

# New Skills for a Global Innovation Society

Asia-Pacific Leaders Forum  
on Secondary Education  
New Delhi, India



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Secondary Education

New Delhi, India, 2008

**Asia Society**

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## TABLE OF CONTENTS

Preface and Acknowledgements.....	4
Executive Summary.....	6
Education: An International Perspective.....	11
Secondary Education in India: Achievements and Challenges.....	16
Strategies for Expanding Access to Secondary Education.....	23
Modernizing Curriculum, Instruction, and Assessment.....	30
Recruiting, Training, and Supporting a 21 <sup>st</sup> -Century Teaching Profession .....	37
Managing Schools for Achievement.....	43
Technology’s Role in Improving Access and Quality.....	50
Summing Up and Moving Forward.....	56
Appendices .....	59
Appendix A: References	
Appendix B: Agenda for the Asia-Pacific Leaders Forum on Secondary Education	
Appendix C: List of Participants	

## Preface and Acknowledgements

Montek Singh Ahluwalia, Deputy Chairman of the Indian Planning Commission, opened Asia Society's 2008 Asia-Pacific Leaders Forum on Education in New Delhi by highlighting the urgent need for change in the world's education systems. Presenting his country's challenges in responding to the new skill demands of the global economy, the Deputy Chairman continued that "much of this is set to change as India is on the threshold of launching a new secondary education program....where we will deliberate, among other issues, how to achieve world class standards in science, math, and technology and how to build an educational environment that fosters innovation."

The Asia-Pacific Leaders Forum brought together leaders and innovators across sectors from **India, China, South Korea, Singapore, Japan, Australia,** and the **United States**, as well as from OECD, UNESCO, and the World Bank. While focusing on key challenges and best practices throughout the world's education systems, Forum participants paid special attention to how international best practices might inform India's secondary education expansion. This report summarizes the presentations and the rich discussion from each session and gives recommendations for future action.

On behalf of Asia Society, we would like to express our deepest appreciation to the Honorable Montek Singh Ahluwalia, Deputy Chairman of the Planning Commission, for his opening keynote address and for providing important insight into the government's plans for expansion of the education system. Ashok Ganguly, former Chairman of the Central Board of Secondary Education and head of the National Council of Education Organizations; Sam Pitroda, Chairman of the National Knowledge Commission; Subhash Khuntia, Joint Secretary, Ministry of Human Resource Development; Sam Carlson, Lead Education Specialist, World Bank; and their respective staff members gave invaluable advice and guidance on creating the Forum. The Honorable Sheila Dixit, Mayor of New Delhi,

graciously hosted the international Forum participants at her home. Dr. Shayama Chona, Principal, Delhi Public School, R.K. Puram; and Parvinder Kaur, Principal, Katha Khazana; allowed the international Forum participants to see and discuss Indian educational practices firsthand. Without all of this support, the Forum could not have taken place.

We are deeply grateful to the participants for their presentations (available online at [AsiaSociety.org/Education](http://AsiaSociety.org/Education)) and their insight into the strengths and weaknesses of their respective education systems. Bunty Chand, Executive Director, and Angeline Thangaperakasam, Programme Associate of Asia Society's India Centre, provided invaluable advice and support. Jessica Kehayes and Heather Singmaster of Asia Society's New York office helped to frame the Forum's agenda, identify participants, and make the Forum a reality. We would like to thank Aashti Zaidi Hai, for writing this report on the Forum.

Asia Society is deeply grateful to the sponsors of the Forum – The Goldman Sachs Foundation, The McGraw Hill Companies, The Chatterjee Group, Courtney Sale Ross, and an anonymous donor – for their vision in supporting this unique gathering. We would also like to acknowledge the Freeman, Met Life, and Bill and Melinda Gates foundations for their generous support of Asia Society's education work.

The quickening pace of globalization over the past twenty years has produced a whole new world, one that produces challenges and opportunities for every education system. We hope this report will contribute to a wider discussion and urgent action to give students the new global skills they need.

*Vishakha N. Desai*  
*President, Asia Society*

*&*  
*Vivien Stewart*  
*Vice President, Education, Asia Society and Chair,*  
*Asia-Pacific Forum on Secondary Education*

# Executive Summary

*“The schools for today and yesterday are not the schools we need for tomorrow. Instead, we need new mind-sets, processes, strategies, and new paradigms for instructional leadership. It surprises us that as the world outside changes, the education system can remain static.”*

– Keynote Address, Ashok Ganguly  
Former Chairman, Central Board of  
Secondary Education, **India**

Today’s students are living in a very different world from the one in which today’s adults grew up. Information and ideas now traverse the world with unprecedented speed and frequency. The pace of economic globalization and scientific and technological change over the past few decades has produced a new world – a world in which higher-order skills, adaptability, cross-cultural communication, and innovation are the keys to individual and national success.

Increasing global interconnectedness creates an urgent need for change in our school systems: what and how and where learning takes place. It demands a new global perspective on teaching and learning. Countries are no longer able to operate in isolation with a single focus on meeting national needs such as the domestic job market and traditional social and economic structures. Education structures that supported a small elite while leaving large masses of the population uneducated will not be able to sustain economic growth and social stability in the future.

Perhaps nowhere is this reality more apparent than in **India**. While education has always been a priority in **India**, the base of the educational pyramid has historically been quite small. In recent years, however, there has been an enormous expansion in primary school enrollment; it has shot up to nearly 97 percent. The stage is now set for a corresponding expansion in secondary education. Traditionally, the secondary sector did not receive as much attention because it was sandwiched between the “high-profile” tertiary sector and the “high-needs” primary education sector. With almost 60 percent of children not completing secondary school, there are significant challenges ahead: building schools and providing the needed

infrastructure, recruiting and training secondary teachers, reducing the significant inequities in the opportunities to receive a secondary education, improving the quality of learning, and the management and financing of schools.

However, as Montek Singh Ahluwalia, Deputy Chairman of the Planning Commission, said in his opening remarks to this Asia-Pacific Forum, “Much of this is set to change as **India** is on the threshold of launching a new secondary education program...where we will deliberate, among other issues, how to achieve world-class standards in science, math, and technology, and how to build an educational environment that fosters innovation.” **India** is planning a massive expansion of secondary education with the goal of having 65 percent of students enrolled in grades 9–12 by the end of the 11th Five-Year Plan (2007–2012). Significant attention will also be paid to improving the quality of schools and teacher preparation, reducing barriers to access, and creating public-private partnerships to achieve these goals.

In order to share lessons that may inform the expansion of secondary education in **India**, the *Asia-Pacific Leaders Forum on Secondary Education* was convened by the Asia Society in March 2008 in New Delhi. It brought together leaders and innovators from key sectors – education, government, business, philanthropy, media, and technology – from **India, China, South Korea, Singapore, Japan, Australia**, and the **United States** – as well as experts from the Organisation for Economic Co-Operation and Development (OECD), UNESCO, and the World Bank.

## **Globalization and Education**

The profound economic and technological changes of the past twenty years are well-known. Less well known are the equally dramatic changes in education worldwide. There has been a rapid expansion in secondary education, considered by many policymakers to be the minimum necessary to participate in the knowledge economy. Thus, for example, while the **United States** used to be far ahead of other countries in the rates of student graduation from high (upper secondary) school, in recent years other countries have been catching



up and even surpassing the **United States**. Similarly, an enormous expansion of higher education is taking place in many parts of the world. All this is creating a fundamental shift in the supply of global skills. At the same time, increased productivity from technology and global migration of lower-skilled jobs means that in advanced economies, the growing demand is for “non-routine analytical and interactive jobs.” These jobs require the ability to innovate, to use technology, and to function in a globalized environment: a far different skill set than schools have produced in the past. The key drivers in today’s global economy are access to knowledge and innovation.

The goals of the Forum therefore were to:

- *Analyze the strategies used to expand access to and completion of secondary education in selected industrialized and middle-tier countries*
- *Share experiences in modernizing curriculum and instruction and using technology to produce the new skills needed to succeed in the global knowledge economy*
- *Examine the practices of some of the world’s most successful education systems in developing world-class standards, creating a 21st-century teaching profession, and improving the management and accountability of schools for achievement.*

Participants discussed presentations on some of the big challenges in secondary education where international experience can shed light on best practices and on key elements of high performance. This report summarizes the discussions at the Forum. The background papers, presentations, and this report can be accessed online at [AsiaSociety.org/Education](http://AsiaSociety.org/Education). Despite differences in educational and political systems, cultures, and economic contexts, participants found many common problems, and shared potential solutions.

## Expanding Access to Secondary Education

With secondary school graduation increasingly seen as a prerequisite for jobs in the global knowledge economy, and with strong pressure to

reduce inequities in access to education, countries are showing that it is possible to significantly increase secondary school access and completion. In the 1960s, **Korea** had an extremely low economic and educational level, but rapidly expanded education from 1975 to 1990 and now has the highest secondary school graduation rate among all OECD countries. This expansion took place through a combination of government investment as well as parental investment in private schools. The importance placed on education in Confucian tradition, high economic returns to educated workers in the economy, and political change all contributed to this transformation.

Another example: **China** had virtually universalized nine years of education by 2007 and plans to have 80 percent participation in upper secondary schools by 2010. Strategies include boarding schools and the elimination of many fees in rural areas, satellite-based distance education, and vocational schools linked to **China’s** rapid industrialization. By contrast, the **United States** has long had universal access to secondary school but not universal graduation. Only 70 percent of secondary school enrollees graduate from high school. Many efforts are underway at state and local levels to reduce the dropout rate through strengthening preparation before secondary school, providing educational supports to students and families, making schools more relevant and engaging, and creating stronger connections between schools and higher education.

## Modernizing Curriculum, Instruction, and Assessment

The kinds of skills that secondary schools need to provide are also changing rapidly. Across the world as countries place a greater premium on innovation, there is a growing emphasis on reducing the amount of material and of rote memorization, and an emphasis on the importance of conceptual knowledge and its application to new areas. The Forum focused particular attention on the key curriculum areas of math and science, areas that all countries are anxious to improve. Here, countries as different as **China, India, Australia, Singapore**, and the

**United States** have all enacted curriculum reforms designed to focus on problem-solving in math and the practice of inquiry in science.

These countries have met with varying degrees of success in modernizing the curriculum as well as in improving the overall performance of their math and science education, as comparisons on international tests like PISA have shown. Those countries that do well in such international comparisons have high national standards, a coherent curriculum, and well-qualified and supported teachers. Assessment systems, as well, need to change to address changing knowledge and skill needs. Most assessment systems still measure the regurgitation of factual information, something that is easy and cheap to measure, rather than higher-order skills and processes. Finally, rather than simply functioning as a summative tool to measure the quantity of what has been learned, assessment needs to be seen as a continual process that is integrated with both curriculum development and instruction in order to improve both.

### **Creating a 21<sup>st</sup>-Century Teaching Profession**

It is increasingly clear from research and practice that teacher quality is tied inextricably to student learning – some even say it is the most important contributing factor. Yet it is also clear that there are significant challenges in most countries to achieving a high-quality teacher workforce. **India** needs 500,000 new secondary school teachers in the next ten years, so understanding the factors that contribute to a teaching force that succeeds in preparing its students for the 21<sup>st</sup> century is an urgent matter. Attracting and retaining effective teachers requires more than just focusing on teacher education programs or on salaries. International studies have identified a range of approaches to the key issues of recruitment, induction, professional development, and working conditions. **Singapore** exemplifies many of the best practices:

- *Recruiting students from the top 30 percent of their secondary school class*
- *Offering financial support during training*
- *Mentoring during the first five years on the job*

- *Providing 100 hours per year of professional development tied to curriculum standards*
- *Giving attention to on-going career development.*

Other countries have developed successful “alternate” certification routes to attract both graduates and mid-career professionals with majors in specific subject areas into teaching. In “alternate” certification routes, candidates are allowed to take their pedagogy courses while on the job, rather than requiring that they be taken as part of a full-time traditional university course. Whichever options are chosen, countries need imaginative and systematic approaches to the recruitment, training, and professional development of both teachers and school leaders if they are to achieve high quality education for all students.

### **Managing Schools for Achievement**

Governance issues are integral to any discussion on school improvement, and the merits of public versus private funding and management and a variety of “choice” schemes are hotly debated. International research suggests that, in fact, the key governance factors affecting school performance, are autonomy - i.e., devolving responsibility to the school level, particularly for staffing decisions within a framework of accountability – centrally determined standards, and measurement of results.

As they considered different school redesign efforts, Forum participants discussed a range of approaches: a system of low-cost private schools in poor communities in **India** that outperformed local government schools; the organization, in **Australia**, of networks of autonomous schools that support their on-going improvement; and the school redesign effort in New York City, the largest school system in the **United States**, where failing schools were closed and replaced by new, small schools run by public-private partnerships or charter school operators. The redesign, which brought new leadership into schools and gave schools more autonomy in exchange for accountability, produced major gains in high school graduation rates.

## Technology's Role in Improving Access and Quality

Forum participants agreed that information and communication technology (ICT) will play a vital role in addressing many of today's educational challenges on a wide scale by providing access to underserved communities, improving quality and learning outcomes, and deepening educational experiences regardless of location. Innovations such as OpenCourseWare and iLabs are bringing courses and labs to millions of students in schools and universities in India and around the world, and a growing body of evidence shows that online instruction can be as effective as conventional classroom experiences. Digital technologies such as **Korea's** Digital Textbook project, also show that engaging students and promoting more interaction, facilitates self-management of learning and greater student achievement.

However, many countries have also discovered that large investments in educational technology have not always yielded great payoffs. **Australia's** extensive and early use of technology in education has shown that effective integration of technology into teaching and learning requires redesigning schools, reforming curriculum, and providing professional development for teachers in order that technological innovation yields educational improvement. Careful thought needs to be given to how to integrate virtual and physical classrooms to maximize learning as well as the measurement of outputs from use of digital technologies.

## World-Class Standards and International Benchmarking

The magnitude and speed of the forces of globalization demand an urgent response. Incremental changes to existing institutions are not sufficient. Content, time, motivation, and delivery methods all need to be re-examined. In today's global environment, the relevant educational standards and practices are no longer those of the next city or state, or even those of the country as a whole, but those of other nations.

Just as companies benchmark themselves against the best in the world, so too must education systems. International analyses of "best practices" can help countries understand the characteristics of high-performing systems and broaden the range of options under consideration. Cities, states, and provinces also need the tools to be able to measure their performance against international benchmarks. The rising Asia-Pacific region needs robust means for exchange of educational ideas on high-priority issues, not just at the Ministerial level, but among the broader range of stakeholders in education.

No nation has a monopoly on excellence in education. There is now a global marketplace of ideas and innovations in every field, including education. In the 21<sup>st</sup> century, the country that is open to new ideas about learning from around the world will be the country that succeeds.

# Education: An International Perspective

*“Developed and developing countries alike need to focus on building the creative and productive capacities of their workforces. In an increasingly globalized economy, knowledge and skills are the key differentiators of nations as well as individuals.”*

– Bill Gates, *The Times of India*, April 3, 2008

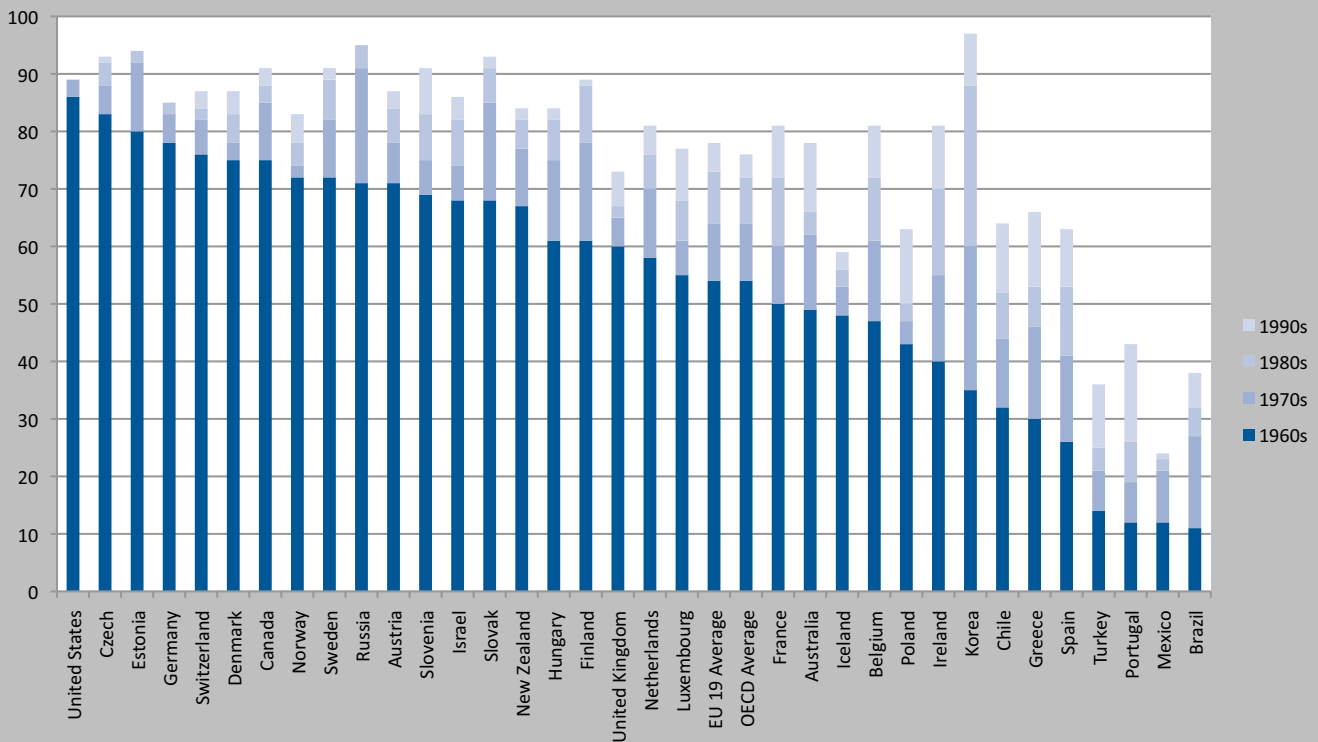
### Globalization and Education

The world is changing. And fast. Rapid economic integration and the development of global companies and supply chains have changed the way countries and people work. The personal computer has enabled millions of individuals to be connected and to share their knowledge. Moreover, the emergence of software standards means that people are able to work together

seamlessly and upload and globalize content. The emergence of technology is accompanied by another big equalizer: the globalization of knowledge and skills.

According to Dr. Andreas Schleicher, Head of the Indicators and Analysis Division, Organisation for Economic Co-Operation and Development (OECD), there is growth and change at all ends of the skills continuum, from the top end to baseline competencies. Whereas the **United States** used to be the “gold standard” in the percentage of high school completers, it has now been overtaken by twelve countries with higher rates – the number one being **Korea**. According to Dr. Schleicher, “It is not about whether you are better than you were, but whether you are competitive in a world of changes.”

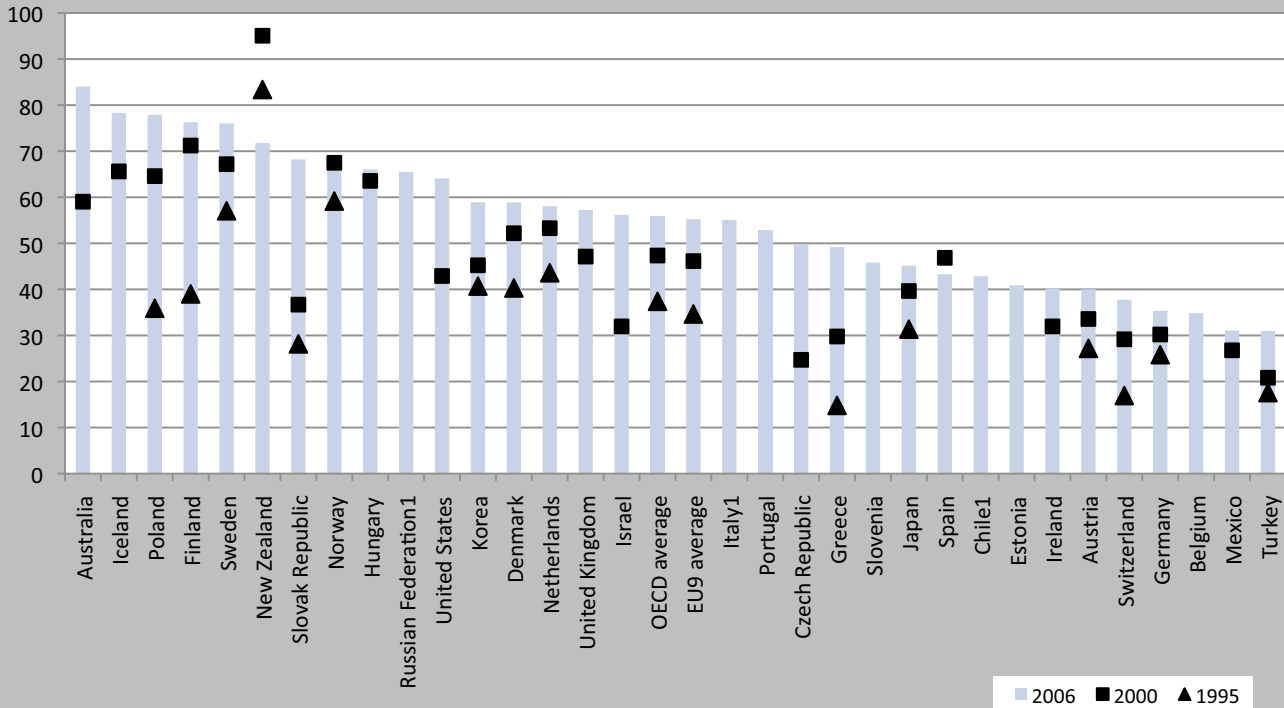
**Box 1: Percentage of People with High School or Equivalent Qualifications**



Source: *Education at a Glance: OECD Indicators*, 2008.

### Box 2: College Graduation Rates (1995, 2000, 2005)

Percentage of tertiary-type A graduates (defined as having sufficient qualifications for such programs as medicine, dentistry, or architecture) to the population at the typical age of graduation)



1. Entry rate for tertiary-type A programmes is calculated as gross entry rate in 2006. Countries are ranked in descending order of entry rates for tertiary-type A education in 2006. Source: OECD. Table A2.5. See Annex 3 for notes ([www.oecd.org/edu/eag2008](http://www.oecd.org/edu/eag2008)).

The changes in higher education have been all the more dramatic. **Korea, Spain, and Ireland** are three countries that have shown large increases in the number of people with higher education degrees. By contrast, **Germany**, with a strong tradition of higher education, has been unable to keep up. This expansion of secondary and higher education in many countries has resulted in a fundamental shift in the global skill supply.

What we see in developed countries is a change in skill distribution and demand, with fewer manual or routine cognitive jobs available as they move to developing countries. As the wage premium for tertiary over secondary education increases exponentially (about 23 percentage points between 1997 and 2003), the potential for growth is coming mostly from what Dr. Schleicher describes as “non-routine analytical” and “non-routine interactive jobs.” Those jobs require, in his estimation, risk-taking innovators and are tied to increasingly globalized contexts and changes in technology.

Improved education boosts economic growth by increasing labor productivity and technological progress. Within the OECD area, one extra year of formal education can raise economic output in the long term by 3 percent to 6 percent (OECD, 2005). Technological developments also play a key role in economic and social development, which interacts closely with educational progress, not just because tomorrow’s knowledge workers and innovators require high levels of education, but also because a highly educated workforce is a prerequisite for adopting new technologies throughout the economy, and thereby increasing total productivity. Now, it is **India and China** that are expanding their secondary and higher education systems and are able to offer moderate to high skill level jobs in the labor market at competitive rates. As a result, in a few years, “the global talent pool,” according to Dr. Schleicher, “will fundamentally shift across the world.”

## Are Our Schools Left Behind? The New Global Skill Set

Given this, the key drivers to growth in today's competitive global economy are access to knowledge and innovation. Yet, schools and educational systems have not yet really responded to the changes in the labor and skills market described above. Basic issues remain: schools are still teaching the same things the same ways. They convey knowledge and ask students to reproduce information. But this is not enough. The 21<sup>st</sup> century demands creativity to develop motivated and self-reliant citizens who are able to innovate.

Schools should focus on teaching students how to use what they have learned and apply their knowledge and skills in new settings. The emphasis of learning should be on providing students with a real-world scenario: finding a relevant mathematical or scientific model and then using relevant tools or evidence to solve the problem.

For example, OECD's Programme for International Student Assessment (PISA), which covered 87 percent of the world's economies, put an emphasis in 2006 on assessing science competencies, defined in terms of a student's scientific knowledge and the use of that knowledge to identify scientific issues, explain

In a few years, "the global talent pool will fundamentally shift across the world."

scientific phenomena, and draw evidence-based conclusions about science-related issues. Beyond that, students must demonstrate an understanding of science as a form of human knowledge and inquiry, and an awareness of how science and technology shape everyday environments.

Similarly, demonstrating mathematical competence is about considering a real situation or problem; understanding, structuring, and simplifying the situation to make it amenable to a

mathematical model; using relevant mathematical tools to solve the problem; taking the results and interpreting their significance. Learning in this way is more than simply mastering information; it's about expanding one's opportunities in life.

## What Produces Excellence and Equity?

Results from the 2006 administration of PISA show **Finland, Hong Kong, Japan, and Canada** at the top of international comparisons. But it is not simply that students in these countries are doing well on average – rather, Dr. Schleicher finds that students in these countries are able to benefit equitably from educational opportunities and excellence. Students at the top end of achievement are able to succeed anywhere. Those at the low end of the achievement spectrum are most affected by inequitable access to opportunities.

According to Dr. Schleicher's analyses, when socio-economic background is not strongly correlated to achievement, a country has attained a socially equitable distribution of learning opportunities. In **Finland**, for instance, there is a mere 4 percent of student performance variability between schools. Conversely, in the **United States** or in **Germany** one finds a great degree of variability in student performance between schools, indicating that students have unequal access to educational excellence.

Countries that have been able to achieve a high average performance on PISA while providing a socially equitable distribution of learning opportunities share certain defining features:

- **High ambitions and universal standards:** Set world-class standards and have a clear definition of academic excellence.
- **Access to best practice and quality professional development:** Ability to recruit the best teachers, retain them, and provide best practice and quality professional development.
- **Devolved responsibility:** The school as the center of action.

- **Accountability systems:** Accountability and intervention in inverse proportion to success.
- **Differentiated learning:** From prescribed forms of teaching and assessment toward personalized learning.
- **Integrated educational opportunities.**

A 2007 report by McKinsey Consultants identifies many of the same factors in the world's top-performing schools. Additionally, McKinsey found that great schools focused on selecting expert principals or headmasters and nurturing them as leaders. They were also quick to respond to failure – at the student, teacher, or school level – making sure that no one student, teacher, or school fell through the cracks. Finally, such systems provided universal early childhood

education programs and were committed to equitable and consistent funding of education.

Dr. Schleicher's analysis of worldwide systems set the stage for the following days of the Forum, which featured in-depth examinations of best practices in many countries.

**Presentations referenced in this section include:**

- *Andreas Schleicher*, Head of Indicators and Analysis, OECD
- *Hideaki Shibuya*, Professor, Tokyo Gakugei University (**Japan**)

**See [AsiaSociety.org/Education](http://AsiaSociety.org/Education) to download these presentations and this report.**

### **Box 3: Japan: An Educational System Responds to Change**

According to most measures, **Japan** has one of the strongest and most equitable educational systems. It has universal primary and secondary education and more than half of upper secondary graduates continue to higher education. On the Program for International Student Assessment (PISA), **Japan** is on average among the top five performers. Yet with one of the lowest fertility rates in the world, the Japanese are challenged by a shrinking population, a generation of youth that is increasingly disenfranchised and polarized, the prevalence of “freeters” (urban youth who hold part-time jobs and are unable to find a full-time permanent work), a growing immigrant population in a largely monolingual country, and a realization that they need to be more creative and innovative with science and technology to maintain their cutting-edge status. The Japanese government enacted a series of secondary school reforms designed to preserve the existing quality of education while tackling the challenges described above:

- **Increasing the variety and flexibility of secondary education:** Japanese secondary education students are offered three choices when they enter upper secondary school. They can enter a General Education course, a Specialized Education course that includes vocational education or other specialized courses, or a Comprehensive course that combines general and vocational programs. Beyond traditional schooling, students are able to take classes online through Try Net schools; attend Challenge School, which is specially developed for long-term absentees and dropouts; or go to Support School, an informal program to complete studies for an upper-secondary equivalency exam.
- **Linking schools, work, and community:** To encourage the connectivity between education, work, and community life, students can elect to participate in a Dual System program, which is a combination of school education and vocational training; a traditional internship which is less vocational training and more work experience; or perform volunteer work in the community.
- **Expanding opportunities for excellence:** Finally, to remain competitive in a world where innovation and excellence in science, language, and technology are paramount, Japan has developed Super Science High Schools, Super English Language High Schools, and a program focused on information and communications technology education.

*Source: Hideaki Shibuya. How School Reforms Promote New Skills in Japan. Presentation available: [AsiaSociety.org/Education](http://AsiaSociety.org/Education)*



# Secondary Education in India: Achievements and Challenges

The impressive economic growth rates in India in recent years have been accompanied by progress in educational indicators at all levels of education. There has been a surge in enrollment, retention, and graduation rates of primary school children, partly as a result of concerted government efforts such as Sarva Shiksha Abhiyan (SSA), a large government-sponsored effort toward Education for All. The push created by programs such as SSA mean that large numbers of students will graduate from primary school and create a surge in demand for secondary education. On the other end of the spectrum, a rapidly growing economy has increased household and labor market demand for high school and college graduates, creating a pull effect. The net effect is a tremendous pressure on the secondary education system to provide access to quality education for large numbers of children.

This section provides background and context to inform and ground the discussion in the remainder of the report. It covers essential questions as **India** moves to expand its secondary education system: Is the system equipped to deal with expansion? How equitable are opportunities for education? What are students learning, and how well are they learning? Is there consistent and equitable funding for secondary education? And, finally, is the system well-managed and held accountable for the quality of learning outcomes?

### Structure of Indian Education System

Subhash Khuntia, Joint Secretary, Department of School Education and Literacy, Ministry of Human Resource Development, described the structure of and challenges to secondary education in India and outlined the government's plan for expansion.

The education system in **India** follows an 8 + 2 + 2 + 3 pattern: eight years of elementary education, two years of lower secondary schooling, two years of upper secondary schooling, and three years of university education. There are, however, some differences by state in the number of grades that constitute elementary and secondary education, which can pose a challenge for the development of a coherent curriculum across educational levels

and states. In most states the first ten years of schooling are expected to provide general education without differentiation, while upper secondary education is directed toward university preparation by tracking students in arts, science, and commerce streams.

### Access and Equity

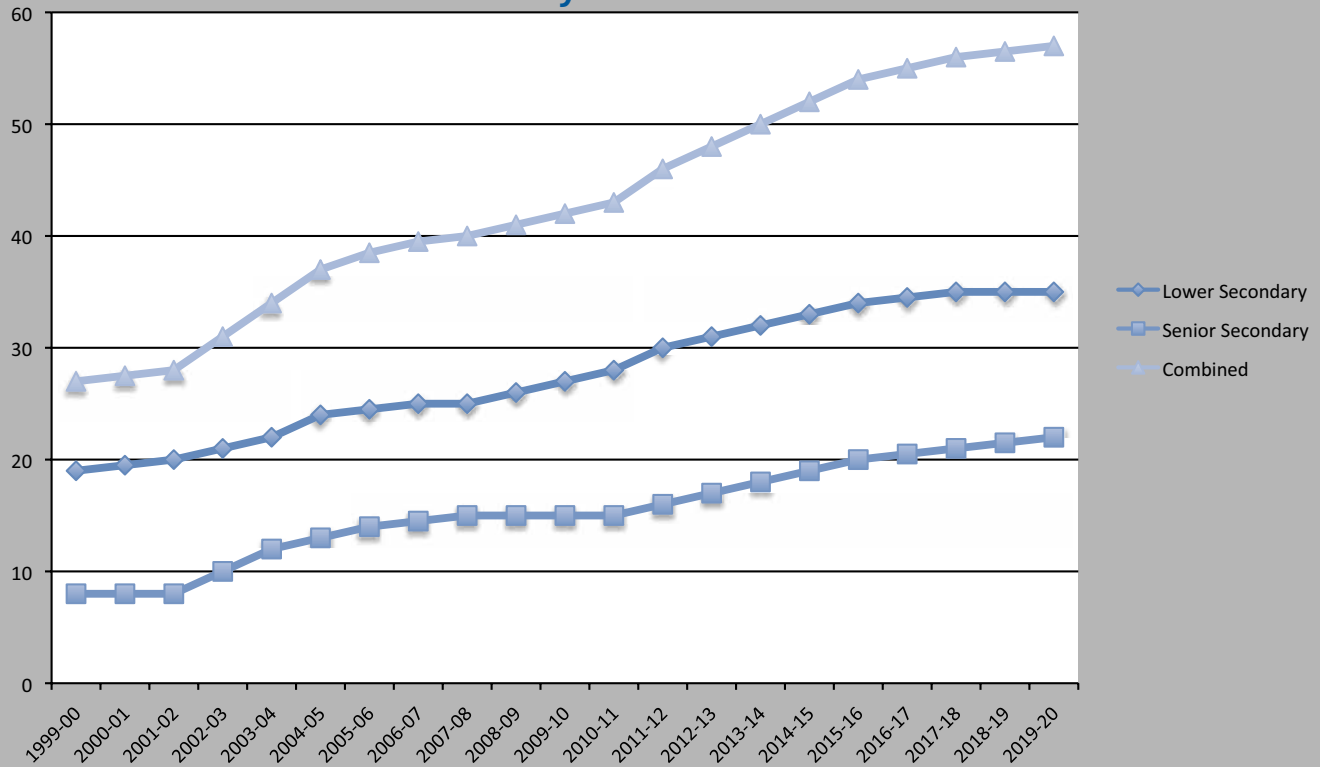
The latest numbers from the Ministry of Human Resource Development place the gross enrollment rate at the lower secondary level (9<sup>th</sup> and 10<sup>th</sup> grades) at 65 percent (24.3 million) and at the upper secondary level (11<sup>th</sup> and 12<sup>th</sup> grades) at 35 percent (12.7 million). Averaging the two gives a combined enrollment for secondary school of 40 percent – about half the rate of most Latin American and East Asian countries.

Participation in schooling is dependent on both demand for and availability of schooling. Secondary education has grown slowly over the past twenty years; it is largely dependent on the growth of elementary education. And the increase in the number of secondary schools over the last two decades has occurred primarily among private unaided schools and not in government schools or private aided schools.<sup>1</sup>

As cited by Kingdon (2007), the Seventh All **India** Education Survey in 2002 found that there were only one-fifth as many secondary schools as primary schools. Despite such constraints, in 2008 gross enrollments are estimated at 40 million, with an average growth in enrollment of 3 percent (World Bank, 2008). Conservative estimates by the World Bank indicate that these numbers will increase at least 17 million by 2017, if not more, given the numbers of children expected to graduate from primary school due to Sarva Shiksha Abhiyan and the growing awareness of the value of secondary education (see Box 4).

<sup>1</sup> Aided schools are a form of public-private partnership, unaided schools do not receive any government funding and rely strictly on household financing, recognized schools offer official transcripts and diplomas, while unrecognized private schools are considered illegal by MHRD and function in the private market.

### Box 4: Actual and Projected Demand for Secondary Education in India



Source: Carlson, Sam. Access, Equity, Quality, and Financing. Presentation available: [AsiaSociety.org/Education](http://AsiaSociety.org/Education)

However, access to secondary education in **India** continues to be fairly inequitable, especially across income groups, gender, social groups, geography, and states. According to Kingdon, the income inequality (measured as the difference in access to secondary education among those in the top and bottom quintiles of the distribution of household per capita income) is greatest in Haryana, Andhra Pradesh, Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh, and lowest in Kerala and West Bengal. In regard to variation in gender, Kingdon found that states such as Bihar and Rajasthan have huge inequities: girls are half as likely to enroll in secondary school as boys. But some states such as Kerala and Tamil Nadu have gender parity or even slightly pro-female secondary enrollment rates.

In response to concerns about access to secondary education, the Ministry of Human Resource Development plans a massive expansion of secondary education as part of the government’s 11<sup>th</sup> Five-Year Plan (2007–2012) similar to Sarva Shiksha Abhiyan. A centrally

sponsored initiative, the Scheme for Universalization of Access to and Improvement of Quality of Secondary Education (SUCCESS), is described in the 11<sup>th</sup> Five-Year plan as providing a lower secondary school within 5 kilometers of every child, and a higher secondary school within 7–10 kilometers. The plan also includes: expanding the capacity of existing schools, upgrading higher primary schools to secondary level, improving teacher training, strengthening teaching-learning materials, expanding facilities for open distance learning, and stepping up the allocation to secondary education from 0.9 percent of GDP to 1.5 percent of GDP.

While the target for enrollment is 65 percent (up from 39.9 percent in 2004–2005) for classes 9 through 12, an enrollment target of above 75 percent has been established for classes 9 through 10. Special efforts will be made to address inequities in access for the rural poor with additional attention toward Scheduled Caste/Scheduled Tribes and other minority

groups. There will also be substantial efforts to harness and strengthen public-private partnership at the state government level. The ultimate goal and vision is to universalize secondary education by 2017, the end of the 12<sup>th</sup> Five-Year Plan.

### Quality and Efficiency

It is difficult to determine the quality of the Indian secondary education system. While recent large-scale learning assessments at the secondary level do not exist, some small-scale standardized assessments of student achievement in mathematics at the lower and upper secondary levels in two states suggest that the quality of instruction and learning in many schools in **India** is low (World Bank). Moreover, because each Indian state examination board sets its own curricula and examinations, there are no national data based on common standardized achievement tests in **India**. And with three national board exams and 38 state board exams at the secondary level, inter-state comparison is rendered meaningless since curricula, exam papers, and learning standards differ from state to state.

However, according to Subhash Khuntia, there have been recent efforts to address this challenge. The National Curriculum Framework of 2005, developed by the National Council of Education Research and Training, provides a basic curriculum, standards, and textbooks for secondary education across the country, while giving the states flexibility to determine their curricula and examination content within certain parameters. The National Curriculum Framework attempts to trim the overloaded curriculum in **India**'s schools and to shift the pedagogic focus from rote memorization to conceptual understanding and real-life application.

Recently, the World Bank (2008) administered a sample of TIMSS (Trends in International Mathematics and Science Study – an international comparison test of student achievement in science and math) questions to secondary school students

in Rajasthan and Orissa. Findings show an average score of 34 percent and 37 percent for students in Rajasthan and Orissa, respectively, while the international average was 52 percent for Grade 8 students. For Grade 12 students, the international mean was 57 percent, but students in Orissa had an average of 38 percent; those in Rajasthan scored 44 percent. On the whole, **India** ranked 44 of 51 countries, suggesting that both the quality of education itself and the assessment of the quality need careful attention.

The ultimate goal and  
vision is to universalize  
secondary education by  
2017.

There are challenges, too, with the quality of teaching in Indian secondary schools. Lower secondary school teachers are required to have a bachelor's degree in addition to completing teacher training. For 11<sup>th</sup> and

12<sup>th</sup> grades, teachers are required to complete additional post-graduate training. Despite these requirements, the quality of teaching varies considerably across the country. Specifically, teacher training or pre-service education and in-service professional development opportunities suffer from poor standards, weak monitoring, outdated pedagogical approaches, and inadequate resources. Additionally, such training is often disconnected from the reality of classroom situations. Less hard data exist about teacher accountability in secondary schools as measured by indicators such as teacher attendance, classroom instructional time, and continuous assessments of students. There have been considerable improvements to the quality of primary education teachers by increasing community oversight of school performance (including teacher absenteeism) and decentralizing teacher recruitment (addressed in more detail in the following section), but such reforms have yet to take place in the secondary education realm.

### Governance and Management

There are 152,000 secondary schools in the country; about two-thirds are lower secondary and one-third is upper secondary. In contrast to primary education, the management of secondary

## The biggest challenge is that of teacher recruitment.

education is left mostly to the states, with relatively limited involvement by central, local, or community authorities.

Multiple management models exist at the state level, including various types of public-private partnerships, large government school systems, and a proliferation of private aided, private unaided schools, and private unrecognized schools. Aided schools are a form of public-private partnership; unaided schools do not receive any government funding and rely strictly on household financing; recognized schools offer official transcripts and diplomas; and unrecognized private schools are considered illegal and function in the private market. As a result of this diversity, there is no best practice governance approach that will work for all states.

While the proportion of government schools has declined from close to 50 percent in 1993–1994 to 40 percent in 2004–2005, private unaided schools have correspondingly doubled their numbers from 15 percent to 30 percent. Particularly in urban areas, such schools account for the majority of the overall increase in secondary enrollments. For example, between 1993 and 2002, 72 percent of the total increase in lower secondary enrollments in urban areas was provided through unaided private schooling (Kingdon 2007).

Private aided schools, on the other hand, are a form of public-private partnership. According to the World Bank, these schools provide 30 percent of country-wide secondary enrollment, but this figure is much higher in some states, including Kerala, Maharashtra, Assam, West Bengal, and Gujarat, where private aided enrollments are higher than 50 percent.

At the management level, the biggest challenge is that of teacher recruitment. Common problems are the highly centralized hiring process, a shortage of qualified candidates, and a high frequency of court cases arising from disputes on selection. Teachers are recruited through their state government to a common cadre (rather than to a school) after which they are assigned to schools, with little input from the principal, community, or local authority. There continues to be a shortfall in qualified candidates for secondary schools, especially in rural locations. An additional recent challenge is recruiting and retaining quality teachers because of alternative opportunities in the private sector. Candidates that might have earlier joined the teaching ranks after obtaining their bachelor's degrees are finding higher paying jobs elsewhere. And disputes with the selection process, which are often based on reservations for Scheduled Caste/Scheduled Tribe and other minorities, have resulted in many on-going court cases.

### Financing

*“Our Government is committed to investing more, much more, in education. ... The Eleventh Five-Year Plan is in fact a National Education Plan. The Plan allocation for education has been stepped up, from 7.7 percent of gross budgetary support for the Plan in the 10th Plan, to over 19 percent in the 11th Plan. In nominal terms there is going to be a five-fold increase in spending on education in the Eleventh Plan. This is an unprecedented increase in financial support for education in India.”*

– Manmohan Singh, Prime Minister of **India**  
January 3, 2008

While outlays to education have increased and, as Dr. Singh promises above, will continue to do so, the race to universalize primary education and to drive excellence in the much-lauded higher education institutions (such as the Indian Institutes for Technology and Indian Institutes for Management), have meant that spending on secondary education as a total percentage of expenditure has not necessarily been a priority. According to the World Bank, (2008), secondary education currently accounts for less than one-third of **India's** total public spending on education, which is equivalent in absolute terms

to about U.S.\$7.2 billion per year. About 75 percent of public spending on secondary education comes from the states, which spend less than 1 percent of their per capita incomes.

In his opening speech at the Forum, Dr. Montek Singh Ahluwalia, Deputy Chairman of the Planning Commission, argued that an increased investment in education, including secondary education, was absolutely vital in order to provide opportunities for more Indians to compete in the knowledge economy. He added that while the focus to date had mostly been on expanding the base of the pyramid with large outlays in primary education and on the top of the pyramid with investments in tertiary education, the time had come to ensure that all Indians had the opportunity to attend secondary school. A continuum of effort is necessary to strengthen primary education, improve quality, ensure entry into and completion of secondary school, and finally, increase the numbers of students that enroll in tertiary education. For this to take place, Dr. Ahluwalia said, total expenditure on education will have to increase from 3.7 percent to at least 6 percent of GDP, which given **India's** high growth rate, translates to a massive expansion.

### World Bank Proposals

According to Sam Carlson of the World Bank and Michael Ward of the United Kingdom Department for International Development (DfID), what **India** needs is to develop a secondary education system that:

- Responds to the country's diverse socioeconomic needs and capabilities
- Is able to meet increased and diversified demand for knowledge workers by expanding access to secondary education
- Is able to retain enrolled students in secondary education
- Helps students graduate with the knowledge and skills needed to exercise their choices beyond secondary education.

They provided a series of recommendations to the Forum based, in part, on an extensive report on secondary education prepared by the World Bank with the support of the Ministry of Human Resource Development and the Department of

Total expenditure on education will have to increase from 3.7 percent to at least 6 percent of GDP... a massive expansion.

Economic Affairs of the Ministry of Finance. Their recommendations for improving the quality of secondary education include:

- **Provide incentives to states to align their curriculum with the 2005 National Curriculum Framework.** It is necessary to establish one set of national standards in each of the core subjects to facilitate the setting of academic goals that teachers and students can strive for, and against which teachers, administrators, and ultimately schools can be held accountable.
- **Improve teacher training and professional development.** The government needs to invest heavily in revamping both in-service and pre-service training programs to prepare teachers for the challenges they face in classrooms, provide support to new teachers, and improve the teaching and learning resources of teacher training institutions.
- **Develop and implement mechanisms to enhance teacher accountability.** Teacher performance standards should be defined clearly and linked with academic and behavioral standards for student performance as well as with schools' standards.
- **Eliminate textbook monopolies.** Textbook development is often a monopoly of state or central institutions, leaving government schools and teachers without a choice and private publishers outside the market. As a result there is no incentive to improve their quality.
- **Invest in information and communications technology (ICT) to give students greater control of their**

**learning while maintaining a focus on improving pedagogy in the classroom.**

The lack of ICT in classrooms limits teachers' abilities to upgrade their subject-matter knowledge and improve teaching methods in the classroom, and blocks students' access to essential learning materials. It also hinders the development of ICT skills and behaviors youth need to compete and succeed in the global knowledge economy.

- **Consider eliminating high-stakes Grade 10 examinations, or at least provide an “opt-out” alternative.** Provide school leavers with a certificate and allow an examination for the tracking of high achieving students.
- **Administer samples-based national achievement survey.** Follow the example of China, and pilot the use of PISA as a technical assistance and benchmarking tool to allow comparisons to international standards.
- **Develop alternative public-private partnership funding models, such as Private Finance Initiatives, to finance improvements in the secondary education sector.** With central funding, pilot alternatives at the state level to the current system, so that financing follows the student and not the teacher.

**Presentations referenced in this section include:**

- Sam Carlson, Lead Education Specialist, World Bank (**India**)
- Subhash Khuntia, Joint Secretary of Education, Ministry of Human Resource Development (**India**)
- Montek Singh Ahluwalia, Deputy Chairman, The Planning Commission (**India**)
- Michael Ward, U.K. Department for International Development (**United Kingdom**)

**See [AsiaSociety.org/Education](http://AsiaSociety.org/Education) to download these presentations and this report.**

# Strategies for Expanding Access to Secondary Education



Despite great strides in the expansion of primary education around the world, access to quality secondary education still faces considerable barriers. With human capital becoming an increasingly important contributor to economic growth, the pressure is mounting to strengthen both the availability and quality of secondary schooling. Moreover, many developing countries are realizing that vast numbers of students who complete primary school are unable to enter or complete a secondary education due to lack of access, lack of resources, or poor quality of education.

To harness and leverage these resources requires not only building more schools or training more teachers, but rethinking the fundamental structures, curricula, and incentive systems to prepare global citizens who are able to contribute productively in the 21<sup>st</sup> century. In the words of one participant, “The real challenge in education is how to deal with both equity and excellence simultaneously.”

Developed nations face another challenge associated with accessing secondary education. The factory model of schooling that was once able to provide a large number of workers the requisite skills for a lifetime of work has been rendered obsolete. Such a system did not focus on turning out substantial numbers of thinkers and leaders, but rather was composed of institutions of higher learning that catered to a privileged minority that filled those positions easily.

The situation today is vastly different. The changing nature of jobs in the **United States** means that all students must graduate from high school and a premium is being placed on graduates who are creative problem-solvers, able to function in the new global context, and adapt to several new jobs in their lifetimes. Students today are looking for engagement, challenge, motivation, and inspiration and find that their high school programs are deficient.

The presentations in this section provide powerful examples of three countries at different points along a continuum. **China**, **Korea**, and the **United States** are countries where a secondary

education is the norm rather than the exception. (Enrollment rates vary from 66 percent for upper secondary education in **China** to a 95 percent rate of participation in the **United States** to close to 100 percent enrollment in **Korea**.) They are also countries where growing numbers of youth are choosing to attend institutions of higher education, be they technical colleges, colleges, or universities. Yet their circumstances, challenges, and efforts to deal with those challenges are highly informative, especially in light of **India**'s ongoing efforts to expand access to quality secondary education.

In **India**, central and state governments have undertaken a tremendous effort to universalize primary education: Sarva Shiksha Abhiyan. Ujwal Thakar, then Chief Executive Officer of Pratham **India** Education Initiative, a leading nongovernmental organization, opened this session of the Forum by saying that the upsurge in enrollments will have a huge impact on the demand for secondary education.

While secondary enrollment has increased steadily over the past twenty years, it remains comparatively low: Gross Enrollment Rate (GER) was estimated at 40 percent in 2004–2005. But this is slated to change dramatically. Conservative projections by the World Bank suggest an increase in absolute demand for secondary education of around 17 million students a year for the next 10 years (2008). As discussed in the previous section, this is accompanied by challenges of equity across income groups, gender, social groups, and geography as well as enormous challenges of student retention, school infrastructure, teacher training and recruitment, quality of learning, management, and financing.

## **China**

Like **India**, there has been a dramatic expansion at all levels of education in **China**, according to Dr. Yang Jin, Senior Programme Specialist at the UNESCO Institute for Lifelong Learning. In 2007, **China** had an enrollment rate of 99.5 percent at the primary level, 98 percent in lower secondary, and 66 percent at the upper secondary level. At the university level, enrollment has

jumped from 10 percent to 23 percent in the past 10 years.

The strategies that the Chinese government has employed to attract, retain, and graduate students from lower secondary school, while simultaneously addressing the needs of their burgeoning economy are an example of a supreme juggling act. The pieces of the puzzle appear to fit together in a mosaic that reflects the priorities and values of a changing **China**, one that focuses on access and equity without forsaking a focus on educational relevance and, ultimately on quality and accountability.

China has an enrollment rate of 99.5 percent at the primary level, 98 percent in lower secondary.

Dr. Yang outlined four major strategies that have had profound effects on expanding access to secondary education in **China**:

1. **Ensure that all children complete nine years of compulsory education.** Since 1986, when the government enacted a law to ensure that all children complete at least nine years of education (from ages 6 to 14), there has been an intensified focus on providing access to primary and lower secondary education for all children. At the end of 2007, some 2,817 (out of 2,860) localities at the county level had achieved the goal of nine-year compulsory education.
2. **Accelerate the expansion of upper secondary education to meet emerging social demands.** As a result of the establishment of compulsory education and a rapid expansion of higher education, there has been a huge social demand for upper secondary education. According to **China's** 11th Five-Year Plan of Education, in 2010 the gross enrollment ratio of upper secondary education will

reach 80 percent (the gross enrollment rate in 2007 was 66 percent).

3. **Strike a balance between general and vocational education at the upper secondary level.** While it has been a government priority since 1985 to balance recruits into vocational and general education, this has received an additional push as a result of rapid industrialization and development of manufacturing sectors.
4. **Enhance the overall quality of secondary education.** There continues to be a focus on improving the quality of teaching and learning, and promoting excellence for all.

Each strategy comprises several innovative initiatives that work together to expand access to secondary education. To ensure that all children are completing compulsory education, the Chinese government has invested 10 billion RMB since 2004 to establish 7,700 lower secondary boarding schools in rural parts of the western region. In 2007, this project received another 10 billion RMB for construction in the central region of **China**. In addition, a unique cost-sharing partnership between central and local governments has resulted in the elimination of fees, free textbooks for rural students, and subsidized school meals for low-income students.

The large expansion in compulsory education has pushed the Chinese government to think of new ways to meet the growing demand for upper secondary education (enrollment rates have jumped from 41 percent in 2000 to 66 percent in 2007) including encouraging the establishment of private schools. From 1995 to 2005, the number of private general upper secondary schools has increased from 375 to 3,175. **China** has also developed a multi-channel funding mechanism for general upper secondary education whereby schools receive money from the central government for tuition, an education levy, and a variety of other funds.

While it has always been the government policy to balance recruitment into general and vocational education, the realities of rapid industrialization

and a booming manufacturing sector have led the Chinese government to invest heavily in vocational upper secondary education, in particular to increase both access and quality. From 2006–2010, the national government will invest 10 billion RMB in supporting the establishment of county-level vocational schools, model vocational schools, and vocational colleges. Additionally, from 2007 the government will provide a 1,500 RMB grant per year to every rural student enrolling in vocational upper secondary education programs to offset living expenses and tuition fees.

In addition to these significant efforts to improve access and remove inequities in the existing system, the Chinese government continues to address qualitative improvements in secondary education. First and foremost is the implementation, since 2005, of curricular reform that emphasizes project-based enquiry, hands-on learning, and flexibility at the local and school levels. There has also been an investment of 10 billion RMB in 2004–2007 to strengthen distance education programs in rural primary and secondary schools. This includes distance teaching sites and facilities for distance education programs and networked computer classrooms.

The Chinese government is also setting up a national monitoring and evaluation system, which will build in several evaluations including working with multilateral organizations such as the World Bank and various UN agencies.

In an effort to benchmark learning against other developed and developing countries, **China** is also in the process of piloting OECD's Programme for International Student Assessment (PISA) with a sample of data from 15-year-olds drawn from several provinces. The results, it is hoped, will better alert the government to weaknesses to address to improve student achievement.

### **Korea**

In **Korea**, by contrast, primary and secondary enrollment rates have been near universal since

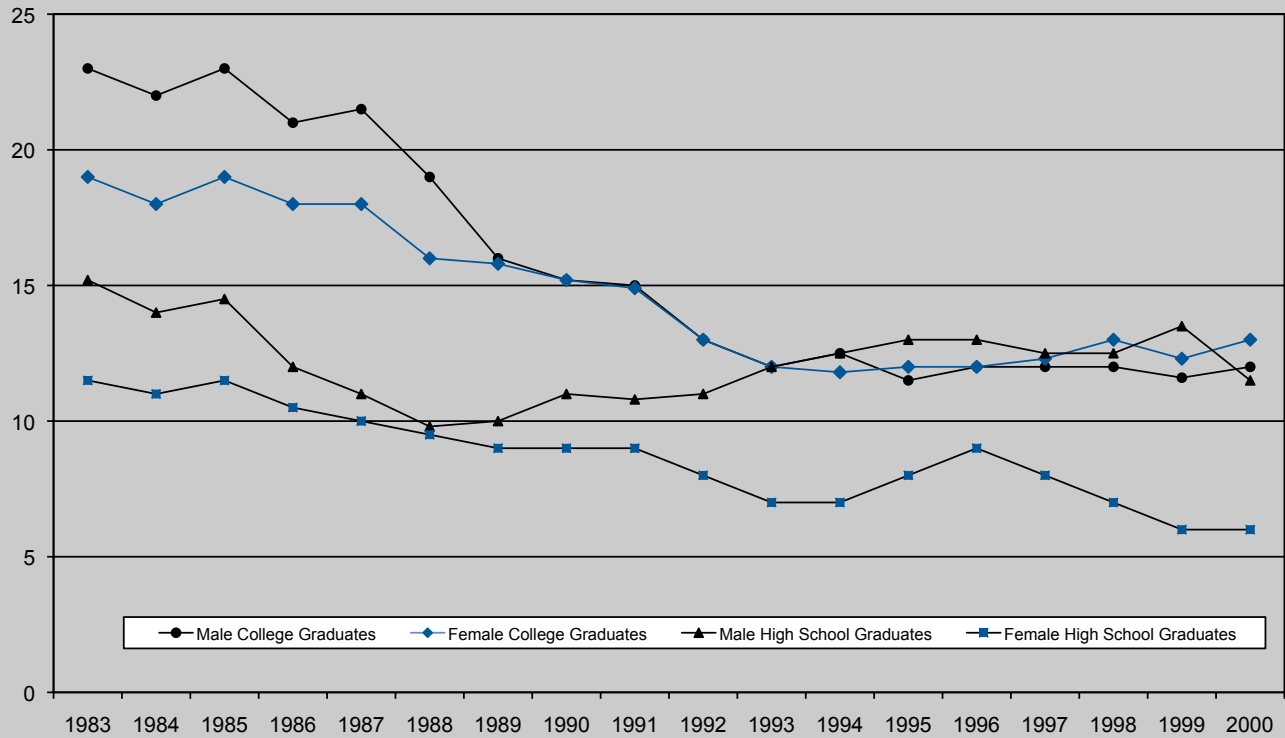
about 1990. According to figures presented by Dr. SooBong Uh from the **Korea** University of Technology and Education, 86 percent of young Koreans enroll in higher education programs. Koreans are also high achievers: they have the highest rank in reading performance, the second-highest in mathematics, and fifth-highest in science on the international PISA assessments. There was an unprecedented increase in primary and secondary education from around 1975 to 1990 when the country also grew at a rapid rate. A commensurate growth in tertiary education took place thereafter and continues to date. This expansion can be explained by a number of convergent factors: cultural and historical reasons, economic growth, value placed on education, and government policies that promote educational achievement.

To begin, a long tradition of Confucianism has established a society in which the scholar sits at the top of the social hierarchy and the attainment of knowledge is considered a priority. The educated man or woman in **Korea**, thus, is highly respected. However, even ordinary Koreans could enjoy the respect and privileges of this highest class by passing the Kwageo (a rigorous civil service examination that pays little heed to consanguinity and political ties) to become civil servants. This democratization of talent has put great stock in the power of education to transform lives.

“It is wiser for young people to invest their money in education than to keep it in the bank.”

Alongside this, a national drive against Japanese occupation from 1910 to 1945 placed a lot of emphasis on the importance of economic self-reliance and national cultivation through education. This resulted in the establishment of approximately 3,000 private schools across the nation, which bolstered the Korean education system. Last, but certainly not least, the devastating Korean War left the country bereft of any social, physical, and economic capital. The recovery process was done on **Korea's** own terms and through hard work.

**Box 5: Rate of Return on Educational Investment:  
By Gender and Schooling**



Source: Estimation based on Statistical Survey on Wage Frame, Ministry of Labor, Korea. Presentation by Soobong Uh. Available: AsiaSociety.org/Education

The dramatic growth of the Korean economy has also contributed significantly to the value that Koreans place on higher education. In the past twenty-five years, the country has realized an extraordinarily high rate of return from education investment, hovering around 10 percent (see Box 5). As Dr. Uh said, “It is wiser for young people to invest their money in education than to keep it in the bank.”

Secondarily, there is a large and growing wage premium attached to obtaining a higher education in **Korea**. In 2007, for instance, college graduates earn up to 2.5 times more than their colleagues with a junior high school degree. With the rapid industrialization of the country, **Korea’s** labor market is highly segmented along educational background. As such, obtaining higher education is seen as essential to enter the primary labor market. Partially as a result of this relationship, in addition to the tradition of Confucianism, education is associated with positions of power

and influence: graduates from ten major universities have almost three-fourths of the high-ranking government positions.

The government also shows a consistent commitment to investing in education: The Ministry of Education has a budget of US\$29 billion, six times what it was in 1990. This accounts for about 20 percent of the central government expenditure. Koreans, as well, are willing to spend on education. The Korean government spends 3.4 percent of GDP on formal schooling; when taking private and informal schooling into account the amount nears 10 percent. Teachers are seen as a key part of that investment: Dr. Uh cited OECD statistics that place **Korea** 10<sup>th</sup> in rankings of entering teacher salaries. After fifteen years of service, Korean teachers move up to third place, demonstrating that the investment grows significantly over time.

## United States

The **United States**, by contrast, is grappling with a different challenge. Despite having universal access to education, universal graduation rates have not been met. As Dr. Lois Adams-Rodgers, Deputy Executive Director at the Council of Chief State School Officers said, “We have taken for granted the access we have had for education. For many students, school [today] is seen as something to get through as opposed something that can take you further.” Dr. Adams-Rodger’s presentation provided historical context by highlighting some of the key legislation that drove secondary education expansion in the 20<sup>th</sup> century, and then moved on to address the biggest challenge of the 21<sup>st</sup> century: innovative strategies to prevent students from dropping out of high school.

Beginning with the GI Bill in 1944, which encouraged more and different kinds of people to attend university and as a result changed secondary school student expectations about their futures, to the Elementary and Secondary Education Act of 1965, which extended the federal government’s involvement to elementary and secondary education, to the Education for All Act of 1975, which guaranteed education to all students, regardless of any disability, the U.S. government has taken an active role in ensuring that all Americans, given their diverse backgrounds, have both the opportunity and the right to receive a free publicly funded secondary education. As a result, Dr. Adams-Rodgers reported that 95 percent of students between the ages 14 and 17 participated in compulsory education in 2006. It also was reported in that year that 85 percent of adults in the **United States** have high school diplomas or an equivalent. However, it does appear that only 70 percent of students complete secondary school. Of the 30 percent of non-completers, some take more than the requisite four years to complete high school; others seek alternative paths to complete schooling, but the vast majority drop out. This is the challenge the **United States** grapples with as it enters the 21<sup>st</sup> century – making education a valuable commodity for students while providing them the necessary skills and education required to participate and succeed

in today’s global economy. A 2006 study conducted by the Bill and Melinda Gates Foundation cites a number of powerful reasons for the high drop-out rate: uninteresting classes, low expectations, flagging motivation, lack of family support, or lack of adequate preparation entering secondary school.

Dropouts cost the **United States** a great deal of money. According to a report cited by Dr. Adams-Rodgers, average costs per student dropout are \$139,000 in reduced taxes, \$40,500 in public health expenditures, and \$26,600 in criminal activity. But beyond the fiscal costs, there is the realization that schools in the **United States** need to do a better job reaching these students, and this needs to happen well in advance of secondary school. Some potential strategies include:

- Educators need to focus on helping students succeed while maintaining high expectations.
- Students need adequate preparation for the rigors of high school.
- Schools need to be more relevant and engaging.
- Educational supports for student learning need to be more accessible.
- A school climate of personal accountability and academic excellence must exist.
- Communications between schools and families must improve.

These strategies are important to consider as ways of reducing the drop-out rate and more broadly as guides for improving the quality of education for all students.

States bear the primary responsibility for elementary and secondary education in the **United States** and every state is working to reduce drop-outs and improve high school quality. For example, Oregon is working to develop policies to improve academic requirements in low-performing schools and to make learning more personal. Schools in Arkansas have raised standards and provide higher expectations for all students in preparation for

college. Indiana allows dropouts who are 17 and older to obtain a high school diploma through coursework at a college or university if they pass the state exit exam. Ohio is targeting boys at high risk – each one gets a “personal motivator” who works with him and engages with his family.

### **Advanced Placement Program (AP)**

One powerful way to reach students, to help them be successful while not only maintaining high standards, but also preparing them for the rigors of higher education is through the Advanced Placement (AP) Program. The AP Program enables secondary school students to take college-level courses and exams, and earn college credit or placement while in school.

Gaston Caperton, President of the College Board, which developed and administers the program, said that participation in the AP Program is a sure-fire way to “deal with both equity and excellence” in education. As such, the College Board is committed to the idea that all students deserve opportunities to participate in rigorous and academically challenging programs and courses. By “democratizing” enrollment in the program by administering the PSAT exam in 9<sup>th</sup> and 10<sup>th</sup> grades, taking AP classes is no longer dependent on teachers nominating their best students, but is based on student performance on a standardized test.

As a direct result, in Florida for example, the numbers of Hispanic students in the program has more than doubled, and the number of African Americans has tripled. Moreover, widespread research confirms that students who score well on their AP exams are more likely to graduate from college in five years or fewer; students who use AP exams to place out of introductory courses are more likely to pursue higher level course study in their exam discipline; and performance on the AP exam is a valid predictor of college success.

Through its work on the AP Program, the College Board has realized that more must be done to prepare students for success. As a result, the College Board has developed a Springboard Program that prepares students from the 6<sup>th</sup> grade

on for success in the AP Program, and as such has created a system of college success.

### **Common Themes and Recommendations**

- Secondary school graduation is becoming an essential prerequisite to a job in the global knowledge economy.
- Certain countries have shown that it is possible to significantly increase secondary school graduation rates by combining a focus on access with qualitative improvements to student learning and achievement.
- More effort needs to be made in preparing and supporting students before they reach secondary school to ensure success there.
- The development of strong technical and vocational education programs should go alongside a general secondary education program.
- Considerations need to be made to restructuring secondary education so that it prepares students not only for the labor market but as leaders, thinkers, and global citizens.

### **Presentations referenced in this section include:**

- Lois Adams-Rodgers, Deputy Executive Director, Council of Chief State School Officers (**United States**)
- Gaston Caperton, President, College Board (**United States**)
- Yang Jin, Senior Programme Specialist, UNESCO Institute for Lifelong Learning (**China**)
- SooBong Uh, Professor, Korea National University of Technology Education (**Korea**)

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# Modernizing Curriculum, Instruction, and Assessment

A secondary education is meant to adequately prepare youth to continue on to higher education or join the workforce, and at the very heart of it all is curricula, instruction, and assessment. Since excellence in mathematics and science is seen as integral to meeting the needs of a global economy in the 21<sup>st</sup> century, the Forum focused on international experiences in modernizing these curriculum areas. To really thrive in a global context, students need to build skills that involve expert thinking and complex communication. Across the world, as countries place a greater premium on fostering innovation, there is a growing emphasis on building skills in numeracy and scientific questioning.

**India** has a unique challenge in responding to these growing demands. It has a diverse federal system with 41 boards of education at the secondary level (three at the central and 38 at the state level) that formulate curricula, supervise affiliated institutions, and develop and conduct examinations. As a result it is hard to compare learning outcomes across the country. As is the case in many developing countries, the secondary curriculum in **India** is driven by high-stakes examinations and is mired in factual regurgitation and decontextualized knowledge removed from social and economic realities.

The National Curriculum Framework, developed in 2005 through a broad participatory approach, is an attempt to deal with some of these challenges. It provides curriculum guidelines for elementary and secondary education while leaving the exact determination of curricula and examination content up to the states. The goals of the new framework are to lighten the overloaded curriculum in schools and align them with student reality outside school; shift emphasis from memorization to higher order thinking, synthesis, and application of knowledge; move away from textbook-heavy learning; and make examinations more flexible and perhaps more integrated with classroom life. Unfortunately, implementation has been very uneven across states, and as suggested in an earlier section, it would be useful to provide states with incentives to align their curricula and examinations to the Framework.

Using **China, Singapore, the United States, and Australia** as case studies, the presentations in this section covered best practices in reforming math and science curriculum and assessment, innovating instructional practices, and modernizing learning materials. Dr. Krishna Kumar, Director of the National Council of Educational Research and Training, who chaired the session, raised several key questions:

- What are the goals and motivation for curriculum reform?
- What are effective modalities of curriculum reform? In highly decentralized systems such as the United States, reform emerges in a highly dispersed manner. China and Singapore, meanwhile, are both highly centralized, so curriculum reform takes a different shape.
- What is the role of science and mathematics in a child's development, and how does that affect the way children are taught in the classroom?
- What is the relationship of what is being taught, the content and the pedagogy of learning, and how one measures excellence in learning?

Each country has unique experiences in these areas, but some common threads do emerge: science and mathematics are, and will continue to be, a source of anxiety and keen interest for both pedagogical planning and educational reforms. As countries rethink the teaching of science and mathematics, there is an emerging focus on the importance of conceptual knowledge and application, development of skills and processes, the ability to problem-solve, and the practice of inquiry in science. Secondly, as learning and curricula shift focus, so too do assessment practices. Indeed, it remains crucial to think about the responsiveness of an assessment system to changes in how and what is being taught.

### **United States**

How standards for learning or curricula for mathematics and science are developed vary from country to country. Dr. Joan Ferrini-Mundy, Director of the Division of Research on Learning in Formal and Informal Settings at the National



Science Foundation, explained that in the **United States**, unlike **China** and **Singapore**, there is no central or nationally developed curriculum, the responsibility for curriculum standards falls largely on the 50 states. However, partly as a result of the No Child Left Behind legislation of 2002, all states are required to have grade-level curriculum standards.

Additionally, there has been a tradition of professional societies or organizations developing standards documents that describe what students should know and be able to do. The National Council of Teachers of Mathematics, for instance, has developed several iterations of a document that addresses curriculum, standards, and assessment in mathematics, reflecting their changing understanding of what mathematics curriculum and instruction should look like.

What you see in the **United States** is a shift from mathematical drills and simple arithmetic to more complex problem-solving. In the 1990s, for instance, there was a push by the National Council of Teachers of Mathematics to reform a curriculum that relied on “shopkeeper arithmetic” to one that forced student engagement, activity, and application. Subsequent reports emphasized the importance of coherence across the grades and focused on defining the most important concepts and skills by grade with detailed instructional examples for teachers. While some states incorporated the National Council’s recommendations, the implementation remains uneven.

In math and science, U.S. students fare poorly in international comparisons such as TIMSS and PISA. They also struggle on the National Assessment of Educational Progress. Students show falling proficiency at higher grades and many need remediation upon entry into college. There is also a growing achievement gap across grades between students in low- and high-income groups.

In 2008, the President of the **United States** convened an expert panel to advise the Secretary of Education on the best use of scientifically based research to advance the teaching and learning of mathematics. The Advisory Panel recommended that the curriculum needed streamlining in early grades and needed to demonstrate coherent progression, with an emphasis on the mastery of key topics. While learning should focus on conceptual understanding, computational fluency, and factual knowledge, the report also suggested that some automatic recall was necessary.

### **Singapore**

By contrast, **Singapore’s** students have consistently been among the top achievers in international tests of student achievement. According to TIMSS 2003, for instance, **Singapore’s** Grade 4 and Grade 8 students received the highest average scores in both mathematics and science from a sample of 49 countries. Duriya Aziz, Publisher and Deputy General Manager at Marshall Cavendish, said that the biggest difference in **Singapore** in curriculum and instruction is the degree of centralization and coherence.

### **Box 6: U.S. Research on Learning Mathematics**

Research on students who are low achievers, have difficulties in mathematics, or have learning disabilities related to mathematics, shows that effective practices include:

- Explicit methods of instruction available on a regular basis
- Clear problem-solving models
- Carefully orchestrated examples and sequences of examples
- Concrete objects to understand abstract representations and notation
- Participatory thinking aloud by students and teachers

*Source: Ferrini-Mundy, Joan. Modernizing Curriculum and Instruction: The Case of Mathematics in the United States. Presentation available: [AsiaSociety.org/Education](http://AsiaSociety.org/Education).*

Not only does the Ministry of Education spearhead curriculum development and implementation, it also recommends textbooks, provides pedagogical guides, sets achievement standards, and administers the national examination system. As such, the intended curriculum is comprehensive, highly focused, and coherent in its coverage across schools. Children are tracked in different streams, and differentiated curricula are used to teach students according to their abilities.

Within this system, several key initiatives have been put into effect to modernize methods of teaching and learning mathematics and science. Starting in 1997 with “Thinking Schools, Learning Nation,” Singaporean students were taught to emphasize “the teaching of thinking.” In 2004, “Teach Less, Learn More” encouraged the building of a foundational knowledge, and in 2005, “Nurturing Every Child” put the focus on encouraging excellence through differentiated learning.

Both the mathematics and science curricular frameworks are built on (1) knowledge, understanding and application, (2) skills and processes, and (3) ethics and attitudes. In mathematics the focus is on problem-solving, and the teaching of science is driven by the pursuit of inquiry. To enable the meaningful pursuit of science by students, the activities and processes involved in inquiry are grounded in the knowledge, issues, and questions that relate to the roles played by science in daily life, society, and the environment. In this framework, Singaporean teachers are expected to play the role of nurturers,

Mathematics and science curricular frameworks are built on (1) knowledge, understanding and application, (2) skills and processes, and (3) ethics and attitudes.

deepening their students’ conceptual understanding and enhancing their problem-solving skills, which will help to sustain interest in mathematics and science and better prepare them for the knowledge-based economy of the 21<sup>st</sup> century.

## China

**China’s** mathematics and science curriculum has also been the subject of considerable reform, especially since 2000. After significant research into about 30 countries’ systems, **China** completely redeveloped its learning standards and national curricula in all core areas to address the needs of a growing economy and changing society, explained Wang Dinghua, Deputy Director General, Department of Basic Education, Ministry of Education.

Similar to **Singapore**, the development and implementation of standards and curriculum is highly centralized at the national and provincial levels. The implementation of the new curricula was rolled out in schools starting in 2001. As of 2005, all primary and middle schools have started using the new curriculum. It is expected that by 2008, 20 of the 31 provinces will have implemented it in high schools.

The mathematics curriculum in **China** has several objectives: strengthening mathematical thinking, developing knowledge and applying skills, understanding the importance of ethics and attitude, and the ability to solve problems. There have been efforts to ensure that the curriculum is coherent across grades; takes into account differential learning abilities; and places emphasis on content, application, and creativity. Finally, there is more of an effort to promote the integration of mathematics and science as well as other subjects into the curriculum to demonstrate the interconnectivity of knowledge and improve hands-on competence of students.

With science and related subjects, the immediate priority is to respect and nurture the innate curiosity and cognitive basis of each student. There is intentionally less focus on textbooks and more on cultivating ability, scientific attitude, and spirit. As much as possible, the revised science

curriculum and standards emphasize the study of science in an open environment, so that students can understand the real-life applicability and importance of science.

### **Science and the Pursuit of Inquiry**

As mathematics and science curricula shift gears, so too does instructional practice. Despite differences, in **China, Singapore, and the United States** there is a common and increasing focus on the importance of building conceptual knowledge and application, developing skills and processes, problem-solving, and practicing inquiry.

#### **What is inquiry?**

Dr. Bruce Fuchs, Director of the Office of Science Education at the U.S. National Institutes of Health, said that inquiry is the approach that scientists use to study the natural world and propose explanations based on evidence, and that it should be central to science education as well. In different fields of science, inquiry includes: (1) rigorous reasoning; (2) the consideration of evidence (based on observations or experimentation); (3) testing of a hypothesis; and (4) building a model or theory that is predictive and subject to further testing.

#### **Why is inquiry important?**

Learning the process of inquiry is not just for scientists but is of growing relevance and value in many fields and career paths, for example: a physician diagnosing an illness, an assembly line worker troubleshooting problems on the production line, or an office worker searching a database to respond to a customer request. Across the world, more and more businesses report that employees with problem-solving and critical thinking skills are in short supply, and these are both skills developed through inquiry.

#### **How does one “teach” inquiry?**

Inquiry is less about what is taught and more about how it is taught; it is in the foreground of classroom instruction. As an example, students in a middle school science class were taught about the process of scientific inquiry then asked to solve a community health problem:

*In Box 7, two middle school bands compete at a “Battle of the Bands.” Some band members from both groups suddenly become quite ill.*

The students are presented with data about the event: the band members’ whereabouts, what they ate, and so on, and are asked to provide a possible explanation.

#### **What are some features of classroom inquiry?**

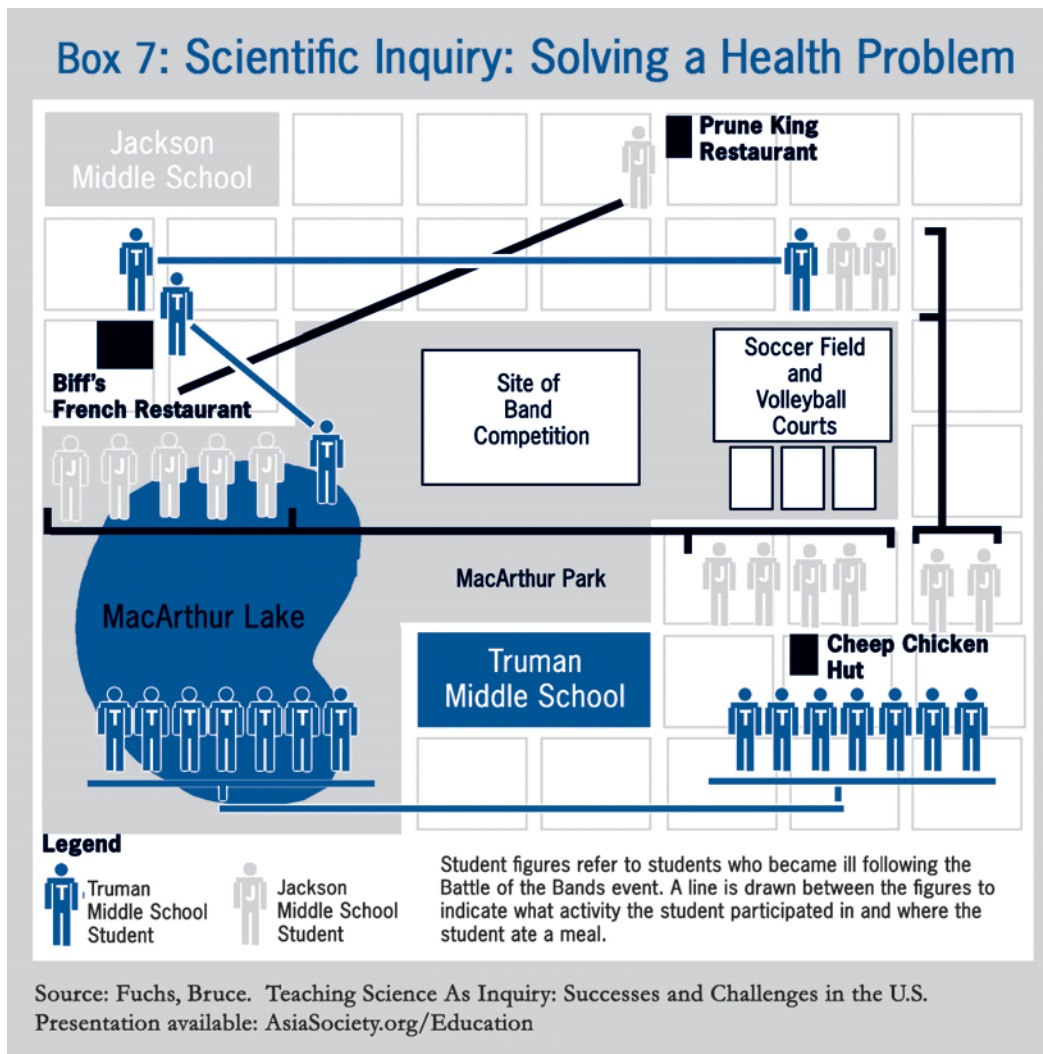
- Students engage in scientific questions.
- Students give priority to evidence.
- Students form explanations from evidence.
- Students connect their explanations to scientific knowledge.
- Students evaluate their explanations against alternatives.
- Students can communicate and justify proposed explanations.

#### **What does a teacher need to teach the process of inquiry?**

The most important tool for the process of teaching inquiry is content-specific knowledge. It can be intimidating to teach inquiry if a teacher is unsure of the content. Teaching inquiry, just like learning it, is an acquired skill and requires professional development in pedagogical constructs. Also essential are supportive curricular materials.

#### **How does one measure inquiry?**

Assessing inquiry skills remains a challenge. Most state- and national-level assessments still place greater emphasis on measuring students’ content knowledge. The Program for International Student Assessment (PISA) measures students’ competency in problem-solving. Results from the 2003 administration of PISA find that students from **Finland, Korea, Hong Kong, and Japan**, on average, demonstrate the greatest competency in problem solving. Business assesses inquiry and problem-solving skills in potential employees and places a great deal of value on employees who are able to demonstrate success in these areas.



## Accountability and Assessment

As mentioned above, there is a growing body of evidence to suggest that workers' future income and contribution to economic growth depend not only on years of education acquired but also on what is learned at school. This literature is summarized in Hanushek and Wößmann, 2007, and underlines the importance of ensuring that schools produce learning achievement.

Geoffrey Masters, Chief Executive Officer at the Australian Council for Educational Research, discussed the important relationship between curriculum, assessment, and school reform. He argued that assessments need to drive and be driven by the changing nature of what and how we need to teach and learn in the 21<sup>st</sup> century, and as such needed to reflect and reinforce the kinds of learning now understood as essential for

successful functioning in society. Assessment, according to Masters, needs to be responsive to the changes that are emphasized in mathematics and science curricula worldwide. He proposed a move toward more holistic assessment programs that facilitate higher-order skills and problem-solving as opposed to rote learning.

The traditional view is that assessment is simply a mechanism to measure student learning: teachers teach the curriculum, students learn what they are taught, and the role of assessment is to establish how well students learn what they are taught. In today's world, this definition of assessment is too narrow. Masters said that in best practice, student assessment is a vital element in the educational decision-making loop. Educational decisions are based on understanding the current situation, on expert knowledge about how to improve, and by

access to resources. These decisions lead to improved student learning outcomes, and by extension to improved life consequences. Assessment plays an essential role at all points in this process.

Typically, it is accepted that the main users of assessments are students and their parents, through the issuing of certificates for the achievement of particular standards. However, Masters suggested that in best practice systems, assessments affect system managers, school leaders, and teachers, as well as students and parents. They are used not only to understand how much of something has been taught and how much a student has learned, but more to establish where students are in their learning, what they have mastered, what difficulties they are having – not just what they have learned. Such systems map and describe growth in areas of learning throughout the school years. Similarly, while the focus of assessment has been on testing the ability of children to recall facts and procedural knowledge, best practice systems go under the surface to promote and reveal deep understanding and higher-order skills.

Finally, assessment systems should support a “learning-oriented” rather than “performance-oriented” culture that is less driven by competition or fear of failure. Masters pointed to recent research that finds that the most effective learning environments are those where students are supported to take risks, make mistakes, and get feedback so they can monitor their own learning.

### Common Themes and Recommendations

- The presentations revealed a growing emphasis across many countries on building conceptual and core knowledge, and reducing the bulk in mathematics and science curricula.
- Science through inquiry. The focus is moving toward applying knowledge in real-life situations for problem-solving – in science these skills are increasingly

taught through inquiry-based lessons and curricula.

- In a decentralized system, it is critical to include all relevant stakeholders in discussions on instruction and content. This includes subject matter experts but also should include local businesses and higher education institutions.
- Assessment systems should be seen as part of curriculum development and instructional practice and not simply as summative tools to measure what has been learned. Moreover, there should be efforts to assess higher-order skills and processes rather than what is easy to measure – the repetition of facts and figures.
- Teachers need support and professional development opportunities to implement reforms properly. Curriculum reform will not succeed without it. Demonstrated materials and textbooks also need to be developed, piloted, and widely available so that reforms are able to take root in a sustainable way.

### Presentations referenced in this section include:

- Duriya Aziz, Publisher and Deputy General Manager, Marshall Cavendish (**Singapore**)
- Joan Ferrini-Mundy, Director, Division of Research on Learning in Formal and Informal Settings, National Science Foundation (**United States**)
- Bruce Fuchs, Director, Office of Science Education, National Institutes of Health (**United States**)
- Geoffrey Masters, Chief Executive Officer, Australian Council for Educational Research (**Australia**)
- Wang Dinghua, Deputy Director General, Department of Basic Education, Ministry of Education (**China**)

See [AsiaSociety.org/Education](http://AsiaSociety.org/Education) to download these presentations and this report.

# Recruiting, Training, and Supporting a 21<sup>st</sup>-Century Teaching Profession

It is increasingly clear through research and practice that teacher quality is tied inextricably to student learning – some say it is the most important contributing factor. Yet it is also clear that recruiting, training, supporting, and retaining quality teachers continues to be a challenge for most countries, including those represented at the Forum.

Little is known about the quality of secondary school teachers in **India**, but what is known is that there are formidable challenges in teacher recruitment, pre-service teacher education, in-service professional development, and teacher accountability. As discussed in an earlier section, secondary teacher recruitment is conducted at the state level – teachers who meet the qualifications are recruited to a cadre and then placed in a school district. School administrators have little or no control over the teachers who are placed in their schools. Pre-service training at 1,000-odd teacher training colleges suffers from poor quality, inadequate monitoring and evaluation, shortage of resources, and outdated pedagogies. Once placed in a school, teachers receive sporadic further training, if any. And finally, while very little is known about teacher accountability, it has been suggested that it is very low; neither state governments nor schools have the mechanisms or incentives to develop or enforce such an oversight system. In fact, as Montek Singh Ahluwalia, the Deputy Chairman of the Planning Commission, said in his opening speech, while there are many ways to bring about quality teaching, one of the most important is teacher accountability: “How can we make sure that teachers are doing the job they should be doing?”

The World Bank estimates conservatively that the Indian secondary education system will require some 500,000 qualified teachers in the next ten years, so it becomes all the more urgent to understand the factors that contribute to a

teaching force that can prepare its students successfully for the 21<sup>st</sup> century. How does one recruit, train, and support teachers to meet the changing needs of students in classrooms today?

## United States

There has been a subtle yet fundamental shift in our expectations of the roles and responsibilities of teachers in recent years. As Dr. Susan Sclafani, Managing Director of the Chartwell Education Group, said, “Teachers are no longer expected to simply deliver information to the next generation. The role of the teacher is changing to meet the expectations of a global society for well-prepared knowledge workers who can synthesize information, identify and solve problems, create the next innovations in their given field, work in teams, and make positive contributions to civil society.” There is an added understanding that teachers should help all students achieve and succeed; they should collaborate with other teachers and their students; and they should use technology as a medium of teaching and learning.

The increasing demands on teachers have been accompanied by a set of economic and social shifts in much of the developed and developing world. While teaching was once seen as the most acceptable and honorable professional choice, women today have opportunities to work in many fields. Beyond this, multinational corporations are creating a wealth of new opportunities for young people in developing countries. Teacher salaries, which were once comparatively attractive, are unable to keep up with salaries in the booming private sector. Additionally, the requirements for becoming a teacher have increased, and teachers are now required to have bachelor’s degrees.

There are several pathways for countries and school systems to deal with the challenges outlined above. At the outset, Dr. Sclafani suggested that the best-performing countries are

The best-performing countries are moving toward school-based decision-making and management, including the hiring of teachers.

moving toward school-based decision-making and management, including the hiring of teachers, within an overall framework of centralized standards and equitable distribution of resources.

To strengthen the recruitment and selection of teachers, it was suggested that schools have two options: Selective enrollment into teacher education programs (**Singapore's** process is described in detail later in this section) or selectivity in the hiring of teachers (as in **Japan** and **England**, for instance). In countries that have a teacher shortage, innovative recruitment practices can also be employed.

For example, some states in the **United States** have developed “alternative certification” programs. In these programs, college students or mid-career professionals with majors in a specific subject area participate in a summer session followed by in-service training during the first two years of teaching. Teachers are fully certified after their first two years in the classroom. The program has had a powerful effect on recruiting academically stronger candidates to teaching and on encouraging mid-career professionals to switch careers and enter teaching.

Dr. Sclafani stressed the importance of induction programs for new teachers to strengthen teacher preparation by providing training, mentoring, and release time for classroom observation. Such programs offer support to new teachers as they transition to their classrooms to increase teacher effectiveness and reduce the numbers of teachers who drop out of teaching in the first five years. **Korea**, for example, offers a two-week pre-employment program that focuses on classroom management, counseling students, and other teacher tasks through the use of case studies and practical tasks. Then, for the first six months of teaching, new teachers receive instructional guidance, classroom supervision, assistance with student evaluations, and support with clerical work.

Most education systems provide some in-service professional development for their teachers; however, the training often lacks coherence and appears only tangentially connected to the needs

of the students. Because the benefits or payoffs from such training seem vague or misdirected, teachers often resist regular participation. OECD, in its seminal 2005 report, “Teachers Matter: Attracting, Developing, and Retaining Effective Teachers,” suggested three main strategies to increase teacher involvement and build a coherent professional development model:

1. *A specific number of hours or courses specified in a contract*
2. *Incentive-based professional development tied to teacher evaluation results or related to compensation incentives*
3. *School-based opportunities in which professional development is tied to a school improvement plan.*

Teacher support is a final area for consideration. Teacher working conditions are determined by five key factors, the combination of which determines the working conditions that attract or deter teacher recruitment and retention. These include: teacher compensation, average working hours per year, classroom size, daily teaching load, and average instructional hours per year (Siniscalco, 2002).

The Forums’ session on teaching continued with case studies of two systems in which structures have been established to recruit, train, and support outstanding teachers, providing an interesting exposition of the challenges and opportunities highlighted by Dr. Sclafani.

## **Singapore**

**Singapore** is an impressive case study of a country that has been more than adequately able to handle the challenges that come with recruiting, training, supporting, and retaining a 21<sup>st</sup> century teaching force. Having recognized early on that the most powerful natural resource of the tiny nation is its people, the government has committed to promote an ability-driven education system in which every young Singaporean is able to develop to their maximum potential. It has focused on managing its education system in sync with a demand for shifting skills in a global economy.



## Box 8: Four Strategies to Improving the Teaching Force

### Recruitment

Option 1: Selective enrollment into teacher education (**Korea, Singapore**)

- Entry based on best exam scores and grades
- Small number of candidates prepared well

Option 2: Selectivity in hiring teachers (**Japan, Korea, England, U.S.**)

- Many candidates prepared in variety of venues but only best performers on employment examinations and interview are hired.

### Induction Programs

- Transition with support, such as mentors, into real world of teaching
- Release time to observe exemplary teachers
- Additional coursework and seminars available

### Professional Development Strategies

- Entitlement to specific number of hours of professional development/year
- Incentive-based participation in professional development tied to teacher evaluation, salary increases, or new roles
- Professional development linked to school improvement goals/curriculum standards

### Targeting Increased Salary

- Starting salaries to attract people (**Australia, Denmark, England, Finland, Norway, Scotland**)
- Mid-career increases to retain teachers in years 5–10 (**Austria, Japan, Portugal**)
- Reward highly experienced teachers (**Greece, Hungary, New Zealand**)
- Reward highly effective teachers (**Australia, England**)

*Source: Sclafani, Susan. Lessons from International Benchmarking for Teacher Recruitment, Training, and Support.*

Duriya Aziz, Publisher and Deputy General Manager of Marshall Cavendish, explained that **Singapore** has adopted a recruitment model in which only graduates from the top 30 percent of the secondary school class can enter the teaching stream. The largely centralized system includes a National Institute of Education, where student-teachers are provided training, and standards are developed and maintained, especially in terms of content knowledge and pedagogical skills. Student-teachers attend a three-year teaching program at the institute followed by a one-year certification program. During training, student-teachers are paid a stipend and tuition costs are borne entirely by the government. Once they enter teaching, new teachers are required to teach only four-fifths of a normal teaching load. The

rest of their time is spent on classroom observations of master teachers and other in-service training.

Beyond this, teachers are required to undertake at least 100 hours of professional development per year, again fully funded by the government. Teachers who are interested in furthering their education are able to do so while taking approved study-leave, and continue to receive either partial or full salary based on tenure. **Singapore** has a “Continual Professional Development Model” that provides several ways for teachers to acquire further certification (including advanced degree programs) through an accreditation process. Efforts to improve pedagogical skills, strengthen content knowledge, and involvement in action

research are understood to be critical. It is estimated that by 2015 at least 50 percent of **Singapore's** 28,000 teachers will have at minimum a master's degree.

There is also a strong emphasis on teacher physical and mental well-being. As a participant reminded us, "Remember that the adults need to create the environment where learning should occur, and it should not be all about the students." To this effect, outstanding teachers in **Singapore** are recognized publicly; teachers are required to work only a fixed number of hours a week to limit burnout.

Another important facet of **Singapore's** professional development system is the strong emphasis on the training of school leaders, including school superintendents, school principals, vice principals, and heads of departments. In fact, the National Institute offers a customized leadership program to match the constantly changing needs of school leaders in their various capacities. There is recognition, for instance, that school principals are no longer required simply to manage their staffs but rather to lead through innovative actions and decision-making.

Thus, according to Ms. Aziz, key factors that contribute to develop and sustain a quality teaching workforce in **Singapore** include: a highly selective teacher recruitment process; a high-quality and intensive pre-service program; an emphasis on continuing education and professional development; and a continual focus on teacher welfare.

To support this system, there appears to be a seamless flow of communication among the National Institute of Education, the Ministry of Education, and individual schools. There is a collective understanding of the over-arching goals and objectives of **Singapore's** education system, and each component works in concert to promote that vision.

### Teach for India

While **Singapore** presents a well-established model of teacher recruitment, training, and support, Shaheen Mistri, Executive Director, Akanksha Foundation, presented a new program in India, Teach for India (TFI), which offers an example of an effort to innovate and inspire a new generation of teachers by adapting one of the most successful programs in the **United States**, Teach for America, to the Indian context.

Teach for India is similar to the **Singapore** program in its focus on recruiting highly capable college graduates. As in the **United States** and **United Kingdom** programs (Teach for America and Teach First, respectively), TFI plans to recruit from among top college graduates who, through a rigorous selection process, demonstrate professional and academic achievement, leadership qualities, and are passionate about facilitating systemic change in education. The fellows will be contracted for a minimum of two years, although once they complete their tenure, the intention is that TFI alumni (like their colleagues in Teach for America and Teach First) will continue to advocate for education for all, both inside and outside classroom walls.

### Box 9: Teacher Policy: The Singapore Model

- Select teachers from top 30% of high school graduates
- Prepare teachers to teach Singapore standards
- Provide financial support during training
- Mentor for first five years of teaching
- Provide 100 hours of professional development annually
- Provide choice of career paths: master teacher, content specialist, or principal

*Source: Aziz, Duriya. Imaging the Nation - Flexibility and Change in the Teaching and Learning of Math and Science in Singapore. Presentation available: AsiaSociety.org/Education*

TFI fellows will receive training in the Teaching as Leadership rubric developed by Teach for America, which holds the simple premise that good teachers should operate as effective leaders. In addition, they will receive training in classroom management, curriculum development, and effective pedagogies.

Unlike in **Singapore**, where first-year teachers assume four-fifths of the normal teaching load and use the remaining time to observe master teachers and receive in-service training, once they complete their training, TFI fellows will be placed in their classrooms for a minimum of two years with a full-time teaching load and full accountability for their classrooms. However, fellows receive regular support, feedback, and resources from TFI staff through trainings and site visits.

Once fellows complete their tenure with TFI, they will be given substantial support to develop and forge a career path – either inside the classroom or outside – that would eliminate educational inequality. Career services, graduate school and employer partnerships, and the network of Teach for India, Teach for America, and Teach First alumni will all be offered.

An evaluation of the Teach for America program provides evidence that their recruits produce significantly greater student gains in mathematics than would typically be expected in one year, but little or no gains in reading (Decker et al., 2004). A study of the Teach First program in the **United Kingdom** finds that their teachers have a positive impact on students, deliver high quality lessons,

and in some cases invigorate other staff (Hutchings, et al, 2006).

## Common Themes and Recommendations

- Establish an early recruitment process
- Provide intensive pre-service and induction programs
- Build-in continual professional development and teacher support
- Invest substantively in the mental, physical, and professional well-being of teachers.

Developing and maintaining such programs and systems provides a respectful, appreciative, supportive, results-oriented teacher environment, one that ultimately leads to improved quality of education and greater student learning.

## Presentations referenced in this section include:

- Duriya Aziz, Publisher and Deputy General Manager, Marshall Cavendish (**Singapore**)
- Shaheen Mistri, Executive Director, Akanksha Foundation (**India**)
- Susan Sclafani, Managing Director of the Chartwell Education Group, Former Assistant Secretary, U.S. Department of Education (**United States**)

**See [AsiaSociety.org/Education](http://AsiaSociety.org/Education) to download these presentations and this report.**

# Managing Schools for Achievement

Governance is integral to discussions about school reform in most countries. Indeed, Andreas Schleicher, Head of the Indicators and Analysis Division, OECD, spoke at length in his keynote address about issues surrounding governance. In his typology of successful school systems, Dr. Schleicher includes devolved responsibility at the school level and strong accountability systems in addition to other factors, including high ambitions and universal standards, quality professional development, differentiated teaching and learning, and integrated educational opportunities.

Research on the effects of governance on student learning has often been inconclusive. However, recent work points to a positive relationship between structural reforms and outcomes. Research conducted by Wößmann, et al, (2007), using data from PISA 2003, found schools that have local responsibility for delivery (in this case autonomy in staffing decisions) within a clear framework of standards far outperform other schools where one or both factors are absent.

Schools that have autonomy in staffing (including salaries), curriculum, and budget have positive effects on achievement when there are measures of school accountability in place, specifically exit exams. Generally, accountability mechanisms that focused on students (exams and assessments used for student promotion), accountability measures that focused on teachers (internal and external monitoring of teaching), and school mechanisms (assessments comparing district or national performance) had a strong effect on learning.

Wößmann finds that students in countries that offered more choices in schooling also perform better. However, the positive effect of private schooling is stronger when schools are held accountable by “external inspections of teachers and assessment-based comparisons to national performance, as well as when schools in the system have autonomy to respond to the private competition” (2007, p. 14).

Perhaps the best way to summarize these findings was provided by Dr. Schleicher: “Whether a school is public or privately financed has no

impact on learning. What does matter are ... accountability and autonomy, and those work best when embedded in a system of strong national standards.” There is a natural struggle between the two, but equilibrium exists when schools are given certain autonomies yet are responsive to the central controls of standard setting, accountability, and assessment. In this way, schools are “agents of change” but are held responsible to their stakeholders including parents and policymakers.

In **India**, conversely, secondary education is managed primarily at the state level, with relatively little federal or community-level involvement. State governments are responsible for infrastructure, teacher recruitment and training, curriculum and textbook development, facilitating examinations, and granting recognition to private schools. Private schools, ironically, are required to have school management committees that include teachers, principals, and parents but public schools do not need to follow the same policy. This is very different from elementary education, which has a strong community involvement component. Similarly, in government and private aided secondary schools, teacher recruitment is done at the state level with little input from the school.

There remain, as a result, considerable challenges to achieving an autonomous yet accountable school system, and the presentations in this section provide important considerations. Included is a case study of a school system undergoing a complete overhaul by expanding autonomy, accountability, and choice in schools; another demonstrates the impact of private schooling on student learning and achievement; and the final presentation addresses already autonomous schools and ways to support their professional development and growth.

Accountability, as used in this report, refers to developing a system with consequences (incentive-based or punitive) for measurable student achievement. Such systems usually consist of three related components: standards of achievement, measurement of achievement, and

consequences for measured achievement. An autonomous school is, according to Dr. Brian Caldwell, Associate Director of Global iNet in **Australia**, never really entirely autonomous, but it is usually one in which “there has been decentralized a significant amount of authority and responsibility to make decisions related to the allocation of resources within a centrally determined framework of goals, policies, standards, and accountabilities.”

School choice is a hotly debated topic among researchers and policymakers worldwide. The basic economic argument is that choice, both among public schools and between public and private schools, will lead to improved student outcomes by allowing the consumers (ostensibly families) to choose the best school for their child. Because parents place value on academic outcomes, competition among schools to enroll students has a natural effect on improving the quality of teaching and learning. Private schools are predicted to be more efficient than public schools “because market forces create incentives for performance-conducive qualitative innovation and efficient resource use, [and] also because private schools typically face fewer regulations than do government-run schools” (Wößmann, Lüdemann, Schütz, and West, 2007, p. 42).

### **New York City: A Test Case in School Autonomy**

New York City is the largest urban school district in the **United States**, enrolling more than 1 million students, 300,000 of whom are in high school. It has been plagued by dismal graduation rates that hovered around 50 percent from 1992–2002 and included many large, low-performing high schools with a majority of low-income students.

Previous reform efforts in New York City, including professional development for teachers, strengthening the curriculum, and dropout prevention programs, had all but failed, leaving behind a legacy of low teacher morale, resistance to change, acceptance of failure, and general fragmentation and disorganization of management.

Five years after the reforms were implemented, the new schools have raised the graduation rate from an average of 35 percent to 77 percent.

Michele Cahill, currently at the Carnegie Corporation, was the Senior Counselor to the Chancellor for Education Policy in New York City from 2002 until 2006. Under her direction, a massive redesign effort for New York City Schools was planned and implemented. After extensive research and a formal competition through a request for proposals, the design principles of the new schools were determined. The reforms focused on setting high expectations and raising graduation requirements, increasing accountability, and opening up the school system by closing a set of low performing schools and replacing them with new small schools<sup>2</sup> that would be managed by partnership models or charter school operators.

The idea was to attract new resources to public schools – intellectual, human, social, and financial capital – and to recruit new leadership talent through a model Dr. Cahill called the “Autonomy-Accountability Exchange.” In exchange for autonomy in staffing, budgets, scheduling, professional development, and curriculum (within New York State standards), schools were held responsible to the central administration for student enrollment, accountability targets, legal responsibilities, and

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<sup>2</sup> According to Dr. Cahill, a study of graduation patterns of all students in New York City high schools from classes of 1999 through 2005 finds the two factors of school size and concentration of students entering significantly below standards in English and math (highly correlated with poverty) explained 41 percent of variance in graduation rates among the high schools. It was determined that small school size creates more favorable conditions for students challenged by poverty and other high needs.

## Box 10: NYC Reform Strategy: New Designs for Schools and for the System

Set high expectations, increase accountability, and raise the quality of talent by opening the system to energy and intellectual capital inside and outside.

- Raise graduation requirements (aggressively counter low expectations)
- End the failure: close the set of lowest performing schools
- Open the system: replace low performing high schools with new small schools, created to a set of design principles of effective schools through partnership models and charter school operators

Develop and open new schools that share three elements:

1. Personalization
2. Academic rigor
3. Partnerships with school development organizations or charters *and* for individual schools with community and cultural organizations and/or higher education

*Source: Cahill, Michele. School and System Designs to Increase Graduation Rates and Lift Student Performance: Impact of Small Schools and Charters on Academic Achievement of Low Income Students in the United States. Presentation available: AsiaSociety.org/Education.*

hiring of school leadership. The reforms introduced new energy, enthusiasm, and innovation into the system, and according to Dr. Cahill, created a system that demanded excellence from its students and schools, yet gave them the flexibility to define what that excellence meant within a broad framework of accountability. The results: Five years after the reforms were implemented, the new schools have raised the graduation rate from an average of 35 percent to 77 percent. Dr. Cahill credited the drastic redesign of the schools, adding that attempts to implement incremental reforms were not targeting the root of the problem.

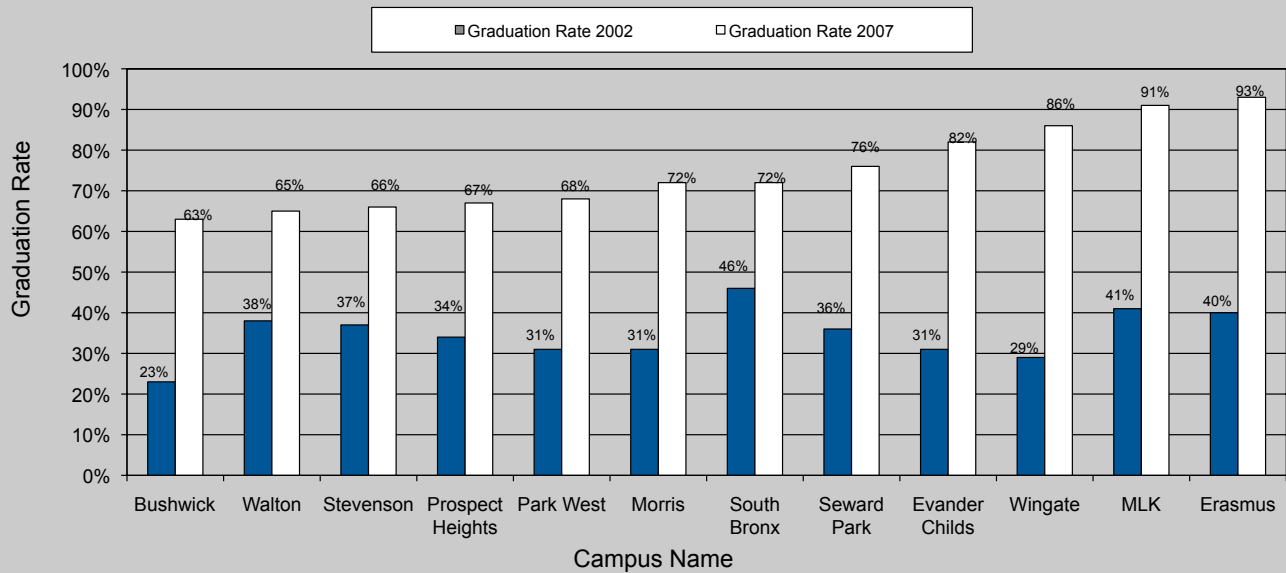
### India: An Experiment in Private Schooling

Dr. James Tooley, President of the Education Fund at Orient Global, is also a proponent of big change that is informed by a strong body of evidence. After conducting a study on schooling choices in a number of countries including **India, China, Ghana, Kenya, and Nigeria**, Dr. Tooley found that private schools were pervasive across all low-income areas. His work, based in Hyderabad, a large city in the state of Andhra

Pradesh in **India**, for instance, found vast numbers of unaided, unrecognized schools that were enrolling 65 percent of the city's children. Similarly, in Mahbubnagar, also in Andhra Pradesh, at least half the surveyed children were attending private unaided schools. Parents, in his research, were willing to pay a nominal fee to enroll their children in private schools if they believed that the quality of education would be superior to that received in government-funded public schools.

Dr. Tooley's research disclosed that the quality was indeed better in such private schools: a sample of 24,000 children in Grade 4 in Delhi was tested in English, mathematics, and Hindi, and in every case there were major differences in achievement. The students who were in the government funded schools repeatedly placed last when compared with recognized and unrecognized private schools. The results were similar for a sample of Grade 8 students in Mahbubnagar. Such schools also operated at a fraction of the costs of government schools, with significantly lower teacher salaries.

**Box 11: Four-year Graduation Rates for Schools Affected by New York City Education Reforms 2002 and 2007**



Source: Cabill, Michele. *School and System Designs to Increase Graduation Rates and Lift Student Performance: Impact of Small Schools and Charters on Academic Achievement of Low Income Students in the United States*. Presentation available: [AsiaSociety.org/Education](http://AsiaSociety.org/Education)

Dr. Tooley’s conclusion was simple: in certain areas, private unaided schools are serving a majority of low-income children and are outperforming government schools at a fraction of the teacher cost. He is, as a result, working in Hyderabad to create a group of low-cost private schools that can be replicated at scale across the country and perhaps the world. Such schools can be powerful vehicles for change in secondary education, given the right framework and structure within which to operate.

The competitive market, in his opinion, is eager for innovation, improvement, accountability, and autonomy. Rather than to try and deny its prevalence, Dr. Tooley argues that the government should encourage access to such institutions, invest in research and development to improve the quality of teaching and learning, and provide a real opportunity for educational innovation and change in **India**.

### Supporting Autonomous Schools: Creating Networks of Model Schools

Brian Caldwell, the Associate Director of iNet in **Australia** posed important questions: How can autonomous schools build capacity to achieve expectations when they are removed from traditional autonomy structures? If a school becomes more autonomous, how does that school still learn? And what are the roles of system authorities at the national, state, or district levels that traditionally provided this learning or support?

**School transformation** is a significant, systematic, and sustained change that secures success for all learners in all settings. Schools that are able to transform successfully, build change in four areas: intellectual capital, social capital, spiritual capital, and financial capital. Intellectual capital is the knowledge and skills of the school staff and leadership; social capital is the strength of formal and informal partnerships and networks; spiritual capital is the coherence within the schools regarding values, beliefs, and attitudes about life and learning; and financial capital is the monetary resources available to the school. The process by which a school builds change in these areas is school governance.

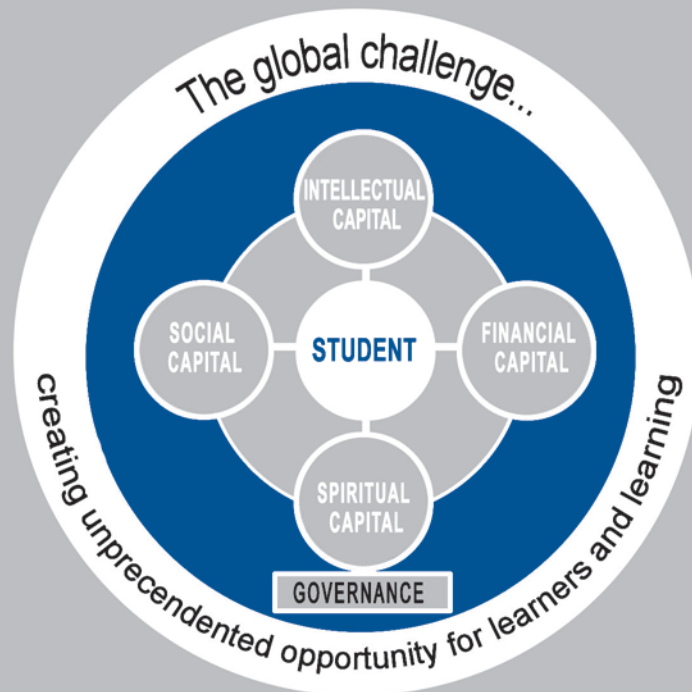


**Developing a capacity for networking** can help build and strengthen each form of capital. There are three types of networks that can operate alone or in combination:

1. A community of practice that involves relatively informal sharing of knowledge within a network of professionals.
2. A networked organization that involves a fairly formal relationship between autonomous organizations with the intention of adding value to each.
3. A virtual community, which may take many forms, with the common element being the medium of information and communication technology (ICT).

Networks involve a range of individuals, agencies, and institutions across private and public sectors in educational and non-educational settings that engage in a range of activities including international study tours, online conferences, and publications to share knowledge, address common challenges, or share resources to improve the performance of their schools.

## Box 12: School Transformation



Source: Caldwell, Brian. *Creating Networks of Model Schools: International Experience and Best Practice*. Presentation available: [AsiaSociety.org/Education](http://AsiaSociety.org/Education)

## Common Themes and Recommendations

- It may be necessary to advocate for a radical change in the design of schools. A powerful mechanism for change is the exchange of accountability to education authorities for autonomy at the school level. This may come in the form of innovation at the classroom level, independent budgeting, and freedom to make substantial changes to staffing and professional development. However, autonomy cannot come at the expense of accountability, it must instead be supported by a central framework.
- The traditional notion of a public-private partnership needs re-examination. What had been about funding new enterprises is now more about the way a community needs to work together to thrive in a global economy.
- Autonomous schools are only as strong as the systems of support they develop to share knowledge and resources and address common challenges. Networks provide a community of learners, formal and informal, that strengthen the social, intellectual, spiritual, and financial capital inherent in schools.

## Presentations referenced in this section include:

- Brian Caldwell, Associate Director, Global iNet, (**Australia**)
- Michele Cahill, Vice President of National Programs and Director of Urban Education, Carnegie Corporation of New York (**United States**)
- Andreas Schleicher, Head of Indicators and Analysis, OECD
- James Tooley, President of the Education Fund at Orient Global (**United Kingdom**)

**See [AsiaSociety.org/Education](http://AsiaSociety.org/Education) to download these presentations and this report.**

# Technology's Role in Improving Access and Quality

*Information and communications technology (ICT) is “opening up enormous opportunities for many more people to participate in the global economy no matter where they may live. Soon the prospects of a highly educated young person in India or almost any other emerging economy will match those of a young person in Europe or the United States, and this opportunity will depend not on where you live, but what you know.”*

– Bill Gates, *The Times of India*, April 3, 2008

Like Gates, there was no doubt among Forum participants about the vital role ICT will play in addressing many of the educational challenges that were raised in the Forum, including providing access to underserved communities, improving quality and learning outcomes, and deepening educational experiences on a large scale.

Today, powerful new tools make it easier than ever to expand knowledge and educational opportunities. In his editorial, Gates explained why he applied to Harvard University 35 years ago – he was attracted by the thought of hearing great lectures from Harvard’s brilliant faculty. In an interesting comparison, Dr. Vijay Kumar, from Massachusetts Institute for Technology (MIT), described how it is now possible for universities to offer such lectures, in addition to online courses, discussion groups, and degrees, to students all over the world via a technological innovation called OpenCourseWare. Technology, in this way, is making higher education – and by extension, economic opportunity – available to the masses, regardless of their location.

### **OpenCourseWare**

MIT’s OpenCourseWare (OCW) program, for example, offers the syllabus, course calendar, lecture notes, examinations, problem sets and solutions, labs exercises, and video lectures from more than 1,800 courses taught at MIT to the public free of charge. OCW is used by educators and students around the world to supplement and deepen their knowledge.

A professor from Melbourne, **Australia**, accesses materials that save him “an enormous amount of

time and stress.” Similarly, an engineering student from Zaria, **Nigeria**, uses OCW to supplement his knowledge, saying, “Last semester, I had a course in metallurgical engineering. I didn’t have notes, so I went to OCW. I downloaded a course outline on this, and also some review questions, and these helped me gain a deeper understanding of the material.”

There is a growing movement facilitated by universities, private foundations, and industry to provide such materials online. In fact, MIT is only one of more than 200 members of the OpenCourseWare consortium that attracts more than 2.5 million visits a month online. The consortium is growing rapidly and contains more than 4,000 published courses (400 of which are translated into 10 languages). The body of evidence to support the impact of such programs is growing: a randomized experiment on a statistics course offered through Carnegie Mellon’s Open Learning Initiative found a significant difference between students who took the OCW class as opposed to a traditional lecture class. Students in the OCW course outperformed their peers and were able to complete the course in a shorter time.

OCW is just one example of open educational resources, which are broadly defined in a working group report on open education as “free and open digital publications of high-quality materials organized as courses that include lectures, related reading materials, snapshots of discussions, assignments, evaluations, etc.” (Adapted from Working Group Report on Open Education).

Another open education resource, MIT’s iLab program, has taken the idea of the traditional lab experiment and turned it on its head. Here, students perform a broad range of educationally meaningful experiments online in real time and as a result are able to access a far greater magnitude of experiments. Students have unrestricted availability without having to compete for time in (often poorly equipped) laboratories and are part of a global online community. These online laboratories are embedded inside educational platforms that include visualization tools, simulations, data processing, and opportunities

for collaboration. Online laboratories and their educational content can be shared across many institutions all over the world. In fact, Zhejiang University in **China** has 50 such labs available today and is interested in replicating the iLab model, as is the University of Queensland in **Australia**.

But these efforts are not limited to higher education. MIT's OpenCourseWare extends its reach to teachers and students in high school by providing innovative materials and resources. Similarly, programs such as Teacher Education in Sub-Saharan Africa (TESSA) provide resources in literacy, numeracy, and life skills. The Physics Education Technology (PhET) project, developed by Carl Weiman at McGill University, provides an extensive set of simulations for teaching and learning physics that are easy to incorporate into classrooms. The team of scientists that developed PhET uses a research-based approach to create simulations that facilitate student engagement with and the understanding of physics concepts.

### **Korea's Digital Textbook**

Similarly, in primary and secondary schools worldwide, teachers are integrating ICT tools into their curriculum in creative ways so their students

can access materials that help them improve their learning outcomes while they learn skills relevant for success in the 21<sup>st</sup> century.

Dr. Okhwa Lee, a professor at Chungbuk National University in **Korea**, described an innovative tool that is currently being piloted in Korean schools. The Digital Textbook (DT), according to the Ministry of Education, is a tablet PC designed to promote student-student and student-teacher interactions while providing personalized learning. The Digital Textbook is a multimedia device and includes content from textbooks, reference documents, workbooks, dictionaries, as well as videos, animation, and access to the virtual world. It incorporates a learning management system, an evaluation tool, connection to the national knowledge database, and an authoring tool. In this way, the tool is multilayered: for the user it is a textbook, dictionary, multimedia content, and supplies evaluation, instructional management, and authoring capabilities; and at the national level it accesses a national knowledge database. The development of the Digital Textbook was in response to the limits of the printed textbook, which is seen as outdated, lacking in interactivity, and too constrained by costs to provide rich

### **Box 13: National Knowledge Commission Recommendations on Technology's Role in Advancing Access and Quality in India**

In India, the National Knowledge Commission has recommended a major expansion of open educational resources and digital technologies in order to: serve the knowledge needs of diverse communities; amplify interaction among students and teachers, introduce innovative and interactive educational experiences; and enhance capacity building for education. They are proposing to:

- 
- Launch a national e-content and curriculum initiative
- Support the production of quality content by a select set of Indian institutions
- Initiate the development of online programs for science and engineering laboratories
- Establish 50–100 laboratories (iLab)
- Undertake a large-scale e-curriculum development effort directed toward adaptation and adoption support
- Establish a national network: Indian Research and Education Network
- Create a faculty and an institutional development program.

*Source: National Knowledge Commission. <http://knowledgecommission.gov.in>*

content. In a pilot study to evaluate the implementation of Digital Textbooks, it was found that there were greater learning gains for lower-middle and low achievers. The tool also showed greater student participation in instructional activities as compared with a traditional desktop PC. At first glance, it seems that the possibilities of Digital Textbooks are enormous – and there are plans to develop at least twenty-five types of Digital Textbooks and roll implementation out to at least 100 schools by 2011. However, the challenges are quite substantial, including the rather prohibitive cost (currently at US\$1,700 for one Digital Textbook) as well as the lack of rigorous evidence as yet regarding the effectiveness of the tool, both of which are under consideration by Dr. Lee and her team. The ability, however, of the tool to transform learning is virtually untapped: it facilitates the development of self-directed learners while reshaping the role of the teacher as guide and advisor.

### **Australia: Information Communications Technology Implementation**

There is a note of caution with both the Digital Textbook and OpenCourseWare among other technological innovations – the effective integration of these technologies into system, school, and classroom continue to be a challenge that eludes many developed and developing countries. It is far too common for schools to adopt a particular mechanism, process, or tool without adequate thought and preparation for a seamless integration into a pre-existing system. To give insight into this process – and the lessons learned along the way – Dr. Dahle Suggett, Deputy Secretary of the Victoria Department of Education and Child Development, **Australia**, took participants through the various phases and themes that defined **Australia**'s experience.

According to Dr. Suggett, although it is clear that information and communications technologies (ICT) have an important role to play in modern

economies, the dividends or payoffs from the investment **Australia** has made, and continues to make, in educational technologies (about \$3.5 billion over the past ten years) is still unclear. **Australia**'s focus now is on understanding where this productivity lies, on putting it to use, and on moving education forward.

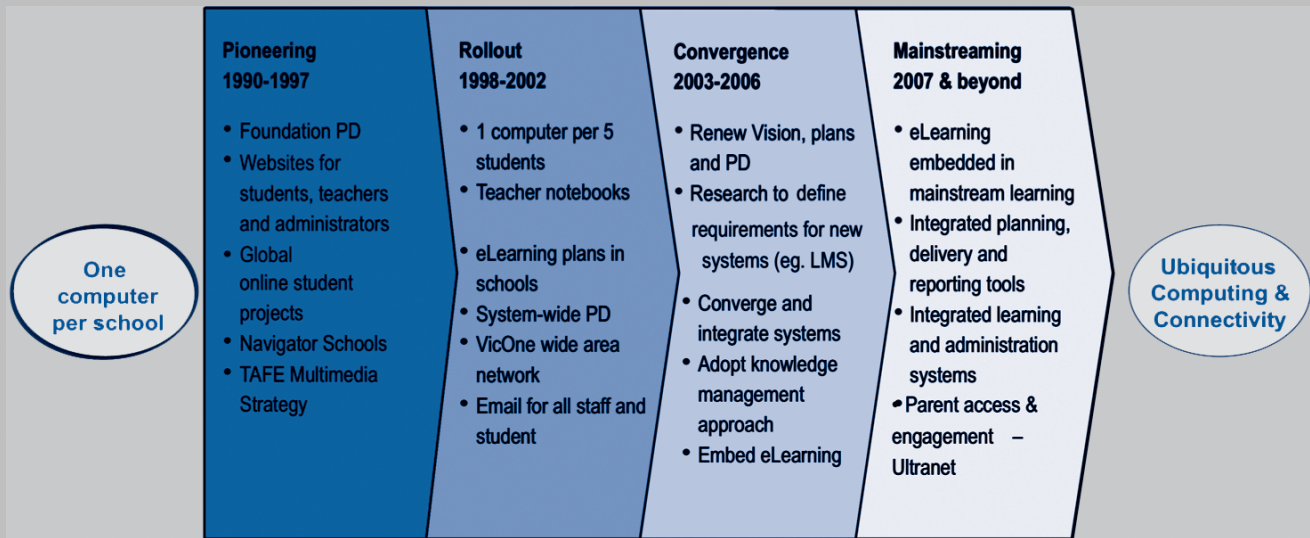
In this process, **Australia** has gone through four phases in its quest to integrate, implement, and operationalize ICT in school systems: Australian schools were pioneers in the 1990s with model schools, foundational professional development for teachers and administrators, and global online student projects. This was followed by a roll-out period that lasted until 2002, when the focus was clearly on inputs. There was one computer for every five students, teachers received laptops, eLearning plans were developed in schools, and all staff and students were networked.

In the next phase, the convergence phase, there was a more “intelligent” conversation about ICT and eLearning; a renewed focus on defining the objectives, vision, and plan for ICT; an attempt to redefine professional development; and to converge and integrate systems and adopt knowledge management. In 2007, **Australia** entered into the mainstreaming phase, where eLearning is now embedded fully in mainstream learning. There is integrated planning, delivery, and reporting tools for the classroom; integrated administration process for the school system; and parent access and engagement.

Dr. Suggett argued that there are three distinct elements to developing an integrated eLearning system that must be considered together for ICT in order to work well in education:

1. Infrastructure, access, and school design issues
2. Curriculum reform and resources
3. Professional capability.

### Box 14: Australia: The Journey So Far 1990-2008



Source: Suggett, Dable. *Australia's E-Learning System*. Presentation available: [AsiaSociety.org/Education](http://AsiaSociety.org/Education)

### Common Themes and Recommendations

ICT will play an increasingly vital role in addressing inequities in access to education, improving learning quality and outcomes and deepening educational experiences of all students, regardless of their location. OpenCourseWare, iLabs, and digital textbooks are only a few of the powerful tools available for implementation. However, a few notes to keep in mind when considering ways to move forward with ICT and education:

- There should be clarity on not only the inputs but also the expected outputs of any given ICT, and these should be systematically measurable – the productivity gain of implementing ICT in a classroom, school, or system should be quantifiable.
- Infrastructure and access issues must be considered in tandem with curriculum reform and developing the professional capability of the staff. Adequate time and energy should be spent on the professional development of teachers and

school staff so that the technological innovation works to empower rather than impede their work.

- Effort should be made to combine the physical and the virtual intelligently. Conventional pedagogy should be integrated with e-learning to deliver high-quality and relevant educational opportunities.
- Develop intelligent systems to monitor the quality of education provided through open education resources, the Internet, and other technologies. On the supply side, this can be done by monitoring institutions that produce the content. On the demand side, there is a duty for educators to select from experience and thereafter point to constructive learning experiences.
- Leverage available resources; do not reinvent the wheel. Dr. Kumar advises: “Creating resources anew to meet the scale of demand is a non-starter. We should localize and contextualize what already exists.”

**Presentations referenced in this section  
include:**

- Vijay Kumar, Senior Associate Dean of Undergraduate Education and Director, Office of Educational Innovation and Technology, MIT (**India** and **United States**)
- Okhwa Lee, Professor of Computer Education, Chungbuk National University (**Korea**)
- Dahle Suggett, Deputy Secretary, Victoria Department of Education and Child Development (**Australia**)

**See [AsiaSociety.org/Education](http://AsiaSociety.org/Education) to download these presentations and this report.**



# Summing Up and Moving Forward

Discussions at the Asia-Pacific Leaders Forum made it clear that policymakers in all countries are concerned that their traditional methods and systems of education may not be up to the task of preparing their students for the more knowledge-intensive, entrepreneurial, and creative jobs of the global economy. The magnitude and speed of the forces of globalization demand an urgent response and all countries struggle to varying degrees with similar problems. No country has a perfect system and all can learn from each other. While focusing on key challenges and best practices throughout the region's education systems, Forum participants paid special attention to how international best practices might inform India's secondary education expansion. The challenges include:

**Access to education:** Universal access to secondary education is essential for a knowledge economy, but only 40% of Indian students are currently enrolled in secondary school. The Indian government plans to increase education spending five-fold and to significantly improve graduation rates from primary into secondary school. In carrying out this ambitious expansion, India could examine the lessons from **Korea**, which has the highest secondary school graduation rate among all OECD countries (almost 100%), or **China**, which expects 80% of its students to have 12 years of education by 2010, achieved through strategies such as distance education, fee waivers, and boarding schools to extend education to poorer rural areas. The growth of private schools in many countries, including India, where they represent about half of secondary schools, provides new opportunities for access and choice but poses new challenges of balancing autonomy and accountability.

**Curriculum and assessment:** A global innovation society will require a different set of skills. Memorization of facts and figures and their regurgitation on tests and examinations does not equip students for the knowledge jobs of the future. There is much international experience, especially in the **United States** and **Australia**, on how to teach the critical subjects of math and science through inquiry and problem-solving approaches. The new Indian National Curriculum

Framework guidelines embody these new approaches, but there need to be national government incentives for states to adopt them, as well as teacher training. New kinds of assessments are also needed to ensure that they measure not just content knowledge, but also the analytical, higher-order thinking and cross-cultural communication skills that students will need to succeed in a rapidly changing world.

**Improving teacher quality:** Research confirms that student achievement is tied inextricably to teacher quality. Many countries are struggling to develop a 21st-century teaching profession in the face of competition for talent from other sectors. To recruit 500,000 teachers in the next 10 years, **India** has the opportunity to follow global best practices, like **Singapore**, for example, which recruits students from the top 30% of their secondary school class, offers financial support during teacher training, mentoring during the first five years on the job, and substantial annual professional development tied to curriculum standards.

**Managing schools for achievement:**

Governance issues are integral to any discussion on school improvement, and the merits of public versus private funding and management and a variety of "choice" schemes are hotly debated in many countries. International research suggests that, in fact, the key governance factors affecting school performance are autonomy; i.e., devolving responsibility to the school level, particularly for staffing decisions, within a framework of accountability – centrally determined standards and measurement of results. Another key need is the development of a new training systems for school leaders, who can manage schools to produce high graduation rates and achievement standards.

**Technology:** The greatest opportunity in addressing the educational challenges of globalization may lie in the immense potential of technology to address issues of access, quality, and the new skill set. Powerful examples of open source curriculum materials, online instruction, teacher training and digital textbooks from **Korea**, **India**, **Australia**, and the **United States** were

presented at the Forum. All show that schooling no longer has to be synonymous with a building with a blackboard and a teacher. However, Australia's early and extensive use of technology has also shown that careful thought has to be given to how to integrate virtual and physical classrooms to maximize learning and to measure outputs from the use of digital technologies.

Clearly, there is now a global marketplace of ideas and innovations in every field, including education. Despite differences in educational and political systems, culture and economic context, all countries participating in the Asia-Pacific

Forum recognized that only by being open to new ideas about learning—from around the world—will they succeed. Countries need to learn about education practices in other high-performing or rapidly improving countries and use the best of what has been observed to continue to grow and improve. The rising Asia-Pacific region needs a robust forum for exchange of educational ideas on high-priority issues, not just at the ministerial level but among the broader range of stakeholders and innovators in education. We hope that this report will help to stimulate continuing communication and cooperation.

# Appendices

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\*Presentations given at the Asia-Pacific Leaders Forum form the basis of this report and are available at: [AsiaSociety.org/Education](http://AsiaSociety.org/Education).

**Appendix B: Agenda for the Asia-Pacific Leaders  
Forum on Secondary Education  
New Delhi, India  
March, 2008**

**Monday, March 24:**

Morning Optional School Site Visits

4:00 – 6:00

**Opening Session**

Welcome

*Bunty Chand*, Executive Director, Asia Society India Centre

Opening and Introduction of Participants

*Vivien Stewart*, Vice President, Education,  
Asia Society

*Ashok Ganguly*, Chairman, Central Board  
of Secondary Education

The Increasing Global Talent Pool: Worldwide Trends  
in Educational Attainment

Speaker: *Andreas Schleicher*, Head of Indicators and Analysis, OECD

Status of Secondary Education in India

Speaker: *Subhash Khuntia*, Joint Secretary of Education, Ministry of Human  
Resource Development

Discussion

8:00

**Dinner: Education and the Global Knowledge Economy**

Economic Growth and Changing Skill Demands in India

Speaker: Guest of Honor *Montek Singh Ahluwalia*,  
Deputy Chairman, The Planning Commission

**Tuesday, March 25:**

9:00 – 11:45 AM

**Strategies for Expanding Access  
to Secondary Education**

9:00 – 10:15

Chair and Introduction: *Ujwal Thakar*, CEO, Pratham India

Panel: *Yang Jin*, UNESCO Institute for Lifelong Learning  
*Soobong Uh*, Professor, Korea National University  
of Technology Education

*Lois Adams-Rodgers*, Deputy Executive Director,  
Council of Chief State School Officers

*Gaston Caperton*, President, College Board

- 10:30 – 11:45      **Discussion on Access**
- 12:00 – 1:30 PM      **Lunch**
- Presentation: Investing in Secondary Education in India**  
Speakers: *Sam Carlson*, Lead Education Specialist, World Bank and *Michael Ward*,  
U.K. Department for International Development
- 1:30 – 3:30**              **World-Class Standards**  
*What are the core competencies and new skills needed for work and citizenship in the global age?*  
*How can education systems define, measure, and promote world-class standards in secondary schools?*
- 1:30 – 2:30              Chair and Introduction: *Andreas Schleicher*, OECD
- Panel: *Geoffrey Masters*, Chief Executive Officer, Australian Council for Educational  
                         Research  
                         *Hideaki Shibuya*, Professor, Tokyo Gakugei University
- 2:30 – 3:15              **Discussion on Standards**
- 3:30 – 6:00**              **Modernizing Curriculum and Instruction**  
*The Case of Science and Math*
- 3:30 – 5:00              Chair and Introduction:  
                         *Krishna Kumar*, Director, National Council of Educational Research and  
                         Training (NCERT)
- Panel: *Joan Ferrini-Mundy*, Director, Division of Research on Learning in Formal and  
                         Informal Settings, National Science Foundation  
                         *Wang Dinghua*, Deputy Director General, Department  
                         of Basic Education, Ministry of Education, China  
                         *Duriya Aziz*, Publisher and Deputy General Manager,  
                         Marshall Cavendish, Singapore  
                         *Bruce Fuchs*, Director, Office of Science Education, National Institutes of  
                         Health, United States
- 5:00 – 6:00              **Discussion on Science and Math**
- 8:30                      **Dinner**  
Location: Private residence of Honorable *Sheila Dixit*, Chief  
                         Minister of Delhi

**Wednesday, March 26**

**9:00 – 11:00 AM School Autonomy and Accountability:  
Approaches and Impact**

9:00 – 10:00 Chair and Introduction:  
*Sunil Bari*, Executive Director, National Knowledge Commission

Panel: *Brian Caldwell*, Associate Director, Global iNet  
*Michele Cabill*, Vice President, Carnegie Corporation of New York  
*James Tooley*, University of Newcastle

10:00 – 11:00 **Discussion on School Autonomy and Accountability**

**11:00 – 12:45 PM Recruiting, Training, and Supporting  
a 21<sup>st</sup>-Century Teaching Profession**

11:00 – 12:00 Chair and Introduction:  
*Rama Mathew*, Head, Centre for Teacher Education, Delhi University

Panel: *Susan Sclafani*, Former Assistant Secretary,  
U.S. Department of Education  
*Chor Boon Goh*, Professor, Singapore National Institute  
of Education  
*Shabeen Mistri*, Executive Director, Akanksha

12:00 – 12:45 **Discussion on Recruiting and Training  
a 21<sup>st</sup>-Century Teaching Profession**

1:00 – 2:00 **Lunch**

**2:00 – 4:30 Technology's Role in Improving Access and Quality**  
*How can technology play a more central role improving  
access and quality?*

2:00 – 3:15 Chair and Introduction:  
*M. P. Kapoor*, Project Director, National Institute of Information Technology

Panel: *Dable Suggett*, Deputy Secretary, Victoria Department of Education and Child  
Development  
*Okbwa Lee*, Professor of Computer Education, Chungbuk  
National University  
*Vijay Kumar*, Senior Associate Dean, Undergraduate Education; and Director,  
Office of Educational Innovation and Technology, MIT

3:30 – 4:30 **Discussion on Technology**

4:30 – 5:30 **Wrap Up and Planning for Next Steps**



## Appendix C: Invited Participants

Lois ADAMS-RODGERS  
Deputy Executive Director  
Council of Chief State School Officers  
(United States)

Isher Judge AHLUWALIA  
Chairperson, Board of Governors  
Indian Council for Research  
on International Economic Relations  
(India)

Montek Singh AHLUWALIA  
Deputy Chairman  
The Planning Commission  
Government of India  
(India)

Duriya AZIZ  
Publisher and Deputy General Manager  
Marshall Cavendish  
(Singapore)

Gyanendra BADGAIYAN  
Secretary  
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