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How to Succeed at
Education Reform
*The Case for
Saudi Arabia and the
Broader GCC Region*



Contact Information

Abu Dhabi

Rabih Abouchakra

Partner

+971-2-699-2400

rabih.abouchakra@booz.com

Chadi N. Moujaes

Principal

+971-2-699-2400

chadi.moujaes@booz.com

Beirut

Nabih Maroun

Partner

+961-1-985655

nabih.maroun@booz.com

Dubai

Hatem Samman

Director of the Ideation Center

+971-4-390-0260

hatem.samman@booz.com

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OVERVIEW OF EDUCATION IN THE GCC REGION¹

In the past several years, many developing nations, but especially Arab countries, have come to identify a good education system as a cornerstone of economic progress. The urgency for education reform in the Arab world has been manifested in the various initiatives aimed at improving the quality and quantity of education, especially with a rising young population that represents a majority in many countries of the Arab world. Recent years have witnessed many Arab countries making efforts to develop and implement comprehensive education reform programs that can result in a skilled, knowledge-based workforce in line with socioeconomic goals.

Recent debates on how best to develop the quality of human capital trace back to Article 26 of the United Nations General Assembly's Universal Declaration of Human Rights. We draw from this article and postulate the following education framework for the Middle East, based on internationally proven best practices. This framework combines three major dimensions central to education reform:

1. A socioeconomic environment in which social and economic priorities can be translated into a viable education strategy and related goals

2. An operating model for the education sector, in which operating entities, good governance, and funding allow for the sustainability of education goals
3. An infrastructure (e.g., quality teachers and curricula, reliable assessment and performance measures, and a good learning environment) ready to make such goals attainable.

In addition to this framework, an effective implementation represents the other side of the reform coin and requires careful consideration. Effective implementation requires

dividing the project into manageable pieces, prioritizing its various processes, ensuring ownership consensus among the stakeholders, and systematically measuring results.

The Case for Education

Although there is no single recipe for education-sector reform, the above framework represents an approach that, if followed holistically, should increase the likelihood of success. Thus, any strategy implementation that narrowly focuses on a few elements of the framework— at the expense of others—will likely fall short of providing an optimal reform outcome. This is because each dimensional element is inextricably linked with the others. Countries that adequately connect these dimensions in the implementation phase of their reform program tend to do well in terms of student achievement and human development indicators, whereas those that exclude them tend to fall short.

There is sufficient research evidence to show that quality education is not only a major contributor to countries' economic growth but also an essential ingredient for general human development.² In the past half century, education was a key factor in catapulting countries like Ireland, Singapore, and the Republic of Korea

to new socioeconomic heights and bestowing on them the status of “miracle country,” with average real per capita GDP growing considerably since the 1960s.

In the Arab world, there has been much debate about the quality of human capital. These debates question whether education improvement alone is equal to the task of improving the quality of life in Arab societies while enhancing the capacity of the population to meet the challenges of the future.³ Studies related to the development of Arab human capital have provided policy recommendations calling for the need to enhance basic freedoms while establishing a comprehensive knowledge-based society.⁴

Using Singapore and the Republic of Korea as models, many Arab countries are garnering the political wherewithal to focus on education reform. Gulf Cooperation Council (GCC) countries are no exception. Countries such as the Kingdom of Saudi Arabia (KSA), for example, understand the challenges of the future; in 2004, Saudi Arabia set forth a 10-year strategy aimed at not just economic requirements but sociopolitical needs as well. GCC countries are also taking a close

look at Jordan, which initiated its education reform in the late 1980s and has shown good progress.

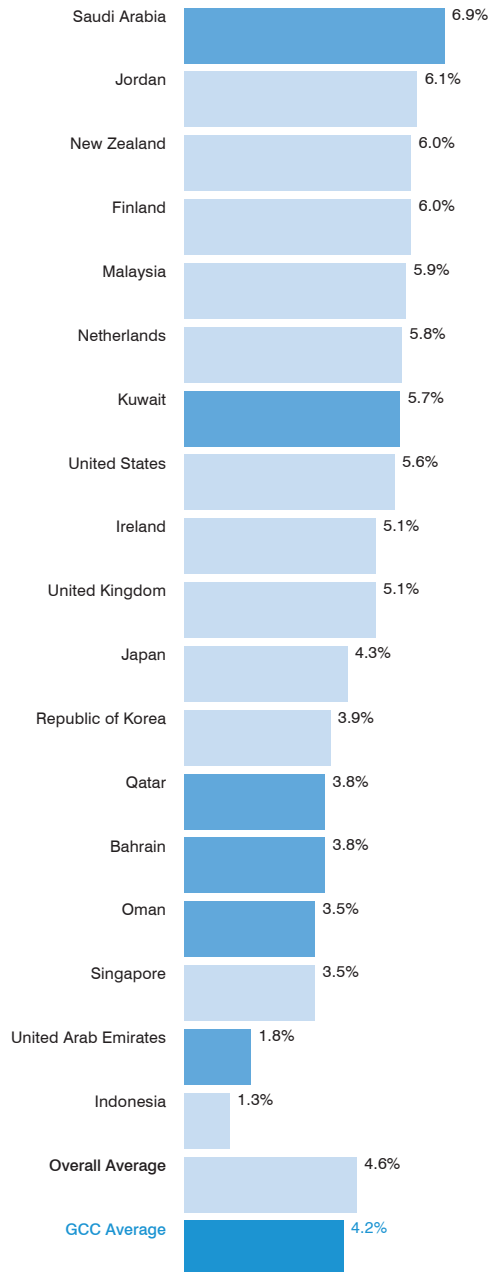
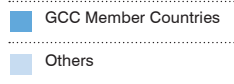
In April 2007, the United Arab Emirates (UAE) released a draft document of its comprehensive education reform with similar aims. Three main conclusions arise from examining the strategies adopted by these countries, which reflect their societies' present and future needs:

- There is increased demand for education at all levels.
- Changing domestic and international conditions are affecting the socioeconomic environment of Arab countries.
- Successful plans for education must be integrated with other government planning.

Limited Returns on Education Investment

Since the 1980s, government expenditure on education for GCC countries has been comparable, on average, to many developed countries when taken as a percentage of GDP (*see Exhibit 1*). However, this spending has not yielded the expected returns on investment from either quantitative or qualitative measures.

Exhibit 1
Average Expenditure on Public Education as a Share of GDP, 1980-2005



Note: Percentages are rounded off; data for some years were missing.
 Sources: World Development Indicators (WDI), 2007; Booz & Company Ideation Center analysis

Exhibit 2 shows that in 2004, out of 125 countries, Saudi Arabia and the UAE ranked 97th and 90th, respectively, in terms of the Education Development Index (EDI), indicating that the countries' education investment did not translate into the desired outcome.

For example, over the 2000-2004 period the illiteracy rate in Oman, Saudi Arabia, and the UAE averaged around 24 percent, compared with Argentina (3 percent), Singapore (7 percent), and other Arab countries like Jordan (10 percent). Other indicators are also cause for concern.

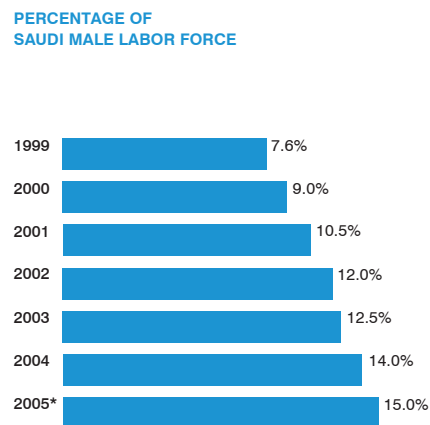
The average gross enrollment ratio (GER) for tertiary education in the GCC region in 2004 was 23 percent, compared with 57 percent, 87 percent, and 89 percent for Canada, Finland, and the Republic of Korea, respectively.⁵

Exhibit 2
Selected Countries Ranked According to Value of Education Development Index (EDI) and Components, 2004

COUNTRY	EDI RANK	COUNTRY	EDI RANK
United Kingdom	1	Lebanon	61
Slovenia	2	Moldova, Republic of	66
Finland	3	Syria, Arab Republic of	73
Korea, Republic of	10	Tunisia	74
Latvia	11	Philippines	75
Estonia	16	South Africa	78
Italy	18	Egypt	79
Israel	19	Algeria	81
Slovakia	20	Oman	82
Hungary	21	Iran, Islamic Republic of	86
Ireland	23	United Arab Emirates	90
Lithuania	30	Saudi Arabia	97
Chile	35	Morocco	102
Romania	38	Yemen	117
Bahrain	45	Mali	122
Jordan	49	Burkina Faso	123
Kuwait	51	Niger	124
Indonesia	58	Chad	125

Source: UNESCO, Education for All (EFA) Global Monitoring Report 2007

Exhibit 3
Saudi Arabia's Official Unemployment Rates



* Overall unemployment rate: IIF GCC Country Appraisal, 2006
Sources: Saudi Arabia Ministry of Economy and Planning (www.planning.gov.sa) Booz & Company Ideation Center analysis

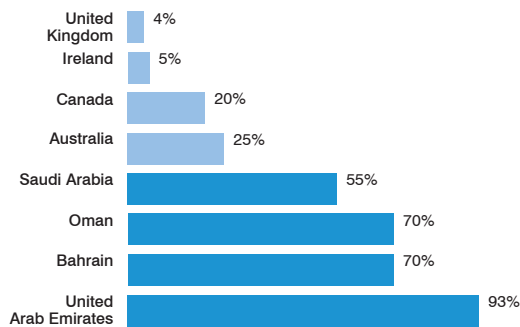
The GCC governments' expenditures on education reform were expected to create a generation of skilled nationals who would ultimately replace the expatriate labor force in the GCC region. However, education spending did not alleviate one of the most important challenges now facing

the region—namely, the problem of unemployment. Despite having an overall (national and non-national) low unemployment rate of 3.0 percent in 2005, the UAE's unemployment rate for nationals reached 11.4 percent in 2004.⁶ In the Saudi case, recent unemployment estimates for 2007

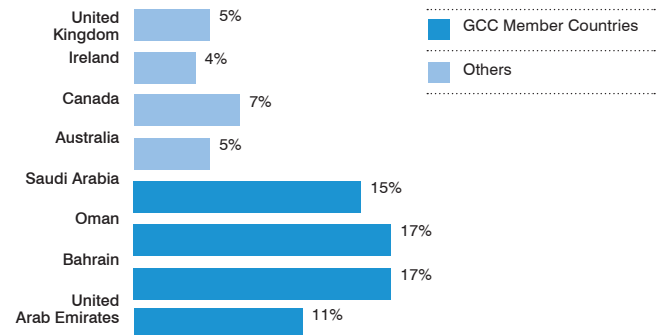
hovered around 12 percent, a figure considered conservative. Yet the trend of Saudi unemployment seems to be on the rise and is relatively high in comparison with developed economies (see Exhibit 3 and Exhibit 4).⁷

Exhibit 4
Labor Force Structure and Unemployment in GCC vs. Other Countries

FOREIGN WORKFORCE¹
(PERCENTAGE OF TOTAL WORKFORCE)



UNEMPLOYMENT RATE²
(PERCENTAGE OF TOTAL WORKFORCE)



¹ Data from 2003 and 2005, depending on availability. The percentage of the foreign workforce in Oman is estimated for 2005 based on total labor force and migrant figures.

² Data from 2005. UAE figure is for 2004. GCC countries' data refer to unemployment among nationals.

Note: Graphs are not adjusted to a common scale and percentages are rounded off.

Sources: UAE Ministry of Economy and Commerce; Abu Dhabi Statistical Yearbook 2005; Saudi Arabia Ministry of Economy and Planning (www.planning.gov.sa); Saudi Arabian Monetary Agency (SAMA) 43rd Annual Report, 2007; IIF: 2006 Summary Appraisal GCC Countries; Booz & Company Ideation Center analysis.

The top factors that drive unemployment among nationals in the GCC region are lack of skill and low motivation to work, coupled with high salary expectations. In recent private-sector surveys, business leaders stressed the need for transformation in the socioeconomic environment, as well as in the operating model and the infrastructure of the education system (see Exhibit 5).

Moreover, business professionals complain about the inability of the

current GCC education system—with its varying organizations and infrastructure—to respond in a timely manner to their changing business needs.

As a result, there is an abundance of certain specializations that are not aligned with private-sector demand (see Exhibit 6). An August 2007 Saudi newspaper article reported a research finding that tens of thousands of pharmacy graduates are required to replace foreign workers in

the pharmaceutical industry in Saudi Arabia.⁸ Exhibit 7 shows that GCC countries can improve their economic competitiveness by improving the quality of their education systems. An effective education framework must be instituted to optimize the channeling of funds and allow for a better return on investments.

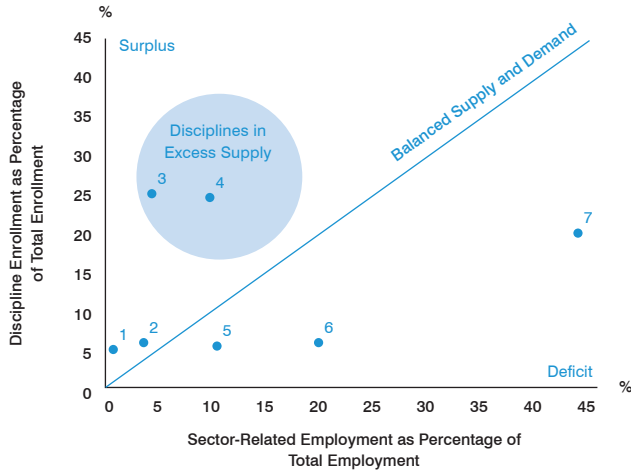
Exhibit 5
Private-Sector Perception of Education System Outputs

		INTERVIEW QUOTES
LACK OF KEY SPECIALIZATIONS	The market is in short supply of science and technology programs, which are essential for the development of key industries, such as transport planning, logistics, and water engineering. On the other hand, there are too many nonscience and nontechnology university disciplines, such as humanities and social sciences.	"We need fewer theoreticians and more capable professionals and technicians."
LACK OF PRACTICE	The curricular taught at higher education institutions are too theory oriented and lack the practical requirements of the business world.	"Provided with adequate training, our technicians are excellent in running daily operations. However, they lack problem-solving skills, which are crucial when things go wrong!"
INADEQUATE COORDINATION BETWEEN BUSINESS AND EDUCATION	Insufficient coordination, communication, and planning channels between the education and private sectors has resulted in a shortage of required skills, thus hindering the economy from responding quickly to emerging opportunities, which are ultimately captured by the competition.	"Our universities graduate good accountants, but not financial managers."
INSUFFICIENT "SOFT SKILLS"	While exhibiting general proficiency in basic skills, graduates from all levels of the education system lack training in "soft" business skills such as leadership, team motivation, project management, problem solving, communication, and negotiation.	"The country was witnessing fast growth in tourism, but there was not a sufficient number of tourism professionals to meet the growth!"
LACK OF CREDIBILITY IN ASSESSMENT SYSTEMS	For some countries, the quality of education and knowledge base of recruited graduates fall short when tested, suggesting a significant difference between official indicators on the quality of the education system and the real perception by the business community about the proficiencies of graduates. Often, companies need to conduct extensive internal training on basic skills.	"Vocational education is [considered to be] for poor-performing students and less privileged individuals... It does not offer serious employment opportunities. An academic degree is always a preference."
WORK ETHIC	Beyond the shortage of technical and business skills, private investors have raised serious concerns with regard to the professionalism and work ethics of their employees, an issue pervasive across the region as a whole.	

Source: Based on interviews conducted by Booz & Company with a number of businesspeople and published in the World Economic Forum (WEF) working paper "Fiscal and Education Policies to Improve the Investment Climate in BMENA—A Private Sector Perspective," 2006

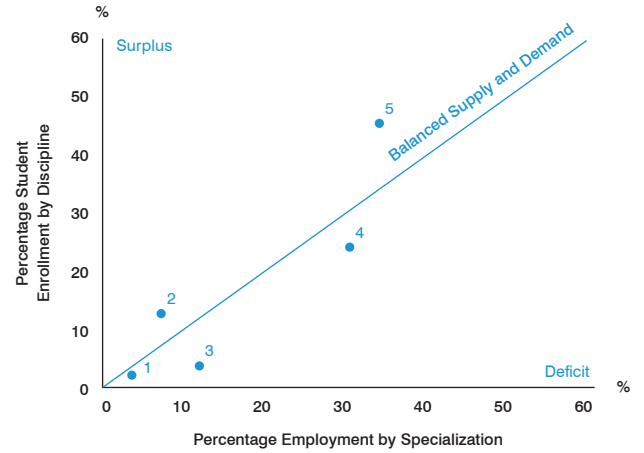
Exhibit 6
Discipline/Total Enrollment vs. Sector Labor Force, 2002

SAUDIA ARABIA



- | | |
|--------------------|---|
| 1. Arabic Language | 5. Sciences |
| 2. Medicine | 6. Engineering Related |
| 3. Islamic Related | 7. Arts, Humanities and Social Sciences |
| 4. Education | |

IRELAND

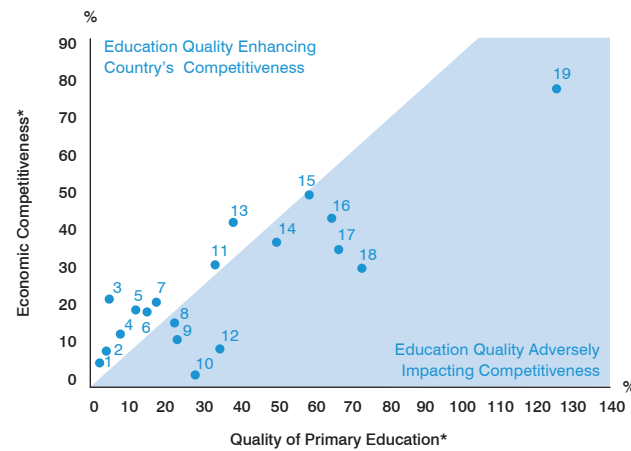


- | | |
|--------------|---|
| 1. Education | 4. Engineering Technology |
| 2. Sciences | 5. Arts, Humanities and Social Sciences |
| 3. Medicine | |

Sources: Saudi Arabia Central Department of Statistics; The World Bank

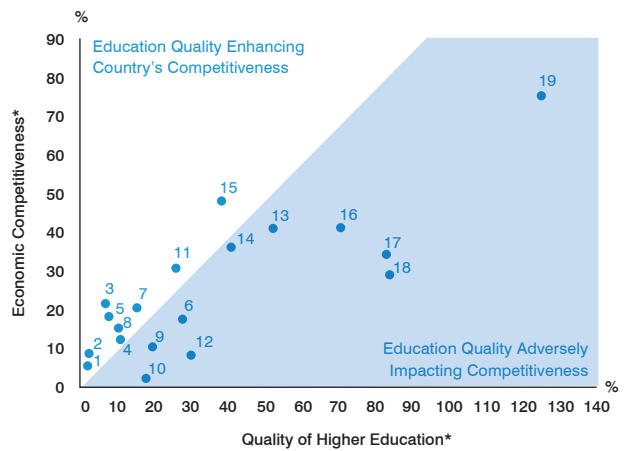
Exhibit 7
Education Quality and Economic Competitiveness, 2007

PRIMARY EDUCATION



- | | | |
|--------------|--------------------|-------------|
| 1. Finland | 8. Norway | 15. Jordan |
| 2. Singapore | 9. Korea | 16. Bahrain |
| 3. Ireland | 10. United States | 17. KSA |
| 4. Canada | 11. Qatar | 18. Kuwait |
| 5. Australia | 12. United Kingdom | 19. Egypt |
| 6. France | 13. Oman | |
| 7. Malaysia | 14. UAE | |

HIGHER EDUCATION



- | | | |
|--------------|--------------------|-------------|
| 1. Finland | 8. Norway | 15. Jordan |
| 2. Singapore | 9. Korea | 16. Bahrain |
| 3. Ireland | 10. United States | 17. KSA |
| 4. Canada | 11. Qatar | 18. Kuwait |
| 5. Australia | 12. United Kingdom | 19. Egypt |
| 6. France | 13. Oman | |
| 7. Malaysia | 14. UAE | |

* Ranking out of 131 countries

Sources: WEF Global Competitiveness Report 2007-2008; Booz & Company Ideation Center analysis

THE CASE FOR A HOLISTIC APPROACH TO SUCCESSFUL EDUCATION REFORM

Based on their high TIMSS and PISA scores,⁹ Finland, Canada, Singapore, the Republic of Korea, Australia, and Ireland can all be considered to represent successful examples of education-reform strategies and are worthy of study and emulation. Within the Middle East, Jordan's experience since the 1980s provides a developing country's perspective on education-reform.¹⁰ With these countries' experiences in mind, we postulate that there are three key dimensions for a successful education-reform process: A strategy based on socioeconomic priorities, an education-sector operating model, and a viable education infrastructure (see Exhibit 8).

I. Socioeconomic Environment

Education-Sector Strategy
Successful strategies include an assessment of a country's environment that links the broader national objectives to the sector. These objectives are evaluated against the current situation. The resultant gap analyses provide themes and priority areas where opportunities are leveraged and weaknesses minimized. Consequently, initiatives and tasks are identified and developed into budgeted action plans for the relevant operating entities to achieve the set targets.

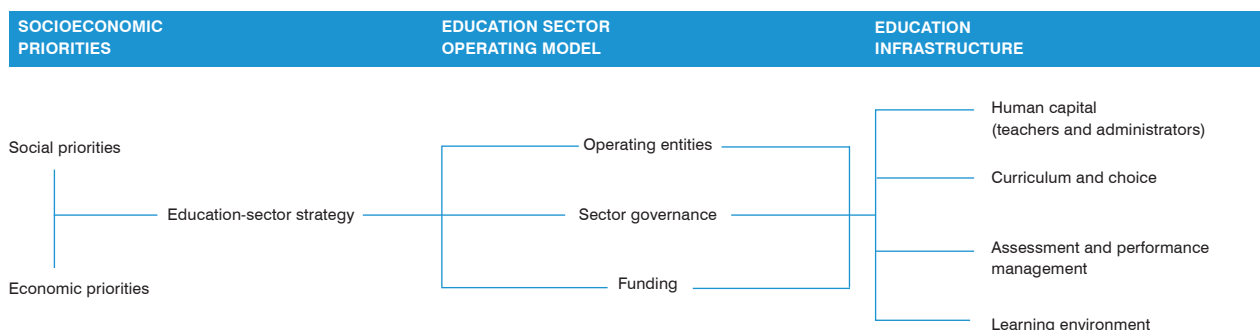
For example, in 1997 Singapore began the third phase of its curriculum-development program, which aimed to prepare Singapore for the knowledge-based economy of the 21st century. At that time, the Curriculum Planning and Development Division emerged to ensure better management of curriculum content and purpose. The aim was the advancement of information technology and citizenship education geared toward fostering national cohesion. The motto "Thinking Schools, Learning Nation" describes the policy vision for meeting future challenges. The Thinking Programme and National Education

and Project Work were aimed at enhancing student proficiency. Similarly, the higher education curriculum in Singapore underwent frequent reforms to keep it in line with socioeconomic strategy.¹¹

The following are key success factors in planning for an education-sector strategy.

1. *Education objectives based on socioeconomic themes.* If the relationship between these two elements is difficult to explain, then it most likely does not exist. There are two ways to ensure a clear connection between socioeconomic themes and education objectives. First, the process of formulating the strategy should involve dialogue with relevant stakeholders (e.g., the business community, labor departments, national human capital development bodies, and local groups). Second, the education targets should be measurable and based on higher-level socioeconomic indicators; that is, there must be a cause-and-effect relation between education objectives and socioeconomic themes.

Exhibit 8
Education-Sector Reform Framework



Source: Booz & Company Ideation Center analysis

2. *Ambitious long-term view with realistic milestones.* Education-sector strategies typically cover 10- to 15-year horizons. Precisely because of their far-reaching impacts, their goals should be ambitious, aiming to take the socioeconomic status of a country from one level to another. However, in order for the strategy to be effective, education strategists should avoid the temptation to solve all the issues in one quick fix. Rather, they must set a reasonable number of priorities and focus on addressing them.
3. *Transparent assessment of the situation.* Education strategists should not shy away from seeing the situation as it is, with all the weaknesses it may reveal, rather than what they would like it to be. An objective assessment of the situation should reveal the obstacles to goals and gaps in the current system and form the basis for addressing them. If an issue is not acknowledged, then it will not be addressed.
4. *Consensus.* To be effective, the strategy should be capable of garnering broad support. The different stakeholders need to believe in its feasibility, objectives, and urgency. Transparent and open communication, as well as an inclusive process, are key to achieving this buy-in.

II. Education-Sector Operating Model

Operating Entities

An education strategy requires the existence of relatively autonomous multifunctional operating entities, which serve to implement the strategy action plans.

Operating entities differ from one country, or state, to another and are an extension of the socioeconomic environment. These entities tend to correspond with the framework of the

Linking Socioeconomic Priorities and Education¹²

Singapore

As the Singaporean economy evolved from labor-intensive manufacturing to higher-value-added activities, so did the education strategy, with three distinct phases that are easily identified. The first “Mass Education” phase (1965–1978) focused on providing sufficient human capital for Singapore’s industrial sector. Also, the education system was geared to contribute to social reconstruction and ensure harmony among the diverse ethnic, cultural, and linguistic groups in the newly independent nation. The second phase focused on the “Efficiency of Education” (1979–1990). Already enjoying high income, Singapore wanted to fine-tune the education system to address low English proficiency, poor literacy, and attrition at schools. To that end, the Curriculum Development Institute of Singapore was established to steer education toward science and math, as well as to foster moral and civic education. In the “Thinking Schools, Learning Nation” phase (1997–present), Singapore has aimed to transform into a 21st-century knowledge economy. The main objectives have been to increase higher education attainment, ensure better management of curriculum content and purpose, and focus on the advancement of information technology and citizenship education, geared toward fostering national cohesion.

Australia

The objectives of the Department of Education, Science, and Training are very much linked to socioeconomic priorities:

- Strengthen national systems
- Raise the quality of outcomes
- Strengthen equity
- Extend international influence
- Build capacity in the workforce
- Engage with stakeholders
- Strengthen business practices.

As a result, the “National Goals for Schooling in the 21st Century” in Australia have three key focus areas:

- Student talents and capacities: Developing fully the talents and capacities of all students so that they can succeed in their lives
- Curriculum: Ensure high-standard curricula and exposure to vocational training during compulsory education years
- Social: Ensure that the education system is egalitarian and provides equal opportunities to all students.

The Australian education system even goes beyond strictly necessary priorities, aiming to “equip students with the knowledge, skills, and attitudes necessary to establish and maintain a healthy lifestyle, and for the creative and satisfying use of leisure time.”

education infrastructure in order to ensure proper implementation of the education strategy (see Exhibit 9).

There are three keys to the optimal functioning of these entities:

- There must be a cadre of talent that is dedicated to the responsibilities related to each entity.
- Coordination needs to take place across entities and between entities and government institutions. For example, the teacher and curriculum entities must coordinate to reach the best possible curriculum design, while at the same time ensure communication with the ministry of education.
- Governance and accountability must be enforced through a specified structure to ensure that the process leading to implementation of policies is not hampered by overlapping functions and authorities and that the accountability of departments and individuals is transparent.

Sector Governance

Good governance is instrumental to education advancement and reform:

- It provides a legal framework for supporting education for all, establishing the needed resource allocations for universal enrollment and provision of quality primary education.

- It provides the legal mechanisms to address education equity. For example, girls' enrollment has been proven to increase through policies that provide for schools closer to the community and that offer families incentives for attending school.
- It furthers the goal of equality in education through the governance of resource allocation, which provides access to quality basic education in remote and poor areas.
- It alleviates corruption in public-sector education by requiring management transparency and accountability through performance standards.
- Finally, good governance provides for citizen participation in the design and oversight of education, as well as the development of civil society partnerships that open the channels of communication between policymakers and society, thus strengthening and promoting the education system.¹³

Consequently, a well-developed governance structure combined with good policies enables operating entities and academic institutions to unleash their potential for maximum benefit. The parties within this

Exhibit 9 Description of Education-Sector Operating Entities

ENTITY	FUNCTION
Curriculum Agency	An independent entity dedicated to curriculum design, management, and development. Identifies talents and abilities from different academic disciplines and develops programs customized to individual students' aptitude and skills.
Teacher Agency	An independent entity responsible for teacher recruitment, training, and licensing. Coordinates activities with other operating entities to promote teachers' rights and interests, undertakes professional discipline, and assists in matters of professional relations.
Monitoring Agency	An independent entity that manages school inspections and interventions related to performance-based monitoring. Monitors program effectiveness and validates data.
Career Agency	An independent and dedicated agency that provides career counseling for students, links industries and employers with academic and learning institutions, promotes job fairs, enhances job matching, and disseminates employment information.
Parents' Council	An independent entity formed of parents and teachers to cooperate on daily matters of schools to ensure students' welfare, both at home and in their learning environment. This entity usually develops at a later stage since parents' and teachers' capabilities will also need to be developed over time, especially with the new curricula and concomitant training.

Source: Booz & Company Ideation Center

structure, especially higher academic institutions, must have a certain degree of autonomy in decision making and fund management while being an integral part of the socioeconomic structure. Recent years were characterized by three main global trends. The first was the transformation of the traditional role of ministries of education from operators to regulators. This trend was coupled with decentralization and empowerment at the school level (see Exhibit 10) and the emergence of specialized independent entities to govern specific aspects of the education system (e.g., assessment agencies, curriculum and standards-setting agencies, and inspectorates).

The third trend is the experimentation with new models (such as public-private partnerships and voucher systems) that are intended to address specific issues in education.

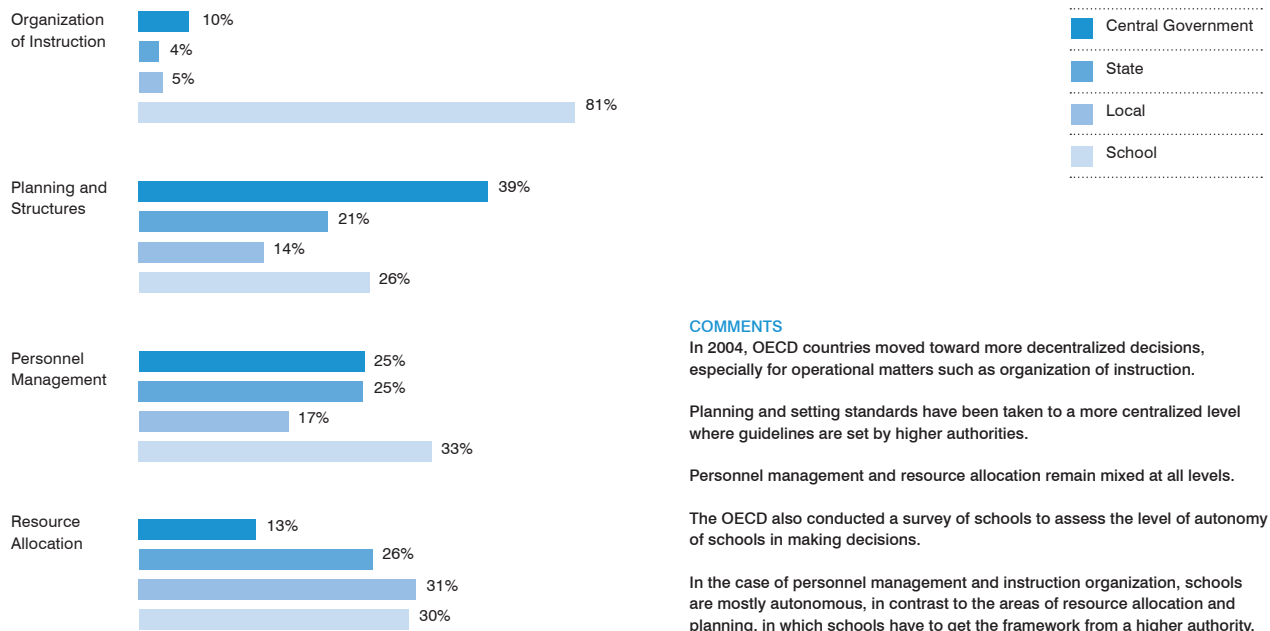
Singapore's system of higher education serves as a good example. The University Autonomy, Governance and Funding Steering Committee (UAGFSC) of Singapore released its preliminary report for publicly funded universities in January 2005 with four key recommendations that outlined the ideal relationship between the government and higher education.

1. Give public universities greater flexibility in decisions related to internal governance, budget utilization, tuition fees, and admission requirements in order to pursue their own independent strategies for maximum benefit to their stakeholders.
2. Continue government support for the universities, but foster a greater sense of self-ownership and independence, which will

allow for achieving excellence so that university stakeholders—council members, management, faculty, students, and alumni—are encouraged to have a more active role in shaping the future of the universities.

3. Ensure that the universities' missions continue to align with national strategy by making them accountable for using public funds. The appointment of council members by the ministry of education allows for such monitoring, in addition to a quality assurance framework and a policy and performance agreement between the ministry and the universities.
4. While committed to being the principal source of funds, the government is providing incentives to universities to seek

Exhibit 10
Level of Education Decision Making by Activity in Sampled OECD Countries, 2004



Source: Organization for Economic Cooperation and Development (OECD) 2004 education indicators (sample of 25 countries)

other sources by matching any funds raised privately. The government funding is on a fungible basis to allow universities greater autonomy to maximize value. At the same time, access to universities remains affordable and merit-based with various plans for the financially needy.

Funding

Targeted funds are necessary to ensure the proper delivery and sustainability of the strategic action plans. Funding differs by level of education and across countries, and originates from government, private, and even foreign sources. As a rule of thumb, however, diversified sources of funding can better ensure continued income and relative autonomy, especially for institutions of higher education.

Two major funding reforms for higher education are emerging in Spain, Denmark, and the Netherlands to increase efficiency and equity in funding without compromising the quality of education. The first gives institutions of higher education more autonomy in spending and consequent freedom in allocating resources. The second simplifies and increases transparency in funding mechanisms while emphasizing accountability.¹⁴ What is also noticeable worldwide is that private-sector involvement in

higher education has been increasing, especially in R&D, where the private sector tends to benefit directly from research in higher institutions. One common factor among many developed countries is their attempt to diversify the sources of funds.

For pretertiary level education, funding in countries such as Singapore, Finland, and Canada derives primarily from government sources, with private schools helping to lessen the public burden by increasing their appeal to parents through the provision of additional curricula and extracurricular activities.

Although funding is central to education development, when it occurs in isolation from the other dimensions of the education-reform strategy framework it will have limited effect. The experiences of the countries cited underscore this very important point (see “*Education Funding in Singapore, Finland, and Canada*”). In Canada, for example, there are four key aspects of monitoring education-sector progress, each of which involves multiple indicators to determine the effectiveness of funding. The first measures the output of educational institutions and the impact of learning; the second, the financial

and human resources invested in education; the third, access to education, participation, and progression; and the fourth, the learning environment and organization of schools.¹⁵ These indicators monitor the return on education and serve as a base for accountability through publicly published reports and subsequent corrective measures. For example, stringent criteria for pretertiary teacher qualifications and frequent testing for teachers were stipulated to ensure quality education.

In Singapore, the UAGFSC ensures that the universities’ missions continue to align with national strategy by making them accountable for their use of public funds. The appointment of council members by the Ministry of Education allows for necessary monitoring in addition to a quality assurance framework and a policy and performance agreement between the ministry and the universities. In Finland, a database on university performance helps monitor how funds are affecting that performance.

The experiences of these countries illustrate two significant points: Funding is important for education, and the sources and models of the funding are important to creating sustainable and effective reforms.

For funding to accomplish its aims, the overall strategy and infrastructure framework must be linked.

Most important, there must be a rigorous assessment methodology for the returns on education funds, transparency of fund mechanisms and processes, and accountability for the outcome.

III. Education Infrastructure

With the strategy well in place and with a functional operating model for education, the next requirement is to ensure that the infrastructure is up and running for sustained education development. Four key factors contribute to the strength and effectiveness of an education infrastructure.

1. Human Capital

Teacher quality is an essential element in student learning; Teachers have an important role in assessing students' readiness for schooling and monitoring their progress. Further, teachers occupy a unique stakeholder position; they not only deliver the curriculum material to the students but also represent an important link between the students, the schools, and the parents.

The influence of teachers on student learning comes as a result of teachers' academic skills, their assignments, their experience in teaching, and their professional development. Several studies have found a positive and significant relationship between teachers' qualifications and experience, and students' achievement. Other variables, which include teacher characteristics such as education and teaching ability, have likewise been found to correlate positively and significantly with the achievement of students. Studies also show that teachers who have taken part in professional development activities tailored to improving their skills and knowledge can help students

Education Funding in Singapore, Finland, and Canada¹⁶

In Singapore, the government has remained the main source of funds since the launch of the current system of education in the 1960s. The Post-Secondary Education Account, for example, is the latest of three national asset-building programs targeting Singaporean children. The other two are the Children Development Account and the Edusave account. These are interest-bearing accounts for students aimed at maximizing their educational opportunities. There has been some noticeable development, however, in Singapore's attempt to diversify its sources of education funds; employer-based vocational training, for example, obtains funding through the Skills and Development Fund (established in 1979), in which funds are collected from a levy on employers to help upgrade the skill of Singapore's workforce. The government also continues to be the principal financial supporter for higher education, but in 1991 it established the University Development Fund to encourage philanthropic donations as an alternative source of income. In 2006, the Ministry of Trade and Industry committed US\$7.5 billion for R&D in the subsequent five years. This initiative is aimed at promoting commercial industries and attracting R&D activities from multinational corporations to Singapore.

In Finland, all Finnish universities are run by the government and are primarily funded from the state budget. However, unlike in Singapore, public funding for R&D in Finland has been declining significantly, while private funding has been on the rise. In addition, industries, universities, and research institutions must compete for public research funding, ensuring a competitive group of educational institutions. Furthermore, funding of the process of innovation is carried out simultaneously to allow for maximum benefit and ensure quality control at each step of the process.

In Canada, elementary and secondary public education is free for all citizens and permanent residents. The provincial ministries' and departments' responsibilities include, among other things, the formulation of funding. Private schools represent the alternative and are independent; however, they are required to meet general standards prescribed by the provincial ministry or department of education. In 2000, Canada ranked second, after the United States, in terms of its expenditure on tertiary education as a percentage of GDP. Government funding accounted for 55.6 percent of total universities' revenue. Student fees represented 20 percent, and the remainder came from donations, bequests, non-government grants, sales of products, and other external sources.

improve their learning and academic achievements.¹⁷

In the early development of the education system in the GCC countries during the early 1970s, most teachers, at various levels of education, came from other Arab countries. Although they had more overall teaching experience than teachers who were Gulf nationals—a commodity in very short supply at the time—they followed old teaching methods, based on rote memorization,¹⁹ without implementing modern techniques of encouraging creative thinking and original work. Because Arab teachers came from countries that were themselves suffering from low teacher quality, they added little value to the overall attempt to build a modern education infrastructure.

The current shortage of qualified teachers, especially at the primary and secondary levels, is due to several factors. These include low teacher wages and inefficient school management, which do not entice the best and the brightest to enter into

the academic profession. However, although insufficient wages are an important problem, the real issue goes deeper than that. Teachers’ academic skills are subject to the low-quality conditions that are pervasive in the education environment.

These conditions have been lacking at various levels, creating a vicious cycle. An ominous 2006 report by the UN Educational, Scientific and Cultural Organization (UNESCO) puts this analysis into perspective: “The future global shortage in teacher quality threatens the goals of education for all [and requires that] the Arab States create 450,000 new teaching posts, mainly in Egypt, Iraq, Morocco, and Saudi Arabia.”¹⁹

The experiences of Singapore, Korea, Canada, and other developed nations suggest that countries with high-quality human capital hold teachers in high esteem, provide them with extensive training and a supportive environment, and make no compromises on teacher quality.²⁰ In Singapore, the Ministry of Education’s mission is to mold the future of Singapore by nurturing and

developing well-rounded and talented individuals; investing in human capital to produce teachers who contribute to the development of students; and focusing on higher education and technology-related fields, thus producing qualified teachers and, consequently, qualified graduates in line with Singapore’s socioeconomic strategies of developing a knowledge-based economy. *Exhibit 11* illustrates some recent initiatives undertaken to develop teacher talent in Singapore.

The Ministry of Education adopted the mission statement “Thinking Schools, Learning Nation” in 1997 to guide the education system to focus on innovation and enterprise as key character traits to develop in students, supported by the appropriate life skills and attitudes. In 2004, the mission statement evolved into “Teach Less, Learn More,” with an emphasis on quality rather than quantity. That means less dependence on rote learning, repetitive tests, and “one size fits all” instruction, and more focus on experiential discovery, engaged learning, differentiated teaching, the learning of lifelong skills,

Exhibit 11
Teacher-Oriented Initiatives in Singapore’s Recent Education Strategy

INITIATIVES	DETAILS
Getting More Teachers	Singapore’s Ministry of Education will recruit about 3,000 teachers, the equivalent of about 15 percent of its teaching force. With more teachers, schools can experiment with new approaches such as parallel teaching and team teaching. Better teacher-to-student ratios will allow teachers to spend more time interacting with students and better address the growing need to motivate and inculcate strong values.
Retaining and Training Veteran and Existing Teachers	A new adjunct teachers program was implemented in October 2004 to attract formerly trained teachers to rejoin the teaching profession. This provided an avenue to retain the experts. To strengthen the professional development of potential and current school leaders, an Education Leadership Development Centre was established in 2006 to provide systematic and high-level oversight of leadership development.
Freeing Up Time for Teachers	Schools will receive a co-curricular program executive to assist teachers in administrative duties related to co-curricular activities and community involvement programs, which will free up more time for teachers.
Enhancing Teacher Resources	By 2010, teachers and school leaders will be given more time and space to allow them to reflect, discuss, and plan their lessons. Each one will be allotted an hour per week for professional planning and collaboration.

Sources: Singapore Ministry of Education (www.moe.gov.sg); Booz & Company Ideation Center analysis

and the building of character through innovative and effective teaching approaches and strategies.

In developing their teaching and administrative human capital, GCC countries face a situation rarely found in other countries. With more than half of their teaching staff consisting of expatriates, not only do many GCC countries need to attract qualified nationals to teaching, but they also need to recruit qualified expatriate teachers. Each of these necessities poses its own set of challenges:

- How to screen, attract, train, and retain qualified nationals in the teaching force, especially men, given the more attractive alternatives available to them.
- How to increase the number of teachers who are nationals and replace nonqualified expatriates, given the current shortages of qualified teachers.

To address some of these challenges, it will be necessary to attract foreign talent in order to fill the talent gap in the years to come. This must be done with an eye to encouraging foreign talent to put down roots—especially those with shared cultural values—and transfer knowledge to national talent, in order to enhance the overall quality of human capital and give the engines of the education system a much-needed boost.

In addition to retaining and retraining retired and existing teachers, some countries, local culture permitting, may also need to consider hiring female teachers (for specific grades) in boys' schools because there is a shortage of male teachers.

Furthermore, some countries can enlist the help of their young people—who make up a majority of the

Funding Models and Sources for Higher Education ²¹

Models

- Basic funds allocated through a transparent formula for long-term planning, including adaptation to demand for higher education and improved teaching and research quality. It allows higher institutions the freedom to allocate their funds. Elements in the formula vary between countries, between fields of study, and over time. The impact of the funds depends on whether they operate on a closed or open-ended budget basis.
- Closed budget funding sets boundaries and promotes efficiency of higher education funding.
- Output-driven funding systems increase efficiency by pushing higher education institutions toward more efficient management of education.
- Objectives-based funding improves efficiency of the education process through accuracy in formulating key objectives.
- Competition-based funding stimulates research by the promotion of applicability and quality of its results. Focus on the value of research will increase its social value and further augment the autonomy and self-governance of higher education.

Sources

- Public funds position the government as a major supporter of higher education. However, these funds have been declining over the years in several developed countries.
- Subsidized loans allow students to cover larger portions of the operating costs of higher education such as tuition fees, while students are responsible for a smaller fraction of the cost such as books and housing.
- Student grants and vouchers incorporate market forces into the education system by allowing students to choose among universities, which compete for student funds.
- Tuition fees are applied to students who are financially able to pay for higher education.
- Self-generated funds are available where higher education institutions sell their services, such as consulting and R&D.
- Donations from internal and external sources and charity organizations can play a major role in the GCC countries. The latest examples are Care Dubai and the King Fahd University of Petroleum and Minerals' donation fund, which are testaments to the importance and benefit of alms giving.

population—by implementing proven measures that allow university students to participate in the teaching process (e.g., internships and part-time teaching).

Finally, a combination of financial compensation and “morale” motivation and recognition will be required. For example, some level of top-of-the-class screening and admission processes, coupled with good awareness campaigns, can help raise the profile of the profession among nationals. All in all, the quality of the teaching profession must not be compromised.

2. Curriculum and Choice

Curriculum reflects a combination of purpose (relating to a country’s socioeconomic objectives) and content (relating to material that would help achieve these objectives); its development is aided by keeping pace with changes in technological know-how. National curricula should also reflect social, economic, and political goals. For example, Singapore’s curriculum since the

1960s reflects sound management of both content and purpose, having kept up with economic and technological challenges. News reports in 2007 that suggested Saudi Arabia and the UAE are cooperating with Singapore indicate a desire on the part of these Arab governments to emulate the Singapore model and transform their curriculum structures.

Pretertiary education in GCC countries is—as in many other countries—a mixture of religious/moral and secular education. Indeed, religious studies are paramount for maintaining and reinforcing religious heritage, but other subjects such as math and science are equally important for a knowledge-based economy and for reflecting socioeconomic priorities. This is especially true at both the primary and intermediate levels of education, so that the structure of curricula is not biased toward literature majors, producing fewer science and technology college graduates than industry requires (see *Exhibit 6, page 7*). Some studies have suggested

that overemphasis on subjects other than science is likely to influence students’ decisions to pursue nonscience majors, even if the individual students are analytically or scientifically perceptive. This trend may be exacerbated by the current rigidity of the education system, in which students are not free to change majors once their educational affiliation, i.e., literature or science, has been determined. In recent years, however, several GCC countries have made major changes to the curriculum structure, whereby a balance is struck between math and sciences, and religious studies. *Exhibit 12* illustrates an estimated share of subjects in the curriculum of selected countries based on available data.

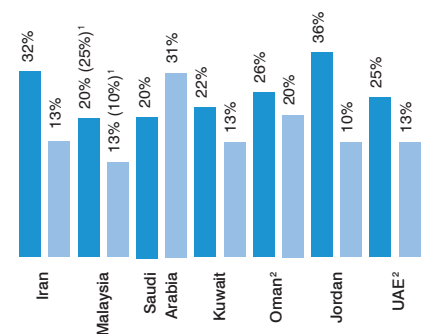
For the GCC countries, curriculum reform must focus on the following elements:

Giving students a broader choice.

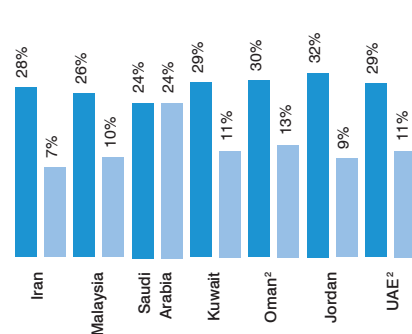
The traditional boundaries separating the vocational and academic learning tracks are being blurred. In fact, many education systems, such as that of

Exhibit 12
Estimated Share of Total Courses for Selected Countries, 2002

PRIMARY/ELEMENTARY



LOWER SECONDARY/INTERMEDIATE



¹ National-type schools (Chinese and Tamil).

² Oman and the UAE began work on a basic education program to gradually replace the old primary to secondary system (other GCC countries, like Saudi Arabia, have instituted a similar model). For presecondary levels, the math and science share of total courses for Oman and the UAE are 35 percent and 29 percent, respectively, while religious and moral studies are 12 percent and 9 percent, respectively.

Note: Numbers are rounded off.

Sources: UNESCO (www.uis.unesco.org); Booz & Company Ideation Center analysis

Australia, aim to equip students with vocational skills as well as academic skills. Moreover, higher education programs are designed to fit the needs of different people. The priority is to ensure that the graduating students will contribute positively to the socioeconomic agenda of the country.²²

Linking curricula with the desired socioeconomic outcome. Curricula need to address the key socioeconomic priorities. For example, Singapore has revised its curricula to emphasize the importance of innovation

(see Exhibit 13), as well as to instill a sense of civic pride among the students, encouraging their participation in different societal activities, including teaching. Additionally, Singapore has been increasingly putting emphasis on flexibility and choice in curricula (see Exhibit 14, see page 18).

3. Assessment and Performance Measurement

Effective management of education strategies requires accountability, frequent monitoring, and

measurement. The results of five different major reviews on effectiveness-enhancing conditions in schools, conducted between 1983 and 1995, list appropriate monitoring and assessment of schooling as key factors.²³ In Singapore, universities' accountability is assessed through the alignment of their policies and policy outcomes with national strategic objectives, and accountability of funds through signed policy and performance agreements with the Ministry of Education. In Finland, the Ministry of Education

**Exhibit 13
Innovation and Enterprise Initiatives in Singapore's Recent Education Strategy**

INITIATIVES	DETAILS
CHARACTER DEVELOPMENT	Greater emphasis will be placed on developing life skills, such as managing emotions, developing positive relationships, handling challenging situations, and making responsible decisions.
CO-CURRICULAR ACTIVITIES (CCAS)	CCAs help to nurture in students qualities like resilience, tenacity, confidence, and perseverance, which, in turn, develop strength of character that will enable them to better adapt and thrive in a rapidly changing world. CCA policies and grading schemes for secondary school and junior college students would be broadened to recognize sports and community activities.
NEW APPROACHES	MOE introduced an instructional approach called Strategies for Active and Independent Learning (SAIL) to enhance teaching and learning in schools. It also introduced Strategies for Effective Engagement and Development (SEED) to help primary schools review and strengthen their foundation year programs in smaller class sizes.
NEW CERTIFICATES	As part of MOE's effort to promote a more holistic education, it announced a comprehensive school testimonial called the School Graduation Certificate in September 2004. This certificate will be given to all students who complete their education at the secondary and pre-university levels from 2008.

Sources: Singapore Ministry of Education (www.moe.gov.sg); Booz & Company Ideation Center analysis

uses the KOTA database as a tool for managing the performance of universities. The database contains information regarding university performance by institution and field of study.²⁴ In Canada, universities are accountable through a mixture of market forces and self-disciplinary criteria.

4. Learning Environment

Learning starts but does not end in the classroom. Parents' involvement in the learning process, in addition to extracurricular activities (e.g., sports and community work), are key factors

in molding students into well-rounded people. Moreover, the surrounding cultural and scientific environment (e.g., museums, theaters, and science competitions) plays an important role in stimulating creativity. For example, Singaporean families exhibit strong concern about their children's education, leading parents to significant involvement, including buying assessment books (e.g., test practice books) and getting private tutoring for their children. Similarly, in Lebanon, parents' dedication to their children's schooling as a means of social progression leads them

to spend a large portion of the family income on education.

Therefore, successful education-reform programs should tackle four building blocks:

1. Build a good learning environment, containing the elements described above, at school and in the classroom.
2. Engage parents in the learning process and promote their ownership of their children's results. For example, many

Exhibit 14 Flexibility and Choice Initiatives in Singapore's Recent Education Strategy

INITIATIVES	DETAILS
Broad Education Landscape	Students are given a lot of leeway to choose what they want to do, especially at the secondary level, where students can join express or normal secondary programs as well as the integrated program. At the pre-university level, they have a choice between polytechnics or junior colleges.
Flexibility in Education Pathways	To allow a more diverse range of student achievements and talents to be recognized, MOE gave selected schools more flexibility in their student admissions. In 2004, MOE introduced direct school admissions, which allowed schools offering the integrated program full discretion on admissions and was extended to autonomous schools and independent schools.
Greater Customization	Customization of curriculum is possible, especially at the secondary level, where students get to choose between normal academic and normal technical curricula. Flexibility in choosing the mother language that best suits children has been given as an option to students and parents.
New Examinations	To match the changes in curriculum and teaching methods, there is a need to evolve assessment methods and review and update the content of examinations. The Singapore Examinations & Assessment Board (SEAB) was established in April 2004 as a new statutory board under MOE; it may launch more international examinations.

Sources: Singapore Ministry of Education (www.moe.gov.sg); Booz & Company Ideation Center analysis

schools allow parents to view their children's results and assignments via the Internet.

In addition, parents are encouraged to participate as representatives on school committees, which make them better informed about school policies and the resulting effects on their children. The greater involvement of parents in aspects of school management—such as the provision of a dedicated Web site, blogs, and chat rooms where ideas on education can be exchanged—allows for a wider range of parental involvement and participation in their children's education.

3. Engage local community stakeholders. Education authorities need to cooperate with other stakeholders, in the public as well as the private sector, to create a continuation of the learning process outside the classroom. This would involve cultural authorities, community sports clubs, and nongovernmental organizations, among others.
4. Integrate classroom technology and equipment with the school's or university's pedagogical approach. This can offer students a richer and more satisfying learning experience, while the

school gains savings in cost and support personnel.

An increasingly important factor in the structure of the educational system is the advancement of information and communication technologies (ICTs). For developing countries, ICTs present a great opportunity to catch up with developed countries in various arenas, including education. Singapore developed a comprehensive plan to integrate ICT into its education sector with discernible results. The plan's objective was to generate knowledge, focus on students, and create a self-directed education approach in which teachers and other education stakeholders were provided more autonomy. In doing so, Singapore developed a number of best practices that other countries can follow. First, any ICT plan must be implemented only after careful consideration of the education system to ensure that it can facilitate and support the plan. Second, any ICT plan must be a tool of education and not an end in itself. Third, the ICT plan must be linked to education policies and/or initiatives to allow stakeholders to examine any potential gaps. Finally, flexibility of the education system is a prerequisite to the success of any ICT plan, as traditional education practices will require adjustments.²⁵

Lessons Learned from Global ICT Investments in Education ²⁶

- The young are the most appropriate target for ICT initiatives.
- Effective training for motivated teachers is paramount to ensure students reap the benefits of ICT investments in education and to ensure effective use of ICT for the promotion of learning.
- Technology should be used to reach rural and poor areas and other at-risk groups such as the young, the unemployed, the physically challenged, and groups close to the poverty line.
- The use of effective and relevant education software is central to ICT learning.

PROPER IMPLEMENTATION OF AN EDUCATION-REFORM STRATEGY

Developing a comprehensive education-sector reform strategy is only the first step. Proper implementation is a key determinant of the success of the reform. Experience from other countries suggests that successful implementation rests on five success factors, similar to the requirements of any large transformation project:

- 1. Divide projects into subprojects.**

Education-sector reform is a major undertaking and is difficult to manage. Although it is essential to tackle it holistically during the planning phase, it is more practical to prioritize the initiatives and divide them into subprojects. Subprojects should have a clear scope, ownership, work plan, and expected results. The number of subprojects running in parallel should be managed carefully to avoid burdening the management of the education system, which is responsible for managing the operations of present school activities in addition to the reform.
- 2. Prioritize the implementation process and manage the speed of reform.**

The sequencing of projects and the speed of implementation depend on the project management capabilities of the responsible organization and on the urgency of the reform. The more capable the management and the more urgent the reform, the more quickly it can proceed. However, reforms undertaken with relatively less time pressure have higher chances of success, as even the most eager stakeholders need a reasonable period for successful implementation of reform elements. Such periods are generally based on available resources and experiences.
- 3. Ensure ownership and consensus among stakeholders and accountability for actions.**

Government leadership in strategy design and implementation could be facilitated by involving the relevant stakeholders, especially employees at all levels within the education system, in the

implementation process. Moreover, the close collaboration and coordination of various stakeholders is essential to ensure the effectiveness of all contributions. Because education-system reform typically involves a large number of stakeholders, it is essential to clarify the expectations, roles, and responsibilities of each contributor in order to mitigate gaps during implementation. To ensure successful cooperation from the concerned stakeholders, the following should be observed:

- Establish effective coordination mechanisms, which provide a platform for dialogue, progress reporting, and timely problem solving. In cases characterized by complex processes, an “operational manual” detailing all the procedures to be followed during implementation should be developed.
- Transparent communication helps in rallying support for

the objectives of the reform and alleviates the concerns of stakeholders who have equity in the process. It also helps ensure that all stakeholders appreciate how their contributions fit within the broader sector policy and strategy and the expected outcomes.

- Last but not least, accountability for specific initiatives should be clarified. A clear meritocratic system can help motivate stakeholders; good performers should be explicitly acknowledged and rewarded while corrective actions should be taken to remedy lagging performance.
4. **Ensure continuous measurement of results.** Measurement should take place at two levels. One level relates to the progress of the initiatives, the other to the results achieved from the reform. Tracking the progress of initiatives

is essential because the success of the overall reform program depends largely on effectively completing the planned projects and subprojects. Moreover, because the reform is a multiyear effort, measuring the outcomes steers the program and allows for corrective actions as needed.

5. **Be patient.** Changing course should not happen at the first sign of problems (or delays in improvement). Reform requires time to be translated into meaningful outcomes. In addition to diligence, patience is necessary for the success of any plan as it allows one to step back, look at the problem, and initiate efforts to solve it.

ESTIMATING THE LENGTH OF TIME FOR A RETURN ON EDUCATION INVESTMENT

The experiences of rich nations and, more recently, newly industrialized countries indicate that in order for human development plans to bear fruit, there must be a sustained investment in human capital. Research reveals strong evidence that quality education (cognitive skills rather than mere degree attainment) is strongly related to economic growth. Countries such as Singapore and the Republic of Korea exemplify this pattern of growth and human development. The lesson learned from these countries is that without the right kind of human capital, economic policies will fail to deliver on economic growth as labor and other resources cease to be of benefit to the next stage of development. Equally important, education reform will tend to fall short without the proper socioeconomic policies to

support it. In particular, socioeconomic institutions are necessary for education reform.²⁷ Such institutional development generally takes considerable time.

Although it is difficult to specify the period required for any reform plan to take effect (with effect being measured in terms of indicators such as GDP and international test scores), the education-reform experiences of Singapore and the Republic of Korea indicate that it takes several decades before the results of education investments are realized.

Given the necessary socioeconomic infrastructure, research provides some insight into the magnitude and duration of education reform. *Exhibit 15* simulates the impact of successful education reform policies on the economy over several reform periods.²⁸ It illustrates the level of difference (in terms of GDP) between reform and no reform at any point after such policy is begun (2005 in this case). For example, a 20-year reform plan (started in 2005) would result in a 5 percent higher GDP in 2037 than an economy with no change in its quality of education, while a 30-year reform plan would yield a 4 percent higher economic growth in 2040.

There are four key conclusions:

1. The time path for strong knowledge improvement (i.e., achieving a 0.5 standard deviation improvement in test scores) is difficult to ascertain but may take a 20-to-30-year period for an entire country.
2. Even if education reform is successful, its economic impact will not be immediate, as new graduates will represent a very small portion of the workforce needed to achieve measurable results. A full impact is expected to take an additional 35 years past the years of reform. That is, for a 10-year reform policy, the impact will take a total of 45 years. Given a critical mass of skilled workers in the economy, however, this period can be shortened with improvements in technology.
3. A faster reform will result in a larger impact on economic performance as workers that are more skilled get to dominate the workforce sooner.
4. Significant spending (on all primary and secondary schooling)

above the typical education spending of 3.5 percent would allow for a return dividend that covers both primary and secondary schooling expenditure.

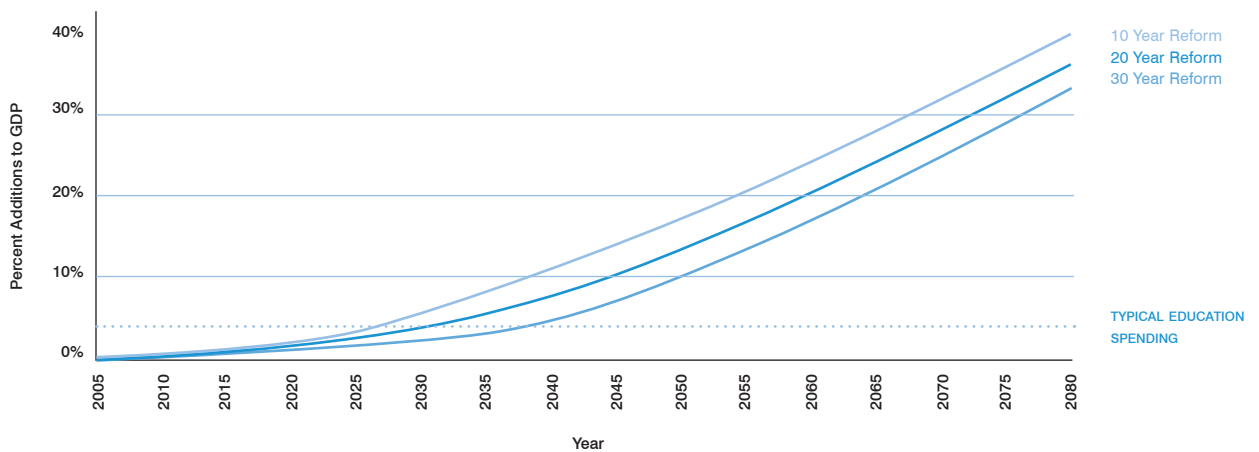
From a practical perspective, Singapore's reform experience, which began in the mid-1960s after a decade of political turbulence, provides some insight. The priority in 1965 was to adopt education policies that would support industrialization and economic growth. This led to a series of political initiatives over the following decades aimed at economic growth and social integration with the goal of catching up, and later competing with, the developed economies. Singapore's success highlights several important points. First, although the planning period is necessarily long to accommodate the development of human capital, such capital tends to self-rejuvenate when aided by appropriate policies that keep pace with changing requirements.

This means that education reform should be part and parcel of policies that, among other things, aim at increasing the demand for educated labor and ensuring that their qualifications are put to good use. Second, paying attention to developing human resources through effective funding has allowed countries like Singapore to experience a technological leap in education that even surpassed the industrial phase other countries experienced. Third, despite a lack of natural resources, the quality of its human capital allowed Singapore to advance rapidly along the economic front. Finally, adopted policies and initiatives, which served to augment the strategy framework in our analysis, helped to accelerate the overall strategy timeline.

One of the major reasons for countries' failures in their reform efforts is a shortage of good teachers. Studies have shown that good teaching can positively affect students' cognitive

skills considerably,²⁹ which in turn has a measurable effect on economic growth. However, there are limits to how much the quality of teaching can be improved, given the challenges of attracting, screening, training, and retaining teachers mentioned earlier, and such reforms take a significant amount of time. Nevertheless, because countries like Saudi Arabia and other GCC states face similar challenges in reforming their education systems to those faced in the early stages of development in countries like Singapore and the Republic of Korea, the Asian nations' example provides hope for the GCC region. These countries' experiences and research findings indicate that, given an education-enhancing framework of socioeconomic institutions, knowledge improvements may be achieved within a decade, while meaningful economic returns will require a period of 30 to 40 years.

Exhibit 15
*Improved GDP with Moderately Strong Knowledge Improvement**



*0.5 standard deviation
Source: Eric A. Hanushek and Ludger Wößmann, "The Role of Education Quality in Economic Growth," 2007

SAUDI ARABIA: IMPLEMENTATION OF A HOLISTIC EDUCATION- REFORM STRATEGY

There is no one-size-fits-all solution for any education-reform program. Some countries, like Finland, have done well with limited expenditure. Others, such as Canada, poured resources into the education system and obtained good results. What is common among these countries, however, is their use of a holistic approach to education, including effective implementations of strategy plans. Such an approach helps provide a prudent guide to focal areas of strategy that are likely to lead to enduring results. By studying what some countries have done, we can propose a similar way forward for other countries—for example, Saudi Arabia, which has already launched a comprehensive plan for reform.

Action Plan for Saudi Education-Reform Strategy

The current need for education reform is well understood by policymakers, who have put forth a more progressive and dynamic plan for the future of education in Saudi Arabia. A 2004 publication by the Saudi Ministry of Education (MOE) states that “there are indications that the fault lies in the kind and methods of education and their ability to influence types and behavior and attitudes of thinking. The education system with its tools and methods has not had the desired effect on students’ behavior and has not contributed to the vision of the present circumstances in relation to the immediate and distant environments. This makes it imperative to provide clear vision and mature recognition of the contents of the education system that will fulfill the society’s needs and aspirations.”³⁰

Consequently, the MOE has set up an ambitious 10-year comprehensive plan that covers all levels of education and engages various interrelated ministries, institutions, and groups. The MOE strategy is based on the following key challenges for the Kingdom of Saudi Arabia³¹:

1. An increasing demand for education requires the expansion of the education system and its programs at all levels, along with the concomitant funding.
2. The success of education is measured by the ability of the education system to produce highly skilled individuals who are able to create and achieve social goals.
3. The effects of globalization must be integrated into an education-reform strategy that will allow Saudi Arabia to face global competition and, at the same time, maintain its traditions and values.
4. Technological development and knowledge building require syllabi revision and reorganization of knowledge and skills for a successful application of technology.
5. National identity must be protected from a cultural invasion by technology and mass media communication, using a balanced approach that would allow the use of technology within cultural limits.

Based on these challenges, a strategy was formulated and developed into

a series of goals and objectives that focuses on subjects ranging from preparing children for primary education to the establishment of an integrated accountability system.^{32, 33} The goals and objectives highlighted in the Saudi Arabia Ministry of Education's report demonstrate the comprehensiveness of the proposed plan, which is ambitious by the MOE's own description. The plan adequately covers the dimensions in the strategy framework. The approach follows a comprehensive seven-stage plan that on paper augurs well for success.

Recommendations

As previously mentioned, proper planning of the education strategy is half of the reform equation. The other half is effective implementation of the plan. Although the Saudi education-reform strategy is comprehensive, its impact will depend on the benefits it accumulates from its experience and the effectiveness of implementation. Consequently, the plan and its resultant outcomes can be accurately assessed only in hindsight. However, Saudi Arabia can benefit from successful experiences by sidestepping potential pitfalls of the implementation process. The following are key factors to consider in the implementation phase of the Saudi Arabia education-reform strategy.

1. Use a transformational approach in lieu of piecemeal reform.

- Experience suggests that a holistic approach generates synergies among stakeholders that cannot be achieved through an incremental approach.
- Various technological and

economic development imperatives will require systemic changes within the education system.

- The state should focus on the major challenges associated with a transformational reform and not be sidetracked by secondary issues.
2. **Divide big projects into smaller projects.**
 - This strategy allows stakeholders to develop their implementation experience, supported by limited interventions.
 - Smaller projects are relatively easier to sequence and adapt to the pace of implementation.
 3. **Ensure ownership and consensus among all stakeholders, as well as a transparent socioeconomic environment.**
 - Government ownership of the strategy design and implementation is grounded by involving employees at all levels within the MOE through activity-based initiatives. It also facilitates mainstreaming of behavioral change and the effective continuity of reform.
 - The close collaboration and coordination of the various sources of funds is essential to ensure the effectiveness of all contributions. The operating entities should play an important role in coordinating with and monitoring other relevant ministries to assist the MOE, encouraging contributors to collaborate and coordinate

their contributions for maximum benefit to the education-reform process.

- An operational guidebook will help clarify the roles of various MOE departments involved in the program. The guidebook should include all the procedures and detailed processes to be followed during implementation.
 - The overall policy must be transparent and accessible for all stakeholders through frequent publication of progress reports and open communication among relevant stakeholders.
4. **Ensure continuous measurement of results and accountability of actions.**
 - Improve financial accountability to have a more efficient disbursement process.
 - The process of teacher and administrator training must be evaluated frequently by external and independent experts, and the training process must be modified based on the results.
 - The MOE should develop its own regulatory and quality assurance capability.
 - Ensure documentation of actions that need approval and clearance for subsequent reference and assessments.
 - Avoid costly changes and corrections by including additional detailed specifications for crucial projects and penalties for delays and/or nonfulfillment of specific details.

A SUCCESS STORY OF A SAUDI HIGHER EDUCATION INSTITUTION

Reform policies in higher education vary across the GCC countries. Although some GCC countries, like Qatar and the UAE, are focusing on private universities, Saudi Arabia is directing its attention toward improving the quality of public universities. The King Fahd University of Petroleum and Minerals (KFUPM) represents a success story that the Saudi government is looking to replicate throughout the kingdom. KFUPM has been at the forefront of higher education in the kingdom and top among Saudi universities since its establishment. Recruitment of students, especially in the private sector, begins at KFUPM before any other Saudi university. Recently, the Ministry of Higher Education selected KFUPM to spearhead the “Aafaq” project, which aims to formulate a five-year strategic plan for higher education focusing on faculty,

students, and information technology. This confidence in KFUPM is based on the university’s success factors, which represent a good model from which lessons can be learned at the institutional level.

The success of KFUPM as an institute of higher education has resulted in the Saudi government budgeting generous sums for additional higher education institutions. The King Abdullah University of Science and Technology (KAUST) will be a graduate university focusing on science and technology research and teaching. Saudi ARAMCO, a state-owned oil company that is one of the world’s largest, is reported to have been commissioned to design and build the KAUST campus, which expands over thousands of acres of coastal land and is expected to be completed by 2009.

King Fahd University of Petroleum and Minerals— A Success Story of Higher Education in Saudi Arabia

Quality Environment

KFUPM is located in the eastern province of Saudi Arabia. The university has a model campus covering a huge area and includes housing for students and faculty.

From its inception, it has had a solid relationship with the American-Saudi oil company ARAMCO, now Saudi ARAMCO, which cooperated with the university in employing graduate students in science and technology to work in its vast technical areas. This relationship laid the foundation for a good link between the university and the business community. The university's series of strategic plans put forth since its inception steered the university in the right direction. In addition, the focus on science and technology provided the university with a clear mandate and a higher degree of autonomy than other Saudi universities from the various regulations that promulgated over the years. The construction of the bridge to Bahrain provided students with exposure to a different environment where they could spend their leisure time.

In addition, the university's connection to international academic institutions, buttressed by ARAMCO, provided a link from which it benefited in establishing a solid infrastructure. Furthermore, commitment to university policies and processes by all faculty members while maintaining flexibility within the process ensured discipline, evolution, and continuation of quality.

Quality Faculty

KFUPM invests heavily in both its faculty hiring process and the retention of quality faculty members. The process is derived from a strategic plan (based on socioeconomic policies) with a gap analysis indicating the necessary fields to add. A search committee composed of five key university personnel has the responsibility of ensuring the recruitment of the right individuals based on quality-defined criteria. The final decision is made regardless of citizenship. Once recruited, faculty members enjoy a rewarding campus life with free housing, education for their children in international schools, and means of transportation. In addition, faculty members actively participate in conferences related to their research areas, as required. A yearly evaluation process by a review committee headed by senior faculty members evaluates faculty performance based on teaching, research, and community service. Reviewed faculty members receive a rating, which determines their nomination for an incentive bonus along with an extension of their contract and/or their promotion based on the level of seniority.

Quality Students

KFUPM is keen on selecting the best and the brightest and not on filling a quota. The reputation of the university and its postgraduation career opportunities attract students from different regions of Saudi Arabia, thus providing diversity among the students. Coupled with a campus environment where the majority of students live in comfortable housing, this diversity allows for the interaction of students, team building, and an understanding of the regional cultures. It also provides a good network that increases postgraduation career opportunities. In addition, the disciplined environment of KFUPM and performance criteria engenders students' commitment to their work and builds good work ethics that students carry over to the business world. KFUPM's association with Saudi ARAMCO, the largest oil company in the world, provides major input on students' progress in the business world. This information feeds back into the KFUPM educational process, including curriculum development.

Quality Curriculum

The university puts significant effort into curriculum design, based on industry requirements and international best practices. The curriculum committee consults with Saudi companies and international universities such as Harvard University and the University of Illinois. These consultations are then analyzed internally and the results are supported by the necessary technological infrastructure. One of the distinguishing features of KFUPM's curriculum requirement is the learning of the English language. The university requires a one-year orientation in which students are obligated to study English and take a test that determines whether they can continue at the university. One example of the constant development of curriculum is the recent addition of a social skills program at the university. This program prepares students for job interviews by helping them build their resumes and enhance their presentation and communication skills in order to "sell" themselves to recruiting companies.

CONCLUSION

There is no doubt that Saudi Arabia and the broader GCC region have come a long way. The unwavering support for education has yielded good results. However, the changing environment has brought new challenges that the region must confront.

The next decade will prove to be a critical time for education policy in the region, and small mistakes may pose huge risks in economic and social terms. Indeed, in the absence of adequate education, government efforts at economic reform are likely to have limited impact in alleviating the unemployment problem. Although quotas may work in achieving lower unemployment rates in the short term, the long-term solution demands a skilled and knowledgeable workforce. This can be obtained only through an overhaul of the education system in line with economic and social strategies aimed at creating new job

opportunities for nationals. Through proper planning and careful implementation of education-reform strategy, goals are likely to be achieved.

The following highlights some complementary policy issues for successful reform of the education system in Saudi Arabia, and indeed in other GCC countries.

The role of the government as employer of last resort must be phased out with a clear strategy to allow the private sector an increased ability to enhance the demand for national employment, make better use of worker's productive capabilities, and help shape the outcome of the education reform. This will also encourage students to study fields in line with the growing sectors in the economy.

Along with empowering the private sector, the GCC governments must continue to move steadfastly in developing social and economic institutions necessary for education and economic reform. In that respect, the 2008 World Bank "Doing

Business" report shows Saudi Arabia ranking substantially higher than previous years in areas of institutional effectiveness. Such signs are encouraging for the region's economic outlook and indeed for its education reform prospects.

Empowerment of the private sector will help infuse additional resources into both pretertiary and higher education levels. While government funding should continue to be the main source of funds, cooperation between the private sector and the education system—especially higher education institutions—must be encouraged through higher autonomy for schools and private-sector incentives.

Finally, it is important to ensure that education expenditure is productive. This means ensuring proper assessment of inputs and outputs to education reform efforts. As such, performance and accountability measures become paramount in ensuring success of any plan. A successful education reform policy depends on frequent and consistent measurement.

In the past few years, Saudi Arabia and the broader GCC region apportioned generous additional resources for education reform. By many accounts, the next decade is likely to provide positive economic growth due to expected oil earnings. This is good news for the education sector. However, as emphasized throughout this paper, strategies based on socioeconomic priorities, a good operating model, and sound infrastructure are integral parts of the overall reform program.

Although the impact of an education policy may not become apparent until years after implementation and invariably depends on other policies and trends, the experience of Singapore and other countries indicate that noticeable results can be obtained in a decade, even though realization of the full economic impact may require a generational period. This by no means indicates that the policymakers' and business leaders' job is complete; rather, it outlines the nature of any good education policy—namely, a continuous process of adjustments and evolution based on a holistic strategy approach.

Saudi Arabia: Harnessing Economic Development through Higher Education in Science and Technology

Demonstrating its commitment to progress, Saudi Arabia is building the King Abdullah University of Science and Technology (KAUST), an international, graduate-level research university dedicated to scientific achievement. This institution, governed by an independent board of trustees, will be open to women and men from around the world. Admission will be merit based.

Slated to open in 2009, the university will initially focus on four interdisciplinary research clusters: resources, energy, and the environment; biosciences and bioengineering; materials science and engineering; and applied mathematics and computational science.

The US\$2.6 billion institution will have an estimated capacity for 13,000 students and plans to attract top faculty from renowned academic and research institutions.

Endnotes

¹ The Gulf Cooperation Council (GCC) region comprises Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

² Robert J. Barro and Xavier Sala-i-Martin, *Economic Growth*, Second Edition (MIT Press, 2003).

³ In January 2003, the Kingdom of Saudi Arabia presented the "Charter to Reform the Arab Position," urging the Arab states to recognize the need for internal reforms and greater citizen participation. Source: Royal Embassy of Saudi Arabia, "Political and Economic Reform in the Kingdom of Saudi Arabia," September 2005.

⁴ United Nations Development Programme (UNDP), *Arab Human Development Report Series 2002–05*.

⁵ GER refers to the number of students enrolled in a given level of education, regardless of age, expressed as a percentage of population in the theoretical age for the same education level. Source: "Global Education Digest 2006: Comparing Education Statistics Across the World."

⁶ The Institute of International Finance (IIF), "Regional Report Gulf Cooperation Council Countries," August 15, 2006, and the International Monetary Fund (IMF) Country Report No. 05/268. The latter, citing the National Human Resource Development and Employment Authority (TANMIA), puts the unemployment figure among UAE nationals at an even higher rate, reaching 16 to 17 percent.

⁷ Exhibit 4 illustrates an often-sited paradox in GCC countries—namely, having high national unemployment while experiencing high demand for foreign labor. High reservation wages and low skills among nationals are strong contributors to this phenomenon.

⁸ Arab News, "More Saudi Pharmacists Needed," August 18, 2007, page 3.

⁹ The Trends in International Mathematics and Science Study (TIMSS) is an examination conducted every four years to ascertain the math and science achievements of students around the world. The Programme for International Student Assessment (PISA) is a collaborative effort among member countries of the OECD to assess, on a regular basis, the achievement of 15-year-olds in reading literacy, mathematical literacy, and scientific literacy through a common international test.

¹⁰ For example, Jordan's 2003 TIMSS average science score was significantly higher than its 1999 score and slightly above the international average. Math TIMSS scores over the same period, although slightly lower in absolute number, represent a 3 percent advancement relative to the international average score. Additionally, Jordan ranks top in science and mathematics among Arab countries and its total adult literacy rate is over 90 percent.

¹¹ Singapore Ministry of Education (www.moe.edu.sg/abtmoe/pa/contact/vo110/pers.htm).

¹² Singapore Ministry of Education (www.moe.gov.sg); Australia Department of Education, Science and Training (www.dest.gov.au); Booz & Company Ideation Center analysis

¹³ U.S. Agency for International Development (USAID), "Approaching Education from a Good Governance Perspective: USAID Resource Guide for Joint DG/Education Programs," August 2003.

¹⁴ See the January 2007 Final Report to the Directorate-General for Education and Culture of the European Commission: "Rates of Return and Funding Models in Europe."

¹⁵ Council of Ministers of Education, Canada Country Profile, 2006.

¹⁶ Singapore Ministry of Education (www.moe.gov.sg); Canada's Council of Ministers of Education; Carl J. Dahlman, Jorma Routti, and Pekka Ylä-Anttila, *Finland as a Knowledge Economy: Elements of Success and Lessons Learned*, prepublication version, The World Bank, 2005; Booz & Company Ideation Center analysis

¹⁷ Richard A. Rossmiller, "Changing Educational Practice through Continuing Professional Development Programs," 1984 (ERIC ED249609).

¹⁸ This is especially true for the pretertiary level. See, for example, Alan Richards and John Waterbury, *A Political Economy of the Middle East*, Second Edition (Westview Press, 1998).

¹⁹ UN News Centre, "Global Teacher Shortages Threaten Goal of Quality Education for All," April 25, 2006.

²⁰ UNESCO, *Education for All (EFA) Global Monitoring Report 2007*.

²¹ 2007 Final Report to the Directorate-General for Education and Culture of the European Commission

²² An indication that the education systems have been falling short of meeting private-sector demand in several GCC countries is that while the private sector prefers job applicants who are proficient in English, public schools have not made much effort, until recently, to teach English at an early age.

²³ UNESCO, *EFA Global Monitoring Report 2007*.

²⁴ Ministry of Education, Finland (www.minedu.fi).

²⁵ UNESCO (www.unescobkk.org).

²⁶ Sources: International Youth Foundation, "Integrating ICT into Youth Development Initiatives: Some Lessons Learned," 2003, www.iyfn.org; World Bank Report No. 25309-JO

²⁷ These market and legal institutions act as facilitating factors for education to have an impact on the economy.

²⁸ Hanushek & Wößmann, 2007. Their study considers an education-reform plan that achieves a 0.5 standard deviation improvement in PISA 2003 test scores (in relation to average OECD student score). Reform policies are assumed to be linear; that is, a 20-year reform plan (which yields a 0.5 standard deviation of higher achievement) would result in a yearly increase in the performance of graduates of 0.025 standard deviation. In addition, the impact on the economy is assumed proportional to the average achievement levels of prime-age workers.

²⁹ Eric A. Hanushek, "Why Quality Matters in Education," *Finance and Development*, Vol. 42, No. 2, June 2005.

³⁰ Saudi Arabia Ministry of Education, in cooperation with the Ministry of Higher Education and the General Establishment of Technical Education and Vocational Training, "The Development of Education," 47th Session of the International Conference on Education, September 8–11, 2004, Geneva.

³¹ See "The Executive Summary of the Ministry of Education Ten-Year Plan, 2004–2014" (www.moe.gov.sa).

³² Broadly, goals are general statements about reaching a desired aim. As such, they are likened to a mission. Objectives, on the other hand, are specific statements that include action and content. They also include measurements of results within a specified period. As such, they are likened to tasks.

³³ See "The Executive Summary of the Ministry of Education Ten-Year Plan, 2004–2014" (www.moe.gov.sa).

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About the Authors

Nabih Maroun is a partner with Booz & Company based in Beirut. He leads multi-functional assignments throughout the Middle East, focused on strategic planning, organization, and social and economic sector development. His primary expertise involves public administration development, public policy strategy, large-scale infrastructure development, organizational redesign and change management, turnaround and restructuring, and utilities privatization.

Hatem Samman is the director of the Booz & Company Ideation Center. He is based in Dubai. As a lead economist, he has written extensively on policy issues across diverse economic sectors.

Rabih Abouchakra is a partner with Booz & Company based in Abu Dhabi. He focuses on public administration modernization, public policy, large-scale transformation, and organizational development and change management.

Chadi N. Moujaes is a principal with Booz & Company based in Abu Dhabi. He focuses on public policy, socioeconomic development plans, public administration modernization, large-scale transformation, and performance management.

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