

# Barriers to Pursuing Careers in Science, Technology, and Engineering for Women in the United Arab Emirates

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## Abstract

The United Arab Emirates (UAE) is keen to make a transition to a knowledge-based economy driven by innovative industries and entrepreneurship. But it can achieve this goal only if it builds a strong knowledge base in the fields of science, technology, and engineering (STE). Women can play an important role in this transformation if they contribute their intellectual might to this field. Using the survey and qualitative research methods, this article identifies the social, cultural, and economic factors that draw UAE women students to STE, and those that keep them away from pursuing careers in this field. The key factors that attract women students to a career in STE include financial independence, the exalted social status associated with this field, the opportunity to engage in creative and challenging projects, and plentiful work opportunities

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perceived in this arena in the region. The barriers that prevent UAE women from finding or even seeking employment in this field include misalignment between university programs and labor market demand, lack of awareness of what a job in STE entails, familial bias against working in mixed-gender environments, and lack of women role models who could inform women students about opportunities in these fields. The analysis also underlines the general unwillingness of the majority of Emirati graduates to consider careers outside the public sector. Findings from this study can contribute to developing policy recommendations to effectively support the development of local human capital in STE fields, which is critical for sustaining the economic transformation of the UAE.

### **Keywords**

Science, technology, and engineering; careers; family; women; women's participation; United Arab Emirates

### **Introduction**

The United Arab Emirates (UAE) came into being in 1971 as a federation of seven autonomous emirates with its capital in the Abu Dhabi emirate, the largest in terms of geographical area and the richest repository of the UAE's oil and gas deposits. Heavily reliant on fossil fuels, the UAE is keen to diversify into a knowledge-based economy driven by innovative industries and entrepreneurship. But to achieve this economic transformation, it needs a strong knowledge base in the fields of science, technology, and engineering (STE) (Calily, 2011).

This article focuses on identifying the factors that attract UAE women students toward STE, and those that put them off pursuing careers in this arena. Using survey and qualitative research methods, the authors identify the social, cultural, and economic factors that impact a woman graduate's plans for postgraduation.

There are two main reasons for focusing on women students: first, despite major improvements in women's roles in society in recent decades, there is still tremendous potential for expanding their economic, intellectual, and leadership responsibilities in the UAE; second, some of

the issues that women face while making education or career decisions are specific to this group (such as concerns about family–career balance) and therefore, require more in-depth assessment.

The study found that the majority of women students intend to work after graduation, mainly with the aim of supporting themselves and their families. Factors that attract UAE women students to a career in STE fields include the social status associated with STE professions, the opportunity to contribute to something meaningful or to participate in challenging projects, and the perception that there are more job openings for STE graduates.

Nevertheless, the analysis also reveals that there are several barriers that may prevent women students from finding or even seeking employment. These barriers include the mismatch between university programs and labor market demand, lack of awareness of what a job in a specific field (that is, STE) entails, lack of women role models who could inform women students about opportunities in this arena, and the bias against working in a mixed-gender environment. Finally, the study also draws attention to the unwillingness of the majority of Emirati graduates to consider careers outside the public sector, which further inhibits women's role in the local economy.

These challenges are not unique to the UAE or to other countries in the Middle East and North Africa (MENA) region. We believe, however, that strategic planning for industrial diversification and economic transformation would be flawed without an in-depth understanding of the current state of human capital (the combination of competencies, skills, knowledge, and attitudes in the workforce) as well as the institutional<sup>1</sup> context that shapes its development. Findings from this study can contribute to developing informed policy recommendations to effectively support the development of local human capital in the field of STE, which is critical for sustaining the economic transformation.

## **Women's Participation in the UAE Economy**

Development and dissemination of new knowledge is important for a dynamic economy (Leydesdorff, 2006; UNDP, 2002, 2009). Therefore, the UAE needs individuals who can create, disseminate, and commercialize

knowledge, as well as institutions that can support them in these activities as it seeks to develop its knowledge-based economy. In 2005, 64 percent of the national population in the UAE was under the age of 24 (UAE Ministry of Economy, 2007; UAE National Bureau of Statistics, 2010a). This young population and the limited out-migration of Emirati citizens can offer significant advantages in the process of economic transformation in the UAE (WEF, 2007, 2011a).

Nevertheless, significant challenges persist. First, the UAE has poor capacity for innovation and knowledge production, which is a bane not only of the Emirates, but also of the larger Gulf region (UNDP, 2009; UNESCO, 2009; WEF, 2007). Second, Emirati citizens make up only around 11 percent of the UAE population (UAE National Bureau of Statistics, 2011), and only about 1 percent of the workforce in the private sector (Abdalla, Al-Waqfi, Harb, Hijazi, & Zubaidi, 2010; Al-Kibsi, Benkert, & Schubert, 2007; Hafez, 2009). The UAE has been promoting an Emiratisation policy that has seen the introduction of a quota system requiring some business sectors such as banking to employ a certain percentage of Emiratis with the aim of providing employment opportunities to young Emiratis and ultimately replacing the expatriate workforce with UAE nationals. Nevertheless, the country must continue to attract skilled and unskilled foreign workforce to meet its evolving development needs (Al-Rostamani, 2004). Thus, the UAE labor market is segmented, with the majority of Emiratis working in the public sector (Al-Kibsi et al., 2007; Hafez, 2009).

Last but not least, the perception that the national labor force lacks adequate skills and work ethics also dissuades companies from conducting business in the UAE (WEF, 2008, p. 1).

To address some of these issues, the government of Abu Dhabi has expressed interest in increasing the participation of the national workforce, and maximizing the contribution of Emirati women to the labor market (GAD, 2009). There are several reasons why it is important to boost the participation of Emirati women. First, there are more women than men in tertiary education in the UAE<sup>2</sup> (UAE Ministry of Economy, 2007; UNDP, 2009; UNESCO, 2009; WEF, 2011b), and girls outperform boys at secondary (MESR, 2009) as well as at tertiary level of education (Vidican, Samulewicz, & Ghazal Aswad, 2010).

Second, women comprise close to 50 percent of the Emirati population (UAE Ministry of Economy, 2008a) and 50 percent of the economically

active age group between 15 and 64 years (UAE Ministry of Economy, 2006). Nevertheless, the Labor Force Participation Rate<sup>3</sup> for Emirati women is only 28 percent as compared to 63 percent for Emirati men and 47 percent for non-Emirati women (UAE Ministry of Economy, 2008b; UAE National Bureau of Statistics, 2010b). In addition, the Global Gender Gap Index (GGGI) indicates that women in the UAE are far from being fully integrated into the economic sphere (WEF, 2011b).<sup>4</sup>

The low participation of women in the labor market suggests that the UAE does not capture the return on investment from women's education and does not fully capitalize on their economic, intellectual, and leadership potential (UNDP, 2002). Still only 40 percent of women students who participated in our survey believe that poor participation of Emirati women in the labor market would have a negative impact on the UAE economy. This is a concern, since advancement of women in all fields of the economy has a significant impact on the growth of nations (Emerson, 2009; ESCAP, 2007; Mason & King, 2001; WEF, 2007, 2011b). Therefore, it is in the society's best interest to encourage women to enter the job market, and the STE fields in particular.

Engaging women in STE education and careers will increase the country's knowledge base, innovation capabilities, and competitive advantage. A local population with stronger scientific and technical knowledge will be better equipped to evaluate Western science and technology in its cultural context (Hays & Farhar, 2000) and will contribute to enhancing local innovation potential.

## Research Methodology

Both quantitative and qualitative research methods were used to examine women's plans for postgraduation and the factors affecting their decisions to enter the labor market. The data were collected as part of a larger study "Expanding Women's Participation in Science, Technology and Engineering: The Case of the United Arab Emirates."

Between March and May 2010, an online survey was conducted among undergraduate and graduate women students in 17 private and public universities across the UAE. The questionnaire consisted of 65 open and closed-ended questions arranged according to the following main themes:

decisions regarding program selection, reasons for choosing or not choosing an STE program, perception about STE fields and STE professionals, education and career advisors, and postgraduation plans.

Over 2,500 women students constituting approximately 5 percent of the 47,216 women students enrolled in the universities invited to participate in the study completed the survey. Since students' names and ID numbers are kept confidential by the UAE universities and as we had to rely on the universities' administration to distribute information about the survey,<sup>5</sup> the study used a non-probability sample, which means that for the purposes of statistical accuracy, the results can be generalized only to our sample and not to the larger UAE student population. We used the SPSS software to analyze the data. Table 1 describes our sample.

To obtain a more comprehensive understanding of the issues at stake, we also conducted 16 semi-structured interviews between May and June 2010 (Table 2). The interviews were guided by an interview protocol, tailored according to the professional background of the interviewee. Interviews were recorded, transcribed, and analyzed using NVivo software. Throughout our analysis, we provide examples of statements from the qualitative interviews. To preserve the originality and avoid changing the meaning of the responses, we have made only occasional and very minor grammatical corrections in the citation.

In addition, between February and July 2010, on every third Thursday of the month, we tracked data published on the Bayt job site ([www.bayt.com](http://www.bayt.com)). Bayt is one of the main job sites in the UAE on which employers post vacancies by specifying such criteria as industry, sector, job roles, career level, location, and gender. Using these criteria, we were able to analyze labor market demands, in particular the share of STE jobs open only to women or men and the availability of junior-level jobs for STE graduates.

## **Main Findings**

Despite the poor participation of Emirati women in the labor market, it was found that 52 percent of women students (in both STE and non-STE specializations) intended to work, or to combine work and study after graduation. Nevertheless, there were several factors that could prevent

**Table 1.** Characteristics of Survey Participants

Sample Characteristics	% of the Total Sample
Emirati women students	64
Women students enrolled in STE programs	46
Distribution of women students by the emirates in which they study	
Abu Dhabi	52
Sharjah	26
Dubai	13
Fujairah	5
Ras Al Khaimah	4
Muslim women students	96
Age group	
Less than 20 years	27
Between 20 and 25 years	69
Between 26 and 30 years	3
Older than 30 years	1
Family income category*	
Poor	2
Middle class	89
Wealthy	9
Marital status	
Single	90
Married	9
Divorced or widowed	1

**Source:** Authors' calculations based on survey data collected in the UAE between March and May 2010.

**Note:** \*Students were asked whether they considered themselves to be from "poor," "middle-class," or "wealthy" families.

**Table 2.** Characteristics of the Expert Sample

Interviewee Affiliation	Number of Interviews
Academics and university administrators	8
Education policy makers	1
Nongovernmental organizations	2
Women in engineering field/successful local women	5
Total	16

**Source:** Authors' calculations based on semi-structured interviews' data collected in the UAE between May and June 2010.

them from finding a job. Each of these findings is discussed in greater detail in the following paragraphs, along with the factors that encourage women to seek employment, and to pursue a career in an STE field.

## **Postgraduation Plans**

Interestingly, almost half (47 percent) of the respondents planned to look for a job after graduation while 5 percent planned to combine work and study. Findings from qualitative interviews also suggested that attitudes toward women working outside home were changing in the UAE:

Workwise, I think, it's also different...for the longest time in the UAE most women did not work. May be in Lebanon, you graduate to work, here you study to study and that's it. But this is changing, and I think that level of education changes that.

[...] We probably overestimate the wealth of the society in the UAE especially given the demand for luxurious good here. The image of the working woman is changing; work has become something "more desirable," even in terms of marriage.

Almost one-third of women students (31 percent) aimed to continue education at the postgraduate level, while 13 percent of respondents wanted to take some time off to decide their future plans. The remaining 4 percent had some other plans which ranged from dedicating themselves to their family or starting a business. Among women students who planned to work after graduation, the majority (65 percent) intended to look for a job in order to support themselves and their families.

My father passed away five years ago and I am the eldest; if I work, I will be able to help my mother in taking care of my five younger brothers and sisters.

The second most important reason, indicated by roughly 60 percent of those who planned to work, was the wish to fulfill personal and career aspirations. The third most important reason, selected by 49 percent of the respondents, was a desire to contribute to nation-building.

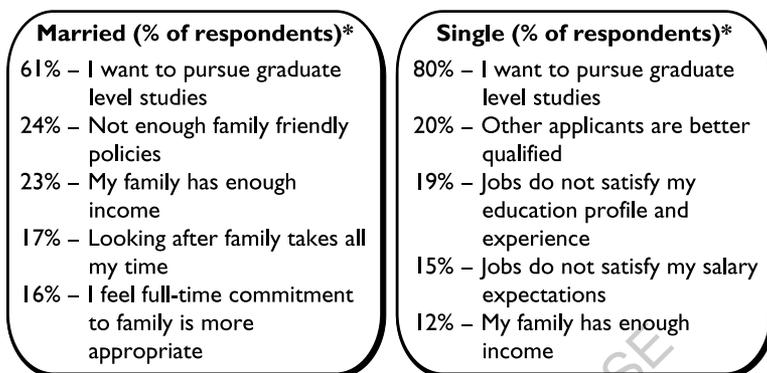
When asked why they did not intend to work after graduation, almost four-fifths (78 percent) of the women students cited the desire to pursue further education. At first, this finding was encouraging, as it suggested ambition for personal and professional development. However, further analysis revealed that among those who did not intend to work after graduation, almost one in five (19 percent of the STE and non-STE women students) cited a mismatch between their knowledge and existing job requirements as a reason for not planning to work. Twenty-three percent believed that other candidates were better qualified. Hence, it was fair to conclude that this group was forced to opt for higher education for want of career alternatives (see discussion in the next section), lack of knowledge about other opportunities (some of our interviewees noted that career counseling is still at an early stage in the UAE), and also due to lack of confidence about their skills and abilities, as pointed out by another interviewee who observed that women students lacked self-assurance.

Men students are more likely to answer questions in class confidently, even if their answer is wrong. Women students meanwhile may know the answer, but are not confident enough to say it...In engineering, even if boys and girls are equally smart, girls are not confident about their abilities; becoming nervous, over-studying, coming to office hours earlier and working harder than men.

Additional analysis revealed that concerns about lack of relevant experience, knowledge, and skills held back single women students, while family-related issues kept married women students from working after graduation (Figure 1). The reflection of one of our interviewees provided an insight into these concerns. The interviewee felt that unless the public sector set a positive example by implementing family-friendly policies (i.e., child care facilities, flexi-time, etc.), it was unlikely for the private sector to implement them.

If you do not have it in the government sector, do you expect to have it in private sector?...In private sector you cannot do a lot...because you are profit-oriented.

Another interviewee pointed to the lack of part-time opportunities as another factor that was discouraging married women from looking for



**Figure 1.** Five Main Reasons for Not Working after Graduation according to Marital Status

**Source:** Authors' calculations based on survey data collected in the UAE between March and May 2010.

**Notes:** \*It was a multiple-choice question (respondents were allowed to check up to three statements).

N (married) = 71; N (single) = 716.

jobs. Two respondents claimed that some employers in the UAE conducted pregnancy tests before offering a job to a woman. It is also a common practice for recruiters (both men and women) to ask job applicants about their family situation and future plans regarding starting or adding to the family.

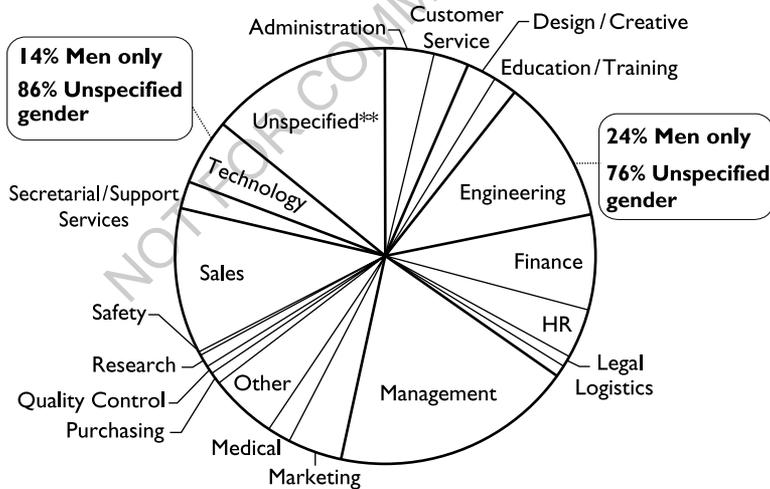
## Availability of Jobs in STE

To gain a better understanding of why women students felt that there was a mismatch between their skills and existing jobs, we assessed the UAE labor market. A misalignment between the requirements of employers and the specialization of graduates, in particular between an oversupply of graduates in humanities and a deficit of graduates in engineering, has already been identified by government agencies as a key challenge that needed to be addressed through strategic interventions (GAD, 2009; MESR, 2009; Volk, 2010). However, we took a closer look at jobs offered in the STE fields by conducting an analysis of data published on the Bayt

job site. The data we collected showed that STE professionals were very much in demand in the UAE (Figure 2). Still, 19 percent of STE women students in our sample who planned to pursue further education cited a mismatch between their knowledge and existing job requirements as a factor preventing them from seeking jobs after graduation.

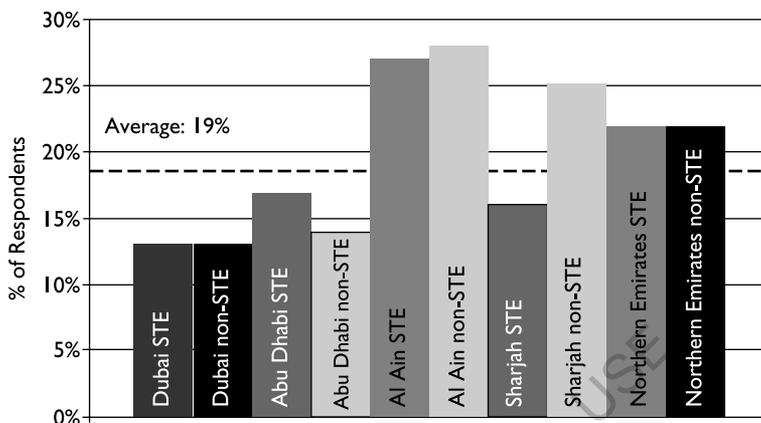
More detailed analysis of the data offered some explanations for the perceived misalignment: (a) the majority of UAE-based STE (as well as non-STE) advertised jobs<sup>6</sup> are in Dubai and Abu Dhabi, which explains why women students who live outside these cities are among the most concerned about the misalignment (Figure 3); (b) the majority of advertised jobs are at the mid-career and management levels; and (c) the number of jobs available in the research (science) field is much lower than those in engineering and technology (Figure 4).

The unequal distribution of STE jobs in the UAE is likely to prevent some graduates from finding a job, and the majority of graduates living outside Dubai and Abu Dhabi will need to look for a job outside their hometown:



**Figure 2.** Analysis of UAE-based Jobs Posted on the Bayt.com Website—By Job Role Category, February–July 2010

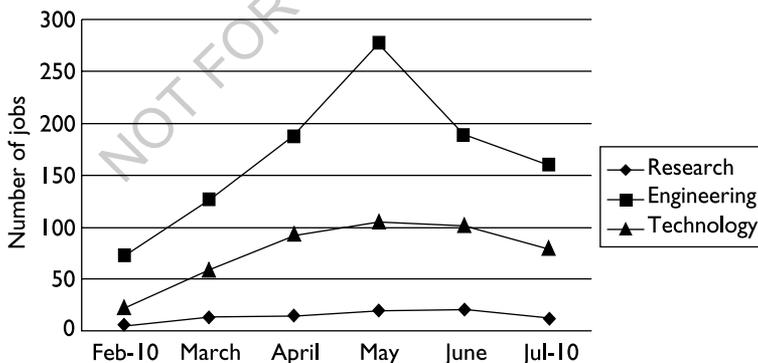
**Source:** Compiled based on job postings published on www.Bayt.com collected every Thursday.



**Figure 3.** Distribution of Women Students Who Do Not Plan to Work after They Graduate and Who Believe that There is a Mismatch between Their Knowledge and Existing Job Requirements—By Students' Residence

**Source:** Authors' calculations based on survey data collected in the UAE between March and May 2010.

**Notes:**  $N$  (Dubai STE & non-STE) = 157;  $N$  (Abu Dhabi STE & non-STE) = 159;  $N$  (Al Ain STE & non-STE) = 157;  $N$  (Sharjah STE & non-STE) = 122;  $N$  (Northern Emirates STE & non-STE) = 142.



**Figure 4.** Analysis of UAE-based STE Jobs Posted on the bayt.com Website—By Selected Job Role Category, February–July 2010

**Source:** Compiled from job postings published on [www.bayt.com](http://www.bayt.com) collected every Thursday.

They need this education to get better jobs...I know lots of friends in Fujairah and Ras Al Khaimah (Northern Emirates) who have these awesome degrees but cannot find any jobs in their area because there is nothing that matches their qualifications. Take IT graduates, where are they going to work in Ras Al Khaimah? They end up working in Abu Dhabi with big companies like Microsoft. Or they just live there (in Abu Dhabi). They have siblings who come to live with them. There are not that many opportunities (in their own Emirates). Like I know this student who was amazing in IT, especially in robotics and animation. She could not find a job in Ras Al Khaimah and ended up working in a bank.

On the other hand, some women may not look for a job due to cultural as well as logistical problems. Results from our survey show that 8 percent of women students who do not plan to search for a job list transportation as one of the main reasons. Our qualitative research also suggests that the need to commute may prevent some girls from finding a job:

Girls from Al Ain find it more difficult to come and work as volunteers because they have to think of transportation (who will bring them to...and who will take them home). So they volunteer during the university hours, but during vacations, weekends or after 5 pm it is difficult for them.

A total of 77 percent of Emirati and 75 percent of non-Emirati women students in the sample indicated that access to socially acceptable transportation<sup>7</sup> was an important factor for women deciding on a specific job. In addition, as many as 24 percent of all Emirati and 16 percent of non-Emirati women students believed that working outside the home would interfere with their religious values.

Scarcity of entry-level jobs is an additional challenge. A comment from one of the interviewees, an Emirati professional, confirmed this: “in construction projects, there are certain requirements of expertise and graduates are not at that level.”

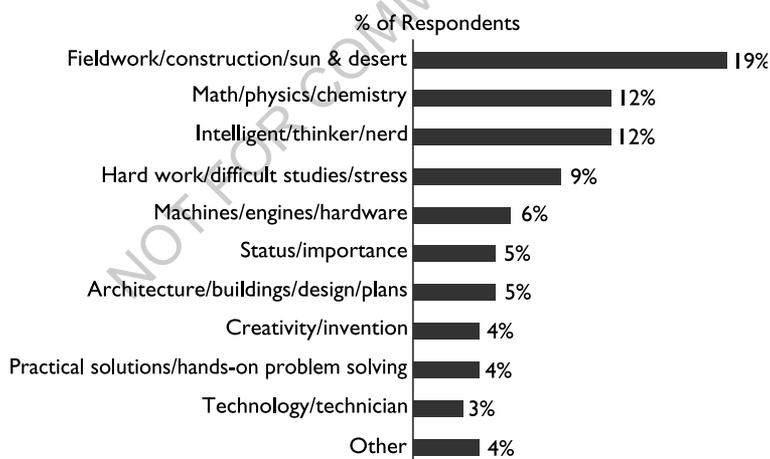
## **Awareness of What STE Fields Have to Offer**

Although 65 percent of Emirati women STE students and 80 percent of non-Emirati women STE students know someone who graduated from STE, as many as 20 percent of Emirati and 12 percent of non-Emirati

women STE students were unaware or uncertain of what a scientist, engineer, or technologist did. It was found that women students often had a distorted view of the field of engineering, as pointed out by one of the women students:

Because they have some misconceptions about these fields, when someone asks me what are you studying and I reply, “I’m doing civil engineering,” they promptly think that I would end up working on a site with laborers. Some people don’t understand that there are many fields in civil engineering.

In the survey, 19 percent of the women students most commonly associated engineering with field work and civil engineering, while 12 percent linked it to maths and natural sciences. They (12 percent) also associated this field with clever people, describing them as thinkers, smart, clever, talented, geniuses, intelligent, wise, well-educated, special, unique, brilliant, brainiacs, and heroic. Or they were dubbed “strange” and termed nerds, losers, introverts, mean, geeky, freaks, very technical, asocial, and complicated (Figure 5). Only a small portion of



**Figure 5.** First Word Women Students Associate with the Word “Engineer” (Ten Most Common)

**Source:** Authors’ calculations based on survey data collected in the UAE between March and May 2010.

**Note:** N = 1,790.

women students (4 percent) viewed this field as involving creativity, innovation, experimentation, and imagination.

An accurate perception of STE among women students is important as less aware students are less likely to opt for a career in this field. It was found that 32 percent of women students who “agreed” and “strongly agreed” that they were “familiar with what a scientist, engineer and/or technologist did” looked forward to a career in STE fields as compared to 14 percent of women students who “did not agree” or “strongly disagreed” and 16 percent of those who were “uncertain” about this statement. These data may, at least partially, explain why only 57 percent of women students enrolled in an STE program consider it an ideal career.

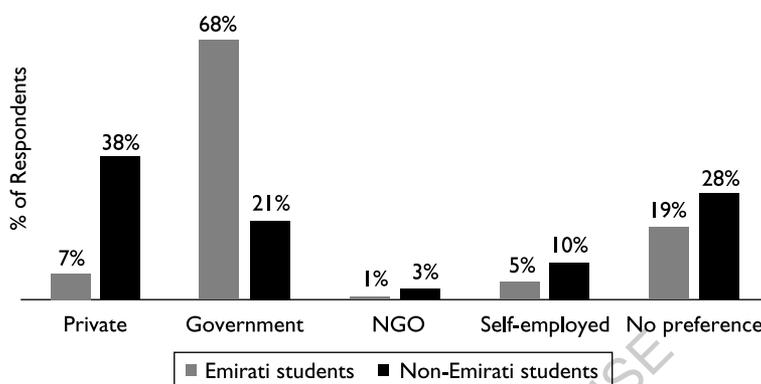
### **Preferred Job Characteristics**

The majority of women students seek a job that is enjoyable, offers a pleasant environment, and allows them to make a difference in society (in the case of Emirati women students), or a job that offers personal and professional development (in the case of non-Emirati women students).

Further analysis of data suggests that women students from wealthy families paid greater attention than women students from middle-class and lower-income families to job characteristics such as personal and professional development, a challenging appointment, high scope of responsibility, prestige, and nonfinancial recognition. Women students from lower-income families were more interested in financial rewards than in prestige, professional challenges, and nonfinancial recognition.

Yet making a difference to society outweighs personal aspirations of women students regardless of their family status. This finding may imply that for UAE women students, the collective needs of the community (that is, family, relatives, society) are more important than individual needs.

Emirati and non-Emirati women students demonstrated different preferences in terms of the sector in which they would like to work. Almost 7 out of 10 Emirati women students, as compared to 2 in 10 non-Emirati women students, expressed their preference for the public sector (Figure 6) (Forstenlechner & Rutledge, 2010; Godwin, 2006; Nelson, 2004).



**Figure 6.** Women Students' Work Preference by Type of Employer and Nationality

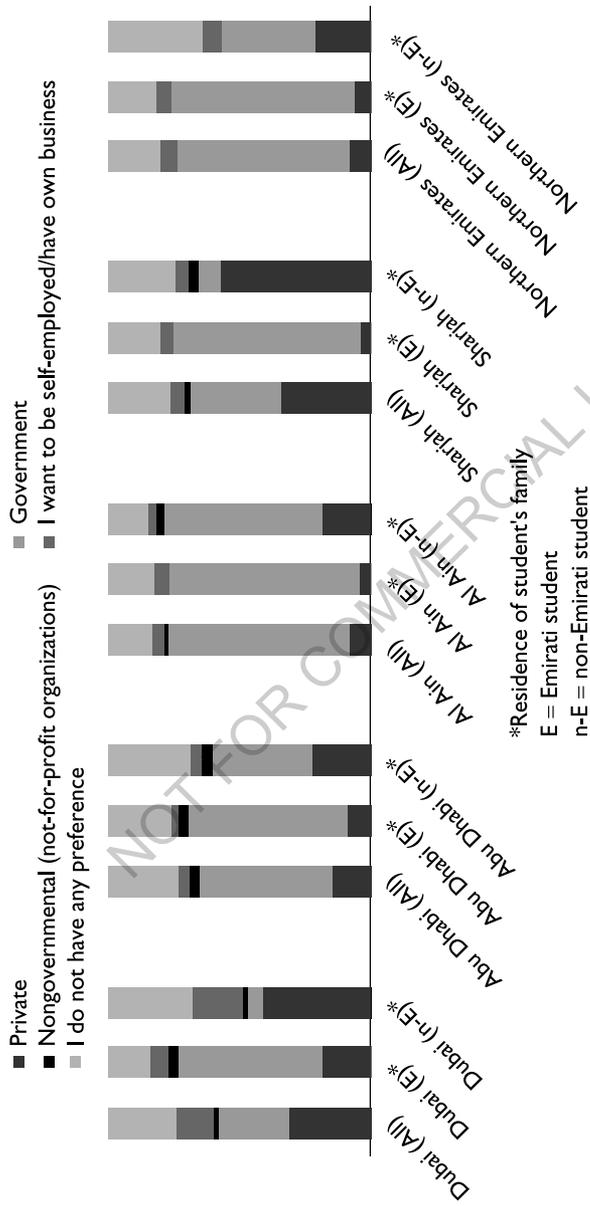
**Source:** Authors' calculations based on survey data collected in the UAE between March and May 2010.

**Notes:**  $N$  (Emirati) = 467;  $N$  (non-Emirati) = 301.

Emirati women students who lived in Dubai or Abu Dhabi were more willing to work in the private sector (Figure 7) than other Emirati women students. Emirati women students from other emirates or cities strongly preferred the public sector, despite the fact that there were fewer such jobs in these regions than in Dubai and Abu Dhabi, and unemployment was also the highest in the UAE in these regions (UAE Ministry of Economy, 2008b).

Increasing the share of Emirati employees in the private sector is a challenge due to (a) the negative perception of the private sector among the Emiratis (Al Hasimi, 2002); (b) private and semi-private sector employers' negative perception of Emirati graduates (Al-Waqfi & Forstenlechner, 2010; WEF, 2007);<sup>8</sup> and (c) misalignment between skills, knowledge, attitudes, and experience sought by employers and demonstrated by graduates (GAD, 2009; MESR, 2009; Volk, 2010).

The situation is further complicated by signals sent by the UAE government to Emirati graduates. Specifically, generous remuneration offered in the public sector and a work environment that is culturally acceptable attracts Emirati youth to the public sector (Forstenlechner & Rutledge, 2010; Godwin, 2006; Nelson, 2004). At the same time, these factors discourage them from seeking opportunities outside the public



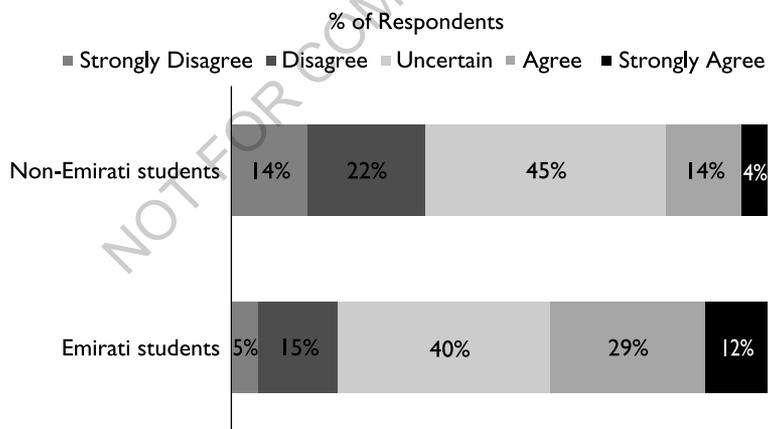
**Figure 7.** Women Students' Work Preference with Regard to Work Sector by Students' Family Residence and Students' Nationality

**Source:** Authors' calculations based on survey data collected in the UAE between March and May 2010.

**Notes:** \*When comparing results between Emirati (E) and non-Emirati (n-E) women students, conclusions need to be treated as tentative as frequencies in some of these categories presented in the diagram were  $N < 50$ .  
 N (Emirati) = 96, N (non-Emirati) = 140.

sector, and contribute to building unrealistic salary expectations. In addition, increasing Emirati students' employment in the private sector without changing the "social contract"<sup>9</sup> or the unwritten expectation that the government would continue to provide a generous welfare system, and that it would keep unemployment rates in check by providing well-remunerated vacancies in the public sector while diversifying the economy in a sustainable way, may appear a difficult, if not an impossible, proposition. In general, the private sector is perceived as the last resort by those who cannot use *wasta* (connections) to enter the public sector (Al Hasimi, 2002).<sup>10</sup>

Furthermore, difficulties associated with dismissing underperforming Emiratis (Hafez, 2009) and a negative perception of the national workforce's work ethics (Al-Waqfi & Forstenlechner, 2010; WEF, 2007) often deter profit-driven organizations from employing Emirati graduates. This perception was reflected in our survey, as 41 percent of Emirati women students and 19 percent of non-Emirati women students believed that private sector companies were unwilling to employ Emiratis (Figure 8).



**Figure 8.** Share of Women Students Who Believe that Employers in the Private Sector are Unwilling to Employ Emirati Nationals

**Source:** Authors' calculations based on survey data collected in the UAE between March and May 2010.

**Notes:**  $N$  (Emirati) = 992;  $N$  (non-Emirati) = 664.

Pressure to enter the public sector may also come from parents. Almost 50 percent of the women students who planned to work after graduation said that their parents were concerned about where they would work, and almost half of them believed that their parents wanted them to take up an “office job” or a job in “an appropriate” environment conforming with the local culture. Given that appropriateness is often associated with a gender-segregated environment or with a workplace where Emiratis constitute the majority of employees, it is highly likely that parents, usually the main career advisors of women students, gear them toward the public sector or semi-private sector.

Oftentimes the parental aversion to a “non-traditional” career or education reflects their strong concern for their daughters’ well-being. A comment from one of the interviewees reflects this point: “...but they worry more about girls, and I think it is just a gender thing. You are a girl; we are expected to pay more attention to you.”

Our research as well as previous studies (Gallant, 2006), however, suggest that a girl, who is determined to pursue a career in a field or environment traditionally viewed as unsuitable for an Emirati woman, often overcomes the initial hesitation of her parents by (a) demonstrating persistence in pursuing her dream; (b) demonstrating maturity by showing her parents that she could study, work, and take care of herself while being true to her religion and culture; (c) winning parental approval and support by involving them in her dreams, and by proving that the environment in which she wants to pursue her career does not pose any threat to her (see also Gallant, 2006, p. 89) <sup>11</sup>:

They don’t want me to work in a mixed environment. I will seek a job and I won’t really care if they agree with me or not. Most women start working and their families are not happy about it, but then they just become okay with it.

That [becoming an engineer] was my plan since I was in grade 11 and I just stuck to it.

She [interviewee’s cousin] worked in the oil industry. This woman harassed her director until she was allowed to go offshore to the oil rigs. They said “you are a woman. Why do you want to go there? You are doing a good job in the office.” She drove them mad. She was eventually sent there.

Another comment from our interviews implies that the government can play an important role in overcoming prejudices and family reluctance:

They [the parents] were very proud that their daughter was smart and that she had got admitted into engineering. There was never an issue of it being against tradition because they knew if it was being offered by the government, the government itself would take the right measures acceptable to society while dealing with women.

Yet, this comment also indicates that it is not the job role or a career field as such that is perceived as “unsuitable” to an Arab woman. Work environment and organizational culture seem to play a more important role, and indeed, other findings from the qualitative analysis suggest that organizational culture is an important factor in attracting or discouraging women from pursuing careers in a specific sector or in a particular organization.

### **Factors that Attract UAE Women to Careers in STE**

Women students attribute their interest in STE to a variety of factors, including the new and interesting knowledge it covers, the job opportunities it throws up, the innovative nature of the field, opportunity to help the society and the nation, and the social status associated with this arena (see Ghazal Aswad, Vidican, & Samulewicz, 2011; Vidican et al., 2010). The social status of STE professionals is a strong motivating factor for choosing a career in STE fields. Many of the Emirati women engineers we interviewed had entered an STE field to distinguish themselves from others and become a part of an exclusive set, which was considered smart and was highly-respected:

It is about the pride of being in science and technology and it shows that you are unique; you are not just a regular. In my opinion, anyone can study any field of humanities. If you are in science and technology field you are unique, and it will take time for the society to appreciate women in this field. You may consider it funny [she laughs] but I think guys should marry girls from science and engineering field. You know why? Because their DNA has a spark of genius. You want your child to be smart. You don't want your child to be beautiful [she laughs]. That's true...isn't it?

Carrying the title “Mohandes” (Arabic for engineer) was another motivator for UAE women students because of the Arab ritual of addressing an engineer (or doctor) by their job title rather than by the first or second name. As one of our interviewees explained, she wanted to make her parents proud, so that they could say “our daughter is an engineer... They are very proud that their daughter was smart and that she got admitted to engineering.”

Another important factor discussed by our respondents was the perception of STE as a creative field that gave an STE professional an opportunity to “build” or “create” something or take part in a challenging project:

Engineers, we love to see things getting built.

Once you are in the projects division, you just fall in love with it, and you just can't come back to operations, because you enjoy the whole pressure of the project life cycle. You start slowly, then the work increases as does the commitment level and the hours you spend on the job. And then you wind up the project...

## The Importance of Role Models

To find out whether having an STE role model in the family affected the career decisions of women students, we examined women students in whose family at least one woman worked outside the home. We found that there is at least one working woman in 83 percent of the Emirati women students' families, and in 74 percent of non-Emirati women students' families. Further analysis revealed that one in three Emirati and one in three non-Emirati women students are related to a woman who works in STE. However, 14 percent of respondents said their woman relative worked in the medical field, while 10 percent said their relative worked as an engineer or architect, and less than 5 percent had female relatives who worked as IT professionals or scientists. In comparison, as many as 42 percent had female relatives working in the arena of education.

Having a woman family member in the STE field does appear to make a difference, as women with such a role model at home are more likely

to enroll in an STE university program, and to view a job in STE as idyllic as compared to those who do not have this connection.

## **Conclusion**

Previous studies have already signaled that the lack of education and the lack of women's empowerment in the Arab world are major obstacles to human development in this region (UNDP, 2002, 2003, 2005). Experts have long advocated the need to promote a knowledge-based society in the MENA region (Lord, 2008; World Bank, 2007). These studies, however, take the region as the primary unit of analysis even though it is far from homogeneous due to the various social, economic, and cultural differences existing within it (World Bank, 2004). Therefore, there is a need for more in-depth, national-level studies to identify specific recommendations for building a knowledge-based economy. That is the reason this study focused on the UAE, one of the most developed countries in MENA, and explored factors that attracted or detracted women from pursuing a career in STE.

First, the study found that women students view the field of engineering in a distorted and stereotypical manner. To change this perception, this field should be introduced to women students in all its variations at the school level, especially in high school. In addition, women role models in STE should be made more visible as they help in stimulating interest in this field, especially among Emirati women students.

Second, while the availability of jobs does not seem to be a major problem, most of the jobs are concentrated in two emirates, namely, Dubai and Abu Dhabi. Given the restricted mobility of women due to cultural or transportation issues, many of them are prevented from commuting to the emirates where most of the jobs are located.

Third, the majority of women students seek a job that is enjoyable, offers a pleasant working environment, and allows them to make a difference in society (in the case of Emirati women students) or one that offers personal and professional development (in the case of non-Emirati women students). Yet, most women students prefer jobs in the public sector, which is associated with better remuneration and benefits, higher job security, flexible work schedule, and a more "culturally appropriate"

work environment for women. In order to change the perception of the private sector from that of an “employer of the last resort” to that of “employer of choice,” both the government and the private sector should make efforts to increase public awareness about opportunities in the private sector and convey to the Emirati population that nation-building (a goal that is very important for the Emirati women students) can also be achieved by pursuing careers outside of the public sector. There is also the need for a more effective collaboration among the UAE government (both the federal as well as emirate-level authorities), universities, and the industry to exchange information on labor market demand, and subsequently inform prospective women students about job openings in STE fields.

Finally, organizations need to consider the social and cultural context in which Muslim women make their decision regarding education and career. This includes the central position of the family in the Arab culture, the belief that a woman’s main priority should be the family, and the reservations about women working in a mixed-gender environment. To this end, it would be a good practice for universities, employers, and professional organizations to educate the families about the realities of the new work environment. They can do this by inviting families to accompany a student to a conference, networking event, or careers day, and by presenting the achievements of women in the STE fields to the extended family. This collaborative approach will not only generate more awareness about STE careers and employer expectations among women graduates but also gain wider societal acceptance for women working in private sector in general and STE fields in particular. Such an alliance will also help employers to better understand the needs of women graduates shaped by local culture and traditions.

### Notes

1. Institutions refer to the “(...) *sets of common habits, routines, established practices, rules, or laws that regulate the relations and interactions between individuals, groups and organizations*” (Edquist & Johnson, 1997, p. 47).
2. Women constitute 65 percent of graduates in the UAE according to UNESCO (2009) data.
3. Labor Force Participation Rate was calculated by the UAE Ministry of Economy (2008b) for the age groups 15–65 years old.

4. According to the 2010 GGGI, the UAE holds the 103rd place out of 134 countries in gender equality. In the Economic Participation and Opportunity sub-index, the country ranked 120th.
5. After we created the online survey website, we contacted various university administrators to request that our invitation to participate in the survey (which included an explanation about the study and a link to the survey) be circulated among all the women students. Up to three reminders were sent to university administrators with a request for dissemination.
6. We compared the data published on job boards and such websites as [www.naukrigulf.com](http://www.naukrigulf.com), [www.monstergulf.com](http://www.monstergulf.com), [www.bayt.com](http://www.bayt.com), and [www.gulfnet.com](http://www.gulfnet.com).
7. This means that a woman drives herself or relies on family members for transportation (Hijab, 1988).
8. We found that 21 percent of Emirati and 10 percent of non-Emirati women students participating in our survey believed that employers in the public sector are not keen on hiring Emirati nationals. Through qualitative research we have also learnt that negative stereotypes concerning Emirati nationals' poor work ethic also exist among Emirati employers. This perception requires further analysis as it potentially points to additional barriers threatening Emiratization efforts. The society in the UAE, and that refers to the labor market too, is very much segregated and heterogeneous: gender, nationality, religion, and outlook matter. Then, for instance, a Catholic Lebanese can be discriminated in favor of Muslim Lebanese, a non-UAE Arab can be discriminated against in favor of a white male European. Even among Emiratis there are divisions based on "how clear their blood is." However, as Emiratization policies are not the main focus of this article, here we only make note of this phenomenon.
9. The social contract refers generally to agreements between members of a society—or between the governed and the government—defining and limiting the rights and duties of each... They define the boundaries of acceptable policy choice and they affect the organization of interests in society by helping to determine who wins and who loses in a given political economy (World Bank, 2004; see also, Forstenlechner & Rutledge, 2010).
10. As one of our interviewees said: "If you are a female graduate with a degree in engineering, you have so many opportunities (in the semi-private or government sector) which are better than in a private company. It also means a significant difference in salary."
11. In addition, interviewees told us about several cases of Emirati girls studying abroad who had been accompanied by a family member for as long as 6 or 12 months, and whose family returned to the UAE leaving the student abroad alone after they had been convinced that the girl was able to take care of herself. "Proving herself" was a "life experience" to many of these girls,

and was often mentioned as something that gave their confidence a boost and made their parents proud.

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