U.S. ENGINEERING EDUCATION: A GLOBAL PRESPECTIVE

Camille A. Issa, PhD, PE, F. ASCE

Department of Civil Engineering
School of Engineering
Lebanese American University
Byblos, Lebanon

Abstract

Over the last several years a number of reports have raised concern about the growing challenge to U.S. science and technology (S&T) leadership – and long-term economic competitiveness – from both rapidly developing Asian nations and European countries with a renewed competitive focus. Such reports have collectively argued that the United States faces intensifying foreign competition in science and technology, and that the country is falling behind in key building blocks of the S&T base, specifically its research and development infrastructure, science and engineering (S&E) workforce, and math and science education.

On the other side, there is a growing trend in the demand for U.S. based and/or modeled engineering education. U.S. institutions of higher education in partnership with local entities have established branches in the Arab Countries and also American Universities (AU) such AU of Kuwait, Dubai, Sharjah, …etc are mushrooming all over the region. All the engineering programs at those institutions are either ABET accredited or actively seeking ABET accreditation. In addition, the engineering programs at the local non-U.S. affiliated Intuitions are also acquiring or seeking ABET accreditation. In this paper, the desire and quest for an ABET accredited engineering education is analyzed. There is clear evidence that U.S. modeled engineering education is a self promoting engineering educational system. The culture of assessment and continuous improvement is becoming dominant.

Introduction

American higher education is often seen from abroad as the best quality available in the world, and as such a model to be emulated. The U.S. system of quality assurance – accreditation – is perceived to be a major reason for this quality, and higher education institutions in developing countries often seek some form of U.S. accreditation as a way to have their own quality

recognized. In many cases, these institutions, which are frequently pioneers in quality assurance in their region, need to be assisted in a developmental mode until they are prepared to pass the scrutiny of U.S. accreditation standards. Table 1 display a list of US Licensed Overseas Institutions.

Table 1. U.S. Licensed Overseas Institutions

NAME	LOCATION	US LINCENSING STATE
American College Dublin	Ireland	Delaware
American College of Thessaloniki	Greece	Massachusetts
American Graduate School of Business	Switzerland	Georgia
American InterContinental University	London, UK	Georgia
American University in Bulgaria	Bulgaria	N/A (USAID)
American University in Dubai	Dubai (UAE)	Georgia
American University in Kosovo	Kosovo	N/A (USAID)
American University of Armenia	Armenia	California
American University of Beirut	Lebanon	New York
American University of Cairo	Egypt	Delaware
American University of Central Asia	Kyrgyzstan	N/A (USAID)
American University of Paris	France	Delaware
American University of Rome	Italy	Washington, DC
American University of Rome	Italy	Delaware
American University of Sharjah	Sharjah (UAE)	Delaware
Bogazici University	Turkey	Massachusetts
Central European University	Hungary	New York
Franklin College Switzerland	Switzerland	Delaware
John Cabot University	Italy	Delaware
Lebanese American University	Lebanon	New York
The American College of Greece	Greece	Massachusetts
Webster University Geneva	Switzerland	Missouri

Many well-established U.S. specialized/professional accreditation agencies have in recent years been offering international accreditation evaluations, and status, as appropriate: engineering, business, and soon teacher education. In each case, the move to offering full accreditation abroad has reflected an evolutionary process on the part of the accrediting agency, often starting with a Memoranda of Understanding (MOU), then some sort of "substantial equivalency", then full accreditation. There are many issues involved in evaluating foreign institutions utilizing U.S. standards. This paper draws upon the experience of the author in quality assurance and accreditation in the U.S. and abroad to explore such issues by examining engineering accreditation.

ABET Accreditation

Engineering programs in the United States are accredited by ABET, formerly the Accreditation Board for Engineering and Technology. After some eight decades of development and activity,

ABET has earned a reputation as one of the best, if not the best, accreditation systems for engineering and related area academic programs. "ABET is a non-profit and non-governmental accrediting agency for academic programs in the disciplines of applied science, computing, engineering, and engineering technology. ABET is a recognized accreditor in the United States by the Council for Higher Education Accreditation[1]." Essentially all engineering and engineering technology programs in the United States are currently accredited by ABET. Any engineering program not accredited by ABET would have a very difficult time attracting students and having its graduates recognized as employable.

ABET was established in 1932 under its former title, Engineers Council for Professional Development. ECPD was founded by seven engineering societies – six technical societies plus the national organization for licensure of engineers. ECPD evaluated its first engineering degree programs in 1936, and began evaluating engineering technology programs ten years later. ECPD was renamed the Accreditation Board for Engineering and Technology in 1980 to better reflect its emphasis on accreditation[2].

"ABET accreditation provides assurance that a college or university program meets the quality standards established by the profession for which the program prepares its students. ABET accredits postsecondary programs housed in degree-granting institutions which have been recognized by national or regional institutional accreditation agencies or national education authorities worldwide[1]".
ABET undertakes specialized accreditation for programs at various levels in four areas:

-- Applied Science Programs
-- Computing Programs
-- Engineering Programs
-- Engineering Technology Programs

ABET began international activities in 1979 when its predecessor, ECPD, signed its first mutual recognition agreement with its Canadian counterpart, the Canadian Engineering Accreditation Board. It then entered into a series of Memorandum of Understanding agreements with engineering organization in various developing countries, aimed at assisting the development of quality assurance mechanisms in those countries based on the ABET model.

As engineering education institutions in developing countries evolved sufficiently to be considered for the type of accreditation evaluations that U.S. schools underwent in the U.S., ABET developed and operated for several years a "substantial equivalency" program. Under this program the non-U.S. programs were evaluated to determine whether they were comparable in program content and educational experience to U.S. accredited programs and prepared their graduates to begin professional engineering practice at the entry level. These "substantial equivalency" evaluations were conducted by approved ABET evaluators from the U.S. following similar policies and procedures used for U.S. accreditation – but no formal accreditation action was taken at the end of the evaluation. By 2006 there were more than 140 substantially

equivalent programs at 27 institutions in 14 countries[2]. In 2006 ABET began phasing out substantial equivalency evaluations and instead proceeded with full international accreditation evaluations, using the regular ABET standards. In the fall of 2007 the first international accreditation visits were conducted.

"To date, ABET has accredited over 3,100 applied sciences, computing, engineering, and engineering technology programs at more than 660 colleges and universities in 23 countries worldwide[1]". Table 2 displays the distribution of the 261 ABET Accredited Engineering Programs by the Engineering Accreditation Commission (EAC). The total number of overseas programs represents about 12 % of the total accredited engineering programs by the ABET EAC which totals 2242 worldwide.

Table 2. Overseas ABET Accredited Engineering Programs

Country	EAC
Kazakhstan	1
Spain	1
Jordan	3
Indonesia	4
Oman	4
Chile	5
Bahrain	7
Qatar	7
Kuwait	8
India	9
Philippines	9
Lebanon	10
Egypt	12
Peru	15
Colombia	16
United Arab Emirates	25
Mexico	30
Saudi Arabia	44
Turkey	51
TOTAL	261

The type of approach ABET has adopted has been successful in encouraging engineering institutions in developing countries to move toward a recognizable world standard for engineering education. The pattern of starting with MOUs, moving to "substantial equivalency", then full accreditation has proven to be effective for ABET[3].

Engineering Manpower Shortfall

In the past the United States has compensated for its shortfall in engineers to a considerable degree by attracting talented students from around the world. But post 9-11 constraints on immigration policies and an increasingly cynical view of American foreign policy have cut deeply into the flow of international students into U.S. universities and industry[4]. This situation is compounded by U.S, inability to address the relatively low participation of women and underrepresented ethnic minorities in science and engineering. Today nearly two-thirds of today's engineering students who are U.S. citizens are white males, at a time when the largest growth in U.S. workforce over the next decade will come from women and underrepresented minorities.

As presidential science advisor John Marburger[5] concluded: "The future strength of the U.S. science and engineering workforce is imperiled by two long-term trends: First the global competition for science and engineering talent is intensifying, such that the U.S. may not be able to rely on the international science and engineering labor market for its unmet skill needs. Second, the number of native-born science and engineering graduates entering the workforce is likely to decline unless the nation intervenes to improve success in educating S&E students from all demographic groups, especially those that have been underrepresented in science and engineering careers".

Of course, some would argue that the marketplace itself should determine the number of engineering graduates, and that the erosion of student interest in these fields may reflect the realities of both future job opportunities and future need. It is also the case that recent studies of salary and employment data fail to find indication of a shortage of engineers in the United States[6]. Most companies indicate that they are able to fill 80% of engineering jobs within four months. Furthermore, many companies actually limit the head count of U.S. graduates in preference to off shoring any growth in domestic engineering capacity, motivated both by lower costs and greater flexibility[7].

However, as Charles Vest [9] argues, no one can look at today's labor market for engineers and predict what students will experience in 30 years. "A generation ago computers and communication technology were esoteric fields with relatively small job demand. Yet today virtually every industry is at heart about information technology and communications in one way or another, which will only intensify as the United States completes its shift from a manufacturing to a knowledge services economy. Virtually every industry is already dependent upon sophisticated logistics, global supply chains, and an integrated global economy. The success of US economy–not to mention US democracy–will require more people with technical knowledge and skills, not less." As Vest[8] puts the question before us: "The world is changing remarkably fast, and leadership in science and engineering will drive it. Where will this leadership come from? China? India? The United States? The choice is ours to make".

Given the recent trends in business, it is perfectly understandable why engineering enrollments have declined in this country over the past two decades. Students are very market sensitive. As Norm Augustine[4] suggests, "All the signals are wrong to attract kids into engineering these days". Imagine the impact on student perspectives of engineering careers when they read a recent headline in a leading Detroit newspaper[9]: "GM Fires 500 Engineers", which quoted a company spokesman's rationalization: "It is all about aligning the workforce with our business needs". Students are very sensitive to such actions, and although many have the aptitude and interests to major in engineering, they view it as a dead-end profession, subject to this commodity treatment and associated with too many risks, in contrast to broader professions such as law, medicine, and business. The same ambiguity characterizes public perception, with images of large rooms of rows upon rows of engineers working on narrow elements of large systems such as airplanes or automobile platforms until the next round of layoffs. Particularly during these days of economic stress, these images are more prevalent than those of master engineers creating the highly innovative products and systems that address critical human needs while adding economic value. Ironically, even as the need for engineers and engineering services continues to intensify in this country, the global marketplace is drawing many engineering activities offshore. While initially this was for more routine engineering services, primarily driven by the wage differential between the U.S. and off-shore providers (particularly in India, China, and Eastern Europe), today we find the off-shoring of engineering services is rising rapidly up the value chain to include sophisticated functions such as product design, research, and development.

Politicians usually rationalize the current phenomenon of off-shoring, the increasing tendency for companies to export knowledge-intensive service jobs like engineering and information services to developing nations like India, China, and Eastern Europe, by suggesting that it is the low wage rates that shift jobs overseas (typically 20 cents on the dollar in India, for example). But increasingly companies are going off shore because they sometimes find higher quality engineering services in high-tech areas like computer software development. They also seek to use off shoring to penetrate new markets. Why? Many of the nations benefiting from the global sourcing of engineering benefit from cultures with strong pre-college education in science and mathematics, a stronger interest of college students in majors in science, mathematics, and engineering, which are seen as the route to leadership roles in business or government, and large populations from which to draw top talent. Furthermore many of these nations are making massive investments in higher education, particularly in technology-intensive areas like engineering and computer science, to create a more highly skilled workforce at a time when our nation and states have been throttling back such investments. Yet despite the advantages of off shoring engineering services–cost savings, 24/7 development cycles, access to new markets–there are also concerns of a bandwagon psychology in which companies, driven by the short-term focus of investors, are moving too many activities off shore, losing their domestic core competence in key technological areas. To be sure today's globally integrated companies no longer embrace the linear, vertical process for value creation characteristic of 20th century industry–from R&D to product design to manufacturing to sales to distribution. Today's global

supply chain depends on a horizontal process, in which each activity is allocated to wherever it can be performed at highest quality and acceptable costs, and then integrated back together again to produce products, services, and values. A company can now procure the best product or service or capacity or competency from anywhere in the world because of the new knowledge infrastructure. Such global sourcing changes quite dramatically the incentives for sustaining domestic capacity in many areas including engineering.

U.S. Universities Outposts Abroad[10]

The American system of higher education, long the envy of the world, is becoming an important export as more universities take their programs overseas. In a kind of educational gold rush, American universities are competing to set up outposts in countries with limited higher education opportunities. American universities — not to mention Australian and British ones, which also offer instruction in English, the lingua franca of academia — are starting, or expanding, hundreds of programs and partnerships in booming markets like China, India and Singapore.
And many are now considering full-fledged foreign branch campuses, particularly in the oil-rich Middle East. Already, students in the Persian Gulf state of Qatar can attend an American university without the expense, culture shock or post-9/11 visa problems of traveling to America. At Education City in Doha, Qatar's capital, they can study medicine at Weill Medical College of Cornell University, international affairs at Georgetown, computer science and business at Carnegie Mellon, fine arts at Virginia Commonwealth, engineering at Texas A&M, and soon, journalism at Northwestern.

In Dubai, another emirate, Michigan State University and Rochester Institute of Technology recently started to offer classes. According to Howard Rollins, US universities are heading now toward becoming global universities. Georgia Tech a primer engineering university, is offering degree programs in France, Singapore, Italy, South Africa and China, and has plans for India. More and more universities are competing internationally for resources, faculty and the best students. Since the terrorist attacks of Sept. 11, 2001, internationalization has moved high on the agenda at most universities, to prepare students for a globalized world, and to help faculty members stay up-to-date in their disciplines.

Overseas programs can help American universities raise their profile, build international relationships, attract top research talent who, in turn, may attract grants and produce patents, and gain access to a new pool of tuition-paying students, just as the number of college-age Americans is about to decline. Even public universities, whose primary mission is to educate in-state students, are trying to establish a global brand in an era of limited state financing.

Partly, it is about prestige. American universities have long worried about their ratings in U.S. News and World Report. These days, they are also mindful of the international rankings published in Britain, by the Times Higher Education Supplement, and in China, by Shanghai Jiao

Tong University. The demand from overseas is huge. Traditionally, top universities built their international presence through study-abroad sites, research partnerships, faculty exchanges and joint degree programs offered with foreign universities. Yale has dozens of research collaborations with Chinese universities. Overseas branches, with the same requirements and degrees as the home campuses, are a newer — and riskier — phenomenon.

Regardless, after a decade of rapid growth, American universities have slowed the pace of opening branch campuses abroad, and much of the activity has moved from the Middle East to the Far East, according to a survey by the Observatory on Borderless Higher Education, a private British research group. The survey, based on data from the second half of 2011, found 200 degree-granting international branch campuses, with 37 more expected to open over the next two years. The group found 162 branches in a 2009 survey, and 82 in 2006.

While universities with overseas branches insist that the education equals what is offered in the United States, much of the faculty is hired locally, on a short-term basis. And certainly overseas branches raise fundamental questions:

Will the programs reflect American values and culture, or the host country's?
Will American taxpayers end up footing part of the bill for overseas students?
What happens if relations between the United States and the host country deteriorate?
Will foreign branches that spread American know-how hurt American competitiveness?

Even though, a lot of these educators are trying to present themselves as benevolent and altruistic, when in reality, their programs are aimed at making money. Whereas, others claim that higher education is the most important diplomatic asset the U.S. has. Some really believe these programs can actually reduce friction between countries and cultures.

The bottom line is that most overseas campuses offer only a narrow slice of American higher education, most often programs in business, science, engineering and computers. Schools of technology have the most cachet. So although the New York Institute of Technology may not be one of America's leading universities, it is a leading globalizer, with programs in Bahrain, Jordan, Abu Dhabi, Canada, Brazil and China. Some lawmakers are wondering how that rush overseas will affect the United States. In July, the House Science and Technology subcommittee on research and science education held a hearing on university globalization.

Another important note is that the engineering degrees offered by all of these branches are not ABET accredited by the mere fact that the main campus is accredited. As a matter of fact, ABET would only accredit these programs as standalone programs. Thus, these engineering programs offered by the branches have certainly lost their luster and are being marginalized.

Engineering Globalization

Globalization is a term that is used interchangeably with internationalization, but both terms

describe different concepts that are important to explain in regard to the context of this paper on Global Engineering Education. However and interestingly enough, one point in common between the two definitions is that both phenomena produce change, and change sometimes can be confused with the concept of modernity or progress, which has a totally different philosophical stand. Globalization expresses the growing changing environment in the economic sphere and the geographical growing interdependence, whereas according to Marginson and Van Der Wende[11], "internationalization is a more modest process which translates into the conventional regulation between states". In higher education, Marginson et al.[11] explain that "internationalization has a long history as a relatively safe method of broadening one's intellectual horizons through reflective comparison". Globalization, on the other hand, is a term originally used to describe contemporary economic phenomena that are related to the expansion of a global free market. There are opponents and proponents of the theory of globalization. Many suggest that globalization has negative effects on the people around the world, but others think that its new developments are positive. Opponents are concerned with the social and ecological devastations provoked by this type of globalization, whereas proponents argue that globalization will bring prosperity and international collaboration[12]. Analysts argue also about the "novelty" of the phenomenon of globalization, observing that economical competition and expansion of economical spheres have existed since the sixteenth century in Europe with the creation of empires and later on with colonization in the late 19th century[12]. Fernand Braudel[13] explained that a world economy is not a global economy and what is experienced today "has nothing in common with previous human experience[14]". Giddens[15] argue that globalization is an ideological myth created by "free-marketeers" to deregulate the social state and that the biggest change is in the increasing use of "electronic money that only exist as a digit in computers" that can destabilize solid country's economies. Carnoy[16] suggests that the emergence of a global economy has been possible since the mid-1980s with "the technological infrastructure provided by telecommunication information systems, microelectronics machinery, and computer-based transportation, which allows economical activities to function on a planetary scale on real-time". Thomas Friedman[17]explains that from an historical point of view globalization's driving mechanisms can be divided into three eras. The first one (1492 to 1800), that he calls globalization 1.0, was essentially the result of countries competing with each other and international economic opportunities. The second globalization 2.0 era (1800 to 2000) was driven by multinational companies interests and the last one, globalization 3.0 (2000 to present), is "the new found power for individuals to collaborate and compete globally". Friedman describes our world as a shrinking place where global competition and collaboration is now at an individual level and this phenomenon leads to a flattening process with people all over the globe. According to Tony Brown[18] who has a critical view of globalization, the process of change called globalization is threefold: the first one describes "the transfers of money around the world, the production and exchange of services and the declining role of the nation state"; the second one refers to globalization as being "an objective entity seemingly with its own conscious purpose" as if it were some kind of "independent active agent". The third conception is related to globalization as a discourse in which the concept is viewed as an inevitable natural process,

independent of human influence[19]. Most analysts like Schaeffer[12] and policy makers "use globalization to describe the growth and spread of investment, trade and production, the introduction of new technology, and the spread of democracy around the world".

The word internationalization in regard to higher education, like the word globalization in the sphere of economics, lacks a firm agreement on its meaning. However, there is an historical antecedent with the Medieval European universities where wandering scholars traveled and studied at different universities across Europe. Presently in Europe, there is an effort through different European programs such as SOCRATES and ERASMUS (exchanges and scholarly programs) to harmonize the structure of programs of studies and the mobility of students which reminds us of their prestigious predecessors[20]. In the United States, however, the field of international education is "fragmented and compartmentalized" with no unifying theory to consolidate the field[21].

In summary, global engineering offers the seductive image of engineers figuring out how to optimize work through collaboration and mobility. Its biggest challenge to engineers, however, is more fundamental and difficult: to better understand what they know and value qua engineers and why.

Changes in Engineering Education

Engineering education in the U.S. has changed dramatically during recent years. Not only has the number of graduates in traditional engineering disciplines such as mechanical, civil, electrical, chemical, and aeronautical engineering declined, but in most of the premier American universities engineering curricula now concentrate on and encourage largely the study of engineering science. As a result, there are declining offerings in engineering subjects dealing with infrastructure, the environment, and related issues, and greater concentration on high technology subjects, largely supporting increasingly complex scientific developments. While the latter is important, it should not be at the expense of more traditional engineering.
Rapidly developing economies such as China and India, as well as other industrial countries in Europe and Asia, continue to encourage and advance the teaching of engineering. Both China and India, respectively, graduate six and eight times as many traditional engineers as does the U.S. Other industrial countries at minimum maintain their output, while the US suffers an increasingly serious decline in the number of engineering graduates and a lack of well-educated engineers.

While until quite recently U.S. engineering firms dominated in global infrastructure projects and the development of new design and engineering solutions, they are now becoming minor participants and are quite often not even invited to propose and bid for important projects. Earlier last century the US has built structures such as the Empire State Building in fewer than 18

months, a feat which could not possibly be repeated today. U.S. engineering used to be the global gold standard in infrastructure engineering and construction, while now the premier examples of major engineering projects are primarily developed abroad. US increasingly lags not only in engineering research, development, and design, but also in methods of survey, construction materials handling, materials fabrication, site development, and more, again particularly in infrastructure engineering.

The results have caused U.S. roads, rail networks, electric power, ports, airports, and other essential infrastructure to not only remain in ill-maintained states, but also to be quite often badly designed and constructed. There are many examples which parallel the shameful so-called Big Dig project in Boston, and there are now few major U.S. engineering projects that measure up to world standards, something that not only adversely affects our economy, but also our standing in the world. For example, much of the Katrina and similar disasters could have been prevented by more competent engineering. For too long, we have somehow failed to give the proper respect, recognition, and resources to engineering education, and now suffer the consequences which may affect not only our reputation but ultimately our economy and standard of living.

Engineering is the most essential of human disciplines. From early on it was the way humankind lifted themselves up from other creatures. It provides the wherewithal for all human physical advances and is as much – if not more – of an intellectual challenge as the sciences and other subjects that advance human standards. History has many examples where the decline of civilizations paralleled the lack of importance given to engineering. The Greeks, Romans, Chinese, and others built their civilizations largely on the foundations of engineering competence and advances. Their power, status, and standards of living rapidly declined as soon as they failed to maintain their superior engineering competence and developments. The hope is that U.S. will learn from history, and not repeat it.

Engineering education should teach the effective application and use of scientific principles to the solution of real-world problems and the development of materials, tools, facilities, appliances, shelters, foods, and services to meet human needs and advance human living conditions, opportunities, and standards. It should probably be broadened to include engineering and project management, in addition to wider, more comprehensive courses in the application of science and technology to the solution to real-world problems – so as to assure that graduates hit the ground running, particularly after completing graduate studies. MIT has for long been the world leader in the application of engineering education, and should follow its success by furthering its study in this direction.

Summary and Conclusions

In this paper, U.S. modeled engineering education was explored within its global ramifications. There is no doubt that the demand for the U.S. branding is very high and desirable.

Unfortunately, the real U.S. engineering educational experience can only be fully attained at U.S. based institutions. The spirit and culture is more important than the model.

Acknowledgement

Funds for the presentation of this paper were provided by the Lebanese American University.

References

1. ABET web site, http://www.abet.org/, last accessed 12 December 2012.
2. Prados, John W., Editor, **A Proud Legacy of Quality Assurance in the Preparation of Technical Professionals**, ABET, Inc., USA, 2007.
3. Jones, Russel C., and Bethany S. Jones, Quality Assurance in International Education, *Multiple Stakeholder Perspectives of Higher Education,* R. Natarajan and N.R. Shetty Editors, MacMillan Publishers India Ltd., 2012.
4. Augustine, Norman (chair), ***National Academies Committee on Prospering in the Global Economy of the 21st Century. Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future,*** Washington, DC, National Academies Press, 2005.
5. Marburger, J.H. "Achieving Diversity in Science and Engineering", Keynote Address, A Celebration of Pioneering African Americans in Physics, University of Michigan, Ann Arbor, Michigan, March 17, 2004.
6. Wadhwa, Vivek, Gary Gereffi, Ben Rissing, Ryan Ong. "Where the Engineers Are", *Issues in Science and Technology*, Spring, 2007.
7. Lynn, Leonard and Hal, Salzman. "Collaborative Advantage", *Issues in Science and Technology*, Winter, 2006, pp. 74-82.
8. Vest, Charles M., *Clark Kerr Lectures,* The University of California, Berkeley, CA, University of California Press, 2005.
9. Detroit News. "GM Fires 500 Engineers: The Loss of Contract Jobs Darkens grim Michigan Outlook", *Detroit News*, January 5, 2006.
10. Pope, Justin, "US Universities Overseas Abroad: Failure Is A Reality", http://www.huffingtonpost.com /2011/10/20/.
11. Marginson, Simon, and van der Wende, Marijk " To rank or to be ranked: The impact of global rankings in higher education", *Journal of Studies in International Education***,** Vol. 11 No. 3/4, Fall/Winter 2007, pp. 306-329.
12. Schaeffer, Robert K., **Understanding Globalization: The Social Consequences of Political, Economic and Environmental Change,** Rowman & Littlefield Publisher, Inc., 2003.
13. Braudel, Fernand, **Civilization and Capitalism, 15th-18th Century, Vol. II: The Wheels of Commerce,** 1979 University of California Press, 1982.
14. Stromquist**,** Nelly P., **Education in a Globalized World: The Connectivity of Economic Power, Technology, and Knowledge,** Rowman & Littlefield Publisher, Inc., 2002.
15. Giddens, A., **Runaway World: How globalization is reshaping our lives**, Profile Books, London, 1999.
16. Carnoy, Martin, "The family, flexible work and social cohesion at risk", *International Labour Review.* Volume 138, Issue 4, pp. 411–429, December 1999.
17. Friedman, Thomas. **The World Is Flat: A Brief History of the 21st Century**. New York: Farrar, Strauss, and Giroux, 2005.
18. Brown, Tony, **"**Challenging globalization as discourse and phenomenon", *International Journal of Lifelong Education*, Volume 18, Issue 1, 1999**,** pp. 3-17.
19. Bourdieu, Pierre, **The Rules of Art**, Cambridge 1996.

20. Altbach, Philip G., "Globalisation and the University: Myths and Realities in an Unequal World", *Journal of Teritary Education and Management*, March 2004, Volume 10, Issue 1, pp 3-25.
21. Mestenhauser, J. A ,"Internationalization at Home: Systems challenge to a fragmented field", *In Internationalization at home: a global perspective* , Edited by: Teekens, pp. 61–77. Rotterdam, The Netherlands, 2006.

CAMILE A. ISSA
Dr. Issa currently serves as a Professor of Civil Engineering at the Lebanese American University, Byblos, Lebanon. His research interests include finite elements, concrete mix design, experimental investigation, repair and rehabilitation of structures, structural concrete design, and seismic analysis and design. Prof. Issa is a registered Professional Engineer in Mississippi and Lebanon. He is a Fellow of the American Society of Civil Engineers and serves as an ABET Program Evaluator.