



SUMMARY

The countries of the Gulf Cooperation Council (GCC) have been able to achieve rapid economic growth over the past 40 years, which has largely been the result of vast reserves of oil and gas. However, the 21st century has seen a global shift towards establishing knowledge-based economies, through moving away from the dependence on oil to promoting business, tourism, and other sectors. This has changed the nature of jobs demanded by the labour market in the GCC and has resulted in a radical shift in the type of education that needs to be provided. The consequence of these changes has been an increasing disconnect between the education sector and the labour market, the impact of which is yet to be seen.

This policy paper will look beyond the quantity of education provision in the UAE and focus on how the quality of education can be improved in order to better contribute to economic growth and competitiveness. It will first provide the context for this discussion, followed by a review of the literature on returns to education, paying particular attention the quality of education as a determinant of economic competitiveness. Next, the paper will consider the case of the UAE and will address the missing link between the education system and the labor market. Finally, it will conclude by offering a number of recommendations that could help policymakers improve the quality of education in the UAE in order to create a truly knowledge-based economy.

Education Quality & Competitiveness in the UAE

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Competitiveness & Education Quality

According to Powell and Snellman, a knowledge-based economy is a technologically and scientifically driven economy, where there is "a greater reliance on intellectual capabilities than on physical inputs or natural resources" (2004, p. 21). In the Middle East this form of development has been associated with increasing "national competitiveness and economic policies that support innovation, technology development, entrepreneurship, workforce skills development, adoption of high performance organizational structures, and ICT infrastructure development" (Schwalje, 2012, p. 4). Over the past decade, the discourse surrounding the knowledge economy has become central in many national strategies and development plans across the region.

As it is difficult to assess the level of progress made in the knowledge sector, indices have been compiled to measure the level of competitiveness and knowledge economy readiness of a country. The Global Competitiveness Index (GCI), developed by Michael Porter in 2004, is a universal measure consisting of 12 indicators used to assess how competitive, or productive, a nation is on the global economy (Schwab, 2011). In the 2011-2012 WEF Report the UAE was ranked 27th, the third in the GCC below its neighbors Qatar and Saudi Arabia, but significantly higher than other Arab nations. While the UAE excelled on the labor market, financial market, technology, and innovation indicators, it fared worst in the 'health and primary education' and 'higher education and training' pillars. Although the Global Competitiveness Index, similar to other global indices, is by no means an exact measure of competitiveness it does indicate areas that have perhaps been neglected and that deserve closer attention.

Education Quality and Returns to Education

The relationship between education, economic growth and competitiveness is typically examined in terms of the returns on investment to education in any given country. It is often argued that investment in schooling will result in higher earnings for an individual

Table 1: Social Versus Private Rates of Return for Primary, Secondary, and Higher Education

| Region | Social Returns | | | Private Returns | | |
|--------------------|----------------|-----------|--------|-----------------|-----------|--------|
| | Primary | Secondary | Higher | Primary | Secondary | Higher |
| Asia | 16.2 | 11.1 | 11.0 | 20.0 | 15.8 | 18.2 |
| MENA | 15.6 | 9.7 | 9.9 | 13.8 | 13.6 | 18.8 |
| Latin America | 17.4 | 12.9 | 12.3 | 26.6 | 17.0 | 19.5 |
| Sub-Saharan Africa | 25.4 | 18.4 | 11.3 | 37.6 | 24.6 | 27.8 |
| OECD | 8.5 | 9.4 | 8.5 | 13.4 | 11.3 | 11.6 |
| World | 18.9 | 13.1 | 10.8 | 26.6 | 17.0 | 19.0 |

Source: Psacharopoulos and Patrinos (2002)

and if replicated on a national level would in the long run increase aggregate growth and productivity of a country. While microeconomists argue that there are predominantly positive returns to investment in education, macroeconomists have struggled to find similarly convincing results (Psacharopoulos and Patrinos, 2002; World Bank, 2004). Empirical evidence from microeconomic studies illustrates that the greater the economic development of a country, the greater the returns to higher levels of education (Carnoy, 2004), but macroeconomic studies have found no conclusive evidence that greater investment in education results in higher economic growth (Pritchett, 2001; Benhabib and Spiegel, 1994).

In addition to the economic returns that can be gained from investing in education, there are also social returns. Social returns to investment in education consist of any positive externality accruing to a society in areas such as health, security, employment, and more. It is difficult to identify the exact social benefits resulting from having a more educated labour force, and if identified these factors are more difficult to quantify than economic factors. However, evidence shows that a productive worker has the potential to improve productivity of co-workers and also encourage greater innovation and efficiency in the workplace. On the national level, social returns can lead to higher political participation, lower unemployment rates, higher occupational status, health, lower crime rates, and improvement in technology (Carnoy, 2004; Karoly, 2010; World Bank, 2004, 2012a; Chandra, 2011).

Table 1 above illustrates the results of a study conducted by Psacharopoulos and Patrinos (2002) comparing the social and private rates of return to education across the different continents. On the whole, the data shows that there are good global private and social returns to education, with private returns typically averaging about 1.5 times the returns to the society. Private returns are also higher at the higher education level than at the secondary education level. There are, however, two noticeable discrepancies. First, both OECD and MENA countries have on average the lowest returns to education worldwide. Second, the Middle East and North Africa is the only region characterized by higher social rather than private benefits to investing in primary education. While the OECD results are consistent with findings from earlier studies illustrating the decreasing returns in countries with greater levels of development (Carnoy, 2004), it is unclear why private returns are so low in the MENA region. The World Bank (2008) offers four possible explanations for this trend: a heterogeneous impact of education on growth across countries in the region, low quality of the education system, a skewed distribution of education across the population (for example, if a small percentage of the population is very educated while the majority illiterate), or a low supply of competitive jobs.

While all of these scenarios are possible, in his seminal work entitled "Where has all the education gone?" Pritchett (2001) attributes the general lack of a significant relationship between economic growth and investment in education to low education

quality. So far most studies addressing returns to education, have used measures such as educational attainment or enrollment to quantify the investment in education, which can be deceiving as they are not always representative of the cognitive ability and creativity of the population (Hanushek, 2005).

Hanushek and Kimko (2000) believe that math and science international test scores are the most representative, albeit still imperfect, measure for the quality of schooling. They found that countries with higher mathematics and science test scores, which they associate with having a better quality education, have higher rates of economic growth, such that one standard deviation in test performance results in a one percent difference in annual per capita GDP growth rate (Karoly, 2010; Hanushek, 2005). Moreover, studies conducted in the United States by Mulligan (1999), Murnane et al. (2000), and Lazear (2003) have shown that test scores of students are correlated with earnings and productivity, where one standard deviation increase in performance in mathematics can result in up to a 12% increase in annual earnings. These results have since been replicated in developing countries, with even greater positive effects.

Education Quality beyond International Tests

Although there is definite value to having internationally comparative data of student performance in the basic subjects, Sahlberg (2006) states that "at best these tests represent a rationalistic, partial, and very reductionist judgement of the complex processes of education for the knowledge economy." Taking the case of the Republic of Korea, Jang and Kim (2004) argue that despite being the top-ranking country on the PISA (Programme of International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study) assessments and being recognized as having one of the most productive work forces in the world, the education system is plagued by weak teacher authority, low quality of higher education, and a lack of creativity and flexibility of students due to an emphasis on rote memorization. Dr. Yong Zhao, a Chinese-US academic, has made a similar observation regarding the East Asian education systems in general, where students are topping international rankings, but are seriously struggling to find good jobs after graduating from university. He

Teachers at the core of Finland's success

In the past 40 years Finland's education system has gone from mediocre to the best in the world. Currently, more than 90 percent of its students complete secondary education and two thirds of those enroll in higher education. In addition, the country has consistently received the highest scores in the PISA (Darling-Hammond, 2009).

Apart having an extremely equitable system, where all children receive a free meal a day, healthcare, transportation, stationary, and counseling at school, the Finnish education system relies on high standards and support for schools, balancing decentralization and centralization, systematic evaluation, and most importantly having the most qualified teachers in the world (Darling-Hammond, 2009). How, then, did Finland succeed in creating the most lauded and sought after teaching profession in the world?

The government took the path of investing in "...very skillful teachers, [so] they could allow local schools more autonomy to make decisions about what and how to teach" (Darling-Hammond, 2009, p. 19). Over the past 25 years the teaching profession has become more competitive by establishing a very selective teacher-training program, where only 10% of applicants are annually admitted (Sahlberg, 2007). The program is up to five years long and focuses primarily on equipping teachers with strong research-based skills so they can play a larger role in schools. Nowadays, teachers collaboratively develop curricula, continuously explore creative ways to evaluate students (that does not involve examinations), implement innovative teaching practices, and conduct action research in their classrooms to improve teaching and learning (Darling-Hammond, 2009; Sahlberg, 2007).

predicts that Western higher education institutions will begin replacing standardized examinations with more equitable and comprehensive measures of student achievement in the near future (Stevenson, 2011).

As a result it is important to broaden the definition of quality to encompass not only achievement on international assessments in a number of subjects, but also other factors that are known to be strong determinants of student performance, the most important of which is teacher quality. According to Hanushek (2005) a good teacher can improve student achievement by at least four percentiles (or 0.12 standard deviations) within one academic year.

Another determinant of education quality in the context of the knowledge economy is the students' mastery of meta-cognitive skills. In a study observing 5 categories of routine vs. non-routine skills performed at work in the US, Autor, Levy and Murnane (2003) noticed an alarming shift in the skills applied by individuals now as compared to 40 years ago, from primarily applying 3 types of manual or routine skills to overwhelmingly using analytic or communication skills. In other words, employment has over time not only come to encompass new occupations, but it now also involves new skills including "the ability to solve problems, work in teams, and effectively communicate with people. These jobs grew at the expense of jobs that required routine skills that could be more readily codified and performed by computers or other machinery, as well as manual jobs" (Karoly, 2010, p. 8).

Addressing Competitiveness in the UAE

In the context of the growing discussions surrounding the importance of competitiveness, the United Arab Emirates has responded by releasing a number of strategy documents and visions, including *Abu Dhabi's Economic Vision 2030* (Government of Abu Dhabi, 2008) and the *UAE Vision 2021* (2009), that address the question of competitiveness and the knowledge economy. *Vision 2021* (2009) identifies four pillars for meeting the demands of the knowledge economy focusing on collective responsibility, destiny, knowledge and prosperity. Under the 'United in Prosperity' pillar the vision describes four objectives for assisting the education sector to build a 'First Rate Education' – a focus on national identity and

cultural values; curricular reforms and an emphasis on international standards; increasing higher education enrollment and expansion of vocational education; and finally equal opportunity for students of all needs and abilities (UAE Vision 2021, 2009). In a similar vein, one of the nine pillars of the *Abu Dhabi Economic Vision 2030* calls for "establishing a premier education system." According to the document, education and training lie at the core of enhancing human capital development through improving "both the employability of Nationals and the productivity and competitiveness of the workforce in general" (Government of Abu Dhabi, 2008, p.15).

There have also been efforts on part of the Ministry of Education and the Abu Dhabi Education Council (ADEC)ⁱ to address some of these objectives by introducing curricular reforms, participating in international assessments, and expanding enrollment. However, more attention needs to be given to the strategic objectives elaborated in the *Ministry of Education Strategy 2010-2020*, in order to improve the quality of teaching and learning in UAE's public schools (2010). Despite a call for a "student-centric model focused on improving student outcomes, school life and equality to meet world-class standards" (UAE Ministry of Education, 2010, p. 15), the education system has remained, for the most part, teacher-centered, hindering the development of skills demanded by the knowledge economy.

Education and the Labour Market in the UAE: The missing link

While it has been argued that the UAE has one of the lowest levels of investment in education in the MENA region, which in 2009 was approximately 1.2% of the Gross Domestic Product per capita (World Bank, 2012b), it is estimated that in 2010 the education sector received the highest percentage of federal funds in the country (22.5%), amounting to approximately \$2.7 billion (UAE Interact, 2009). Therefore, despite mixed reports one thing remains clear – the financial investment in education to date has not succeeded in bringing about sufficient improvements in the quality of the public education system to satisfy the demands of the knowledge economy.

To further evaluate the education sector in the UAE, three areas need to be examined – educational enrollment, attainment, and quality.

Enrollment

Despite the growing population of youth in the UAE, one area that has improved considerably in recent decades has been the expansion of access to schooling. According to UNESCO's Education For All (EFA) Global Monitoring Report (2011), in 2008 the net enrollment ratio in primary and secondary education hovered around 92% and 94% respectively, similar to rates in other GCC countries. While there are no gender differences observed at the primary level, the gap widens slightly at the secondary level, where high rates of boys are dropping out of school. While this trend is visible in many of the neighboring states, studies have yet to identify the exact reasons for this phenomenon. A number of UAE-based studies have estimated that the dropout rate ranges between approximately 8 and 25%, and is clustered primarily around grade 10 (UAE Ministry of Education, 2010; Ridge, 2010). Then, a greater shift occurs between secondary and tertiary education, where a larger percentage of females choose to continue their studies, while most males are lured by the high economic incentives of the labour market. At the higher education level, the gross enrollment rates are 17% and 36% respectively (Education for All, 2008). Moreover, according to Fox (2007) the ratio of Emirati males to females in local higher education institutions is 3 to 7.

Attainment

The rising enrollment rates in the UAE have been accompanied by higher educational attainment across the country for females. This unfortunately has not been the case for males. According to Ministry of Education data from 2006/7, males in Ras Al Khaimah performed more poorly than their female counterparts in essentially every subject in grades 10–12 (Abdulla and Ridge, 2011). Similar results were found in the PISA 2009+ results, where the UAE was found to have the highest gender gap of all the participating countries, with a 31-point difference between male and female student achievement in science (Walker, 2011).

There is also data illustrating an inverse relationship between the ratio of the percentage of males to females engaged in the labor force with primary education and those with tertiary education. In 2005

it was found that the ratio of males to females in the labor force who have completed primary education was approximately 2 to 1, while in those who have completed tertiary education it was 1 to 2 respectively (World Bank, 2012b). While this illustrates a positive step for Emirati women who are undoubtedly seeing the returns to investing in their education, it does not bode well for males, and perhaps UAE society as a whole.

Quality

Although education enrollment and attainment are considered the primary measures used to assess the impact of the education system on economic growth, it is precisely because these measures are so easily quantifiable that many scholars argue that they are misleading and do not reflect the actual quality of an education system (Gylfason and Zoega, 2002; Hanushek, 2007). This section will address the question of quality by examining two areas—international assessments and teacher quality.

In recent years the UAE has participated in assessments such as the TIMSS and PISA, which provide a quantifiable measure of how students of different age groups are fairing as compared to the rest of the world. Although the results of the TIMSS (2007), administered only in Dubai, illustrated that the performance of UAE's students is the highest in the Middle East, both TIMSS and PISA 2009+ⁱⁱ found that their performance still falls far below the global and OECD averages, signifying a need to improve their abilities in all the tested subjects (Walker, 2011; KHDA, 2009). The PISA 2009+ results revealed that while approximately half of UAE's students are proficient in mathematics and over 60% are proficient in reading and science, they scored well below the global average in all three subjects. In reading, the UAE scored 431, 63 points below the OECD average, and in mathematics it scored 421, 75 points below the OECD average and almost 180 points below Shanghai, the top performer (Walker, 2011). The assessments also illustrated that students in public schools are not doing as well as their counterparts in private schools, and overall girls are performing significantly better than boys across all three subjects – reading, mathematics, and science. These considerable gender differences may indicate, among other things, a lower quality in the education received by Emirati boys as compared to the girls (Ridge, 2010).

Studies have also illustrated that a good teacher can significantly improve student achievement and as a result education quality (Hanushek, 2007). Evidence from the UAE has shown that on the most part there is a weakness in teaching. Classrooms are typically teacher-centered and the official curriculum does not provide teachers much freedom to decide on how to lead their classes, leaving little or no room for students to play an active role in the learning process (Ridge, 2010; Mysken and Nour, 2002). "The long term effect of this lack of encouragement and freedom for teachers to take risks in their teaching is a stifling of creativity and risk-taking skills in the students. It means promising scientists, inventors, entrepreneurs and the like are taught that to get ahead in life it is better to play it safe" (Ridge and Farah, 2011). It may also discourage students from choosing to pursue these fields for their careers, as evidenced by the significantly lower enrollment rates of Emirati students in science as compared to literature streams in high school and in higher education. It has been reported that in any given year double the number of students in grades 11 and 12 are enrolled in the literature track as those enrolled in the science track (Shaheen 2010). Similarly, data from the EFA Global Monitoring Report (2011) illustrates that only 21% of Emirati students attending UAE universities are enrolled in science or engineering programs, with the large majority pursuing humanities, social sciences, or business degrees. This trend also has visible consequences on the labour market, whereby Emiratis consist of 86% of public sector employees (Abdulla and Ridge, 2011) and only approximately 2% of those working in the private sector (Gonzalez, 2010). Given the incentives of the public sector with its higher wages, greater job security, and better benefits it is not surprising that most young graduates make this choice. However, "this choice means a lack of entrepreneurial talent for the country as a whole which in turn causes problems for economic diversification and long-term economic growth" (Ridge and Farah, 2011).

Policy Recommendations

The UAE is a highly competitive and growing knowledge-based economy. While its educational enrollment and attainment rates have been on the rise, the overall quality of the education system still needs improvement. Any efforts to improve the competitiveness of the country must begin at the school level. Some possible recommendations to improve the situation include:

1. Making boys' education a priority

Males across the world are currently fairing worse than their female counterparts, but nowhere is it more evident than in the GCC countries. To increase the competitiveness of the UAE, urgent steps need to be taken to re-engage males at the preparatory, secondary and tertiary levels of education. Some of the ways in which this problem can be addressed are by making the curriculum more relevant to their daily lives and incentivizing more Emirati males to join the teaching force who can serve as role models for the students. In addition, boys need to be encouraged by their teachers, counselors, and families to pursue higher education, particularly in the science and technology fields, for which there will be growing demand in the near future. It is also critical that further studies are conducted to examine the economic incentives currently in place that prematurely drive men out of the education system and into the labour market (Ridge, 2009).

2. Establishing a long-term plan for improving teacher quality

Hanushek (2007) argues that the most effective way to improve teacher quality is to invest in highly qualified teachers, as has been successfully implemented in Finland, rather than expending resources on retraining current teachers. Therefore, rather than offering a multitude of professional development courses that are rarely relevant to the day-to-day activities of teachers, the UAE should improve the quality of teacher education programs at local universities by establishing high more rigorous standards for both incoming students and faculty, as well as enforcing minimum entry requirements for all incoming teachers in the UAE. Although this solution requires a long-term investment, the results of which may only be visible in 20 or 30 years, it would hopefully result in higher educational and economic outcomes (Hanushek, 2007).

3. Increasing focus on STEM

The UAE Vision 2021 states that productivity and competitiveness are driven by "investment in science, technology, research and development" (2009, p. 18) and can only be increased by prioritizing these areas and putting greater financial investments towards graduate programs and research, increasing enrollment rates in STEM (Science, technology, engineering and mathematics), as well as building better relationships between academia and industry.

Beginning in primary school students need to be more engaged in active learning of these subjects as studies have found that young children are nearly two times more likely to enroll in science and engineering fields if they enjoyed studying these subjects at school (World Bank, 2008). In addition, once enrolled at the higher education level, students should be expected to complete internships, traineeships, or participate in research, all of which have positive effects on students considering careers in those areas (World Bank, 2012a).

4. Continuous external and internal evaluation of reforms and policies

Evaluation is a critical component of any new program or policy and must be addressed. On the national level, the UAE should continue to participate in international assessments, such as

TIMSS and PISA, to assess the students' academic standards in comparison to other countries. It should also publish the results of national assessments to allow a closer examination of the weaknesses in the education system and the reasons behind it. At the school level, principals should be trained to conduct action research to assess new improvement policies, such as in parent engagement, quality assurance, governance, and more. Finally, at the classroom level, teachers should be encouraged to continuously evaluate both teaching and learning. Regular and ongoing evaluation will provide teachers, school leaders and policy makers more direction in decision-making to ensure that the weaknesses in the education system are being appropriately addressed.

- i The Ministry of Education is responsible for all schools in Dubai, Sharjah and the Northern Emirates while ADEC governs schools in Abu Dhabi, Al Ain, and the Gharbia region. For more information about the structure of UAE's education system, please see Ridge and Farah "The Role of School Curriculum in Developing a Knowledge-based Economy: The Case of the United Arab Emirates" (2011).
- ii The PISA 2009 consists of results from Dubai only while the PISA 2009+ results are based on aggregate data from the whole of the UAE.

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