coordination between schools and local businesses. Assistance from businesses includes financial contribution, equipment, staff development, experts, and other resources that are provided on agreement between the partners. One school may work with more than one business, and each business may work with more

than one school. For example, the Kanjanapisak Goldsmith College provides training in goldsmithing and jewelry making to young students studying at the same time for academic qualifications.

The program provides a combination of work-based learning, a competency-based curriculum, and job opportunities for students. Key success factors of the program are the active relationship between businesses and schools, partnerships built on mutual benefit, and providing opportunities to teachers for training in the workplace.

Industrial-Lead Program (Thailand)

One of the most successful programs in skills development in secondary education in Thailand is the Industrial Owner-Led Program designed and organized independently by the CPall Company. The training is provided by the Panyapiwat Techno Business School, which developed a three-year vocational secondary education program for 7-Eleven convenience stores throughout the country. The curriculum framework and structures are based on Ministry of Education qualifications, but students are given specific workplace skills training. Students who complete this program receive a vocational certificate equivalent to those from other schools.

Work-based learning is emphasized. Students spend three months in school and another three months in the workplace, or 7-Eleven convenience stores. Students become employees on the first day of enrollment in the school. Students earn income during their practical experiences at the workplace. An important innovative strategy of this program is the distance learning program for those students who enroll at 20 centers and 70 networked schools. They receive the same quality standard of theory subjects as those at the school. Practical training is provided by well-trained and experienced staff at the workplace. This strategy has increased the number of students to 10,000 instead of only 1,800 at the school only. Key success factors of this program are an active administrative team and teachers, continuous improvement of the program, attractive practical experiences, and concentration of required attributes for the retail occupation.

Innovations Targeting Excluded Populations

One of the most innovative programs identified in the ISESE competition was a program that provides advanced ICT skills to a particularly marginalized population in Vietnam—students with disabilities. The program not only provides training and employment opportunities to this excluded population, but also provides the opportunity for social mobility.

IT Training for Youth with Disabilities (Vietnam)

This IT training program, implemented by Catholic Relief Services, seeks to address the lack of employment opportunities for people with disabilities in Vietnam by providing them with advanced technical training, soft-skills training, and business linkages.

Approach. The program aims to bridge physical, financial, and societal barriers that prevent youth with disabilities from receiving quality education and training. The program provides advanced IT skills in training modules that last from three to 12 months, and works to provide job placement at the end of training. The program has solicited the cooperation of employers to form the curriculum and facilitate recruitment of trained graduates.

Training includes IT skills such as programming, website development, graphic design, and network administration, as opposed to basic IT skills such as data entry, which increases these students' options for employment and also reverses society stigma about the capacity of people with disabilities. The training also includes development of soft

skills such as teamwork, communication, problem solving, and confidence building, which complements the technical training and prepares students for work in a modern workplace.

Scale and Impact. The program has trained approximately 550 youth with disabilities in advanced IT skills, and more than 80 percent of those trained have found employment after graduation. Salaries obtained by graduates are generally higher than those of the manual labor/handicraft jobs traditionally assigned to people with disabilities.

Cost and Sustainability. Advanced IT training costs approximately US\$250 per student per month, including tuition, activities, and room and board. Funding currently comes from USAID, but the project is currently recruiting funding from the government, fundraising, partnerships with the private sector, and student loan programs. Graduates from the training program make approximately US\$100 to US\$200 per month more than they would at an entry-level job in a manual labor/handicraft trade, so a loan system would be a feasible means of support to the school, if the government or private sector partnerships would insure the loan.

Section 4: Innovations Around The Globe

While the specific nature of jobs may differ between low- and high-income countries, the challenge of skills mismatch and the resulting youth employment gaps exists across the globe. Research has shown that across Latin America and the Caribbean, Central Europe, the Middle East and North Africa, and the OECD and North American regions, students on the whole are not entering the workforce with the skills needed to obtain employment.¹⁷

A number of models are successfully preparing students for 21st-century jobs in Europe and North America through systemic, pedagogical, material, or other innovations. The following section outlines a selection of those important initiatives that may be replicable or offer lessons for LMICs.

Changing the Way Schools Are Managed: Academy Schools in the UK

Nearly half of all secondary schools have opted to become academies under a government scheme to change the way secondary schools are managed in the UK (UK academies). As academies, secondary schools have greater independence and can access additional resources directly from the central Ministry of Education. Academies have greater freedom over pay and conditions for teachers, and managers can also make adjustments to the curriculum, although they are still bound by national minimum standards and are subject to government inspection in the same way as mainstream schools. For example, the University Technical College in Reading is a collaboration between a local college, Microsoft, Network Rail, Cisco, and other major local employers to provide state-of-the-art training in engineering and IT skills to secondary-aged students.

Changing the Way We Recruit Teaching Talent for Secondary Schools: Teach for America, Teach for All, and Teach First

There have been a number of successful innovations in the United States to recruit high-quality graduates to teach in challenging schools in deprived areas. There are now more than 20,000 alumni of the Teach for America program entering their mid-thirties, and similar programs are being trialed in poor countries.

Norman Atkins, president of Relay School in New York, says that the disadvantage of many developing countries is that there is a lack of incentives to attract and retain top talent into the schools. New incentives and short-term contracts possibly linked to supporting continuing university studies could be introduced in African countries with lessons learned from the successes and failures of the Teach for America programs in the United States.

Changing a Teacher's Supply Closet: Integration of Blended Learning Technologies

There have been a large number of high-profile innovations that use technologies to give teachers new resources and new ways of teaching in and out of the classroom. The most successful interventions are those that take a "blended approach" to use existing or new technologies and find ways of integrating them into the school structures. One example of this is the Flip School in Arizona, which has used inspiring Internet lectures such as TED talks and the Khan Academy lectures by leading experts in their fields as the main source of "input" to learning. Class time is then dedicated to discussions and guidance from the teacher. The traditional model of the teacher as the main provider of knowledge has been "flipped" to reflect the increasing trend of students accessing information for themselves from a wide variety of sources.

Three main insights emerge from practitioners in the field. First, innovation in education through technology can provide increased access to student-relevant material and processes of learning. Second, technology has revolutionized the way we can collect and analyze data. Programs are inviting students and teachers to be collaborators in a particular student's progress, finally lifting the veil behind the grading system. One teacher emphasized that this would be accomplished through more team-based, formative assessments. Third, mobile phone technology is providing an exciting opportunity for many students and parents in the developing world to leap-frog the traditional mediums for accessing and interacting with content. MPrep and eWalimu are concrete examples, but they are only the beginning of a wave of innovation in the mobile phone space for learning, assessing, and sharing information for secondary education.

¹⁷This section draws heavily on Cunningham (2012)

Changing the Expected Outcomes for Secondary School Students: 21st-Century Skills and Beyond

It is widely acknowledged that the basic skills that formed the foundation of 20th-century education systems will not suffice for future schools. The so-called 3Rs of arithmetic, writing, and reading, though still important, have been supplemented with the 4Cs of collaboration, critical thinking, communication, and creativity (Robinson 2010). Students are being pushed to become prepared for college, careers, and citizenship in the 21st century. To be college-ready and work-ready, schools must find ways to equip their students with the skills and knowledge necessary for success in information, media, and technology as well as traditional roles in management and teamwork on large, longitudinal tasks with strict deadlines and specific objectives to be met.

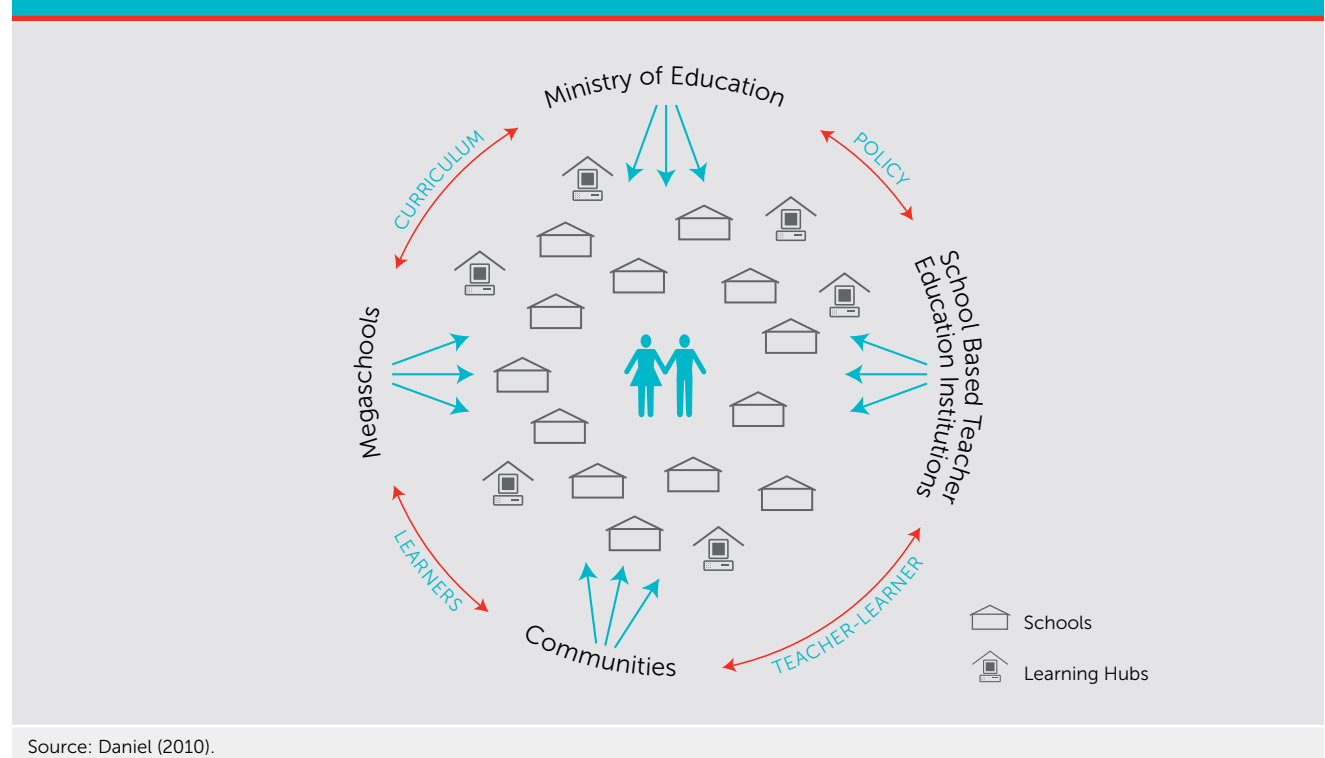
New literacies that we must develop in the 21st century include global awareness, financial, economic, business and entrepreneurial, civic, health, and environmental literacies. The skills synthesis paper confirms the importance of these skills for employers. Finding a way to develop them more effectively in schools remains a challenge in developed as well as developing countries.

Beyond the School Walls—Open and Distance Learning

Millions of students around the world are accessing secondary education through various forms of open schooling that allow them to study in their own time and at their own pace. John Daniel's visionary book *Mega-Schools, Technology, and Teachers* (Daniel 2010) makes the persuasive case for the urgent need to rethink our model of the school as a single location where young people go to study eight hours a day, five days a week. He argues that this traditional model will not be able to cope with the 400 million additional students that will surge toward the secondary school system in the developing world over the next decade. Programs such as Telesecundaria in Mexico (a million-plus graduates), the National Institute of Open Schooling in India (1.5 million graduates), and the SLTP Terbuka (Open Junior Secondary School) in Indonesia (2.5 million graduates) have demonstrated that it is possible to deliver high-quality education at scale to secondary-aged students at a lower cost and a much wider reach than traditional face-to-face schooling.

The key to success in open-schooling systems is building effective quality assurance mechanisms and accreditation systems to ensure that qualifications are accorded equal status to those obtained in the mainstream education system. Open access to education resources and a greater diversity of learning opportunities will form an increasingly important part of the education ecosystem in the 21st century.

Figure 2: An educational ecosystem for the 21st century



Conclusion and Discussion

The regional reviews, case studies, and innovation competition identified a wide range of innovative models to enhance skills training—some of which are widely known, many of which are not. Further analysis is required to assess the cost-effectiveness and the potential for sustainable impact, scalability, and replicability of these models. However, the most promising models identified in this study have some common features that show potential for impact and sustainability:

- **Multi-stakeholder partnerships are critical to quality and sustainability.** Programs that draw upon some combination of the demands of employers, the buy-in of communities, the skills of the education sector, the financial resources of the private sector, and the institutional resources of government will be the most successful at creating quality, scalable, and sustainable models. In particular, financial sustainability is greatly reassured with financial public–private partnerships.

Examples: FHI 360 Middle School Program in Senegal; BRAC and Aga Khan Foundation programs; NSDC and Multi-Skill Vocational Training Program in India

- **Targeted scholarship and voucher programs can counter demand-side constraints.** Innovative financing to help counter constraints such as high costs or lack of community support for continuing education is critical to reaching excluded populations.

Examples: Jua Kali in Kenya; stipend programs in Bangladesh and Pakistan

- **Open and distance education delivery models will expand access to education and training.** Widespread use of various models of open and distance learning can provide access to secondary education and skills training especially for students living in remote areas or part-time students combining study with work. However, these programs rely on a supportive national policy framework for distance learning.

Examples: Open schooling and distance learning schools in Botswana and Namibia; distance learning for vocational training in Thailand

- **Effective use of ICT can help modernize pedagogy and complement mainstream teaching.** Models that focus not only on teaching IT skills to students but also on using innovative ICT tools to enhance learning will be successful at enhancing learning outcomes and equipping students with skills for future employability. The common key to success is to focus first on the teaching and learning, rather than the technology and tools.

Examples: Science Resource Centers in Ghana; SMART schools in India; Flip School and blended-learning approaches in the United States

- **Non-cognitive elements of education will enhance traditional cognitive and technical skills delivery.** Models that emphasize non-cognitive or life skills as complementary to traditional cognitive or technical skills-based curricula have shown promise for improving learning outcomes.

Examples: Emusoi Center in Tanzania; Educate! in Uganda; Yuwa Kicking It New School in India; Passport to Success in India

What is strikingly absent from the reviews—and will be addressed in the next stage of the research project—is any detailed analysis of the positive impact (or lack thereof) on students' chances of obtaining a decent job after completing these training programs. The question remains: Do these models actually give young people the skills they need to thrive in the modern economy? A critical component of further evaluation of these skills development programs will be devising a way to measure impact on employability.

A second important question is touched on by some of the projects profiled here but is as yet not fully answered: What are the most effective models for delivering the 21st-century skills that employers say are so important? As the skills synthesis has shown, effective communication, high-performing teamwork, and critical problem-solving skills are an important part of almost every job in the modern economy. Further, many of the jobs students are preparing for do not even exist yet, and these transferrable skills will be critical to ensuring that students are employable both today and tomorrow. Identifying ways of teaching these skills, therefore, remains one of the most important challenges in the education sector today.

Appendix

Partner Organizations

Council for the Development of Social Science Research in Africa (CODESRIA), Senegal

Dalberg Global Development Advisors

Institute of Statistical, Social, and Economic Research (ISSER), University of Ghana

National University of Educational Planning and Administration (NUEPA), India

Thailand Development Research Institute (TDRI)

ISESE Reference Group

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Christina Olenik
JBS International

Dilshad Ashraf
Aga Khan University

Ferdinand Gunn
Ernst & Young

Jacob Bregman
World Bank

Jee Peng Tan
World Bank

Keiko Inoue
World Bank

Mary Chandler
Cummins

Michel Welmond
World Bank

Rachel Blum
USAID

Rebecca Winthrop
Brookings Institute Center for Universal Education

Sarabecka Mullen
International Youth Foundation

Tony Oteng-Gyasi
Association of Ghana Industries

ISESE Competition—Shortlisted Entries

Optimizing Secondary Schools for Skills and Livelihoods through Public–Private Partnerships and Corporate Social Responsibility (Pakistan). There are fewer government secondary schools than primary schools in Pakistan, so this TVET program was established to teach secondary students a variety of skills with several partners through CSR and public–private partnerships.

Joyful Learning in Non-State Secondary Schools in Bangladesh: Public–Private Partnership (Bangladesh). Through this program BRAC seeks to support mainstream secondary schools by creating an environment conducive to learning. BRAC works to improve the capacity of School Management Committees, provides teacher training, and promotes computer-aided learning. BRAC also initiated a student mentorship program to promote leadership, self-esteem, and creativity among secondary school students.

Empowering Teachers toward Digital Content Creation, Blogging, and Online School Links in Uganda (Uganda). Conducted by the Kisubi Associated Writers Agency (KAWA Uganda), this program seeks to empower teachers to develop digital content by writing schoolbooks and saving them online in PDF format. These can then be accessed online and via mobile phone, thereby helping to promote a greater reading culture among students.

Aparajitha TTT: Transformational Change through Awareness (India). Aparajitha Foundation is the not-for-profit wing of Aparajitha Corporate Services Limited. It has established an innovative life-skills education program for adolescent children that seeks to provide adolescents with emotional and psychosocial competence, as well as boost their self-esteem and confidence, through teaching life skills that are not covered in the regular curriculum.

Arts-Based Learning for English Language Skills: Local Culture- and Place-Based Education (India). This is a unique model based on spiral learning, arts-based education, and knowledge construction that facilitates the development of English proficiency in very short periods of time. The program is centered around using the local language, culture, and way of life to learn English.

†Emusoi Center (Tanzania). Emusoi Center seeks to provide opportunities for education, both academic and vocational, for secondary-school-age Maasai girls. The center provides a transitional space for young women coming from traditional lifestyles. They are mentored academically, socially, and psychologically to join the multi-cultural/multi-tribal environment of secondary schools in the area rather than a school for Maasai only.

Enhancing Science Education through Science Activity Centers (India). Through the organization Plan India, science labs were created with the aim of simplifying the concepts of math and science, and to stimulate interest and understanding among students. The science activity centers serve as facilities for conducting science- and math-related activities based on the school curriculum, but encourage hands-on, activity-based learning and teaching.

Interactive Multi-School “Mock” Exam Competitions (Kenya). Asante Africa Foundation seeks to help students become more comfortable in taking the important yet intimidating national exams in Kenya, by organizing competitions of mock exams that simulate the national exam conditions. In this way students can gain familiarity with the process of standardized testing and learn strategies for coping with the stress of studying for and sitting for exams.

†IT Training for Youths with Disabilities (Vietnam). This IT training program would seek to address the lack of employment opportunities for people with disabilities in Vietnam by providing them with advanced technical training, soft-skills training, and business linkage.

†Multi-Skill Vocational Training and Entrepreneurship Development as Part of Secondary Education (India). Lend-a-Hand India implements a program in government-aided schools that is a blend of traditional academic work and hands-on projects that emphasize relevant skills students need in rural areas.

Project 1947: A Technology Catalyst for Social Change Using Secondary Schools (India). Project 1947 gives government secondary schools DVDs and videotapes for students to learn about topics on the SSLC State Exam, such as mathematics and the sciences, in order to improve exam pass rates.

Rural Youth Empowerment Program (India). The Rural Youth Empowerment Program works to improve rural youths’ job skills in the manufacturing, construction, service, and infrastructure sectors by using the Model-Train-Place model.

UCEP: A Beacon of Hope (Bangladesh). UCEP educates children from the slums by providing them with a relevant education that includes skills training and job placement.

Youth Social Inclusion for Civic Engagement in Bukedea District (Uganda). The Oluwa Youth Activity Group uses leadership trainings, peer education, networks, advocacy programs, and information centers to increase youth civic participation. Youth can implement and address a variety of initiatives, which cover social, economic, and environmental issues.

[†]Yuwa: Kicking It New School (India). In Jharkhand, educational attainment is low for boys but especially low for girls. Yuwa provides girls with the opportunity to gain self-confidence by joining a soccer team and to receive a better education by participating in Yuwa's building-bridge programs.

Industrial Owner-Led Program (Thailand). The role of this program is to develop and improve the capacity of a new-age workforce with adequate skills to serve economic growth in Thailand, especially in the retail business industry or service sector. The program consists of a vocational training course through apprenticeship with 7-Eleven convenience stores. Upon completing this program, graduates are offered full-time employment.

[†]Improving the Quality and Relevance of Middle School in Senegal (Senegal). Through this program, FHI 360 worked with the minister of education, civil society, and the business sector to reform the middle school curriculum in Senegal to create a cohesive curriculum capable of teaching 21st-century skills.

[†]Competition winner

[†]Competition runner-up

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