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Research paper

Building capacity for knowledge economies in the Arab world: The role of human capital

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Abstract

Recent literature on development studies highlights the importance of human capital as a pillar for knowledge creation and innovation. Human capital is a multidimensional concept comprising elements of education, health, income, and social well beings. Unlike other concepts of development which revolve around the traditional factor of production of land, human capital, as an economic input powering sustained economic growth, endows people with technical skills, knowledge and competencies serving to improve employability and increase earnings. The aim of this paper is to discuss the impact of human capital on building capacity to create and sustain knowledge economies in Arab countries. Prospects for the future development of the region will improve commensurate with investment in people and knowledge creation. The current regional development model, centered on the generation of income through resource extraction and channeling investment in large scale real estate projects, misses the mark in terms of generating capacity to sustainably countervail global competition and attain economic benefit from international terms of trade substituting stable high-value-added goods and services for volatile low-value-added equivalents.

Keywords: *Human Capital, Arab, Knowledge, Education*

1. Introduction

In recent years, the rise of globalization, advancement in Information and Communication Technologies (ICTs), diffusion of technology, knowledge creation, and innovation have increased the demand for knowledge workers making human capital a key driver in socio-economic development. Individuals, organizations and nations began to rely on skill acquisition, training and lifelong learning to strengthen development fundamentals and build capacity for rapid transformation into a knowledge-based society. The success of several countries in recent years to convert their economies into knowledge-based has shown that human capital has not only become a critical input in production, but also an important source of wealth creation. Unlike capital which depreciates in value over time, knowledge appreciates in value causing rapid growth in productivity and creating substantial spillover effects. Thus, in the new economy, greater recognition has been given to the role that human capital plays in knowledge creation and technology diffusion. In this regard, skills and other individual attributes can be improved through the educational system and its ability to provide the technical and scientific training for workers to participate in the knowledge-based economy.

The stock of human capital in a given nation plays a key role in the long run sustainability and economic success of an economy. Human capital enables the economy to become more productive through the generation of new ideas and development of new technologies. State institutions can strengthen the fundamentals for building knowledge capacity by increasing the stock of human capital through the establishment of universities and training centers. In other words, future development will depend on the policy initiatives to increase the capabilities of the labor force to become more productive, creative, and innovative. Long term sustainability in economic growth marches in lockstep with capabilities embodied in the labor force. The stock of human capital transcends in value all other resources possessed by a nation and, therefore, it stands to reason that allocations of the nation resources earmarked for the development of human capital ought to be sharply augmented. However, national resources are, of course, finite and in some Arab countries public budget constraints limit the ability of governments to effectuate sharp reallocations of capital in service of the promotion of human capital.

In such environments in particular, greater collaboration between universities and industry to conduct research provides a mechanism to spur spillover effects to the domestic market stimulating local enterprises and entrepreneurship to create jobs that add value to the economy. In this regard, governments have critical role to play by providing an enabling environment for the mobilization of technical resources on the part of the private sector to support innovation and the development of new technologies in universities Despite financial endowments of considerable magnitude accumulated by energy exporters, these economies trail the rest of world's regions in terms of job creation, creativity and innovation. Radical reforms, driven by clear vision and well defined strategy, need to be introduced aimed at enhancing human capital and increasing knowledge dissemination throughout the economy. Competition in global markets depends on the creation of enabling environment that encourages private entrepreneurs to participate in the economy. This paper aims to shed light on the extent to which human capital currently generates, and in the future might contribute to, sustained growth across the economies of Arab countries.

2. The Arab world: An overview

To date, the performance of most Arab economies has not been sufficient to transform Arab societies into viable players in the new global economy. Taking into consideration the current socio-economic challenges facing these countries, it is cause of concern that these countries will be able to stand against these challenges in the near future. High population growth in the region is posing serious concern about the ability of these countries to create jobs for the younger population. Currently, the population of the Arab world stands at about 400 million people compared to about 120 million people in 1970. This rapid increase in population raises expectation about the ability of the economies of these countries to foster economic growth and sustain development. Youth unemployment in the Arab world is close to 30 percent, the highest among developing countries.

In the Arab world, high dependency on rental income, mainly from export of oil and gas resources, has created economic duality weakening in the process the spillover effects of the leading export sector. The linkage effect of the oil sector in most oil producing countries has been limited to narrow economic activities linked mainly to the oil operations. As a consequence, little spillover effects were generated to stimulate economic activities in the rest of the economy. In other words, high capital-intensive nature of the oil sector discouraged local enterprises from taking part in the development of new industries and diversifying the productive system. Accordingly, high unemployment, especially among youth, prevails in Arab countries.

Unfortunately, moreover, oil revenues in Arab countries have not been invested strategically to strengthen the sustainability of these economies by generating spillover effects that would foster stable economic growth and stimulate economic diversification. Revenues from oil are squandered on imported consumer luxury goods and armaments needed for protecting the national security against regional threats. Further declines in oil prices are expected to negatively impact the economies of several Arab countries causing lower economic growth, higher unemployment and reduced government expenditures –collectively rendering the region less attractive for multinational business and the flow of FDI. "The failure to moderate the impact of revenue instability on growth, and the failure to pursue a more counter-cyclical policy in Arab producers, are often attributed to a weak institutional environment, weak governance structures, and lack of transparency and accountability in resource-rich economies." [1]

Lack of government incentives, small size of the local markets, high costs, inadequate managerial skills and poorly trained workforce discouraged the establishment of new industries involving, in particular, manufacturing. The share of manufacturing as a percentage of GDP is the lowest in the Arab world among all world regions including Sub-Saharan Africa. Only in six Arab economies does the manufacturing sector contribute close to 10 percent of the total output. [1]. In 2010, the Philippines sold more manufactured goods than all Arab countries combined reflecting weakness in the industrial sector and its inability to support development. In addition, the high dependency of Arab economies on exports of a limited number of products has curtailed, if not fully having thwarted, radical economic reforms intended to reduce dependency on oil earnings. Internally, rapid population growth, driven by increasing demand for governments to support public programs, has discouraged governments from moving away from the reliance on oil revenues. The size of the public sector continues to grow draining resources away from being channeled to the private enterprises and inflating dependency on oil production and export. Ultimately, the burgeoning public sector has reduced the effectiveness of entrepreneurs as agents of the creation of new industries and in the diversification of the economy away from oil sector.

Moribund private enterprises have discouraged flows of FDI into these countries denying their economies of the benefit of technology transfer, knowledge absorption and skill acquisition that foreign companies provide. In recent decades, globalization has provided new opportunities for private enterprises to acquire knowledge and compete in the global markets. Access to these markets is closely linked to the creation of new products and development of new technologies that exhibit high knowledge content and innovation. Hamstrung by the low knowledge content embedded in their product offering with a consequent inability to meet international standards, most Arab industries founder in the face of the challenges of globalization. Multinational corporations provide local enterprises training and technological learning -- essential for assimilating new technologies and diffusing new knowledge. A diaphanous transnational corporate involvement in Arab economies has stymied acquisition of managerial skills, creation of knowledge, training of workers and accessing of technology by local enterprises.

The model for development currently implemented in Arab countries needs to be reengineered to take into consideration indigenous knowledge with a view to strengthening potential for scientific and technological applications. In this vein, cooperation among Arab countries in various fields of science and technology will speed up progress towards conversion of their economies into knowledge economies. Knowledge-based development requires building productive capacity based on science and technology, innovation, human skills, knowledge absorption, and environmental management. Unlike capital, which depreciates in value overtime, knowledge appreciates overtime causing the value of output to accelerate through knowledge uses and knowledge applications. In other words, investment in knowledge increases the country capabilities to generate greater linkages and enhances productivity within various sectors of the economy. Several common problems beset the Arab world, including low productivity, knowledge deficit, poverty, income inequality, low manufacturing production and inadequate innovation. "Arab countries require a new form of development to be globally competitive. In times of change and uncertainty, knowledge-based development is capable of directing the growth model towards some of the problems in Arab countries, namely education, poverty, and the restricted rights of women. The knowledge revolution offers a unique opportunity to evolve in a direction that is better suited to the current and future socio-economic needs of Arab countries." [2]

These countries should make use of their revenues from oil exports to increase the stock of human capital and support rapid economic growth through knowledge creation, research and development, innovation and creativity. In the knowledge economy, economic growth depends on the use of knowledge and human creativity to create new ideas and develop new products. In other words, knowledge is the key input in the process of development generating large stimulus that induces rapid growth and enhances productivity. Since knowledge appreciates in value overtime, high returns on investment can be had in education which empowers workers with skills and competencies needed for building knowledge-based economies. "Arab societies can build stronger cooperative partnership and help each other toward. Most importantly, Arabs can unleash the potential within their own societies by spreading and strengthening knowledge institutions: universities, civil society organizations, private companies, scientific academies, and professional networks." [3]

The stock and quality of human capital can also be increased through joint programs between Arab and international foreign universities involving the establishment of research centers with foreign academic institutions through bilateral exchange of students and collaboration in research activities. The purpose of these initiatives is to meet the requirement of the economy and respond to the challenges facing Arab countries in the coming decades. By 2030, the Arabs need to create 100 million employment opportunities to satisfy labor market demand. Universities should be able to introduce programs and design curriculum that are relevant to market needs [4].

The Arab countries can benefit from the experience of the newly emerging economies to address some of the main impediments facing their economies and build national capabilities to enhance research and development, invest in human capital, increase financing of educational institutions, and promote innovation. Future development is driven by knowledge creation, human resource management, institutional incentives and technology dissemination which need to be addressed by governments in the region. Ultimately, the power and the creative minds of the people that allow the building of enabling environment capable of cultivating the knowledge and competencies of the nation and channel them into productive use. In the knowledge economy, the educational system has a critical role to play in the development of flexible curricula and supply the necessary skills needed in the market place. In the new economy, involvement of participation of women need be maximized to reach full potential for knowledge creation in the economy.

Table 1 shows the number of years required for different region to catch up with the current level of industrialized countries. For example, it will take the Middle East and North Africa 11.5 years to catch up compared with almost quarter century for Sub-Saharan Africa and three decades for South Asia to catch up with the current level of industrialized countries in average years of schooling. The table also illustrates that it will take longer years for males (11.6) in Arab countries to catch up as compared to female (10.6). This is a reflection of the fact that in the past few decades, the growth rate in average years of schooling has been higher among females compared to males. However, the average years of schooling for both males and females in the Middle East and North Africa are lower than the world average and with the exception of Eastern Europe and Central Asia regions, the Middle East and North Africa has better chance to reach to the level of the industrialized countries in less time.

Table 1: Years to catch up with the current level of industrialized countries

Region	Male	Female	Total
Central Asia	12.7	4.2	7.6
East Asia & Pacific	18.6	12.9	15.6
Eastern Europe	6.2	5.3	5.6
Industrialized countries	0.0	0.0	0.0
Latin America & Caribbean	14.5	14.0	14.3
Middle East and North Africa	11.6	10.6	11.5
South Asia	26.9	29.7	29.3
Sub-Saharan Africa	22.8	25.1	24.2
World	17.2	16.8	17.0

Source; Asian Development Bank, Human Capital Development, ADB Economics Working Paper Series No. 225

3. The importance of knowledge

Emphasis in recent literature on development studies has shifted toward knowledge application as an alternative for measuring development performance. The new economy is described as a knowledge-based economy which exhibits certain features and characteristics linked to use of knowledge in production processes. Knowledge is classified into explicit, or codified knowledge, which can be easily obtained, shared and applied by all users, and tacit knowledge or implicit which resides with the individuals and is acquired through increasing peoples' capabilities to obtain skills and information. In this era of knowledge application, new opportunities have been provided, especially for developing countries, to build knowledge capacity and speed up the process of development through investment in education. Human capital is identified among the important pillars that drive the knowledge economy due to its contribution to knowledge creation and innovation diffusion, i.e., intellectual capital has become a key driver of economic growth and wealth creation. As pointed out in the Arab Knowledge Report: "Knowledge acts as a support to development, powerfully leveraging it and improving the quality of life." [5]

Globalization has increased the share of services in global trade causing substantial demand for people to work in high-tech and knowledge related industries. In production, intellectual assets represent the most valuable resource that organizations use to enhance global competitiveness and increase profitability. In reality, the new economy requires people with special skills to create, design and apply knowledge in the production process. Globally, the communication and information industries have become important determinants of global competitiveness. Producers using intellectual capital induce innovation and keep pace with global competition. In recent years, the demand for labor has changed reflecting the structural changes in the economy and the rise of high-tech industries. The demand for labor in these industries revolves around workers, able to work efficaciously in teams, with flexible knowledge and skills able to accommodate, and to adapt seamlessly to, unforeseen changes in technology through training in the context of life-long learning.

The indigenous knowledge system must be incorporated into the knowledge economy along with the innovation system to utilize tacit knowledge and endorse change. Economic development exhibits indigenous elements including social, cultural, economic and environmental forces. Understanding the knowledge of the local environment and the traditional culture speeds up technological development and reduce the risk of failure. Working with the local environment requires making selections of technologies and adaptation of scientific methods suitable for the local environment. Indigenous knowledge is about exploitation of tacit knowledge which is critical for fostering economic growth and sustaining development. In unmodified form, foreign technologies could be damaging to the environment for not being consistent with domestic standards. Cultivation of tacit knowledge strengthens a country's ability to promote innovation by incorporating the indigenous knowledge system into market activities. Local producers and entrepreneurs are more familiar with the local environment to qualify them making the right selection of environmentally friendly technologies to foster economic growth and sustain development. Linkage creation increases the capabilities of the economy to induce change through building new clusters. [6]

The model of development currently employed in most Arab countries generates inadequate linkages to stimulate growth. This is due to the low contribution of local inputs used in production as well as to the low role played by local entrepreneurs to stimulate domestic production and increase linkage creation. Absent the contribution of the indigenous forces, especially in the form of tacit knowledge, prospects for significant productivity enhancement would be bleak. Accordingly, the local environment exhibits unique features that need to be addressed in development strategy. "Much knowledge and skill is tacit rather than codified and documented –either because it defies codification or the task of codification has simply not been carried out. The more knowledge is tacit rather than explicit, the more difficult it is to share and communicate." [7] This is true in the case of most developing countries, including the Arab world, where untapped tacit knowledge represents the bulk of the indigenous knowledge.

Conventional development models have not been able to provide adequate economic stimulus for creating conditions that support modernization. Development in the new model should focus on indigenous knowledge to diversify the economic structure and create jobs for booming populations. Arab countries need to make changes in education to produce skills that meet the challenges of the knowledge economy. Radical policy reforms need to be implemented to deepen integration into the global markets and facilitate access to trade and investment. In this regard, the state plays a critical role by using governmental institutions as means to create enabling environments suitable for providing the necessary infrastructure and incentive that encourage both local and foreign entrepreneurs to become creative and innovative. Productivity of the economy depends on the ability of various sectors to create market value and contribute to the national output. Unfortunately,

however, oil production adds little value to domestic market activities since most of the oil extracted is exported in a crude form. In addition, the dual nature of the economy has weakened the linkage effects of the oil sector by keeping the rest of the economy in isolation of the traditional sectors. As pointed out by the Arab Knowledge Reports: "Arab environments, as a whole, still lack the most important mechanisms for empowerment based on knowledge."

Recent decline in oil prices should increase awareness about future development in the region by increasing the use of indigenous knowledge to make development "more appropriate, provide innovation solutions to certain problems, contribute to a sense of self-worth and collective self-esteem, and enhance popular participation and empowerment." [8]. The Arab world must act with urgent desire to rethink development and construct strategy for building capacity for knowledge-based development. Economic development entails scientific applications and technological advances to support innovation and the development of new products. Emphasis should be placed on human capital and human creativity to provide applicable solutions and tools to address the challenges facing development. Without local participation, development will continue to suffer from a dearth of appropriate ideas for designing framework applicable to the local conditions. "The appropriateness and viability of specific development policies for individual countries depends in large part on the historical experience of those countries and the complex web of sociocultural, political, and economic structures that condition development in them." [8].

4. Human capital

Human capital contributes to the well-being of nations in a variety of ways. It raises productivity, creates new wealth, promotes innovation, produces new knowledge, and alleviates poverty. A country with a large percentage of educated people is capable of producing more output reflecting the importance of the human factor in national development. The larger the share of the society's resources invested in people, the greater the aggregate stock of human capital. Where human capital reaches a critical mass, a process of leapfrogging surpassing several stages in its development should ensue. Human capital creates conditions for creation and innovation that enhances productivity and diversifies the economic structure. As pointed out by the Arab Knowledge Report 2014 [9] that the human capital is the main capital in the knowledge economy: i.e., "the citizen and more specifically qualified young people capable of processing information into a feasible economic value. Consequently, countries that have not yet recognized the importance of investing in the human element and its formation, or in the provision of an adequate enabling environment for the knowledge society, will not only fail to be part of the knowledge revolution, but will also become even more marginalized than countries that were not able to catch up with the industrial revolution." [9]

Human capital is defined to represent "The knowledge, skills, competencies and attributes embodied in individuals that facilitates the creation of personal, social and economic well-being." [7]. Wikipedia Encyclopedia defines human capital as representing the "stock of knowledge, habits, social and personally attributes, including creativity, embodied in the ability to perform labor so as to produce economic value [10]. Alternatively, human capital is a collection of resources –all the knowledge, talents, skills, abilities, experience, intelligence, training, judgment, and wisdom possessed individually and collectively by individuals in a population. These resources are the total capacity of the people that represents a form of wealth which can be directed to accomplish the goals of the nation or state or a portion thereof."

In the knowledge-based economy, human capital is critical for knowledge-sharing and technology dissemination, i.e., the quality of the workforce and its ability to upgrade technology and use knowledge to transform the economy. In this regard, education is vital for improving the stock of human capital and creating new jobs, especially for young people. In particular, Arab countries are in dire need for productive and skilled manpower capable of reengineering the productive system through the applications of creativity, innovation, technological learning and knowledge absorption. Building capacity for technological advancement and scientific applications requires collaboration of skilled workers with creative thinkers to generate new ideas and techniques for generating sustained economic growth. In this way, natural-resource-poor countries, such as Japan, Singapore, Finland and Hong Kong, succeeded in transforming themselves into knowledge economies.

Gary Becker, an American economist and Nobel Prize winner, points out that human capital represents the return on investment that people earn from education. Earning skills through schooling and training provide individuals greater opportunities to participate in the labor market which exceeds the cost paid to obtain the skills and competencies through education. Individual's "age-earnings profile" over his/her lifetime becomes a product of investment in people making education and expenditure on education amongst the most important investment that a society undertakes. In other words, investment in people adds greater value to the society's output through the development of new techniques, innovation, creativity and rapid economic growth [11]

Human capital and lifelong learning are among the important ingredients required for building knowledge capacity and accelerating the process of economic growth. In the knowledge-based economy, the most valuable assets are intellectual assets which "refer to knowledge and experience acquired by workers and stored in networked digital documents and databases. The knowledge and creative genius of product strategists, developers and marketers is key factor in attracting, retaining and increasing the capabilities of knowledge workers and providing an environment for innovation and creativity. The digital age is not just an age of smart machines, but also of humans who combine intelligence, knowledge and creativity through networks to achieve breakthroughs in social development and wealth creation." [2]

Human capital differs from that of physical capital for being embodied in people and, therefore, the development of human capital requires continuous learning. In a world characterized by rapid change, abstention from using, or underutilization of, the skills and competencies embodied in people could atrophy aggregate national human capital. In the knowledge-based economy, lifelong learning and training become necessary to upgrade human skills and ensure market flexibility. Creativity and innovation induce dynamism and promote change that requires continuous learning to support employment and increase technological learning. Under these circumstances, investment in education is vital for building human capital capacity and strengthening the fundamentals for knowledge creation. However, formation of human capital goes beyond education and training to include "interaction with others as well as through self-reflection and self-directed learning." "Renewal, innovation and knowledge production certainly depend on the major elements and values that are rooted and employed in the cultural system."[12]

Throughout their history, the Arabs enjoyed rich cultural heritage characterized by interactions with other civilizations which gave them access to the knowledge and scientific heritages of ancient civilizations. In other words, they were able to establish global interactions which facilitated the rise of civilization driven by rich scientific and philosophical heritages. Unfortunately, in the modern history of the Arab people, interactions with other civilizations have been limited to imported knowledge and technology making them more of consumers than producers of knowledge. Both internal and external forces have prevented the Arabs from civilizational renewal to bring back their cultural heritages and contribute once more to the global scientific knowledge.

Table 2 illustrates indicators used to measure the contribution of human capital to development. The Human Capital Index (HCI) is constructed using a broader set of indicators listed under four main

pillars comprising education, health, workforce and employment and enabling environment. The index provides information that allows the establishment of comparative assessment among nations and across income groups. Scores above zero indicates a positive trend in human capital development, whereas data below the mean conversely indicates a negative trend in human capital development. As the table illustrates, the contribution of human capital in most Arab countries remains too weak to support economic dynamism driven by innovation, creativity and knowledge creation. The Arab countries occupy fourth place among the six world regions on health, ranked second to the last on the education and enabling environment and is the last on workforce and employment. These results reflect the urgent need for reengineering the educational system and make it more applicable to meet the challenges facing Arab countries in this rapidly changing world. Worldwide, among the 120 countries ranked in the index, Yemen and Mauritania are ranked last among the nations surveyed reflecting the low contribution of human capital to the social and economic development. Untapped potential of human resources in these countries is symptomatic of a dependency on natural resources to generate national income widening, in the process, the knowledge gap with other countries in the world. "The Arab world has the highest unemployment among developing regions; the highest jobless rates among youth; and the lowest economic participation rate among women." [13].

Table 2: Indicators of Human Capital in the Arab World

Country	Overall Index	Education	Health	Workforce & Employment	Enabling Environment
Qatar	0.834	0.684	0.206	1.154	1.294
UAE	0.610	0.626	-0.032	0.527	1.320
S. Arabia	0.245	0.098	-0.041	-0.099	1.023
Bahrain	0.232	0.274	0.011	0.099	0.544
Oman	0.220	0.032	0.307	-0.280	0.822
Jordan	0.005	0.350	-0.015	-0.481	0.167
Kuwait	-0.059	-0.285	0.065	-0.297	0.281
Tunisia	-0.165	-0.099	0.173	-0.499	-0.236
Lebanon	-0.220	0.548	-0.099	-0.458	-0.870
Morocco	-0.336	-0.590	0.061	-0.485	-0.323
Egypt	-0.790	-1.206	-0.521	-0.878	-0.555
Algeria	-0.954	-0.991	-0.413	-1.345	-1.066
Mauritania	-1.297	-1.774	-0.666	-1.404	-1.373
Yemen	-1.395	-1.972	-1.134	-1.320	-1.153
Total	-3.070	-4.305	-2.098	-5.766	-0.125
Mean	-0.2193	-0.3075	-0.1499	-0.4119	-0.0089
Median	-0.1120	-0.0335	-0.0235	-0.4695	-0.0345
Standard Deviation	0.6743	0.8751	0.3966	0.7147	0.9247

Source: World Economic Forum, Human Capital Report 2013 (author's calculations)

Summary data clearly indicates negative trends in human capital development in the region with an aggregate score of -3.070 with only five GCC economies exhibiting positive trends: in the first rank Qatar (.834) and United Arab Emirates (.610) followed by second tier Saudi Arabia (.245), Bahrain (.232) and Oman (.220). Mean HDI is -.2192. Jordan is stagnant with neither progress nor retrogression in human development with a score of zero. In contrast, eight countries manifest retrogression in the case of Kuwait marginal (.059) and in the case of Yemen substantial (1.395). It is clear that the data is not normally distributed inasmuch as the left-hand tail exceeds that of the right-hand in magnitude and amplitude so standard deviation data has limited interpretative value other than observing a considerable deviation in the distribution of HDI scores. [If Yemen is eliminated from the list on the grounds of it being a failed state, then, although still negative, the aggregate score improves (-1.625) while the mean and standard deviation respectively become -.1289 and -.112.] The two most substantial drag factors on the overall HDI appear to be Education and Workforce and Employment – the two dimensions most clearly linked to human capital. Least insidious is enabling environment.

Exacerbating matters for many Arab countries is the brain drain incurring a loss of skilled laborers and university graduates. Over the past two decades in response to a lack of employment opportunities, large numbers of students who graduated from universities outside the Arab world preferred not to return back home. Recent political instability associated with human right violations, low pay, low absorptive capacity, and non-recognition of educated people have contributed to the flight of human capital from Arab countries. As pointed out by the United Nations: "The Arab region is considered one of the most active in terms of the export of highly qualified human capital equipped with university degrees. Indeed, human capital is among its major exports, possibly equaling oil and gas in value. The little data available on this indicates that 45 percent of Arab students who study abroad do not return to their home countries, that 34 percent of skilled doctors in Britain are Arabs, and that the Arab world has contributed 31 percent of the skilled migration from developing states to the West, including 50 percent of doctors, 23 percent of engineers and 15 percent of scientists."

Both push and pull factors play an important role in the migration of skilled labor to countries outside the Arab world. No serious attempts have been made in recent years to reverse human capital flight from the Arab world. Brain gain has been amongst the policies that India and China adopted in the past two decades to repatriate nationals working in the West. Thus governments in Arab countries need to create appropriate environments that encourage Arab endowed with high human capital to return home to contribute to the building of a MENA region knowledge economy. To combat intellectual migration, governments need to introduce measures designed to eliminate discrimination, restructure investment in education, to catalyze local receptivity to change and introduce financial incentives for expatriates, educated abroad, to return home.

5. Education and lifelong learning

Education is regarded as a key driver in building human capital capacity. Education is considered as an investment in people providing them with skills and competencies they need to engage in creative and productive market activities. The ability of a nation to convert its economy will depend on the ability of the people to share, use, create and acquire knowledge productively. In the new knowledge-based economy, education represents critical factor in the creation, use and application of knowledge across the various sectors of the economy. Education empowers people to think critically and make decisions concerning allocation of resources and management of productive activities in an efficient and profitable way. In the global economy, education provides countries with the means to acquire skills and develop new ideas aiming at encouraging innovation and promoting competition. Education and educational institutions not only enhance national capacity to absorb and create knowledge, but also increase capabilities of individuals to think of new ideas and develop new methods that enrich living standards and enhance economic security. In the Arab world, the benefit from education remains limited due to high unemployment among university graduates and their inability to participate in the economy. It is estimated that in some Arab countries, 40 percent of university graduate are unable to find jobs relevant to their specialization [14].

Table 3 illustrates a set of educational attainment and labor force participation rates for various world regions. The table shows that the Arab world is ranked below the world average on all indicators. With regard to labor force participation rates, the share of women in the Arab world is the lowest among all regions whereas the share of men represents the second lowest after Latin America and

the Caribbean. Similar low educational attributes can be seen with regard to mean years of schooling, expected years of schooling and population with secondary education. Low participation rates not only contract levels of capital stock in the national inventory but also deflate economic productivity.

Table 3: Indicators for Educational Attainment and Labor Force Participation Rate, 2016

Region	Mean years of schooling	Expected years of schooling	Population with secondary education Male	Female	Labor force participation rate (% 15 age & older) Male	Female
Arab States	6.8	11.7	52.3	41.6	75.1	22.3
East Asia & the Pacific	7.7	13.0	73.0	64.1	79.1	62.3
Europe & Central Asia	10.3	13.9	85.7	78.1	70.5	45.4
Latin America & the Caribbean	8.3	14.1	58.1	57.8	78.6	52.8
South Asia	6.2	11.3	58.6	36.9	79.4	28.3
Sub-Saharan Africa	5.4	9.7	33.9	25.3	76.1	64.9
World	8.3	12.3	69.2	60.3	76.2	49.6

Source: United Nations, Human Development Report, 2016

Education not only instills skills and competencies in the labor force, but also education endows workers with enhanced receptivity to new knowledge and applications of new techniques. Low productivity of labor in developing countries is a reflection of the weakness of the educational system and its inability to provide students with adequate vocational training to impart entrepreneurial abilities and managerial skills. Arab countries spend sizable amounts of money on education to train students in theoretical studies with little technical knowledge in modern scientific and technological subjects. Investment in science and technology in Arab countries lags significantly behind other regions. In addition, women in most Arab countries are not given equal educational opportunities designed to acquire scientific and technical knowledge to participate in the labor market. As table 3 illustrates that educational gap between men and women in the Arab world is measured by the high illiteracy rates among women and also by low enrollment of girls in the school system. Among women in the Arab world, about 42% have secondary education, compared to about 52.3% among male reflecting the challenges facing both policy makers and women to increase enrollment in the educational system of women.

The global economy is rapidly changing and, therefore, government support should induce universities to take advantage of the opportunities offered by the new economy to acquire knowledge and disseminate technology. In most Arab countries, education has been under government control jeopardizing the capacity of universities to play more effective roles in the new economy driven by globalization. Modern organizations require adaptable staff with good people skills able to work in groups. "In sum, Arab educational systems are not functioning well in the creation of critical masses of the qualitative knowledge capital Arab societies need to enter sure footedly into the knowledge economy and to participate effectively in the knowledge society." [5]

Most governments treat education as a public good, the support of which is usually provided in the form of public expenditures through the public budget. On average, although spending about 4 percent of their GDP on education, Arab countries suffer from a 20% illiteracy rate making the input of education vital for transforming these societies into knowledge-based economies. At this stage in their development, these countries need not only to increase investment in education, but also to invest in skills and competencies relevant to labor market requirements, particularly knowledge-based and high-tech production. In doing so, the government should be directly involved in preparing the new generation to become knowledge workers by adopting "comprehensive and complete policies of educational reform and economic and social development plans in the context of freedom and democracy in society led by a strong political will and supported by an active communal will. … school should be viewed a comprehensive system of goals and incentives, information systems, technology, flexible management and distinguished leadership. Therefore, education will become a transformative factor able to prepare a new generation, in a new society, that can deal with new world." [15].

In Arab countries, mean years of schooling is 6.8 years compared to 10.3 in Europe and Central Asia, 8.3 in Latin America and the Caribbean, 7.7 in East Asia and the Pacific and 8.3 worldwide. At 6.8 years of schooling, the Arab world comes up short given relatively short notwithstanding the total educational expenditures by Arab countries. Current political and economic insecurity brought about by Arab Spring has worked to undermine the quality of teaching and learning in most Arab countries. To reduce the risk of sliding further, Arab countries should enshrine education as a key component of national and regional strategies designed to increase the stock of human capital and to build internationally competitive economic clusters around sustainable high-value-added goods and services reducing dependency on volatile and depletable primary exports. Rational and regionally harmonized investment in education would spur knowledge absorption, new products development, innovation and dissemination of technologies.

Successful diversification of Arab economies depends on effective educational delivery to the future work force. Effective educational institutions must produce students equipped with skills and competencies to close the knowledge gap and speed up the process of catching up with the rest of the world. It is essential that linkages between universities and the labor market be established to enhance collaboration and support development. These linkages would not only enhance knowledge sharing and technology dissemination, but also accelerate the process of global integration. Low levels of economic diversification characteristic of rentier economies has stifled generation of linkages serving induce innovation and to stimulate economic growth. As pointed out by the UNESCO: "We can deduce from the afore-mentioned studies that higher education across the Arab region is in need of serious reform. In the majority of countries, higher education is succeeding only in producing bureaucrats with little innovative capacity to meet the needs of the private sector. There is a dire mismatch between the skills companies are seeking and what most universities in the region are producing. The results are millions of young people with high expectations and no hope of fulfilling their dreams."[16]

Universities in Arab countries must strengthen linkages with industry as well as encourage collaboration among universities to contribute effectively to the national stock of scientific competencies and technical know-how. Funding universities to carry out research requires government support to endorse the role of universities and increase their involvement in development. Under conditions of volatility in energy markets, high dependency on oil exports risks unhinging development. Emphasis should be placed on private entrepreneurs, in tandem with private universities, to participate in building knowledge capacity through research and development and scientific experiments to support innovation and develop new products. Building scientific and technological capacity empowers the economy by galvanizing new techniques and creating new knowledge for development. "Although Arab countries have public and private scientific research institutions and centres, they are heavily informed by the notion of technology transfer and do not work to indigenize existing knowledge so as to allow for innovation and local knowledge production. As a result, these institutions have not succeeded in determining societal needs

and setting research priorities, and this in turn has lowered their actual impact on higher and technical educational curricula." [9]
Innovation and creativity are essential for rapid transformation from a resource-based to a knowledge-based economy. The ability of the economy to innovate and compete in the global market is directly linked to human capital. Human capital plays a critical role in the national innovation system, and therefore, investment in education is vital for promoting creativity and knowledge application. Universities must contribute directly to the national innovation system by creating research centers and carrying out experimentation to strengthen linkages with the rest of the economy. University-industry collaboration underscores the importance of joint research in the development of new products. Because of low manufacturing output in Arab countries, collaborative linkages between universities and local enterprises are rarely practiced -- causing little or no economic-value-added to the domestic economy. Most educational programs at universities in the Arab world are of theoretical nature with little or no application to support practical use of knowledge in the market place. Students generally lack practical experience to qualify them doing scientific experiments and conducting research.
ICTs are vital to permit exchanges of knowledge among universities to empower to students to obtain skill enabling them to participate in incipient knowledge economies. In knowledge-based economies, the demand for labor is linked to the acquisition of technical skills and competencies adaptable to the changing conditions in the market place. Moreover, the use of ICTs requires training in skills necessary to operate and apply these technologies in the productive system.
Arab countries should increase cooperation in higher education to facilitate mobility of people with requisite skills and expertise among countries within the region of the Middle East. Cooperation should involve the acceptance of graduates from private universities across the Arab world by having their degrees accepted on the basis of regional reciprocity. Such a regime would facilitate the free flow of regionally educated knowledge economy workers across regional borders. Otherwise, to avoid their cross-border movement being blocked by non-acknowledgment of their degrees, Arab tertiary students would have to study extra-regionally (subject to the post-graduation risk of brain drain being incurred by the Arab country of which they are citizen) or have to study at a public university (subject to the pre-matriculation risk of being denied entry due to capacity constraints).

6. Conclusion

The future development of any society lies in its people capabilities to induce change through skill acquisition, technology dissemination, development of new ideas, and knowledge creation. Human capital is a term that possesses all these ingredients obtained through investment in education and training of workers. In this regard, education becomes a powerful instrument capable of providing solutions to complex problems enabling the society to enhance productivity, increase living standards, create wealth and alleviate poverty. Building capacity for education will require the allocation of greater share of society's resources to promote scientific learning and increase the stock of human capital. In relation to the Arab world, the region is ranked low in all four pillars of the human capital index. This reflects the inadequacy of the educational system and the failure of public policies to create enabling environment aiming at enhancing the human factor in the process of creativity and growth. Meeting the economic challenges of the region will require countries to restructure the economies of the region and increase the knowledge contents in production. The Arab world has the potential to speed up the process of transformation by enhancing the stock and skill base of its human capital. In the new economy, skilled labor in the form of human capital is the most important motor of sustainable growth transcending the role of land (resources) and physical or financial capital.
Although economic trends have shown that four GCC countries (Saudi Arabia, UAE, Qatar and Bahrain) have improved their human development performance, the overall MENA region is dragged down by laggard economies (Egypt, Algeria and Yemen) which manifest a complete lack of knowledge economy readiness. While a knowledge gap between the MENA region and other regions is obvious, a knowledge gap, no less insidious, pervades within MENA regionally. To close the knowledge gap within the region will require knowledge transfer from the "haves" to the "have-nots." It would be possible to close the knowledge gap with other world regions, as well as to harmonize development among Arab countries, by using oil revenues, despite recent declines in energy prices, to build human capital capacity through the financing of education and educational institutions.
In the new economy, the role of the state is instrumental in building the foundation for knowledge economies through the construction of strategies aiming at enhancing people capabilities and increasing knowledge production and use in the economy. Policy initiatives for knowledge creation should be integrated into the national economic policy to induce creation of knowledge economies across MENA as detailed in the following prescriptions:

1. Arab governments should monitor both public and private universities through the institution of regulatory standards and quality assurance methods. Provided they pass muster, higher educational institutions, be they public or private, should be given the choice to select their academic offerings and determine their curricula with a view to delivering skills in demand by the labor market in the new economy in which both hard technological skills as well as soft skills (human resource management, teamwork, foreign languages and communication) feature prominently. Arab governments must allow leeway for universities to transform the educational system into flexible mechanisms able to transfer scientific and technological skills efficiently to the future workforce in training.
2. By creating a level playing field that treats both public and private universities equally, Arab governments should endow private educational institutions greater space to operate on a par with that afforded public universities.
3. Arab governments should encourage women to study science and technology in order to enable them taking part in the knowledge economy fostering, in particular, a culture of innovation on the part of women entrepreneurs. Reengineering the educational system to increase the enrollment of women in technical studies is essential to increase their employment in the market place in the new economy.
4. Arab governments should establish a council representing ministries of education from different Arab countries to harmonize quality standards across all tertiary educational institution in MENA.
5. Arab governments also need to establish a center for joint Arab universities that offer joint educational programs and establish academic networking capable of connecting all academic institutions and research activities with one another.
6. Arab governments should endorse the creation of a joint digital library with open access to students from all countries in the Arab world that would be set up to increase contact among students in various academic fields (through readers joining public reading groups in which contacts could be shared) making information available to all those interested in exchanging ideas and finding common solutions to existing problems.
7. Similarly, Arab governments should increase investment in higher education to beef up research capabilities and encourage research collaboration on various levels: university-private sector, university-public sector, private university-public university and private university-private university. The share of investment in science and technology should be increased to buoy experimental scientific applications and knowledge creation. In doing so, Arab graduates would gain enhanced technical and scientific know-how

that more directly addresses desiderata of incipient knowledge economies.

8. To facilitate informational exchange among various actors, Arab governments should also earmark further investment in ICTs.

Working together, Arab governments can still avail of a window of opportunity to transform their resource-based economies into knowledge-based economies. Lessons can be drawn on parallel experience of such small and resource-poor countries as Singapore, Finland, Hong Kong, Taiwan, New Zealand and South Korea. Whether they will avail of these lessons is unclear.

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