

ANALYSIS OF UNIVERSITY-INDUSTRY RELATIONS

A Case Study

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Abstract: The study investigates the relationship between university and industries in Dubai, the United Arab Emirates (UAE). The research calls for building a bridge between universities and industries and rallies for enhanced “cogency” of information technology education, strengthening the academia to industry partnership. This was influenced by discussions with female Emirati undergraduates at Zayed University in Dubai in 2009, where graduates from the College of Information Technology proposed means to initiate creating feasible and sustaining links between local tertiary educational institutions and local industries. Approaches were used to support collaboration between academia and industry, and college programs were employed to narrow the gap between university education and industry. Undergraduate programs need to adapt to industry to ensure graduates gain industry-demanded skills and experience. The investigation suggests that practical and constructive measures are to be taken to effectively develop collaboration between university and industries.

1 INTRODUCTION

The Information Technology (IT) education in Dubai, United Arab Emirates (UAE) faces new challenges such as increased demand for qualified seasoned graduates in IT, new teaching methods in academia, increased educational tuition, and decreased funding that are linked to the search of educational cogency in IT undergraduate programs. This forces the colleges of IT to re-evaluate their programs and offerings, and to undertake a reconstruction of their current educational infrastructure (Akili, 2005). “The aim of this collective is to promote coordination between members in all fields in order to achieve unity” (Sheikh Mohammed al Maktoum, 2010).

This study used empirical sources and data to discuss the impact of university-industry relations. The authors of the study considers the relation between universities and industries to be based on the basic missions of the university: teaching, building and transfer of knowledge, and research and innovations in.

University-industry relations are a somewhat new subject of research. To understand the present situation of Information Technology education in Dubai, it is essential to learn about the current

educational system, its organization and early development, and the informal aspects that lead to the current situation. The higher education interaction with external business and industry partners is extremely important. The participation and knowledge of government and industry need to be encouraged to help master the educational challenges that affect information technology education in the region. The participation of industry in adjusting information technology education creates a valuable reciprocal relationship between universities of Information Technology programs. While such a relationship may be somewhat difficult to develop, it could contribute to improvement of the educational system in Dubai and the region (Akili, 2000).

In some developing countries, the relationship between university and industry has not been successful (Alwan & Obeid, 2000), because of problems at both local tertiary educational institutions and industries. The industry may be managed by governmental laws that restrict the consideration of innovative products, which discourages development and research. Issues with universities could include limited industrial knowledge by faculty and their applied research abilities low enrollment numbers of undergraduate

students at universities. Although there are difficulties, there is an increasing interest in improving the university-industry relations in the Gulf Region (Tawfig & Awlana, 1999). The research aims to present some of the complex issues about “connectivity” between university and industries in Dubai. The authors discuss the urgent need for universities to establish an effective and long-lasting interaction at foundation level so that there would be mutual interests of participants on both sides (learners, instructors, researchers, and industry partners) to be effectively satisfied. Indeed, the successful achievement in this interaction is to create dynamic education in the area of information technology, by bridging universities closer to industries.

There has recently been an urgent call for students and faculty to become engaged in “real practical problems” and to participate in providing real-experience solutions. Teaching instructional material in blended learning communities is not enough (Draganova, 2010). Educators need to bring their own knowledge and skills to the classroom. So far, universities are indisposed to working with businesses and industries and both business and industry’s apathy to those matters have troubled academics. This is one of the critical reasons for universities “weakness” that has taken over the academic world of Dubai. These problems need to be rectified such that industries begin to interact actively with university programs, and to participate in teaching practical abilities and skills to the students. The participation of industry in students’ learning processes provides graduates with “real life” experience which at the same time narrows the gap between universities and industry. Universities and industries need to focus on developing approaches and to strengthen their collaborative efforts in support to university graduates. Internship programs, capstone projects, hands-on training, joint interdisciplinary capstone projects, and faculty perceptions aimed to facilitate the cooperation between the two parties are essential.

The authors draw on their own experience as faculty members at Zayed University in Dubai. In addition perceptions and suggestions from graduates, colleagues, and business managers in the area are evaluated. The authors had numerous meetings with managers from leading industries in Dubai and university specialists, to discuss the status of university-industry relations (UIR). Universities and industries agree that mutual cooperation and relation is needed to effectively develop and foster universities to have more substantial information

technology education, and industries to have better prepared graduates. Through cooperation, the industry can enhance its reconnaissance potential and subsequently enhance its innovative ability (Bright, 1994). Furthermore, results reveal the effectiveness of collaboration between students and the industry partners (Bright, 1994).

The University-Industry Relation (UIR) has a special effect on the universities by keeping them up-to-date with advanced technological developments in industry. Examples include incubators for technology-driven entities at universities. This helps universities and enterprises increase and expand their functionality in the process of innovation (Etzkowitz et al., 2005). Guston and Kennington, (1994) identified the success of a UIR as a “new social contract” for science.

The research aims to shed light on the UIR in the form of joint university and industry organization, located at a single physical site. Suggestions are made focusing on reducing barriers to UIR success (Fontana et al., 2006). Example of such an organization is Microsoft Laboratories in USA.

2 RESEARCH OBJECTIVES

This research aims to assist university educators in searching for better possibilities to initiate, develop and monitor collaborative work between students and industries. Market studies (Alwan & Obeid, 2000) have shown that there is little written about the availability of information and tools to develop strategic methods for collaborative research, negotiation, and clarification of the relationships between universities and industries. In this study, guidelines are proposed to encourage university educators to better relate to industry partners. The proposal recaps important policies in academia and makes an attempt to refine roles and relationships between university educators and industries.

In response to job market requirements, industries have focused on attracting university graduates to assist in the establishment of long-term, knowledge-based economies. Universities and industries will need to develop mutually effective relationships with one another. The authors of the study aim to present guidelines for efficient collaboration between university and industry at Zayed University, Dubai. The objective of this research is to provide an enhanced understanding of the mechanism of university–industry relations and to develop a framework and tools for Zayed

University (ZU) to further use to relate to the industries. The objectives include:

- Revision of current university-industry relations to encompass current barriers and issues;
- Analysis of the literature on effective experience patterns globally;
- Investigation of interaction and collaboration between universities and industries needed for the effective relation between the two;
- Investigating the impact of university-industry relations on academic outcomes;
- Development of an effective framework for Zayed University to industry interaction.

3 METHODOLOGY

This research used qualitative research methods consisting of:

- Literature review to analysis of university-industry experiences globally.
- Data collection from Zayed University on existing practices of interaction with industries (a survey)
- Data collection from Dubai industries on their perceptions towards effective relations with Zayed University, conducted through four in-depth interviews with industry senior managers and site visits.
- Data collection of perceptions from Zayed University faculty members on enhancing relations with local Dubai industries, using questionnaires and conducting interviews.
- Report about data collection, recommendations, and recording of findings.
- The questionnaire was used to collect quantitative data to prepare a comparative study. The literature review was conducted on university-industries relations (UIR) to identify significant resources of motivation, barriers, and solutions to defeat these barriers were singled out. The data was collected and a questionnaire used to define that all important aspects of UIR were analyzed.

4 SURVEY

The relations and collaboration between a university and industry can take a large number of different forms, which may relate to students (aka learners), faculty (aka educators), and industry, depending on the degree of their protocol and complexity. These

forms include the 18 forms grouped into 3 categories as shown in Table 1.

Table 1: Forms of university-industry relations.

Educators	Learners	Industry
Advising Undergraduate Projects	Capstone Projects	Industrial Companies
Research (Funded)	Scholarships	Business Innovations
Lab Courses	Technical Lab Training	Organize Meetings
Collaborative Training Courses	Collaborative Training	Industrial Advisory Board
Membership in Professional Societies	Employment	Organize Activities
Faculty Professional Development	Student Practical Training	Industry Funded Scholarships
Site Visits to Industry	Site Visits to Industry	Professional Societies
		Development of Curricula

Data was collected on existing forms of relations between universities and industries across university colleges; a detailed study by Career Services at Zayed University was performed across all university colleges.

5 SUGGESTED FORMS OF UNIVERSITY-INDUSTRY RELATIONS

- Partnership with industry experts and consulting offices;
- Cooperation with international companies and these in the Gulf;
- Professionals sent to Zayed University for continuing education on scholarships sponsored by the industry;
- Companies offer employment to ZU graduates.
- Industry professionals perform educational advises in other universities;
- Professionals from industry teach courses as adjunct instructors and supervise these at the university;
- Professional development at universities and industries host faculty and industry experts;
- Expand visits to industry.

6 RECOMMENDATIONS FROM THE PRESENTATIONS

The in-depth interviews with senior managers from industries in Dubai presented experiences and views of four leading companies such as DUBAL, TECOM, KHDA, and DEWA. The themes of their presentations included university-industry relations to build on developing research projects and enhancing faculty technical experience in the industry. Topics collected from the interviews include:

- Need to properly publicize ZU research;
- Mutual cooperation between university and industry in the areas of research and professional development;
- Technical skills hands-on training by industry instructors to students while attending ZU undergraduate academic program;
- Bridging the gap between university-industry by developing of an innovation system between the two;
- Create incentives for faculty to work in industry to build experience to convey to the students;
- Include consultation by faculty members to their academic portfolio to encourage university and industry to relate better;
- Increase communication between university and industry to mitigate the misunderstanding between universities and industry.

7 SUGGESTIONS FOR CONNECTING TERTIARY EDUCATIONAL INSTITUTIONS AND INDUSTRIES

There are numerous reasons for university and industry to collaborate. There are also factors that vary such as university and industry culture for collaboration, demographic location, category of the university, and possibly the size and capacity of the industry (Hutt et.al. 2000). Based upon the authors own' collection of empirical data, there were four main barriers such as (i) faculty interactions with industries, (ii) Lack of connecting undergraduate research with industries, (iii) learner's training by industries, and (iv) Resources and funding for laboratories at tertiary educational institutions.

Below are suggested forms for collaboration between university and industry:

- Establishment of funding and budgeted resources for laboratories at universities;
- Connecting ZU with industries in Dubai;
- Improvement of teaching;
- Acquiring latest technological novelties;
- Access to empirical data from industries;
- Establishment of long term research projects;
- Professional training of students/Development of effective Internship programs;
- Establishment of reputational relation between university and industry;
- Organize monthly meetings and workshops between educational institutions and industry;
- Job opportunities for university graduates;
- Cooperative work between educational institutions and industry;
- Involve industry in to Capstone projects at university;
- Development of a strategic plan that sustains cooperative relation between universities and industries;
- Learn from other university-industry experiences and best known approaches worldwide.

8 NEED FOR UNIVERSITY-INDUSTRY RELATIONS

With the advent of information technology development, the new challenge for the universities is to keep up with the profession, a mission that was not challenged during recent times of relative stability. The information technology profession is global and undergoing critical changes, including: ample intellectual connection, developing new technical skills, new teaching and learning approaches, diminished employment opportunities and job security, and challenging accreditation prospects.

The authors' motives for investigating the impact of collaboration between university and industry are well aligned with the literature, in particular with Hurmelinna's study about the motivation for collaboration that was described as an improvement of teaching followed by financial funding and enhanced reputation (Henderson et. al., 1998). The source that documented the "knowledge increase" from industry and the usage of empirical data from industry was endorsed by Reynolds (2004) who supported university instructors' publications,

entrepreneur-ships, and cooperation with the industry.

Another motivational prospect is the job offer opportunities for university graduates that cultivate the reputational relation between the university and the industry. On the industry's side, the motives are an early access to latest technological novelties, the establishment of long term research projects, and students' training while attending internship programs. In addition to the job opportunities for graduates, Azaroff (1982) stated that the collaboration on research might increase its efficiency and reduce cost for recruitment of graduates.

9 CONCLUSIONS

The foundation of a departmental unit at university grounds with the purpose to entail in university-industry relations is perceived by the stake holders as efficient. This allows better selection of projects that enhance the output of important scientific projects to be transferred to the operating units of the industry. The above-mentioned entity gains reputation as an innovative one while in the process of producing new and relevant outcomes both with an academic and a technical implementation. Drawn from two years of practical experience some good experiences have been discovered:

- Development of jointly shared targets and activities;
- Development of community of trust and openness;
- Policy of transparency in intellectual properties and publications;
- Team work between academia and industry partners.

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