



## About the Council

Mohammed Bin Rashid School of Government took the initiative to launch the Policy Council, a round table dialogue program, to promote meaningful dialogues that will enrich shared knowledge within government entities. The Council also aims to highlight vital public topics and policies of high priority within the framework of the renowned achievements realized by government entities in the UAE in various fields, positioning them locally, regionally, and globally as leaders within their specializations. Additionally, the Council strives to encourage the dissemination of expertise, promote knowledge sharing, and ensure that all government entities benefit from the same. In this context, the School aims for participant diversity at every session, so as to include federal and local levels, central authorities, and specialized authorities, in addition to promoting the engagement of influential non-government stakeholders in relevant discussions. This will enable meaningful, comprehensive dialogues and the ability to tackle topics from a variety of perspectives, as the School seeks to restructure the Policy Council with a view to integrating it within comprehensive action agendas that will enable the Council to conduct in depth discussions of topics on the table. This, in turn, will enhance common understanding and knowledge-sharing efforts. The objectives of the Council can be summarized in providing a platform for cognitive dialogue between experts, specialists and stakeholders involved in the government sector with a view to highlighting issues of priority and importance on government and community levels. The Council also aims to document and disseminate dialogue in a balanced, comprehensive and practical manner to enrich cognitive content within government. Additionally, the Council strives to encourage individual and organizational communication and relationships, and to strengthen the cognitive network within government to enhance effective organizational cooperation. Finally, the Council strives to present insights and recommendations that will have an effective impact on joint action and the development of government performance.

## Building an Inclusive Society: Supporting Youth Employment and Development in the Innovation Economy

### Summary

The UAE Vision 2021 and the Dubai Plan 2021 have emphasized the participation of Emiratis in economic and social development. The UAE's ambitious goal to become one of the world's leading innovation and knowledge economies necessitates the participation of youth in the nation's innovation and knowledge sectors.

While the innovation sector is in need of professionals from all backgrounds, science, engineering, math and technology professionals make up its backbone. Beyond economic competitiveness, global warming, food and water shortages, and energy crisis have created a need for dedicated researchers and applied scientists able to work on long term solutions.

The PISA (2012) study that was conducted in the UAE in 2012 assessed the math and science capabilities of 15 year olds in the UAE against their counterparts in other countries in the world. The UAE ranked 48th (out of 65) in mathematical literacy. In comparison to OECD countries, the UAE measured 60 points lower than the OECD average. Furthermore, enrollment in Science Technology Engineering and Math (STEM) subjects in UAE universities is lower than in business and the humanities and social sciences. Roughly 21% of students in government universities and 19% of students in private universities are enrolled in STEM subjects.

As the innovation and knowledge economy in the UAE grows, training young Emiratis for jobs in those sectors will be crucial for achieving sustainable youth inclusion in the long run.

This MBRSG Policy Council brought together key relevant partners to examine the current state of Emirati participation and preparation for jobs in the innovation and knowledge sectors. The ultimate goal of this session was to discuss how young Emiratis can be prepared for jobs in the innovation economy through stronger STEM education and recruitment.



## Purpose

The purpose of this Policy Council was to gather government partners, educators, and industry leaders for an exploratory discussion around the issues involved in achieving the goal of increasing participation among Emirati youth in UAE economic development, particularly in the innovation and knowledge economy. It aimed to:

- 1) Define the desired forms of participation of youth in the new innovation economy
- 2) Define what youth inclusion might mean for the UAE as it embarks on achieving its 2021 vision
- 3) Understand the challenges facing youth inclusion in the new innovation economy
- 4) Discuss possible policy and other solution to youth inclusion in the UAE

## Background and Rationale

### STEM and the Innovation Economy in the UAE

The nation's mission and vision as reflected in the UAE's Vision 2021 clearly outlines this as a national priority, with the dedicated theme of "United in Knowledge: A Competitive Economy Driven by Knowledgeable and Innovative Emiratis," in which "a diversified and flexible knowledge-based economy will be powered by skilled Emiratis and strengthened by world-class talent to ensure long-term prosperity for the UAE" (UAE Vision 2021 website)<sup>[1]</sup>. Embedded within these messages is an underlying quest to become one of the most competitive nations, not just regionally, but also globally, in line with the most advanced countries of the global north. Indices, such as the WEF's Global Competitiveness Index and the World Bank's Knowledge Economy Index (KEI) became primary indicators for measuring progress and success. Moving up the rankings of global competitiveness indices is important to the national agenda, with dedicated government departments and institutions working towards this goal. The efforts channeled have seen the UAE rank 19 out of 148 countries on the WEF's 2013-2014 KEI and become the only Arab country to be classified as "innovation-driven"—the most advanced stage of economic development—for the past seven years (ECC, 2014)<sup>[2]</sup>. Driving this move towards a knowledge economy in the UAE is a strong university infrastructure as well as independent and government research institutions and foundations which support research and innovation and underscore their importance in becoming a strong contender in the global knowledge market. Furthermore, the UAE has taken measures to reform primary and secondary education; to upgrade higher education curricula in ways that promote creativity, innovation, and research capabilities. The UAE today houses 79 accredited higher education institutions, encompassing public and private universities and a number of satellite campuses of western based institutes.

As global competitiveness rises and as the need for innovation and knowledge economies becomes more urgent, countries all of the world have turned their attention to science and technology education to solve the innovation stagnation. Globally, there is a crisis in the STEM labor market whereby the demand for STEM professionals is higher than the supply.

[1] United Arab Emirates Vision 2021 (n.d.). Retrieved from <http://www.vision2021.ae/en>

[2] Emirates Competitiveness Council. (2014). Policy in Action: The Heart of Competitiveness: Higher Education. Creating the UAE's Future. Dubai



The UAE has not escaped these trends. Only 19% of Emirati students in private universities, and 21% in government universities were enrolled in STEM majors. Of the students who are enrolled in STEM majors, 31% were studying engineering. Only 0.61% of students in government universities were enrolled in the natural sciences. Additionally, only 16% of all Emirati females and 35% of males entered STEM majors<sup>[3]</sup>. The PISA (2012) study that was conducted in the UAE in 2012 assessed the math and science capabilities of 15 year olds in the UAE against their counterparts in other countries in the world. The UAE ranked 48th (out of 65) in mathematical literacy. In comparison to OECD countries, the UAE measured 60 points lower than the OECD average. It was found that UAE students were more proficient in applying mathematical methods than interpreting and reflecting on problems and then finding solutions. With regard to science literacy, the UAE ranked 44th (out of 65). Students in the UAE scored low points for problem solving skills, scoring 89 points below the OECD average<sup>[4]</sup>.

A study conducted by the MBRSG and the Emirates Foundation entitled: Persistence in the Abu Dhabi STEM Pipeline (2015)<sup>[5]</sup>, investigated the “leaks” in the STEM pipeline in the Emirate of Abu Dhabi and found that students in both schools and universities showed a great deal of enthusiasm for STEM subjects and careers. Many viewed STEM preparation as an appropriate way to support the UAE’s national agenda.

[3] UAE Statistics Center Website

[4] PISA UAE Study

[5] Shaer, S. R., Moonesar, I.A., Mourtada, R. (2015). Persistence in the STEM Pipeline: Preparing Emirati Youth for Science and Technology Careers in the Innovation Economy. MBRSG: Dubai. Retrieved from: <http://www.mbrsg.ae/HOME/PUBLICATIONS/Research-Report-Research-Paper-White-Paper/Persistence-in-the-Abu-Dhabi-STEM-Pipeline.aspx>

Percent of Science Track Students Intending to Pursue STEM in University

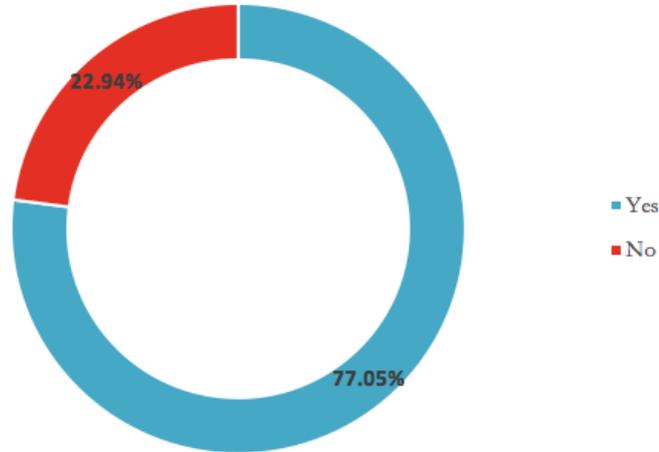


Figure 1. Interest in STEM university majors among science high school students<sup>[6]</sup>

While enthusiasm for science and for the direction that the country is moving toward is high, participation in STEM remains low. This could be explained by the high social cost that is associated with studying STEM and entering STEM careers. STEM careers are still viewed as being time consuming, difficult and demanding. The time spent on these activities is seen as reducing the quality and amount of time that one can spend on social activities such as spending time with friends and family.

Perception of social cost of studying STEM (High school students)

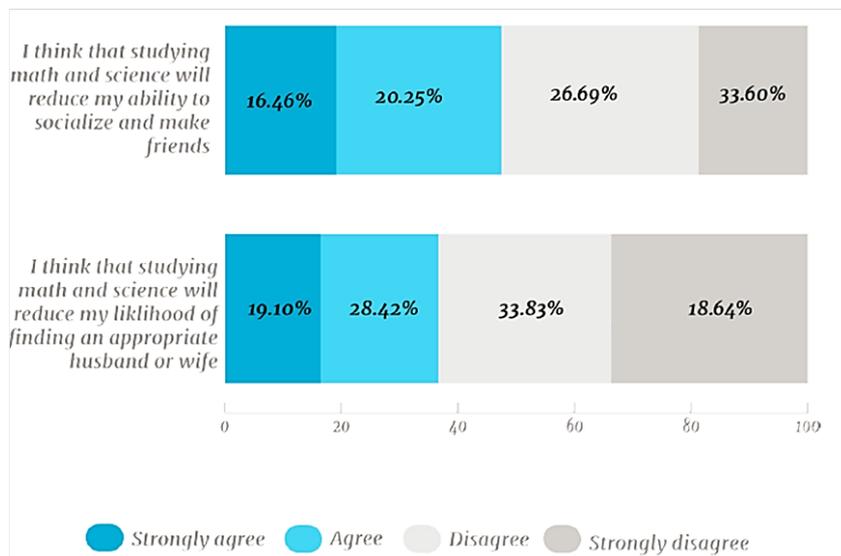


Figure 2. Perception of the social cost of studying STEM

[6] All data and figures pertaining to the MBRSG and Emirates Foundation study can be found the resultant report entitled “Persistence in the Abu Dhabi STEM Pipeline”. The Report can be downloaded from the following link: <http://www.mbrsg.ae/HOME/PUBLICATIONS/Research-Report-Research-Paper-White-Paper/Persistence-in-the-Abu-Dhabi-STEM-Pipeline.aspx>

While the cost of participating in STEM is viewed as high, the reward is also viewed as high. The survey conducted as a part of the study, and among university students, found that, by and large, STEM students believed that jobs in the STEM labor market are of high quality (83%), and are highly available (85%). 88% were optimistic about finding jobs in that market. When asked if they felt prepared to enter the STEM job market, 89% reported that they did indeed feel prepared. Correlation analysis showed that attitude toward the quality and availability of STEM jobs was significantly correlated with students' intentions to pursue STEM careers.

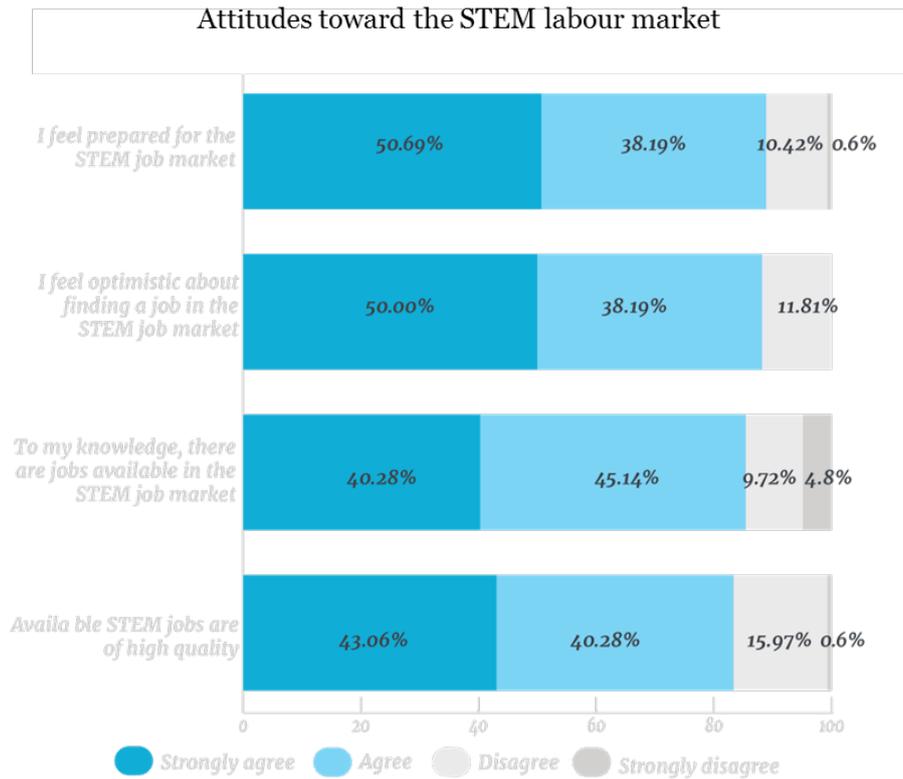


Figure 3. Attitudes toward the STEM labor market

Among high school students, encouragement from parents was highly correlated with the desire to enter into STEM fields. This was also true for “science identities”. The more that a student viewed themselves as a ‘science person’ or capable in the sciences, the more likely they were to want to continue on in STEM concentrations in university. Of course, interest in math and science was also a significantly correlated factor, suggesting that interest in math and science is closely related to students’ enrolment in those fields.



## Challenges to Emiratization

While Emiratization policies have been in place since the 1980s, it is accepted wisdom that the effectiveness of these policies in encouraging the private sector to employ Emiratis and in encouraging Emiratis to pursue private sector careers varies widely. A recent study by Al-Waqfi and Forstenlechner (2010)<sup>[7]</sup> indicated that both expatriates and Emiratis believe that Emiratization policies in the private sector have thus far been ineffective.

While it is important to Emiratize all sectors, Emiratization in the new strategic sectors on which government will rely in the future is crucial. Emiratization in STEM fields and in the innovation economy faces multiple challenges, some are similar to that in other fields and some are unique to STEM fields in particular. On the one hand, there is a need for trained and capable young people in STEM that is not yet fulfilled due to the low number of youth entering those fields. On the other hand, traditional barriers to entry into the private sector exist for Emiratis in STEM as they do in other fields. Our study showed that Emirati students in STEM fields still prefer to enter the government sector over the private sector for some of the same reasons cited for other fields such as stability, compensation, benefits, and cultural sensitivity.

Studies on the barriers to Emiratization have cited unrealistic expectations of young people as a barrier to recruitment into the private sector (Al-Waqfi and Forstenlechner, 2012)<sup>[8]</sup>. Focus groups with industry professionals conducted for our study indicated that this is often also true for STEM fields. In addition to the long hours and heavy workloads traditionally associated with the private sector, STEM fields are often technical in nature and require some element of technical work and expertise, at least in the beginning. Furthermore, for those in the energy or construction sectors, site visits and field work are a common requirement of the job. These make recruitment into STEM fields difficult and turnover high.

The gender element is important for Emiratization in general as the large majority of university graduates in the country continue to be female. As such, some have referred to women as the key to a successful Emiratization strategy. While the percentage of men who enter STEM fields is higher than that of women, in absolute numbers, more Emirati women graduate with STEM related degrees than men in the UAE. As such, women's participation in the STEM labour market is important for Emiratization of those fields. In STEM fields in particular, barriers to entry for women may be higher than in other fields. These traditionally male dominated fields may not yet be ready to accommodate female workers, whether on site or in offices. While some women may even be interested in doing technical work, the conditions on the ground make it a very unattractive career option.

In addition to the attitudes of young people toward the private sector, negative stereotypes about young Emiratis abound in the private sector. A survey conducted by Al-Waqfi and Forstenlechner (2010) of private sector employees found that there were perceptions among both expatriate and national employees that Emirati workers were entitled and had a poor work ethic. This kind of harmful stereotyping of young Emiratis contributes to both the unwillingness of the private sector to hire them but also to their dissatisfaction in their private sector jobs.

[7] Al-Waqfi, M.A., and Forstenlechner, I. (2010), 'Stereotyping of Citizens in an Expatriate Dominated Labour Market: Implications for Workforce Nationalization Policy,' *Employee Relations*, 32, 364 – 381.

[8] Al-Waqfi, M., and Forstenlechner, I. (2012), 'Of Private Sector Fear and Prejudice: The Case of Young Citizens in an Oil-Rich Arabian Gulf Economy,' *Personnel Review*, 41, 609 – 629.



## Discussion Points

### Theme 1: Gaps in the STEM Pipeline

- It is not yet clear if there is a STEM gap in the UAE as the STEM sector is still nascent. However, it is clear that there is a current and future need for STEM professionals for which universities and industry must prepare.
- Despite having high quality STEM subjects being provided in academic institutions and STEM job opportunities available in the market, a small number of STEM graduates work in STEM fields.
- There is no understanding of the importance of natural sciences and careers in the field. The return is low for the amount of effort inputted whether it be university studies or work experience in the field. This makes it less attractive for students and current STEM employees.
- The private sector in the UAE is still highly service oriented and so even when students graduate with technical skills and STEM expertise, they have difficulty finding technical jobs in the private sectors.
- Research and development in STEM fields in the private sector needs to be encouraged. STEM industries in the country need to diversify from primarily service oriented to include more R&D. This will provide more career opportunities for graduates with technical STEM expertise.
- In general, there is a lack of communication between universities and the private and public sectors. More conversations need to be had about the needs of the STEM job market and the ways in which universities can better prepare students to fill those needs.
- In general, there is a lack of appetite among youth for the jobs in the private sector. However, while there have been many efforts to raise awareness about private sector jobs among young people, there needs to be a further commitment from the private sector to engage youth and actively try to attract them to the sector.
- Students need to be more aware of the opportunities available for STEM professionals in the labor market.

### Theme 2: Preparing youth for careers in STEM

- While students are interested in STEM careers, they are not provided with proper academic guidance to clarify the steps they need to take to plan their career paths.
- Students in STEM fields need to be encouraged to start their own STEM related businesses and be encouraged to innovate within the field. This will encourage diversity in STEM industries.
- There should be more research centers and funding available to STEM students and professionals in the UAE.
- Youth already working in STEM fields should be provided with further career guidance and training relevant to their field of work.
- Despite the high quality STEM curricula in the UAE, STEM related work placements and internships should be more encouraged by universities. This will enable students to get a clearer idea of what to expect if they were to embark on STEM careers.
- STEM careers are a long term investment and require patience and persistence. Mentalities



have to shift from an expectation of short term returns to long term returns.

- The UAE needs to become a competitive economy which requires an active and burgeoning private and third sector.
- Instead of hiring and employing talented Emiratis, STEM government entities can incentivize youth to start their own STEM businesses by providing them with small contracts that would otherwise be outsourced to small companies in Asia or Europe.

## Council Recommendations

- 1) STEM labor force planning has to be long term and integrate initiatives and objectives for secondary schools, universities, industry and SMEs.
- 2) Students in the country need to be oriented from a young age to become more aware of their individual roles on the growth of the country and their impact on the sectors of which they will be a part. Schools and universities must encourage long term perspectives that depart from the focus on short term gratification and returns.
- 3) Career guidance and counseling for STEM university students must be improved. Awareness amongst students about the nature of STEM careers and STEM career planning needs to be improved.
- 4) Universities and industry must develop a better understanding of their mutual needs and the ways in which they can cooperate to improve STEM education and training so that it meets the needs of the labor market
- 5) In addition to traditional curricula, project based learning should be encouraged in STEM university programs such that university students work on hands on projects that will give them skills that they can apply directly to their future jobs. Projects should be applied and relevant to the labor market.
- 6) Work placements and internships should be obligatory/applied to all university students to prepare them for the demands of the workplace and equip them with the necessary skills
- 7) STEM R&D needs to be encouraged among private sectors companies and SMEs. Government needs to support and incentivize STEM R&D in the sector until it becomes self-sustaining.
- 8) In addition to incentives for R&D in the private sector, there also needs to be a legal framework for protection. This includes reducing instances in which government competes in private sector ventures and protecting intellectual property in the sector.
- 9) Government needs to trust STEM entrepreneurs and invest monetarily and otherwise in STEM ventures.
- 10) There should be an effort to provide STEM training programs for those already employed in the private and public sectors in order to provide opportunities for upskilling
- 11) The private sector needs to do more to engage students and actively recruit them to STEM fields in the sector
- 12) Emiratisation and incentives for youth need to be strategic and specific. Young people need to be encouraged into strategic sectors rather than all sectors.
- 13) Government and large companies need to utilize local SMEs for small contracts that are otherwise outsourced in order to allow the mushrooming of enterprises around certain innovation and knowledge sectors.



## Modality and Participants

In order to address the complex and multifaceted issues related to participation of Emirati Youth in the innovation and knowledge economy, the MBRSG Policy Council brought together stakeholders and government partners to discuss relevant policy and strategy options. These include members from various government entities, academia, and industry. The Policy Council began with a short presentation of relevant research and background information. This was followed by a summation and introduction by the facilitator, after which questions were posed to attendees and discussion commenced.

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	Emirates Mars Mission	
Mr. Ibrahim Al Qasim	Deputy Project Manager for Strategic Planning	Mohammed Bin Rashid Space Center
Ms. Wafa Al Awlaqi	Director of Technical Vocational Education and Training	National Qualifications Authority
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