On Industry-Academia Relations in the Arab Gulf States: Steps toward Building Strategic Partnership

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Abstract - Current industry-academia relationships in the Arab Gulf States are minimal, and do need to be strengthened and improved. The paper calls for increased “relevancy” of engineering education, with greater industry-academia collaboration on many fronts. It was inspired by a round table discussion, where engineering graduates of the Region’s colleges have suggested ways to develop viable and enduring connections between local industries and the academic institutions of the Region. Activities perceived as effective in closing the gap between academia and industries are outlined. The paper focuses on: the mission, the nature, and some relevant strategies that could lead to collaboration. Slanting curricula towards industrial relevance and the “practice”, helps equip graduates with the “tools of the trade”, thus lessening the burden on industries, in having to prepare and train employees at the start of their career.

Index Terms – Arab Gulf States, Industry-academia collaboration, Industrial relevance and the practice, To cultivate mutually beneficial and lasting relations.

INTRODUCTION

Engineering education in the Arab Gulf States (Saudi Arabia, Bahrain, Kuwait, United Arab Emirates, Qatar, and Sultanate of Oman) faces many challenges today. Changes in the external environment (e.g. reduced funding, increased costs, demands by industry for well-seasoned graduates, and rapid advances in technology) coupled with the quest for educational relevance, are forcing colleges of engineering of the Region (the Arab Gulf States) to “rethink” engineering education and to undertake constructive steps towards reforming the current systems[1,2,3,4].

The higher education arena interacts in a complex way with a variety of external partners whose role, participation, and expertise must be harnessed to help overcome some of the challenges that have beset engineering education in the Region. Perhaps the most notable partner in this endeavor is the industrial sector whose role and participation in shaping engineering education has, unfortunately, been extremely modest by best estimates. Establishing a beneficial working relationship between colleges of engineering in the Region and industries at large, has proven to be difficult, often short-lived, and appears at the outset, not to be rewarding to either side. Among the many factors contributing to this failure, is the tremendous inertia of the educational systems of the Region [2, 3].

The paper sheds light on the seemingly complex issues that have curtailed proper “connectivity” between academia and industry in the Region, and argues for the need to work together towards developing mutually beneficial and long-lasting relations, so that the interests of people on both sides of the aisle (students, graduates, faculty members, industrial staff, industry managers, research proponents, etc.) will be properly served. Perhaps the greatest achievement is to improve the “relevancy” of engineering education, by bringing the College closer to the “realities” on the ground. There is a tremendous need for faculty and students to be involved with “real problems” and to share in providing solutions. Drawing materials out of textbooks is not enough. We, as engineering educators, need to bring our own contributions to the classroom! Academia’s reluctance to work with industry and industry’s indifference to those issues that have beset academics, has been a major cause of the “malaise” that has gripped the colleges of the Region. Unfortunately, this “detached” role of the university is seen by some as justified; partly because they feel (and wrongly so) that the role of the university is to teach the fundamentals, and not necessarily applications. These misconceptions need to be corrected, and industries have to be “lured in” to participate in the academic process. By having a stronger voice in academic matters, industry would provide more appropriate-on the job- training to students and fresh graduates.

In this paper, strategies to help promote collaboration between the colleges of engineering and industries in the Arab Gulf States are outlined. Those activities (plans, and scenarios) perceived as effective in closing the gap between academia and industries are explored. In particular, the paper focuses on: the mission, the nature, and relevant bench marks of this collaborative effort (i.e., effort to close the gap between academia & its industrial partners). Training, capstone courses, consulting by faculty and joint research projects, aimed at serving the interest of both parties (academia & the industrial partners) are also addressed. At this critical juncture, if engineering faculty and program planners, would slant curricula and programs more in the direction of “industrial relevance” and the “practice”, it would help a great deal in equipping graduates with the “tools of the trade” thus lessening the burden on the industries.

In this endeavor, the author draws on his experience as a faculty member in the Region (recently in Qatar and earlier in
Saudia Arabia); in addition to views and suggestions of: colleagues, students, graduates, and business leaders in the Region. The main objective here is to motivate the Region’s educators to collaborate with industry and begin to integrate greater relevancy into engineering education.

A GLIMPSE AT ENGINEERING EDUCATION IN THE ARAB GULF STATES

Engineering education in the Arab Middle East is relatively new, as organized educational endeavors go. It had its early start shortly after World War I. Colleges of engineering (or schools of engineering as they were labeled) were founded then, in Cairo and Alexandria, Egypt, and also in Beirut, Lebanon. By the end of World War II, colleges of engineering sprung out in Iraq and Syria. And two decades later, Jordan had its first college of engineering in its capital, Amman. The colleges in Lebanon and Syria paralleled, by and large, the French schools of engineering; except for the American University of Beirut (AUB), typically a North American school, looked after by a consortium representing colleges on the East Coast of the USA. Colleges in Egypt and Iraq were influenced, at the time of their establishment, by the British system of education [1, 2, 3].

Engineering education in the Arab Gulf States started, in earnest, during the early to mid sixties. Initially, colleges of engineering were founded in Riyadh, Jeddah, and later, in Dhahran, Saudia Arabia. In the other smaller states of the Region, other engineering colleges were founded soon after these states had gained their independence. Although many of the recently established engineering schools in the Region have been impacted (positively and/or negatively) by events in neighboring Middle East countries – the fact that the Region has always had strong ties to some western countries, and in particular the USA – has helped enormously in setting up, manning, and providing needed guidance to these fledgling institutions during their early years.

The dramatic increase in oil revenues during the 70s, and 80s, coupled with lack of skilled professionals in areas deemed necessary for growth and development of oil-related industries, has been pivotal in the start-up of higher education in general and engineering education in particular. There are today eight public colleges of engineering in the Region (see Table I) in addition to several, recently founded, private and semi-private colleges and/or universities that offer engineering degrees. These eight public colleges have, since their inception, been guided by advisory boards made up largely from faculty members drawn from US colleges. Previously, the Grinter’s Report [5] and the Goals Report [6] have been used to guide the educational process. Recently, ABET Engineering Criteria 2000 [7] has been the subject of seminars and workshops, intended to shed light and assist colleges in the Region in making use of the EC2000. Indeed, the EC2000 has generated a lot of interest and challenges in the Region. How much of the EC2000 may be implemented in the years to come would depend on: institutional vision, available resources, students’ preparedness, the leadership, and prevailing traditions and norms.

The public colleges of engineering – eight in all – are part of the public university systems, and thus are government run and almost totally government financed. The organizational structure is nearly the same in all. Students are mostly nationals of their respective countries and graduates of similar public education systems. Admission policies, for all eight colleges, are based on grades obtained in an official examination sanctioned by the Ministry of Education, upon completion of the 12th grade. Additionally, an entrance exam and evidence of proficiency in English, a requirement imposed by many of these colleges, may exempt the applicant from a pre-engineering “prep year” administered as a separate unit from the college. Statistics have shown that over 80% of first year students attend the “prep year,” during which students are to embark on: learning English skills, revisiting math and science in preparation for engineering “gateway” courses, and acquiring desirable attributes such as: analytical skills, curiosity and desire to learn, creative thinking, and the importance of team work[2, 3].

Table I

<table>
<thead>
<tr>
<th>Country</th>
<th>College of Engineering</th>
<th>Year Established</th>
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<tbody>
<tr>
<td>Saudia Arabia</td>
<td>King Saud University – Riyadh</td>
<td>Early sixties</td>
</tr>
<tr>
<td>Saudia Arabia</td>
<td>King Abdul-Aziz University - Jeddah</td>
<td>Early sixties</td>
</tr>
<tr>
<td>Saudia Arabia</td>
<td>King Fahd University of Petroleum and Minerals (KFUPM) – Dhahran</td>
<td>Late sixties</td>
</tr>
<tr>
<td>Bahrain</td>
<td>University of Bahrain – Manama</td>
<td>Mid seventies</td>
</tr>
<tr>
<td>Kuwait</td>
<td>College of Engineering and Petroleum at Kuwait University – Kuwait City</td>
<td>Mid seventies</td>
</tr>
<tr>
<td>Qatar</td>
<td>University of Qatar – Doha</td>
<td>Early eighties</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>UAE University – Al-Ain</td>
<td>Early eighties</td>
</tr>
<tr>
<td>Oman</td>
<td>Sultan Qaboos University – Muscat</td>
<td>Mid eighties</td>
</tr>
</tbody>
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Thousands of native Arabs – citizens of the Region – have completed their engineering education at one of the eight public colleges (Table I), and have occupied government positions or joined the private sector, side by side with expatriates. Some have established their own business, and many have moved up the ladder into responsible managerial positions. In a recent survey directed at graduates of engineering colleges of the Region aimed at getting first hand information on a number of topics, including industry-acade relationships, as perceived by the graduates. Fifty seven out of sixty five respondents expressed a desire to see better relations with local industries as a means to improve relevancy of engineering education. Majority of respondents were between 25 to 30 years of age, citizens of the Gulf States, either employed or practicing engineering on their own [8]. Therefore, the impetus behind this paper has been, the remarks made, the suggestions offered, and the questions...
raised by these graduates, who have voiced their concerns about the relevancy of their education, in general, and their wish to see a “working and sustainable” customer-supplier relationship with the employers of engineering graduates in their locale.

**ACADEME AND INDUSTRY**

When universities and industry find common ground to meet each other’s needs, the mutual benefits can be substantial. Not so long ago, most industrial firms’ involvement with engineering education in North America was limited to a few activities: hiring graduates, occasionally funding research projects, and, from time to time, donating some funds from their foundations. Today, industry partners appear to have a great deal to offer to universities, particularly when educators become willing to descend a few flights of the ivory tower to embrace the new realities of engineering research. The most significant challenge to any engineering college is: remaining relevant to the profession, a quest that is challenging enough during times of relative stability. Today, with the engineering profession undergoing dramatic changes on many fronts, including: less predictable employment patterns, globalization, reduced job security, shifting funding opportunities, broader intellectual alliances, and changing accreditation expectations — remaining relevant has become far more difficult under the circumstance.

Despite the many uncertainties that surround engineering education, industry could assist engineering colleges’ accreditation efforts and challenges. Engineering Criteria 2000 has two basic parts: it gives each engineering college the opportunity to define its unique mission, and also requires that the college assesses the outcomes of its educational process, determine whether it is meeting its own objectives, and take corrective actions when necessary. People of the industry are ideally positioned to render a helping hand to an engineering department in defining its mission, in a way that is relevant to the “real engineering world”. Also, industry has a great deal of experience assessing outcomes, and could suggest effective assessment mechanisms to assist academic departments.

It was a logical progression for some of the colleges in the Region to turn towards industries in their locale, to build bridges and set-up advisory boards. Establishing a working relationship between selected industries and the engineering college, by and large, has proven to be difficult and often short-lived. It takes more than an enthusiastic faculty member acting alone, or a single joint project that has seen daylight, to claim that a lasting and beneficial relationship has been achieved.

Unlike North America, academe and industry in the Gulf States, reaching out and attempting to work together, is a relatively new experience. Except for oil and oil-related industries, the bulk of the industrial sector in the Region is small-size entrepreneurial, and sees no direct benefits in opening up to the College of Engineering. In all the states of the Region, major industries (oil industry in particular) have maintained some lines of communication with the University in general and the College of Engineering in particular. With one or two exceptions, the industry-college relations can be described as intermittent, short-term, and does not seem to be rewarding to either side. Who is responsible for the status quo? What would it take to build long lasting mutually beneficial relations? While there are no clear-cut answers, certain factors appear to have contributed to the state of “malaise” that appears to exist today. These factors include:

- lack of interest (to the extent of indifference) on the part of most industries to get involved with engineering institutions;
- clear differences between the two cultures — that of industry versus academe;
- inability of the College to market its services and products;
- reliance of most industries on expert opinion and/or technical support from abroad, thus reducing potential collaboration with the College;
- the prevailing misconception that expatriate faculty – which make up about 30 to 50% of all engineering faculty in the Region – should not be allowed to consult or engage in after-hours activities; and
- the petty attitude of intermediaries (civil servants, administrators) that hinders collaborative effort and often adversely affects the outcome of a joint venture.

On the bright side, some of the industries of the region have responded rather well to students’ training and cooperative education programs in general. All present curricula require successful completion of either an eight-week training period, or two consecutive semesters of cooperative education. The major industry players in these domains are primarily: oil and gas companies, chemical and steel companies, large-size building and road contractors, electric utility companies, some government agencies; and, to a lesser extent, small engineering service firms. Despite some setbacks, misjudgments and unpleasant outcome experienced by some — the vast majority of students has positive impressions and believes that the training or co-op period is time well spent [2, 3].

I. Some Benchmark of Engineering Education in the Arab Gulf States

Studies of education and specifically of engineering education in the Arab Gulf States, have pointed towards omissions and weaknesses in undergraduate engineering education. Some believe that better preparation of graduates could result in tangible advantages upon entering industry. Unfortunately, a majority of faculty members of the Gulf Region – expats and nationals — have hardly practiced engineering any where prior to becoming faculty members! And personal experience based on practicing engineering - at least for sometime - has never been a requirement to become a teaching faculty. Fortunately, more and more educators are becoming aware of this “acute” problem; and some are taking steps to remedy the situation. One approach has been to form symbiotic partnerships between a “willing” industry and a respective engineering department through “capstone” projects. While little if any has
been reported in the Region on the extent and success of this type of partnership, it appears that a lot could be done, to bring the practice into the classroom. A particularly exemplary institution, that has been successful in this domain, is Harvey Mudd College [9], where industry-academia projects, known as Engineering Clinics, have been conducted for nearly 40 years. A list of weaknesses of Gulf States engineering graduates (Table II) has been agreed upon and compiled by a group of industry personalities, including, older well-established graduates of Region’s colleges, who have had a chance to interact with more recent Gulf graduates. The consensus of these leaders was inspired by a roundtable discussion addressing the relevancy of engineering education in the Arab Gulf States [8]. Evidently, from the perspective of industry, the definition of a quality graduate is markedly different from the way academia views it! Industry, by and large, looks forward to a graduate who is flexible, versatile, fits well within the company (trainable), and is able to exercise engineering judgment on his own, and able to participate as a team member.

### Table II
AN INDUSTRIAL PERCEPTION OF WEAKNESSES IN NEW GRADUATES OF GULF REGION’S ENGINEERING COLLEGES

<table>
<thead>
<tr>
<th>Weakness</th>
<th>Industry Perception</th>
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<tr>
<td>Thoroughly deficient in thinking critically and independently</td>
<td>Inadequate thinking</td>
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<tr>
<td>Lack of design capability and/or creativity</td>
<td></td>
</tr>
<tr>
<td>Lack of appreciation for considering alternatives</td>
<td>Poor perception</td>
</tr>
<tr>
<td>No knowledge of value engineering</td>
<td></td>
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<tr>
<td>Lack of appreciation for variation</td>
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<tr>
<td>Majority wanting to be analysts</td>
<td></td>
</tr>
<tr>
<td>Do not know how to utilize time and/or resources</td>
<td></td>
</tr>
<tr>
<td>Poor perception of the overall “engineering” process</td>
<td></td>
</tr>
<tr>
<td>Inadequate communication skills</td>
<td></td>
</tr>
<tr>
<td>Do not desire to get their hands dirty</td>
<td></td>
</tr>
<tr>
<td>Trained to work as individuals</td>
<td></td>
</tr>
<tr>
<td>No experience working in teams</td>
<td></td>
</tr>
<tr>
<td>Do not have the desire and/or the skills to do their own search or learn on their own</td>
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</table>

To try to understand today’s state of engineering education in the Region, it is important to understand something about the Region’s pre-university educational systems, and the way these systems impact engineering education.

### II. Pre-University Education in the Gulf Region

The most significant change in the pre-university systems occurred in the decades of the 70’s and 80’s, as a direct result of the substantial wealth derived from oil revenues, which have found its way to the Region. Public schools, in particular, were substantially and positively impacted by the increase in revenues. The major improvements realized, as a consequence of increased funding, have included: (i) substantial increase in the number of well-equipped modern school buildings; (ii) significant modifications to curricula and academic programs, in conformity with standards and guidelines prevalent (at the time) in some other Arab countries (Egypt, Jordan, Syria); (iii) provision of qualified teaching staff drawn from neighboring countries; (iv) improved management; (v) introduction of special education for physically and/or mentally challenged students; and, (vi) the emergence of a more concerned general public with education issues.

Public schools, by and large, are under the auspices of the Ministry of Education who is solely responsible for planning, operations and budget. Hardly any difference exists among schools of the same category in any of the states of the Region. Admission policies, teaching materials, teaching methods, counseling and testing, and grading standards are nearly identical in all the public schools of the Region. Schools, at all levels, are free (i.e., free tuition, no fees, free textbooks) for Gulf nationals and expatriates alike. In addition, a stipend, equivalent to approximately US $300 per month, is provided to those students that are in need [1, 2, 3].

Despite the progress made and the many positive steps that have been introduced to many facets of the K-12 educational arena over the last three and a half decades; there are those aspects that seemingly are extremely difficult to modify despite some efforts on the part of some concerned individuals. The main issue we are faced with is: the traditional methods of teaching that have persisted over many years and appear to be “immune to any change!” Practiced on a wide scale, the traditional approach embodies the following: (i) students are bombarded with information, drawn primarily out of textbook(s); (ii) students do not participate! The process is “one way,” with minimum interaction between students and instructor; (iii) emphasis on rote memorization — over all other kinds of learning — has always taken precedence; and (iv) most students study to get the grade rather than “to understand” and retain knowledge. This shallow approach to learning is decidedly incompatible with engineering education, in general, and in direct conflict with the “ethos” of the engineering profession.

The main difficulty with pre-university education in the Gulf Region, as seen by both insiders and outsiders, is that it tends to promote rote and uniform learning over independent thought. In fact one can go as far to say, that it suppresses independent thinking. While these systems appear effective in developing students who are able to learn (but soon forget!) vast amount of “testable” information, it falls terribly short in fostering creativity, and analytical skills that are more difficult to monitor and test. The skills referred to here, are those that need to be acquired by students who wish to get into engineering. The author’s perception of some of the weaknesses and deficiencies in high school graduates, as they prepare to get into science and or engineering, are listed in Table III. As previously noted [2, 3], the reluctance of decision makers to reform public education in the Region has continued to adversely affect outcome. Students finishing high school and applying to engineering are only marginally prepared. To rectify the current situation and rid the schools of the Region of the “malaise” that has gripped public education, at all levels; bold steps have to be taken by policy makers, i.e., to start a “reformation” process that will eventually do away with the existing “traditional” methods in favor of “student-centered” approach that has “active learning” as its prime feature [4].
III. Proposed Measures

Forging long-lasting relationships with industry is a quest that colleges of engineering in the Region should embrace and work hard to achieve. As faculty members, we cannot be professionally satisfied with teaching only. Today, with the engineering profession undergoing dramatic changes on many fronts – there is need to be involved with real problems and to share in providing solutions. We owe it to our students to prepare them to meet the challenge ahead by focusing on real issues derived from tangible situations. Drawing materials out of textbooks is not enough – we need to bring our own contributions, when possible, to the classroom! Therefore, we do need to communicate with industries around us and genuinely attempt to understand their point of view. It is argued that constructive measures have to be taken, sooner rather than later, to rectify the current stalemate and turn things around. The measures referred to would include the following:

- Introduce sweeping changes to current regulations and bylaws, to reduce red tape that impedes the process. To be effective, these changes have to be recommended by the University administration, mandated by the Government, and overseen by joint committees.

- Encourage faculty members (expats and nationals alike) to reach out to the industrial sector to cultivate meaningful contacts, develop (one on one) connection with their counterparts, and search and find potential areas for collaboration, within their field of specialization. This would invariably result in faculty members gaining relevant experience that would eventually be passed on to students.

- Institute a Faculty Fellowship Program, where tenured or tenure-track engineering faculty could spend 10 weeks, a semester, or an academic year, gaining valuable industrial experience (on site) in their field of technology, or in an allied area, compatible with the interests of the Industry and the College.

- Set up advisory boards to: facilitate collaborative efforts, provide logistical support and resources to collaborators, and monitor progress of joint activities.

| TABLE III |
| AUTHOR’S PERCEPTION OF WEAKNESSES IN HIGH SCHOOL GRADUATES APPLYING TO ENGINEERING |
| Inability to use math & science and/or to build on it (as a base) for engineering gateway courses. |
| Their thought process is totally confined to what they have been tutored to respond to. |
| Weak communication skills. |
| Inability to improvise and/or consider alternatives. |
| Trained primarily to work as individuals. No experience working in groups. |
| Encounter great difficulties when integrating knowledge, when connecting previously acquired knowledge with more recently learned, in seeing interactions between different concepts, and in conceptualizing in general. |
| Do lack the drive, the patience, and the discipline to perform independent work. |

The most probable areas for such collaborative ventures in the foreseeable future are:

- Short-term, stop-gap consultation, trouble shooting, and professional advice by experienced well-seasoned faculty;

- Longer term joint research studies aimed at resolving chronic problems of industry, and help find longer lasting solutions;

- Help the industry in setting up appropriate analysis and design methods, and help develop applicable standards and relevant testing methods.

The author is of the opinion that the initial hurdle is to get started. Faculty and staff members with industrial experience are ideally positioned to play a major part at the start of a collaborative joint venture. Their insight and experience would help greatly in defining the mission and chartering an appropriate course of action.

Contrary to what some entrepreneurs in the Region believe, joint participation need not be for philanthropic reasons; nor should it be undertaken to gain favors, improve company’s image, or win government approval. These ventures can, and thus should, provide real benefits for all involved. Industry can benefit by gaining access to university facilities and its human resources. Also, by receiving the services and products that faculty and staff generate. In turn, joint collaboration can provide the College with additional revenue and access to industrial equipment and setups not available on campus. Successful ventures also help overcome the complaints about education: lack of hands-on experience, not enough teamwork, and textbook problems rather than real-world applications. Students’ involvement in such collaborative efforts can boost their self-confidence, help in improving their communication skills, and at the same time, enable them to make better choices with regard to their future careers. Joint undertakings could provide professional development to faculty members as well, by exposing them to practical situations and relevant technologies. As and added benefit, and when conditions are right, project data and outcome may get published, thus enhancing faculty members’ list of publication.

IV. Some Encouraging Results

Although the overall impression portrayed here, on collaboration of engineering colleges and surrounding industries of the Region has not been positive to say the least; there are nevertheless some success stories that deserve to be reported.

During the late seventies, the Research Institute of King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia was founded. Housed on campus, with its own skeleton staff and facilities; it began to reach out to potential partners (industry and government) with a well-defined mission. Despite some setbacks in the beginning, the Institute became fully operative within a few years. It has been rendering services to participating industries and Government agencies in the domains of: economic modeling, oil and gas technologies, water resources management, environmental
impact studies, characterization and testing of materials, and setting up new standards [10].

In the author’s opinion, the Research Institute of KFUPM, Dhahran, Saudi Arabia, is a success story by all measures. Factors contributing to its success have included:

- its well-defined mission and appropriate organizational structure;
- its proper administrative setup with staff that can relate to industry, thus help foster collaboration; and
- having campus as home-base has helped provide easy access to university’s vast resources.

Perhaps additional factors that may have come to play in the case of KFUPM Research Institute, its unique position with, and close proximity to, Saudi Aramco, the largest oil producer in the Middle East. KFUPM has always enjoyed the tremendous support provided by Saudi Aramco since its establishment.

CONCLUDING THOUGHTS AND SUMMARY

Engineering colleges in the Arab Gulf States (Saudi Arabia, Kuwait, Bahrain, Qatar, United Arab Emirates, and Oman) — established in the late sixties, seventies and early eighties, and modeled after North American colleges, have many of the symptoms that “beset” engineering institutions in their natural sequence of progression. Changes in the external environment (increased costs, reduced funding, technological innovations, and demands by industry for better prepared graduates), coupled with the quest for educational relevance in undergraduate engineering education, are ample reasons for the colleges of the Region to “update” and “revise” current systems in a direction consistent with societal needs.

Amongst the many issues being debated on college campuses today, is the need to collaborate with industry in the Region, in order to meet common goals and work harmoniously together in equipping graduates with the skills and traits desired by the industrial sector. In order to better prepare young graduates, and foster improved technology transfer practices and policies, the industry of the Region will need to seek stronger voice in academia. Unfortunately, academia has been reluctant and slow in “opening up” to industry. Apparently, engineering educators in the Region have not as yet conceived of working with industry to improve the relevancy of engineering education, and many see no motivation for change at this time.

These problems are ripe for change, but, in the short-term, the outlook is not very encouraging. On the whole, industry in the Region is not calling on engineering educators and educational policy makers, to reform higher education. Also the rigid education system, that currently grips the Region, seems to perpetuate itself. Challenging times await!

The paper sheds light on the complex issues that appear to have curtailed proper and enduring connections between academia and industry in the Arab Gulf States, and argues for the urgent need to establish proper relations, at the grass-root level so that the interests of people on both sides of the aisle (students, graduates, academics, industrial managers & staff, researchers, etc) will be properly served. Making headway, through collaboration, would eventually “bridge the gap” between academia and industry, resulting in better prepared students for the challenges ahead.

REFERENCES


