CHAPTER THREE:

THE ENABLING ENVIRONMENTS AND THE TRANSFER AND LOCALISATION OF KNOWLEDGE IN THE UAE

Introduction

The enabling environments are represented by the various structures and forms of support that society provides to the youth for the creation of an environment that facilitates their engagement in the knowledge society. Therefore, the knowledge-enabling environment is an integrated system based on the interaction of educational, economic, social, political, technological and media frameworks among others. Enabling, therefore, refers to two overlapping processes: the first is related to the acquisition of knowledge, skills and capacities. The second refers to the environments that foster the utilisation of these capacities, skills and knowledge in the production of knowledge. And if the process of enabling is associated with capacities, skills and values, then it also requires appropriate fostering environments. This means that we will not succeed in empowering the youth and society by merely equipping them with knowledge, skills and values; we also need proper fertile ground and appropriate surroundings in which the youth can practice those skills for the employment and production of knowledge. This requires institutions that are qualified with the features of supporting systems in the knowledge society. This also confirms the importance of the integration of various institutions so that the youth can move throughout those stages.

Accessing the knowledge society is based on a number of determinants that must be made available. These include: success in education, efficiency in research and innovation, rationality in planning and management and adoption of good governance.[1] How are these factors reflected in the Emirati experience? And is their role manifested in the integration of the youth in the knowledge society? To answer these questions, we shall address the problem of building the knowledge society in the UAE in relation to the youth, through the various enabling environments that could better enable them to contribute to the transfer and localisation of knowledge.

The Educational Environment

Higher Education in the UAE

The mission of universities is associated with three main goals: teaching, scientific research and community service. Universities and institutions of higher education in general play a major role in the consolidation of national identity and community values, as universities are considered to be the main influent which provides society with qualified and trained young national cadres. This is in addition to the scientific, technical and administrative competencies and skills in various fields, so as to achieve economic and social development. Universities also contribute to solving the various issues and challenges faced by society.

Statistics indicate an increase in the higher education enrolment rates in the UAE; the total number of students enrolled in higher education and university stages (nationals and expatriates) was around 118,600 students in the academic year 2012/2013, with a growth rate of 7.95% compared to the academic year 2011/2012. The number of Emirati

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Table 3.1

The Number of Students in Higher Education and University in the UAE for the Academic Year 2012/2013

	Citizens			Non-Citizens			
	Male	Female	Total	Male	Female	Total	Total
Private Education	19,652	14,619	34,271	19,840	22,798	42,638	76,909
Private Education	10,508	27,589	38,097	1,340	2,214	3,554	41,651
Total	30,160	42,208	72,368	21,180	25,012	46,192	118,560

SOURCE: UAE National Bureau of Statistics, 2014. (Reference in Arabic)

citizens among students in 2012/2013 statistics was 72,400, representing 61% of the total number of students.[2] The increase in the proportion of citizen undergraduates (aside from the financial factors and free education for citizens in public universities) might be due to the high input rate from high school graduates, where the number of secondary school certificate holders was 46,900 students in the academic year 2010/2011, 27,900 of which were Emirati (59.5%).[3] Statistics also indicate that female citizen undergraduates represented 58.3% of Emirati citizens among students at the higher education and university stage, while the percentage of non-citizen female undergraduates from the total non-citizen undergraduates was 54.1%. In general, the proportion of females to males in higher education and university was 56.7%.[4]

In reference to the party providing the educational services, we find that the private sector provides nearly 65% of higher education and university education in the UAE. This is due to the fact that 92% of university education provided for non-citizens takes place at private universities, while citizens represent 47% of the total number of private university students, which is a high percentage compared to the privileges offered to citizens in Emirati public universities. Undoubtedly, the increase in the private education contribution rate in university education in UAE has its impacts on the transfer and localisation of knowledge. We shall debate this issue later when addressing foreign and private universities.

While discussing the status of universities, we must address the relationship between current student specialisations and the scientific specialisations that serve the process of the transfer and localisation of knowledge; especially since undergraduate students are considered to be a key component for the creation of the critical mass of human capital that is qualified and cognitively capable of leading the processes of the transfer and localisation of knowledge, up to the establishment of the knowledge society and economy.[5]

According to the data of the Ministry of Higher Education and Scientific Research, published by the National Bureau of Statistics for the academic year 2012/2013, specialisations ranked as follows in terms of student enrolment: economics and administration ranked first with 27.1%; followed by basic education in second place with 16.2%; and engineering in third place with 13.6%; with the total for the three specialisations being 56.9%. On the other hand, the specialisation of Sharia and law attracted 10.8%; humanities 4.6%; medical sciences 3.5%; and sciences 0.8% (see Table 3.2).

The population of non-citizen students was estimated at 46,192 students. Among this population, the number of those majoring in business and economics ranked first, accounting for 29.4%, of students; followed by engineering at 18.9%; then Sharia and law 7.5%; and medical sciences attracting 7.1% of non-citizen students. When comparing Emirati students to non-Emirati ones, it appears that the latter category tends to specialise in scientific majors while the majority of the Emirati students would rather specialise in humanities and social sciences. The proportion of citizen students specialising in Information Systems from the total population was 6% against 4.8% among the total non-citizens; a percentage that remains low in the Information Age. Unfortunately, both citizen and non-citizen students are not inclined towards "science" majors; where the percentage of specialisation came at 0.6% among citizens and 1.1% among non-citizens.[6]

The relatively low enrolment rates in scientific majors that directly contribute to the transfer and localisation of knowledge can be related to internal and external variables affecting the educational system. The percentage of high school graduates enrolled in the humanities division during the academic year 2010/2011 was 73.5% while that of those enrolled in the scientific division was only 26.5%. This clearly highlights that the citizens who stray away from scientific majors, do so during the pre-university stage, which affects the decision

Table 3.2

Enrolment in Higher Education and University by Subject and Gender for the Academic Year 2012/2013

Specialisation	Citizen			Non-Citizen			Total Number of Students (Citizen/Non-Citizen)	Ratio of Specialisation to Total (%)		
	Male	Female	Total	Male	Female	Total		Citizen	Non Citizen	Total
Arts & Design	34	836	870	329	1,222	1,551	2,421	1.2	3.4	2.0
Engineering	4,527	2,925	7,452	5,882	2,831	8,713	16,165	10.3	18.9	13.6
Information Systems	1,810	2,555	4,365	1,368	834	2,202	6,567	6.0	4.8	5.5
Management, Business & Economics	8,241	10,362	18,603	7,280	6,305	13,585	32,188	25.7	29.4	27.1
Education	164	2,123	2,287	259	1,671	1,930	4,217	3.2	4.2	3.6
Foreign Languages	85	445	530	31	350	381	911	0.7	0.8	0.8
Health & Environmental Sciences	115	1,317	1,432	461	2,625	3,086	4,518	2.0	6.7	3.8
Medical Sciences	100	692	792	1,047	2,254	3,301	4,093	1.1	7.1	3.5
Media and Communication	2,958	3,348	6,306	878	1,625	2,503	8,809	8.7	5.4	7.4
Sciences	58	389	447	188	336	524	971	0.6	1.1	0.8
Sharia & Law	6,544	2,775	9,319	1,909	1,555	3,464	12,783	12.9	7.5	10.8
Humanities	711	2,226	2,937	468	2,038	2,506	5,443	4.1	5.4	4.6
Primary Education	4,757	12,157	16,914	1,000	1,289	2,289	19,203	23.4	5.0	16.2
Food & Agriculture	40	49	89	12	6	18	107	0.1	0.0	0.1
Unspecified	16	9	25	68	71	139	164	0.0	0.3	0.1
Total	30,160	42,208	72,368	21,180	25,012	46,192	118,560	100	100	100

Source: Estimations by the AKR team based on data from the Emirati National Bureau of Statistics 2014. (Reference in Arabic)

over which major to choose at university. Furthermore, the female preference for humanities majors is evident, with more than 70% of the female students enrolling in such subjects as shown in Table 3.3.[7]

External factors that could affect university and higher education in the UAE include the fact that the current educational policy is based on the market being the main mechanism for developing the university education system. In this regard, the impact of the socio-economic model seems to be largely pushing university and higher education towards vocational domains.[8]

Considering the active and growing role of private educational institutions in the higher education sector in the country, with more than 70 institutions in the Emirates and with the primary goal of profit, it is thus not surprising that such institutions are focusing on the most popular specialisations and programmes. The number of programmes offered is also anticipated, since in terms of returns, the most popular programmes offered are those of business administration and economics, engineering, computer science and information technology.[9] This may also be due to the relatively recent higher education system in the UAE and

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Table 3.3

Distribution of Emirati Students, Holders of the Secondary School Diploma, across Educational Divisions for the Academic Year 2010/2011

Section	Number of Students in the Scientific Division			Number of Students in the Humanities Division		
Category & Gender	Male	Female	Total	Male	Female	Total
Private	1,203	2,219	3,422	4,189	5,458	9,647
Public	91	86	177	217	111	328
Total	1,294	2,305	3,599	4,406	5,569	9,975

Source: National Bureau of Statistics 2014. (Reference in Arabic)

Table 3.4

Distribution of Emirati Students with Study-abroad Scholarships during the Academic Year 2012/2013, by Educational Level and Gender

Degree	Number of Males	Number of Females	Total Number	Percentage of Males of the Total Students at the Educational Level
Doctorate	6	6	12	50%
Master	39	23	62	63%
Bachelor	371	87	458	81%
Total	416	116	532	78%

Source: Emirati National Bureau of Statistics 2014a. (Reference in Arabic)

the lack of established university traditions, leading to an increased focus on vocational domains, in addition to a decreased interest in pure scientific specialisations, such as science and mathematics. One of the researchers described this situation as a "Commodification"[10] of knowledge, in the sense that it is related to the social benefits of the country and the individual, than the individual's personal, intellectual and cultural development. Hence, this may lead to an emergence of problems in providing the diversification required in the subject areas necessary for social development in the long-run.[11]

"It should be noted that the budget for education is derived from two main sources: the federal budget; and the local budget of each emirate. The federal budget for education, in both primary and tertiary education, was AED 9.9 billion of the total 2013 budget, representing 22.2% of total public spending. The budget for basic education was AED 6 billion, which represents a significant proportion of 13.5% of total public spending. This reflects the efforts of the federal government in supporting the Ministry of Education towards the development of federal education so as to advance to the level of local education in the UAE, as well as to exert efforts to introduce modern education techniques to public schools".[12]

As for the share of university education, it amounted to AED 3.9 billion of the federal budget, which makes 8.7% of total spending of the 2013 federal budget. This is expected to contribute to the significant development of public university education and an increase in the number of citizen students studying at universities outside the UAE. It would also contribute to developing

the academic, scientific and scientific research skills required for establishing the knowledge society and the knowledge economy.[13]

Study-abroad Scholarship Programmes

Following on the presentation of the educational environment and the capability to transfer and localise knowledge, one significant element in the process of the transfer and localisation of knowledge in the UAE is the study-abroad scholarship programmes. These programmes are considered some of the most important cognitive channels that flow directly into achieving two goals: the creation of the knowledge society and the building of the knowledge economy, whether on the level of increasing competency or productive

Table 3.5

Scientific Specialisations for Students on Study-abroad Scholarships during the Academic Year 2012/2013

Specialisation	Number	Percentage
Management Sciences	91	1%
Engineering Sciences	209	39%
Banking and Financial Sciences	69	13%
Computer Science	22	4%
Political Science	35	6.5%
Education	19	3.5%
Law	17	3%
Mass Communication Sciences	5	1%
	17	3%
Forensics	5	1%
Medical Sciences	38	7%
Environmental Sciences	5	1%
Total	532	100%

Source: Emirati National Bureau of Statistics 2014a. (Reference in Arabic)

One significant element in the process of the transfer and localisation of knowledge in the UAE is the study-abroad scholarship programmes

communication with the world. In this context, the number of students who were granted a scholarship for the academic year 2012/2013 was 532, with 86% of these students being undergraduates, 11.6% at the Master's degree level, and 2% Doctoral students. As for the overall percentage of male students, it was 78%. This indicates low female participation in the study-abroad programmes and thus their limited involvement in the transfer and localisation of knowledge in the UAE (See Table 3.4).

Looking into the scientific specialisations of the students on scholarships studying abroad, we notice the prevalence of the specialisation in engineering sciences, at 39%, followed by management sciences at 17%, then banking and financial sciences with 13%.[14]

Foreign Universities in the UAE

The Arab Gulf states present a new model in the establishment of higher education for building the knowledge society. This model is represented in the branches of Western foreign universities, especially from Australia, England and the United States, being established in campuses with innovative names such as Dubai's Knowledge Village and Sharjah's University City. In Abu Dhabi, MIT (Massachusetts Institute of Technology) has a huge university campus. The UAE hosts almost one quarter of the total number of branches of foreign universities in the world, with the University of Wollongong being the first foreign accredited university to open a campus in Dubai in 1993. In 2010, the number of students enrolled in this university was 3,500, in various areas of specialisations at the undergraduate and graduate levels. In 2006, Abu Dhabi hosted the first Paris-Sorbonne University branch (PSUAD), and New York University (NYU) in 2010.[15]

All of the private universities and educational institutions operating in the country are licensed by the Ministry of Education and receive the necessary accreditation for their programmes from the Commission for Academic Accreditation (CAA). In October 2010, the number of accredited private universities was 66 with 479 educational programmes.[16] At the end of August 2012, there were 75 universities with more than 600 programmes, accredited by the Commission.[17]

More than 30 foreign universities are based in Dubai International Academic City (DIAC), in the Free Zone. Within this area, foreign universities enjoy many privileges that include the right to 100% foreign ownership, 100% tax-free profits, and the right to transfer 100% of the profits. In Dubai for example, both the Knowledge and Human Development Authority, along with the International Network for Quality Assurance regulate the work of foreign educational institutions.[18] While branches of foreign universities attract its vast majority of students from UAE residents, some of them, such as NYU Abu Dhabi, attract students from all over the world to ensure the highest possible number of exceptional students.[19]

Since the establishment of foreign universities branches within the country, a significant number of national students have decided to enrol at these universities rather than travel abroad. In 2009 for example, the proportion of citizen students enrolled at Wollongong University was 13.4% of the total number of students.[20]

DIAC has aspired since its establishment to become a regional hub for students from all over the Middle East, South Asia and Africa. In 2013, DIAC had already attracted 20,000 students of 125 nationalities, studying in 21 branches of foreign universities.[21]

Undoubtedly, the branches of these universities contribute to the facilitation of mutual understanding between students of different nationalities and backgrounds, as well as to crafting the students as global citizens. These universities have succeeded in reducing the number of students who study abroad and the migration of some of the youth. They have also contributed to the diversification of experiences among students who thus acquire the knowledge

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and skills that help them gain employment at a pace faster than that of their counterparts in public universities.

It is noteworthy to point out that all of the higher education institutions must commit to the standards and regulations of the mother institution. Also to be noted is that the increase in the number of branch campuses will lead to positive impacts on quality through competition to improve the programmes so as to achieve the most prestigious levels in the recruitment of graduates.[22]

On the other hand, we find ourselves facing the reality of the "commodification" of education. And since profit maximisation is the goal, some universities branches lean towards reducing the cost hence paying less attention to investments in libraries, education sources and students' social facilities.

Further arguments of criticism include that the outputs of these universities may be of high quality in the countries to which they belong, but they are not at the same level of quality and excellence once they depart to other countries. Some of these institutions tend to provide the same educational programmes in their university branches in the UAE as those provided in their mother country, which means that they request "off the shelf" what is already available in the original university, in terms of standards and content, and transfer it to the branch. This results in a clash between the provided knowledge and education, and what is locally required.[23]

A series of questions may be asked here, some of which are: do these universities have a genuine and active role in the transfer and localisation of knowledge? How keen are these universities on their contribution to the processes of transfer and localisation? What is the actual impact of these universities on the UAE community in light of the fact that the majority of professors and students at these universities are non-citizens?

Some researchers believe that Western universities are more inclined towards a colonial style in its new sense. Some aim at control, not for the establishment of a certain ideology or certain political reasons only, but for the mere achievement of commercial profit. The expansion in the establishment of foreign branches in the Arab countries might lead to the emergence of inequality. Universities in Europe, the United States and English-speaking countries will prevail, while the other local universities would remain marginalized, unable to compete.[24]

Proceeding from the concept of countries of the centre and countries of the margin, two other researchers believe that the Gulf States will face further educational and knowledge marginalisation, while the counties of the centre will become more and more powerful, so much so that the Arab Gulf states will easily fall into the trap of knowledge consumption and not production.[25] However, several branches of these universities have embarked on the establishment of research centres offering Doctoral programmes, which would contribute to connecting knowledge to the country's needs.

The higher education market in the UAE is considered to be one of the most competitive markets in the Gulf States as this market seems to face excess demand. This was evident in the results of the Wilkins Study (2010) that concluded that many of the private higher education institutions in the country are facing a difficulty in attracting students. Consequently, these institutions failed to expand their programmes as planned. They have also failed to increase university expenses and tuition fees due to competition and were unsuccessful to manage or offer all of the programmes and courses they had pledged.

Smart/E-Learning Initiatives

E-learning is an advanced way of learning, leaving behind the traditions of memorisation and textbooks and embracing innovation, interaction and skills development. E-learning uses the latest electronic methods of teaching, learning,

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Box 3.1

Roger's Theory on Knowledge Transfer and Innovation

According to Rogers' *Diffusion of Innovations* theory,[26] pioneers of change and educators do not give enough attention to the results of the transfer and diffusion of knowledge and innovations because it is a relatively difficult task. Moreover, there is always the assumption that the result would be positive, but this is not always the case. The consequences of the diffusion of new knowledge may be desirable or undesirable, in addition to the fact that the transfer of the best Western models and practices in the field of education is a commendable and positive approach since human beings are always eager for new knowledge and new ideas. The adoption of a Western best-practices approach to education in the UAE has supported the observance of a quantum leap in the students' learning techniques. This came through limiting the act of memorising and encouraging self-reliance as well as independent critical thinking, with the goal of equipping students with the analytical skills needed for them to make their own decisions. This enables students to be educated for their entire lives and able to contribute in their communities and their professions in the future. Moreover, the adoption of Western approaches to education provides the students with the opportunity to acquire a perspective on the Western culture, which will help reduce the differences and bridge the gap of understanding. This by itself is vital to bring about a certain kind of understanding between the different cultures, which is a significant element in the settlement of certain conflict between the Arab world and the West.

However, the Western education models, as well as the best practices, books and educators, might also bring along some specific cultural jargon that could be entirely different from students' cultural context and contrary to what students are learning; this may even be against their values and may have adverse consequences. In addition to that, the students' pattern of thinking might not change but they would emulate their teachers' behaviour. There are many cases in which Western teachers violate, whether intentionally or unintentionally, the cultural and religious beliefs of Arab students. Those teachers bring along their own norms and values and those of their own communities; they might be threatening to the concepts of the students and the society in general. This might happen unintentionally because these teachers cannot detach their desire to offer knowledge or innovation to a country other than their own. Rogers assures that values, beliefs and stances in a certain culture are effective for that culture, and judgement has to be based on their functions in terms of their own circumstances and needs. Thus, these foreign standards must not be imposed since "every social system includes some qualities that should not be destroyed if we seek the welfare of the system and its sustainability".

Also according to Rogers, innovations are not without any limitations or conditions. Some consequences of the transfer of knowledge are predictable, but others are hidden, unintentional or unexpected. Rogers provides an analogy of the possible changes that accompany the transfer of knowledge. He says it is a bowl full of marble balls, and once any of them is moved, the others are moved as well. However, the transferors of these particles do not necessarily understand the complementarities among them all. At the same time, foreigners do not fully understand the nature of the internal and external forces operating within the system.

The act of re-invention or re-discovery represents another aspect of Rogers' *Diffusion of Innovations* theory. It is "the extent to which an idea or knowledge is changed by the user in the process of adopting the idea and implementing it". Astonishingly, foreign universities arrive in the Gulf with a preconceived notion of "copy & paste" of their educational model into the area, only to find out that this method is futile. Western educational programmes should be amended and adapted to the local context of the Arab Gulf. In other words, and as Rogers has indicated, the receiver of knowledge is not always passive, but can also be an active converter for new ideas.

Sources: Everett Rogers 2003. Juliana G-Mrabet 2010.

The higher education market in the UAE is considered to be one of the most competitive markets in the Gulf States as this market seems to face excess demand

acquiring knowledge and diffusing it, relying on high-tech educational methods, equipment and applications such as computers, tablets and high-speed internet. This provides an advanced and attractive educational system as well as high-quality educational services, that in turn lead to the improvement of learning outputs and exposes the youth to the language of the era. It allows the wide interaction of learners with each other as well as with their teachers, during classroom time or not, which embodies the future's learning pattern that accompanies the student wherever he or she may go.

In order to keep up with the global changes, take advantage of the potential of the ICT infrastructure in the country, and better enable the youth as to receive knowledge by all possible and available means, His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai launched the

"Smart Learning" initiative in 2012. The AED 1 billion initiative covers all the public schools in the country and is to be implemented over a period of 5 years. It is considered to be a national necessity for the achievement of UAE's vision 2021 and is set to transform conventional classroom environments into smart classrooms through access to high speed 4G networks, designing innovative curricula, providing pupils with tablets and training teachers on modern technology devices to ensure the proper implementation of the initiative and its intended objective. The initiative is being implemented in collaboration with the Ministry of Education and the Telecommunications Regulatory Authority.[27]

To ensure the success of the Smart Learning initiative, it should be emphasised that technology alone cannot change the teaching methods and styles because it is closely linked to the method by which programmes and curricula are designed. Therefore, curricula must be redesigned in a comprehensive way that leads to the development of teaching methods that meet the needs of the students, while focusing on operational thinking, problem solving and critical thinking.[28] Also, to ensure the success of the Smart Learning initiative, efforts should encompass the student, teacher and family because such an initiative will induce a huge quantum leap in society. This requires the launch of a parallel media project to introduce both the community and parents to the initiative. It shall also require the development of an integrated programme that supports the eradication of digital illiteracy among parents in order to enable them to follow up on their children's lessons through the school's digital network. Moreover, teachers must receive proper training and their competencies development to support the shift into smart learning in UAE's public schools.

And to complement the process of shifting into smart learning at the university stage, the iPad Initiative was launched at three higher education public institutions: the United Arab Emirates University (UAEU), Zayed University (ZU) and the Higher Colleges of Technology (HCT); which is a significant leap that would render the learning process easier and much more interesting. This last step would make the UAE among the first countries in the world to introduce the iPad in university education and thus achieve an international precedence in the shift to E-learning. The implementation phase of the shift to smart higher education started with 14,000 enrolled students in the Foundation Year Programme at the United Arab Emirates University (UAEU), Zayed University (ZU), and the Higher Colleges of Technology (HCT) at the beginning of the academic year 2012/2013. Consequently, the UAE is stepping into the electronic shift in education and is undergoing the most significant global experience with the use of the iPad in university education.[29]

Research and Development Environment

The driving force behind the transfer and localisation of knowledge, as well as the technological and industrial progress, undoubtedly lies in research and development. The importance of research has increased in recent years, due to a raging battle over the acquisition and production of knowledge, especially following the opening up of new markets and the world trade environment. The new environment has introduced a global competition which has encouraged many states to enter the creative field through research and development. Scientific research is an activity that enjoys its own tools, methods and foundations, as well as its physical and human requirements that should be provided so as to achieve positive results to the benefit of the community, and contribute to the transfer and localisation of knowledge. Without these requirements, it would be hard for countries to compete in the new global economy.

UAE has continuously encouraged research through the establishment of the "National Research Foundation". Despite this, the local research environment did not develop enough to form a true pillar for building the knowledge society. The country still suffers

from a shortage in research products, including studies and research papers in international scientific magazines.[30] The Emirati status does not differ much from that of the other Arab states with respect to the lack of potential, spending and production. The financial support falls below the required level, whereas it only represents 0.2% of the GDP, in comparison with what is allocated to the research budget in many developed countries, reaching more than 4% of the National Product.[31] The scarcity of financial support for research and the lack of encouragement and care thereof are considered to be among the most important challenges facing the UAE in establishing the knowledge society.

In addition, the private sector's small contribution hinders innovation and development in carrying out scientific research, due to the scarce financial provisions allocated to projects and innovations in universities, leading to the failure of numerous research projects and their incompleteness, and as a result, the frustration of those in charge. The inadequacy of research funding at universities is clear, since research does not fall within their priorities. Universities, rather, show more interest in the academic and educational aspect, that neither enhances the true role of the university in serving the community nor helps in building the knowledge society.

Among the challenges hindering the progress of research in the country is the lack of a trained national cadre capable of elevating the national research activity and pushing it forward. There is also a shortage in Emirati executives who assume leadership in research positions, as well as a scarcity of patents and a lack of awareness towards its importance. It is also noted that the number of patents registered and declared by the country is small relative to what is produced by universities and research centres in developed countries.

One researcher attributed the limited research in the country to the weak beliefs among stakeholders in the importance of research, lacking the proper scientific foundations

necessary for research production in schools and universities, missing financial and moral support for researchers as well as awareness on the importance of research as an essential factor in achieving a developmental revival in all fields.[32]

Box 3.2

The National Research Foundation

The National Research Foundation was established in March 2008, in view of founding a research leadership in the country. The Foundation is involved in all research matters; it issues recommendations specific to funding centres, programmes, institutions and individuals, monitors grants periodically to insure the achievement of the intended goals, provides an internationally competitive research capacity and an innovation system in the country so that the outcomes of these research activities become a source of intellectual property, ideas and knowledge, and enables Emirati companies to be more competitive and enhance the lives of the citizens of UAE.

Source: National Research Foundation 2014. (Reference in Arabic)

Despite the establishment of research centres, knowledge villages and academic villages, the increase in the number of international universities and university instructors, both citizens and non-citizens, along with the increase in the number of citizens graduating with Master and Ph.D. degrees, there is no push towards linking research with development. These institutions have failed to become project initiators. This might be attributed, as some researchers stated, to the commercial drift in administering these institutions. Dubai's Knowledge Village is inclined to making money through its orientation to work as a trade centre system, bringing along leasers with the latest trademarks.[33] It is to be noted that the UAE Vision 2021 includes seven main goals, among which is a strategy to transform the economy into "a competitive knowledge economy". This entails a re-analysis of the research status that is currently marginalised and does not support the establishment of the required environment for the transfer and localisation of knowledge, which is a prelude to the transformation into a knowledge society or knowledge economy.

The inadequacy of research funding at universities is clear, since research does not fall within their priorities

The UAE is in dire need of local research and development efforts in order to increase the knowledge absorptive capacity. However, this issue is apparently lacking in the countries of the Middle-East region in general. Although "Knowledge Cities" are prospering in the Gulf area in general and the UAE in particular, they are still infrastructure cities that have attracted foreign universities because of the facilities they offer. Most of these branches only carry the names of the mother universities, with no instructors or administrators from the mother university.[34] The other important aspect is the dependence of these branches on education and training, and their obvious negligence of research, and this also applies to western researchers working at these branches.

The establishment of systems of innovative research seems to undergo three stages: the first is the creation of a group of companies in one specific area, the second is the creation of a group of knowledge institutions around these companies, and the third is the facilitation of the social communication process and mechanisms between the companies, institutions and universities, allowing the establishment of a mutual interactive learning process. The UAE has succeeded in achieving the first element. The Dubai Government, for instance, has been attracting foreign companies working in many fields by creating several free zones in which thousands of employees from around the world are working for hundreds of companies. As for the second and third elements, they need more attention. The system of creativity and innovation through research and development does not only require the existence of economic and commercial entities; it rather needs knowledge entities working around these institutions, and building networks and communication channels between them.

The role of universities must be reconsidered, especially in UAE, in such a way that research and community service become top priorities. Partnerships should be established between universities and economic and industrial entities, with the goal of serving creativity, innovation, as well as knowledge employment and production.

UAE has provided many financial requirements in a serious attempt at supporting creativity and research. However, planning and monitoring resources, even building facilities and providing requirements is not enough to establish the desired knowledge society. All such efforts will not be productive unless the two previous elements are in place and invested in to benefit the youth so that they can acquire the skills and capabilities required to keep up with the scientific age and enter into the knowledge society.[35]

The Economic Environment

The UAE national economy has witnessed major growth from 1990-2010. The GDP volume has increased, in current prices, from AED 125.3 billion in 1990,[36] to exceed, and for the first time, AED 1,093 billion in 2010.[37] According to the 2014 report of the National Bureau of Statistics, the country's GDP was estimated at AED 1,477 billion for the year 2013, achieving a growth rate of 8.1% from 2012. The same applies to

The role of universities must be reconsidered, especially in UAE, in such a way that research and community service become top priorities

the total GDP, in fixed prices, which reflects a growth rate of 5.2%, from AED 1,033 billion in 2012, to an estimated AED 1,087 billion in 2013.[38] The federal government's budget was estimated at AED 44.6 billion for the year 2013, with estimated expenses of AED 133 billion, with no deficit. This budget is expected to cover the total needs of the federal government for its services and programmes directed at the country's inhabitants; citizens and residents.[39]

While the UAE economy is still largely dependent on oil revenues, it has made notable achievements in gradually transferring from a oil-based economy to a diversified economy where non-oil production and services sectors contribute more than two thirds of the domestic product. The sectors of tourism, services, industry, construction and real estate have gained a leading role in diversifying the country's GNI (Table 3.6). The country also achieved an unprecedented record of reduction in inflation to reach less than 0.66% in 2012,[40] from 0.88% in 2011 and 1.7% in 2010.[41]

The economy of the UAE is the second largest Arab economy, right after Saudi Arabia. However, the UAE has a high global ranking in the GDP per capita, reaching USD 58,100, and is third after Qatar and Saudi Arabia at the Arab level in this regards.[42] The UAE is considered among the high-income non-OECD member countries.

Over the past few decades, the Emirati economy has achieved positive growth rates

The UAE Vision 2021

As a result of the belief in the importance of knowledge and its central role in the human development of the UAE society, the UAE Vision 2021 was set to ensure the country was one of the best in the world by 2021, which coincides with the 50-year anniversary of the establishment of the state and the formation of the Union. The vision was launched in 2010 by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, under the slogan: "We want to be among the best countries in the world".

The UAE Vision 2021 is centred on the four important pillars of national identity, economy, education and health. It aims at building an ambitious, confident population that is attached to its identity and heritage, a strong Union bonded by a common destiny and a competitive economy led by Emiratis distinguished by innovation, knowledge and a high quality of life in a generous and sustainable environment. The UAE Vision 2021 also aims at developing a knowledge-based economy that enjoys diversity and flexibility, led by skilled and experienced Emiratis; on the basis of the achievements already attained, while looking forward to achieving more in the future.

The Government's strategy for 2011-2013 included a set of strategic foundations, which the Government is currently working on, as a prelude to the UAE Vision 2021 goals. The Government is prioritising these efforts through many executive initiatives that relate to the strategic plans aiming at establishing a "competitive knowledge economy".

Source: UAE Vision 2021. (Reference in Arabic)

thanks to its developed infrastructure, which is on a par with many developed countries, as well as its flexible economic legislations and investment-inducing environment.[43] UAE

While the UAE economy is still largely dependent on oil revenues, it has made notable achievements in gradually transferring from a oil-based economy to a diversified economy where non-oil production and services sectors contribute more than two thirds of the domestic product

Table 3.6

The Contribution of Oil and Non-Oil Sectors to the UAE GDP in Fixed Prices for the Years 2012 and 2013 (Billion AED)

Data	2012	2013
Gross Domestic Product	1367.3	1477.6
GDP of Non-Oil Sectors	828.2	903.5
GDP for Oil Sectors	539.2*	574.1
Contribution of Non-Oil Sectors in the GDP(%)	60.6%	61.1%
Contribution of Oil Sectors in the GDP(%)	39.4%*	38.9%

Source: UAE National Bureau of Statistics 2014b. (Reference in Arabic)
* Report team calculations based on data from the UAE Ministry of Economy

has worked towards developing the laws and legislations. This has provided a major push that contributes to fostering investors' trust, supporting the continuity of growth, developing non-oil sectors, and providing a competitive environment for the business sector and the UAE markets at both regional and global levels. UAE also achieved notable major progress in the fields of education, health, housing services, foreign trade, transportation and communications.[44]

Nevertheless, the funding of development programmes still mostly depends on the country's oil revenues.[45] Economic diversity for the UAE is suggested as the best solution to achieve sustainable development in a future that is less dependent on oil resources. This entails the stimulation of new strategic sectors in order to establish a higher potential and appeal for the industries and services that enable building long term competitive advantages,[46] hence the importance of the UAE's transfer into the knowledge economy.

E-Commerce

E-commerce is one of the features of the knowledge economy and one of the most important basic applications of information and communication technology. The fast development and increasingly widespread usage of information technologies have led to a change in the nature of commerce; from the traditional pattern to new more electronic forms. E-commerce has also become a tangible reality in light of the current components and the accelerating progress of the electronic transactions sector: referred to more generally as "E-commerce". The World Trade Organisation defines E-commerce as "the production, advertising, sale and distribution of products via telecommunication networks, especially the internet - the medium with which electronic commerce is primarily associated".[47]

The globalisation of E-commerce has led to the minimisation of the role of borders and barriers in entering the trade markets. This has turned the world into an open market before the consumer, regardless of the geographic location of the vendor or purchaser. The internet is considered to be the fostering environment and the most widely used electronic means. The steady increase in the growth rates of E-commerce in recent years indicates its increased importance. The internet has enabled individuals, as well as small, medium and large business sectors to benefit from E-commerce technologies and operate them in various ways.

With regards to the frameworks of regulations and legalisation on E-commerce in UAE, a law regulating E-commerce in the State was promulgated in 2006 (Federal Law No. 1 on E-commerce and Transactions), which stipulated the authorisation of the Telecommunications Regulatory Authority (TRA) to license and monitor the activities of E-commerce service providers. Another license was issued for Etisalat, being the national company for providing telecommunication services, to provide Electronic Certification services by law.[48] To be noted here is the role of the Emirati government in supporting a higher penetration of E-commerce, through pushing TRA to create a stimulating environment. The establishment of an electronic payment gateway had a tangible effect on spreading E-commerce by allowing the agents to pay online the fees for governmental electronic services, round the clock and in a secure way.

In light of the encouragement of E-commerce in UAE, TRA signed a Memorandum of Understanding with "Dubai e-government" to become a partner in the "Trustae" initiative, and to grant the initiative seal to any company practising E-commerce. The initiative protects the rights of the dealers and promotes improvement in the quality of services since it guarantees to the dealer that the electronic dealings bearing this stamp will be governed by the corresponding code of conduct for E-commerce transactions in the state.[49]

One can say that the UAE's efforts in both economic and institutional areas, do not fiercely compete in the current global industry in the traditional sense. The state

E-commerce is one of the features of the knowledge economy and one of the most important basic applications of information and communication technology

UAE: The E-Commerce Hub

UAE is considered the hub for E-commerce in the region. It ranked first among the GCC countries, attracting approximately 60% of the total market volume in the GCC countries, estimated at around USD 3.3 billion at the end of 2011, due to the increase in the rate of internet use and the increase in the awareness in using credit cards, in addition to the higher levels of trust in internet shopping and online payment services. Around 42% of the population use E-commerce solutions. Data issued by the Centre for Studies on Electronic Economy (Madar) reveals a growth in E-commerce activities in the UAE at an annual rate of 15% compared to a growth rate not exceeding 10% in the Middle East and North Africa, according to usage statistics of "CashU", a secure platform for online payment services.

Source: Al-Ittihad 2013. (Reference in Arabic)

economy depends on investment in non-industrial sectors such as higher education, funding, insurance, real estate, banking, tourism, aviation and others.

Despite the tangible progress in both the economic and institutional areas in these sectors, it might be best for the UAE to go beyond the phase of attracting capital and commissions, to enhance its capability in attracting knowledge and talent as well. In order to achieve such a leap into the future, UAE will have to master and improve the imported or copied knowledge which is made possible by the attractive economic and institutional environment. However, studies show that such a leap is no easy task. The successful transfer and localisation of knowledge is a long-term process, and usually entails learning, assimilation, apprehension and production of knowledge by individuals in the society.[50]

The Social Environment

The Social Dimensions of Progress

UAE society has witnessed tremendous social changes. This is not merely due to modernisation and to opening up to the outside world, but also to other internal factors that include the transformation of the country into a welfare state after discovering oil and the huge economic and cultural changes that followed. This lead to the emergence of phenomena that were not present before. Some of these phenomena are positive and others negative in terms of relationships between the members of society, the relationships between fathers and sons, the effects on family solidarity, the interaction and understanding between generations, and how all of this reflects on the family's setting and role in transferring the social culture to its members through social upbringing.

There is no need to stress the centrality of the family's role in the development of the youths' skills and values. To be emphasised, however, is that the role of the family might be competing with other roles in social environments, smart technology and the means of communication and media. This is not particular to the UAE community, but is global. Young people are nowadays creating their own world relatively away from the control of their families, and many of them now live in a virtual world, away from reality. From here, specific attention must be dedicated to the youth and one must try to bridge the gaps that this new social environment might create for them. The Emirati family was characterised, and still is, by being extended and patriarchal, and by having a prevalence of the endogamy pattern. It is known that the presence of the extended family has positive effects on the upbringing of children and youth. It grants them many values and habits that the elder enjoy. New generations learn from their elders how to assume responsibility and to enjoy feelings of affection, love and sacrifice. It is obvious that the youth living in extended families under strong social and economic relationships do enjoy a psychological and spiritual balance, and a stability that enables them to truly benefit from their education and develop a social, scientific and technical sets of values.

The economic progress in UAE has led to positive developments, notably with respect to empowering women and their role in society. The developmental efforts have contributed to an increase in

Despite the tangible progress in both the economic and institutional areas in these sectors, it might be best for the UAE to go beyond the phase of attracting capital and commissions, to enhance its capability in attracting knowledge and talent as well

women's participation in society. The most important factors that have enabled women and increased their participation include providing equal opportunities for education and granting increasing opportunities in work and economic activity. The UAE government also took steps that reduced the gap between males and females in the labour market by issuing laws and adopting international conventions that advocate the right of women to be treated equally with men. The constitution of the UAE confirms equality between all citizens[51] and Emirati Labour laws denounce all forms of gender-based discrimination. Women, according to the Constitution, are entitled to secured rights of education, health and social care, as well as the rights to exercise the same professions as men, the right of inheritance and ownership rights according to Islamic Shariah. However, the tangible progress in developing the capacities of Emirati women, especially in the field of education, has not largely contributed to changing the social positions and values related to them. The biggest obstacle to the participation of women in work and in development in general is, the cultural and social dimension. Despite advocating equality at many levels, cultural and community traditions still prevent achieving that in full.

The Challenges of Language and Citizenship

A society's culture, customs and traditions are passed on to subsequent generations through language, which showcases a society's identity. Preserving the native language of Arabic in the UAE means preserving the identity of society and culture. Given the nature of the Emirati society and the composition of its population, with a high rate of expatriates who outnumber citizens with a variety of nationalities and languages, the extent of influence of these languages and cultures on the language and culture of the society should be taken into consideration.

Accordingly, preserving the Arabic language is a political and social claim imposed by reality, so that no complete reliance on languages other than the language of the society takes place. This should be achieved without overlooking the openness of the UAE to other countries economically and culturally, which gives individuals, particularly the youth, the opportunity to enjoy other languages that enable them to communicate with others and get acquainted with the cultures of the world, especially the English language which is considered the language of the knowledge society.

Emphasis should also be made on the importance of citizenship. The central element in the citizenship concept is the sense of belonging to the nation. Belonging is not achieved unless one enjoys protected rights and feels part of the society. In order for this feeling to consolidate, individuals ought to enjoy appropriate standards of living in their society, respect for their privacy as well as non-violation of their rights and freedoms. The concept of citizenship is present in the UAE society, where citizens enjoy all the rights that guarantee them a good living.

The Constitution of the UAE stipulates that equality, social justice, ensuring safety, security and equality of opportunity for all citizens shall be the pillars of society, and that co-operation and mutual mercy shall be a firm bond between them.[52] This is why belonging to the nation is highly evident and frequently manifested in rallying around their leaders and in their love for the nation and their desire to protect it, defend it and preserve its acquisitions and achievements. This feeling of loyalty and belonging is extremely important to the youth because it makes them active members of their society, with a sincere desire to give.

A study[53] argued that the concept of national identity was witnessing a certain crisis among the youth in UAE, as a result of the variables and challenges experienced at the social, cultural and economic levels. Such challenges include the multiple expatriate cultures, the media openness and the accelerated technological progress at the societal level. Decision-makers are focusing on the issue of national cultural

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The biggest obstacle to the participation of women in work and in development in general, the cultural and social dimension
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identity in UAE, through tailored plans and programmes that aim at preserving the national identity among the Emirati youth, hence the organisation of the Emirati Youth Forum, the Arab Youth Forum, Youth TV programme, Youth Heritage Forum, and Shura Council of Youth, among others. All these activities and programmes implemented by the youth centres play a great role in entrenching the local culture and the national identity in UAE.

Communal and civil work is of significant importance in the UAE, where the society maintains its supportive and cooperative nature in the service of its members. UAE promotes the establishment of civil and communal organisations and associations, out of a belief in the role they play in providing support and care in social, health, services and knowledge sectors, besides what is provided by official institutions. The civil society organisations in UAE are diverse. According to the statistics of the Ministry of Social Affairs, there has been 145 associations of public benefit, six institutions, and 17 funds in the end 2012.[54]

The nature of the programmes in these associations varies across human, cultural, educational, professional, folklore, theatre, women's and community affairs. There are also many professional associations in UAE that play various roles according to their areas of specialisation. Such associations include those of social workers, lawyers, teachers and doctors, as well as the Association for protection of Arabic language, environmental associations and others. However, it is obvious that most of these associations do not directly address issues related to youth empowerment or the knowledge issues.

Other examples of these institutions include the General Authority of Youth and Sports Welfare, which is the supreme body specialising in youth welfare, catering to their affairs and activities in UAE.[55] The Authority aims at implementing the Government's policy on youth welfare, socially, culturally and in sports, in accordance with the principles of Islam, moral values

and national goals. The Authority generally focuses on fitness and sports. However, there are no specialised sports establishments for the sports federations. In addition, athletic establishments are not equally distributed throughout the country, and the sports culture is fragile among society members. The customs and traditions, as well as the lack of an adequate environment, also limit the participation of women in sports.

The Political Environment

The United Arab Emirates (UAE) is a federal independent and sovereign state that was established in 1971. It comprises seven emirates: Abu Dhabi, Dubai, Sharjah, Ajman, Um Al Quwain, Ras Al Khaimah and Fujairah, with Abu Dhabi city as capital. The UAE adopts a federal system and the supreme council of the emirates is the Supreme Council of the Federation comprised of the rulers of the seven emirates and has an elected chairman serving a five-year term. The cabinet represents the executive authority while the Federal National Council represents the legislative authority. According to the Constitution, the authority of the Federal National Council is restricted to its legislative tasks including discussing constitutional amendments, approving, modifying or rejecting draft

Many associations do not directly address issues related to youth empowerment or the knowledge issues

laws, commenting on international treaties and agreements, and all conventions forwarded to it by the president, in addition to discussing state budget and submitting any comments thereon. The 40-member National Council serves as an authority of political supervision and control. 50% of the Council's members are elected every four years while the remaining members are appointed by the government. Women make up 20% of the members of the Council.[56] The local government of each emirate manages its own domestic affairs in coordination with the federal government.

The UNDP reports have adopted a definition of the knowledge society where knowledge goes hand in hand with freedom. Based on that, we must emphasise the fact that the UAE's Constitution and its system of governance have guaranteed freedom in the transfer of knowledge and educational attainment.

The Constitution of the state guarantees the personal freedom of citizens (Article 26) and freedom of opinion and expression in all its forms (Article 30). It further guarantees citizens the right to work in various fields and gives them the freedom to establish associations in accordance with the Law (Article 33). Foreigners as well enjoy the rights and freedoms stipulated in the applicable international instruments, treaties and conventions to which the UAE is a party (Article 40).[57]

Observers of political life in the UAE often note the existence of effective participation of the different segments of society. This includes the youth whom the state is keen to rehabilitate educationally, and to enhance their abilities so that they can take the lead in various national positions; in addition to women who are now active participants in various fields, and have become qualified to occupy positions in different state institutions. This confirms to what has been mentioned earlier in the Arab Knowledge Report 2010/2011, that the system in the UAE allows its citizens to exercise their roles in a society based on transparency and objectivity.[58] This stems from what is described in the report as the availability of enabling environments which the UAE has succeeded in establishing, since the laws, the prevailing regulations and the existing institutions provide the supporting institutional framework for all the sectors of society.[59]

The Demographic Environment

The UAE witnessed an unusual population growth that resulted in a rise in the number of its residents from 557,887 in the first official census conducted in 1975 to 4,106,627 in the 2005 census, with an average annual growth rate of 12.5%, bringing the number of those who dwell in the UAE to 8.26 million in 2010. According to demographic estimates in mid-2010, the UAE population has reached 8.26 million

Table 3.7

Population Growth of Citizens and Non-Citizens in the Period 1975-2010

Population/Year	Citizens	%	Non-Citizens	%	Total
1975	201,544	36.12	356,343	63.87	557,887
1980	290,544	27.9	751,555	72.1	1,042,099
1985	396,114	28.71	983,189	71.28	1,379,303
1995	587,330	24.36	1,823,711	75.6	2,411,041
2005	825,945	20.1	3,280,932	79.89	4,106,427
2006	851,164	16.98	4,161,220	83.02	5,012,384
2007	877,741	14,12	5,341,265	85.88	6,219,006
2008	904,857	11.21	7,168,769	88.79	8,073,626
2009	933,381	11.38	7,266,615	88.62	8,199,996
2010	947,997	11.46	7,316,073	88.54	8,264,070

Source: UAE National Bureau of Statistics 2014a. (Reference in Arabic)

Table 3.8

Age Distribution of the Emirati Citizen Population (Estimates of Mid 2010)

Age Groups	Number of Males	Number of Females	Total Number
(15-19)	63,604	60,388	123,992
(20-24)	58,004	60,655	118,659
(25-29)	45,154	47,283	92,437
(30-34)	29,724	30,554	60,278
(35-39)	23,223	24,868	48,091
(40-44)	16,845	18,862	35,707
Total Number of Residents Aged 0 to 80+	479,109	468,888	947,997

Source: UAE National Bureau of Statistics 2012. (Reference in Arabic)

people, of whom around 948,000, i.e. 11.46% are citizens; divided between 50.5% males and 49.5% females. Non-citizens (i.e. expats), constitute 88.5% of the country's population, divided between 77.67% males and 22.3% females.[60]

The increase in the population was due to the employment of large numbers of foreign workers to contribute to the overall development process that accompanied the rise in oil revenues. The population of citizens is distributed in variant proportions across the emirates. The Emirate of Abu Dhabi ranks first in the number of citizens with 42.7%, followed by the emirate of Dubai which hosts 17.7%, and the Emirate of Sharjah is third with 16.2%. This means that 76.6% of the UAE population is concentrated in the three emirates, while the rest of the population are in the other four emirates.[61] Table 3.7 presents a comparison between the growth of citizen and non-citizen populations from 1975-2010.

This table reveals the imbalance in the growth of citizen and non-citizen populations. The local population has tripled in the past three decades (1980-2010), whereas the number of non-citizens has grown nine-fold over the same period. The unbalanced upward trend in the number of residents in the country since 2005 is very clear, as the increase in the percentage of the citizen population between 2005 and 2010 has reached 14.7%, whereas the percentage of non-citizens has jumped to 123%. This reveals a problem in the population structure; the percentage of the citizen population was 11.46% in 2010 compared to the high non-citizen population of 88.54%.

However, one reason for optimism is that the percentage of the youth, aged 20 to 39 among citizen population is roughly one third, and that is a significantly high percentage (as shown in Table 3.8).[62] This is an asset that can be built upon in the transfer and localisation of knowledge and the establishment of the aspired-for knowledge society. The phase of the youth is one of very special nature in terms of its circumstances and psychological and social characteristics. It relates to those engaged in the labour market or who are in the final stages of education. For this reason,

The increase in the population was due to the employment of large numbers of foreign workers to contribute to the overall development process that accompanied the rise in oil revenues

Distribution of UAE Population (2010)

Nationality	Males	Females	Total
Citizens	479,109	468,888	947,997
Non-Citizens	5,682,711	1,633,362	7,316,073
Total	6,161,820	2,102,250	8,264,070

Source: UAE National Bureau of Statistics 2012. (Reference in Arabic)

UAE Citizen Residents According to Age and Gender (2010)

Age Group (Years)	Number of Males	Number of Females	Total Number
0 – 17	223,178	211,420	434,598
18 – 35	162,968	167,621	330,589
36 – 79	89,806	87,010	176,816
80 +	3,157	2,837	6,994
Total	479,109	468,888	947,997

Source: Statistical Annex Data.

The media plays
a significant role
in the formation
of society in its
different segments,
especially the youth.
Therefore, media
institutions bear a
responsibility that
is equally important
and influential as
that of educational
institutions,
and might even
sometimes be of
greater influence

this age group of young producers enjoys a particular importance in the processes of building a knowledge society.

The demographic composition as a whole should not be considered an impediment to the establishment of a knowledge society. On the contrary, its positive aspects are to be dually regarded. The country should benefit from the presence of so much expertise among non-citizens and utilise this to assist in the transfer and localisation of knowledge for the Emirati youth. It is unjust to consider expats an obstacle to the transfer of knowledge because they have helped in developing the country's economy, which allowed it to achieve notable global recognition. The second positive aspect is that the small number of citizens represents an opportunity for officials in the country to provide the necessary attention and support for the youth so that they can become knowledge workers capable of directing the society towards the target of establishing the knowledge society and economy.

Media Environment: Media and Mainstream Values among Youth

"The media scene in the UAE has witnessed a number of important developments in terms of improving the infrastructure to keep pace with global developments in the field of ICT, in addition to instilling transparency and freedom of the press, updating legislations that regulate the media and establishing new free zones for the media. The UAE hosts many print and broadcast media outlets,[63] including eight daily newspapers published in Arabic, six newspapers published in English, and dozens of magazines and specialised journals, in addition to a number of television and radio stations".[64]

Modern media has developed mechanisms and an ability to create a special educational environment of its own. This has marked the end of the monopoly of formal educational institutions in the dissemination of culture and knowledge. Many societies have been witnessing a veiled and an open competition between the education and media systems. The media plays a significant role in the formation of society in its different segments, especially the youth. Therefore, media institutions bear a responsibility that is equally important and influential as that of educational institutions, and might even sometimes be of greater influence.

One study found that the dominance of imported ideas from Western media was the main reason behind the alienation experienced by the youth in the Arab region. While the youth ignore reading as a source of knowledge, they are dependent on the media as their main source of information and knowledge. The study also noted the prevalence of the technical aspect, represented by the internet and television, on the daily life of the youth as it takes up most of their time. This confirms the influence of the media on the youth as a major source of knowledge.

Clearly, educators are faced with a challenge in the UAE regarding the media environment. This challenge is represented by the means to deal with advanced and rapid media production, and how to benefit from these enormous media outlets in instilling good values. This would develop an ability within the youth that would help them judge whether a programme was valuable or not so that they could choose

Models of Leading Media Organisations in the UAE

The Emirati National Media Council was established in 2006 as an independent federal body. Its role encompasses overseeing the media policy in the state, supervising and regulating media outlets, and following up on print and broadcast media content inside the country and what comes from abroad, in addition to supporting and developing the media capacities of citizens and representing the country in media events at home and abroad.[65] The media law was instated to promote freedom of the press in the UAE, and support political and economic empowerment to the better service of development and national identity, and to keep pace with the various professional and technical developments that have been taking place in the media sector.[66]

The UAE enjoys a large media presence which has made it one of the most wired states in terms of the percentage of media outlets compared to the population size. The media sector in the country has witnessed remarkable growth during the past two decades in terms of the number of institutions, media information and technological development.[67]

There are four active free media zones in the country: Fujairah Creative City, Ras Al Khaimah Media Free Zone, twofour54 Abu Dhabi, and Tecom Investments, which includes Dubai Media City and Dubai Studio City and other businesses.[68]

It should be noted here that Dubai Media City is one of the most famous media cities in the region. It was launched in January 2001 in line with Dubai's vision to become a hub for communication and media in the region. Since its inauguration, the city offers its services to the media community in sectors such as publishing, printing, music, new media, entertainment, broadcasting, film, information and media agencies and marketing services.

Dubai Media City offers an opportunity to interact with some of the leading marketing companies and media giants such as Bertelsmann World, CNBC, CNN, Forbes, MBC, Reuters, Showtime and Sony. Additionally, the business centres in the city have contributed to the process of encouraging talents and entrepreneurship in the region, as these centres offer the opportunity to gain experience and build relationships with media producers.[69]

Source: National Media Council, UAE 2010 and 2014. (References in Arabic). Abdullah Al-Jbali 2013. (Reference in Arabic). Dubai Media City 2014.

what benefits their abilities. In parallel, it is necessary to think about the alternatives to audio, visual and internet media production, those which provide virtuous content that is exciting and impacts upon the youth. Such alternatives will attract the youth and help them abandon any invalid programmes offered by the media market.

"Investing in the media to instil values and search for alternatives directed towards the youth in the framework of a strategic plan that integrates the efforts of the family, schools and other institutions, is the strongest guarantee of protection for future generations from the negative influence of poor channels without ignoring the impact of their surrounding environments".[70]

Cultural Environment

Emirati citizens enjoy the multiplicity and diversity of cultural channels that provide them with a distinct and attractive environment of cultural and cognitive diversity, with several cultural institutions and events. These have built a bridge for citizens to communicate with other cultures and thus benefit from their knowledge. Perhaps the most important of those cultural channels is what is being offered by the cultural initiatives and projects that the UAE implements to support the country's strategic shift towards becoming a regional centre for culture, arts and heritage and a bridge to communicate with civilisations from around the world.

Dubai Museum of Contemporary Art (DMOCA): A Valuable Cultural Landmark

The DMOCA and the Dubai Opera House project are among the many cultural and tourist projects launched in the city of Dubai to promote and strengthen the status of the UAE as a regional hub for world-class cultural activity. These projects include: Khor Dubai Cultural Centre, international museums in Dubai - where artistic, cultural and heritage treasures from around the world are showcased - the Museum of Middle East Modern Art (MOMEMA), and the Dubai Culture Village.

Source: Emarat Al-Yawm 2012b. (Reference in Arabic).

Emirati citizens enjoy the multiplicity and diversity of cultural channels that provide them with a distinct and attractive environment of cultural and cognitive diversity, with several cultural institutions and events

The Strategy of the Ministry of Culture

The strategy of the Ministry of Culture in the
UAE is focused on preparing educated youth,
aware of the issues of their homeland and
nation - and even the world - by raising the
level of cultural and community awareness;
improving practices and innovations; enriching
cultural interaction; developing and boosting
young people's capabilities in knowledge and
skills; and enhancing their productivity and
competitiveness. Moreover, Emirati cultural
weeks are being organised in various capitals
across the world to introduce the culture
and history of the UAE and boost human in
communication with the cultures of the world.

Locally, there are many cultural organisations
that contribute to the efforts of making young
people more knowledgeable about their own
culture and other cultures. These bodies include
the ADACH, which seeks to promote culture
and national identity as a source of pride for
all. ADACH focuses on the preservation and
protection of the cultural and material heritage
at archaeological and cultural sites and at historic
buildings, while it also organises art festivals and
exhibitions for hundreds of Emirati and non-
Emirati artists from around the world. The UAE
also organises several book fairs, including the
Abu Dhabi International Book Fair and the
Sharjah International Book Fair.

Source: National Media Council UAE 2010. (Reference in Arabic)

The country has worked to build cultural and
artistic partnerships with many countries
and institutions in order to attract the most
famous cultural, archaeological and heritage
regions to the UAE. The Cultural District
of Saadiyat Island is among the most
notable of these projects, where the island
is becoming a global cultural destination
hosting Sheikh Zayed National Museum,
the Louvre, the Guggenheim Museum, and
the cultural minaret of Saadiyat *Manarat Al
Saadiyat*.[71]

The cultural and literary scene in the UAE
presents a multitude of regular events,
activities, exhibitions and cultural, scientific
and technical seminars through the different
governmental and communal institutions
concerned with culture and science. These
institutions include the Ministry of Culture,
Youth, and Community Development;
the Emirates Centre for Strategic Studies
and Research in Abu Dhabi; Abu Dhabi

Authority for Culture and Heritage
(ADACH); the National Centre for
Documentation and Research in Abu
Dhabi; the Culture and Sciences Symposium
in Dubai; the Department of Culture and
Information in Sharjah; the Department of
Culture and Information in Fujairah; Dubai
Culture; Juma Al Majid Centre for Culture
and Heritage; Sultan Bin Ali Al Owais
Cultural Foundation; Ousha Bint Hussein
Cultural Centre; Fujairah Culture and Media
Authority; among others, in addition to the
UAE Writers' Union and the UAE Women
Writers Association.

The informational and cultural environment
available to young Emiratis is considered
among the most important factors that
will support the processes of knowledge
transfer and localisation. Once properly
exploited by young people in the UAE,
these factors are not solely local cultural
institutions, but also direct sources of
knowledge, arts and literature from all over
the world, connecting the youth with the
cultural and scientific riches of the world.

Technological Environment

Supporting the Legislative and Regulatory Structure in Technology

The telecommunications market in the UAE
achieved a stimulating 20% average growth
rate per annum, from USD 8.2 billion in
2005 to USD 13.6 billion in 2011. This was
largely due to the new legal framework,
which allowed for the Telecommunications
Regulatory Authority (TRA) to issue several
regulations to support the development
of the information technology and
telecommunications sector.[72] The liberation
of the telecommunications sector in the
UAE began with the issuance of the Federal
Law N° 3 of 2003, *The Communications Act*,
establishing a regulatory authority for the
telecommunications sector in the UAE.[73]

"*The UAE correspondingly sought to promulgate
and develop the legislations related to the support
of the legal and regulatory environment in various
technology and telecommunications areas. Three
federal laws to protect the intellectual property*

rights were issued in accordance with the provisions of Trade-Related Aspects of Intellectual Property Rights (TRIPS). The UAE joined the membership of treaties, conventions and charters on intellectual property, and the Dubai Government also approved a number of laws regarding the establishment of the Free Zone Authority for Technology and Media and the organisation of electronic transactions in all economic and social activities in the emirate".[74]

Developing Human and Institutional Capacities in the Field of Information Technology

The UAE has worked on strengthening the processes of transforming into the knowledge society and the knowledge economy through the development of policies and programmes aimed at increasing the impact of information technology in education reform and economic and social development, while attempting to modernise education and link it to rapid and successive variables in information and educational technology. An example of this is the expansion in the provision of laptops and internet connected smart boards at schools, and the expansion of e-learning and smart learning programmes through smart technology such as the iPad. Capacity building in the field of technology

can be discussed here through the two following dimensions:

The first dimension is manifested in establishing ICT institutions and the country's expansion in higher education institutions to enable the better penetration of e-learning, which was introduced in a number of universities, institutions and research and technology institutes, to motivate the youth towards activities of scientific research and innovation. The most important among these institutions are Hamdan Bin Mohammed Smart University; Masdar City; Masdar Institute of Science and Technology, which is considered a higher education university directed at research that focuses on alternative energy and the environment;[75 76] Mohammed bin Rashid Technology Park; Dubai Biotechnology and Research Park; Dubai Silicon Oasis Authority; Dubai Silicon Oasis City, Centre and Masterplan, to host the different expertise of workers in the technological field; the International Media Production Zone in Dubai, where Dubai Internet City (DIC), Dubai Media City and Dubai Knowledge Village are located; Arab Science and Technology Foundation in Sharjah; Science Information Technology Centre, Ras Al Khaimah; the Centre of

The informational and cultural environment available to young Emiratis is considered among the most important factors that will support the processes of knowledge transfer and localisation

Box 3.10

ICT Fund

Besides setting the legal framework for the advancement of the information and communication technology (ICT), the UAE also launched financing programmes to stimulate the growth of the telecommunications industry. The ICT Fund is the first of its kind in the Middle East, and is designed to support innovative research and development projects, and to provide education and training opportunities in the ICT field. In terms of research and development, the fund supports the initiation anf promotion of business incubators, as well as support the establishment of high-quality researc and development institutions. The fund provides scholarships for citizens who wish to specialise in the ICT sector, and also provides the necessary support for the establishment of institutions that organise courses and trainings in the ICT field.[78]

Within the broad objective of preparing and qualifying national cadres to localise the ICT sector,

the ICT fund is expected to finance the studies of 680 students abroad, in coordination with the relevant authorities, during the next five years. The programme, called "Be'tha" [*lit. Mission*], aims to training specialised cadres to become the real nucleus for knowledge localisation processes in the ICT sector in the country. The Fund has allocated an estimated budget of AED 198 million for the study-abroad scholarship programmes that will support up to a thousand citizen students. Thirty per cent of the programme has been completed so far. The Fund requires the student to obtain a score of more tha 85% in high school and pass the examinations related to the programme. Around 100 students are already on scholarship grants currently in the United States and Britain under the programmes's scheme, in cooperation and coordination with the Scholarships Office of the Ministry of Presidential Affairs. The fund targets to provide scholarships for 120 students annually in the coming years.

Source: Youssef A-Arabi 2012b.

Table 3.11

ICT Development Index (IDI) in the UAE and Selected GCC Countries (2012)

Country	Rank on the Regional Level	Rank on the Global Level	Index
Qatar	1	31	6.54
UAE	2	33	6.41
Bahrain	3	39	6.3
Saudi Arabia	4	50	5.60
Oman	6	54	5.36

Source: International Telecommunication Union 2012. (Reference in Arabic)

> The UAE has worked on strengthening the processes of transforming into the knowledge society and the knowledge economy through the development of policies and programmes aimed at increasing the impact of information technology in education reform and economic and social development, while attempting to modernise education and link it to rapid and successive variables in information and educational technology

Excellence for Applied Research and Training (CERT); and the institutes and centres that focus on environmental research and water biotechnology treatment.[77] These institutions, among many others, provide many programmes that aim at the development of the human capacity of nationals and expatriates in the field of information and communication technology and the wider technological field.

The second dimension in capacity building is manifested in the development of ICT and associated infrastructure. The information and communication infrastructure is considered a key pillar of the knowledge economy and the gateway of the population's access to ICT. It also promotes the use of ICT in order to maximise the potential flow of information and knowledge. The UAE has upgraded the technological competence of its telephone network and other telephone services supporting the internet. As a result, it has reached a leading position among the world countries and ranked 33rd globally in the Communication Technology Development Index in 2013.[79] It now provides one of the most modern infrastructures in terms of the capacity and diversity of the services offered – all at affordable rates. The prevalence rate reached 22.32 lines per 100 inhabitants in 2013, with a total number of around 2 million subscribers to fixed lines as by the end of 2013. The number of subscribers to mobile phone lines totalled around 16 million subscribers, with a penetration rate of roughly 172 lines per 100 inhabitants for that year.[80]

As for the penetration of broadband internet services, according to the statistics of September 2013 the number of subscribers has exceeded one million, at a rate of 11.11 subscribers per 100 inhabitants. Those indicators are considered the highest among the GCC and Arab countries.[81] The UAE also ranks first among the Arab countries in terms of the quality of its infrastructure and connectivity (see Table 3.11).

The International Telecommunication Union (ITU) Guide, "Measuring the Information Society 2013", shows 11 indicators related to accessing ICT, the associated benefits and the relevant skills needed. The index includes 157 countries and compares them on the global and regional levels, classifying them into four groups based on the ICT level: Very high, high, medium and low.[82]

"The UAE ranked second in the MENA region and 36th globally in the "Special Preparations and Equipment for the ICT" Index. It also ranked 3rd in the MENA region and 30th globally in the "Use of Information Technology" Index. Moreover, it ranked 3rd in the MENA region and 33rd globally in the "Economic and Social Impact of Information Technology" Index".[83]

"The UAE ranked on the top of the list of world countries in regard to the number of houses connected to the fibre optics services, ranking second in terms of highest penetration. This international achievement comes as the fruit of the great investment by the Emirates Telecommunications Corporation "Etisalat" in the fibre optic network. Investments in this

network had exceeded AED 15 billion by the end of 2012. Etisalat is working to raise the coverage rate of fibre optic networks to the highest rates towards complete coverage so that the UAE becomes the first country in the world to provide such a record rate of penetration in high-speed telecommunications technology".[84]

The Networked Readiness Index (NRI) measures the ability of a certain economy to benefit from ICT to increase competitiveness and development. The NRI study, published in the 2014 Global Information Technology Report, is based on the data collected by organisations such as the International Telecommunication Union, the World Bank and the United Nations. In this context, the UAE ranked second in the MENA region and 24th globally in "Networked Readiness" General Index, as shown in the report of the World Economic Forum of 2014. It also ranked second in the MENA region and 18th globally in the "Overall Environment for Information Technology" indicator. Moreover, the UAE ranked among the top Arab countries in several indicators, including the rates of internet users; the importance of ICT in the government's vision for the future; and e-government readiness. At the global level, the UAE also featured in advanced positions coming second place in the government's success in promoting ICT, the government procurement of advanced technology products and e-government readiness.[85]

E-Government

According to the e-government report for the year 2014 issued by the United Nations, the UAE has assumed a leading position among 193 developed and developing countries participating in the report. The UAE ranked second among Arab countries and 32nd globally, according to the "E-Government Development" Index. Although as such, the UAE retreated 4 ranks from its 2012 standing (28th globally), it maintained its significant progress compared to its 2010 ranking when it ranked 49th globally.[86] The E-Services Index measures the development of electronic services in terms of abundance, quality

Box 3.11

E-Government in the UAE

The UAE is considered among the first Arab countries to implement the e-government concept. The Emirati e-government supervises the UAE e-Government Portal, which provides all of the services and federal and local government information in the country. It also works to increase the readiness levels for e-transformation of the services provided by the federal government, so as to ensure the provision of modern and efficient government services that can be obtained around the clock. The portal also provides several files and documents with open content within the concept of "open data."

Source: UAE Telecommunications Regulatory Authority 2014a. (Reference in Arabic).

According to the e-government report for the year 2014 issued by the United Nations, the UAE has assumed a leading position among 193 developed and developing countries participating in the report

Box 3.12

Development Initiatives for the ICT Sector

"My Government" Initiative (Interaction with Citizens)

This initiative aims to promote the e-services that guarantee improving the operating efficiency of the federal government services. It is considered one of the main pillars of the UAE Government strategy for the period 2011/2013. The "My Government" initiative was launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President, Prime Minister and Ruler of Dubai. It is an integrated electronic gateway directly linking citizens to the five federal entities participating in the service. These entities are the Ministry of Labour, the Dubai Electricity and Water Authority [DEWA], the Sheikh Zayed Housing Programme, the National Transport Authority and the Ministry of Interior.

Source: International Telecommunication Union 2014. (Reference in Arabic).

Arabic Domain Initiative ".emirates"

Based on its belief in the importance of the use of the Arabic language in electronic addresses, the TRA has launched the Arabic domain name ".emirates" in Arabic to maximise the benefit for Arabic speakers from the internet and its multi-channels. The Arabic domain .emirates is an achievement for the country in the communication technology sector at the regional level; it introduced the Arabic language for internet domains, and became one of the few countries in the world to get the ICANN approval.

Source: UAE Telecommunications Regulatory Authority 2014. (Reference in Arabic).

International Partnership

The country has supported the establishment of key partnerships and economic ties with many of the world's most prestigious companies, which have cutting-edge technology potential, in order to bring these capabilities and direct them towards research and development. This has created an environment that drives economic diversification in various economic activities, by making use of what those companies enjoy of potential knowledge to promote the transfer and localisation of knowledge. The country has called on the leaders of both the public and private sectors to work together on forming partnerships to support research and innovation across all sectors. This includes the information technology sector, through the Abu Dhabi Government's establishment of the Mubadala Development Company, General Electric (GE),[90] the EBX Group, Boeing company and Airbus.[91]

Sources: Mubadala 2014c. Mubadala 2014a. (Reference in Arabic).

and variety of channels and the use of these services by the public. The UAE's ranking among the top best 20 countries in "providing electronic services", maintaining the progress it has attained since ranking 99th in the "E-Government Services" Index of 2010, where it ranked 12th for the same index in 2012. This progress is considered one of the rare and unprecedented cases in the history of the United Nations reports on e-government readiness.[87]

The e-government participation indicator measures the extent of internet use by the government in the areas of transparency, communication with the public and involvement of the public in formulating policies and developing services. According to the results of the UN E-government Survey Report 2014, the UAE consolidated its advanced position, assuming the 3rd place according to that indicator.[88] The report named UAE specifically as one of the pioneering countries in setting phone participation as a priority for providing round-the-clock services to its citizens since June 2013.[89]

While discussing the economic, political, cultural and technological situation in UAE, it seems clear that the horizon for the transfer and localisation of knowledge,

leading to the establishment of a knowledge society and knowledge economy, has strong potential in terms of the availability of requirements. There is no economic, political, cultural or technical obstacle that prevents focusing attention on this subject. On the contrary, it can be said that the UAE has a historical opportunity, reinforced by the pillars previously mentioned, to move forward with this project. This falls within the framework of the political climate supporting the freedoms, the strong technological environment and, depending on its culture and its stable economy, to finance the costs of this project.

Youth Empowerment Initiatives

Youth empowerment is an efficient means of securing the availability of the knowledge capital needed by the country for the transfer and localisation of knowledge. Thus, there is an interactive relationship between youth empowerment and knowledge localisation; and the higher the level of youth empowerment, the more knowledge localisation operations are facilitated. Based on this, the UAE has given great importance to the empowerment of the youth and equipping them with science and knowledge. It has put these goals at the top of its priorities and concerns, based

Box 3.13

Leading Institutions in Youth Empowerment

The Khalifa Fund and The Mohammed bin Rashid Al Maktoum Foundation[92]

"The Khalifa Fund for Emiratisation Empowerment," which aims to provide the necessary financial resources to support programmes and policies that encourage Emiratis to join the labour market.[93]

1. Emirates Foundation for Youth Development, the vision of which is represented in working to inspire, guide and empower young people in the UAE to contribute to building a sustainable future for the country. One of its main work areas is considered to be in the field of leadership and empowerment, through launching national talents and the provision of a new range of learning and skills development opportunities.[94]

2. Mohammed bin Rashid Al Maktoum Foundation: it is a quality initiative launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, UAE Vice President, Prime Minister

and Ruler of Dubai. Through this initiative, His Highness allocated USD 10 billion to establish a solid knowledge base in the Arab region. The foundation aims to nurture and develop a generation of future leaders to be the human capital representing the main engine of development, especially in light of the low level of intellectual and scientific activity in Arabic, both produced and translated, which is considered one of the lowest levels in the world. The foundation serves the community of youths, intellectuals, cultivated people and writers. Its mission is "to provide opportunities for the Arab youth and prepare them to lead their region towards the knowledge-based economy by encouraging entrepreneurship, research and innovation; promoting access to quality education and quality professional development; and supporting the production, acquisition and dissemination of knowledge sources in the Arabic language."[95]

Box 3.14

Sectors and Institutions of Knowledge Transfer and Localisation in the UAE

The UAE seeks to achieve the transfer and localisation of knowledge in different sectors in the country, i.e. the modern scientific sectors, especially those with high added-value of knowledge. The following is a discussion of the most important of these sectors and institutions that sponsor the transfer and localisation of knowledge.

1. Mubadala Company and the Aviation Sector
Local parties that are subsidiaries of the "Mubadala Development" Company, and entirely owned by the government of Abu Dhabi, have cooperated with global parties to manufacture the first airliner in the UAE within a period of 10 years, i.e. by 2022. This aircraft will operate on the future technology of this industry. The company is currently manufacturing parts of this aircraft, maintaining and repairing them, in addition to training pilots. It also currently supports and develops the local skills and competencies working in the aviation industry. Work is currently underway in the first stage to establish Al Ain Aerospace Park.[96]

2. Sector of Nuclear Energy for Peaceful Purposes
Due to increasing demand for energy in the UAE, the country has developed a programme to provide safe, economical, efficient and environment-friendly nuclear energy by 2017. This is to be achieved through building nuclear power plants based on the highest international standards for safety, performance and environmental impact. Four units of the nuclear power plant are currently being built in partnership with South Korea, and the first is expected to be linked to the electricity grid in May 2017. The other three units will be run one after the other until 2020.[97]

3. Masdar Company
Masdar Company was founded in 2006 as a fully-owned subsidiary of "Mubadala Development Company" owned by the government of Abu Dhabi. The company operates in the context of the overall vision of Abu Dhabi. This vision is aimed at development in all areas of renewable energy and sustainable technologies to ensure energy security, the diversification of the economy and the transition to the knowledge economy,[98] in addition to determining a course of action to address challenges in this area. The vision of Masdar Company is to stabilise Abu Dhabi's position as a leading centre of knowledge in renewable energy, its development and its application, and a global model for sustainable development.

First: Masdar Institute
It is an independent university for postgraduate studies concerned with research,[99] developed in collaboration with the Massachusetts Institute of Technology. The Institute focuses on the science and engineering of advanced alternative energy, environmental technologies and sustainability. It is considered the core of the local research and development complex in Masdar City.

Second: Masdar Capital
"Masdar Capital"[100] seeks to build a portfolio of major renewable energy companies promising clean technology, and targets investments that have the components of success on global and local levels. It particularly focuses on the sectors of:
Clean energy: including the technologies of power generation and storage, transport technologies, technical innovation/clean energy and sustainable bio fuels.
Environmental sources: including technologies of water and waste management and of sustainable industry.
Efficiency of energy and materials: The development of the efficiency of modern materials, the efficiency of energy networks and supporting technologies.
Environmental services: Environmental protection and business services.

Third: Masdar Clean Energy
The unit "Masdar Clean Energy"[101] works on the development and operation of power generation projects from renewable sources, through building a portfolio of strategic projects at the service level. Masdar Clean Energy directly invests in individual projects within the areas of renewable energy, with a focus on concentrated solar power, solar PV and wind energy.

Fourth: Masdar's Carbon Management Unit
"Masdar's Carbon Management Unit"[102] works on the management and operation of the projects that reduce carbon emissions by promoting energy efficiency and waste heat recovery, as well as carbon capture and storage. The unit provides an exceptional value to the owners of industrial assets through the purchase of carbon emissions under the UN's "clean development mechanism" and other feasible business plans linked to global climate, and also through the provision of integrated solutions to achieve these goals, i.e. by funding the carbon credits, identifying and managing projects and analysing the projects of technology sources and registering them with the UN.

Fifth: Masdar City
Masdar City is considered one of the world's most sustainable cities. It is a rising global complex for clean technologies and will allow companies headquartered there to be close to the centre of the development of renewable energy and clean technologies. Masdar City is located 17 kilometres away from Abu Dhabi's city centre, and encourages transport by walking or biking. It also constitutes a platform to showcase the renewable energy of the future and the clean technologies, to conduct research on them, and to develop, test, apply and market them. The city will provide a platform for all the stages of development of renewable energy and sustainable technologies in an integrated complex for housing and work.[103]

on its belief that young people are the foundation of society and its vital cord, being the efficient and driving force behind any potential development and evolution of the country. The more these young people are qualified and possess the scientific skills associated with the knowledge economy, the more they will be able to attain the objectives of the country. This is embodied in the UAE's various initiatives and orientations that target the good formation and preparation of the youth to actively participate in the development of society and its evolution.

Conclusion

The enabling environments in the UAE, present a great opportunity and play a substansive role in the transfer and localisation of knowledge in the UAE. These environments and their fellow institutions are considered incubators for the members of society, especially young people, and thus contribute to building the knowledge society. Yet, many of these institutions need a comprehensive vision directed towards the establishment of the knowledge society in order to enable young people to access it. And in order to do so, they must focus on their orientation and steps so that their basic tasks revolve around the access of knowledge and its localisation; the generation, dissemination and employment of new knowledge; and an increased contribution to strengthening the capacities of young citizens to transfer this knowledge and localise it.

Increasing coordination between these initiatives and institutions is a must, as to ensure its harmonious operation as a single and comprehensive system that connects them, or more precisely on setting a goal that unifies all of their efforts. In many cases, each institution or enabling environment operates separately, which leads to some inconsistencies and redundancies between the goals of some of these institutions and their activities. Therefore, one party sponsoring the knowledge project should be assigned to take charge of coordination between all of these institutions in the country. This party shall develop, set strategies and distribute tasks to different enabling environments that will achieve the goals, each according to its mechanisms, specialities and nature.

Following the establishment of knowledge as a central point in these institutions' various objectives and strategies, and the designation of a specific party to foster the coordination and harmony among them, the responsibility would rest on the shoulders of young people to participate and efficiently benefit from them. Several key questions emerge in this regards: How can the UAE adopt serious policies and strategies that promote knowledge localisation systems through young people? How can the country turn the wealth of youth into an opportunity to achieve knowledge-based human development? How can the policy of qualifying the youth and integrating them in the process of the transfer and localisation of knowledge be successful and bring about the desired social and cultural change and economic growth in which these young people become a productive force of knowledge within the framework of these enabling environments? These and other questions will be addressed in the final chapter of the UAE case study.

> The enabling environments in the UAE, present a great opportunity and play a substansive role in the transfer and localisation of knowledge in the UAE

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