

The Preparation of Geographical Information Systems Students at the United Arab Emirates University for the Job Market: Considerations and Challenges

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Abstract

This paper reviews whether geographic information systems (GIS) students from the United Arab Emirates University (UAEU) are well-prepared for the job market. A questionnaire was prepared and circulated by the author to alumni of the GIS program, as well as to ten organizations in the United Arab Emirates (UAE) who use GIS applications. Many of the alumni responded that they were dissatisfied with their undergraduate experience. These results indicate that broadening the focus of the coursework and emphasizing internships and real-world interaction would make the students' experience more satisfying and prepare them better for the job market they will face when they graduate.

Key Words: GIS, Job Market, Alumnus, United Arab Emirates University.

Introduction

Geographical Information Systems (GIS) teaching in the United Arab Emirates University (UAEU) started in 1995 and followed a largely conventional path, where lectures on GIS theory were combined with practical exercises using the latest technology from the major vendors, such as the Environmental Systems Research Institute (ESRI). UAEU has the highest level of resources around the country in terms of staff, computer systems, and GIS software (Yagoub, 2002). It also has the highest student numbers. In total, about 35 % of the curriculum is directly related to the topics associated with GIS. The Geography Program at UAEU launched the GIS track in the 1999- 2000 academic year. In the 2003- 2004 academic year, the College of Humanity and Social Sciences changed the name of the track from GIS to Geo-informatics. Geo-informatics is a broader concept, and includes GIS, remote sensing, digital photogrametry, computer mapping, cartography, surveying with global position systems (GPS) and the Total Station. The name change did not lead to major changes in the balance between these fields in the curriculum.

This paper discusses the fit of the teaching and training provided in the GIS track with the demands of the job market. This is done by analyzing feedback from alumni who work in the GIS field, and from managers in firms identified as being involved in the GIS field. The study's objective is to provide information to the University's leaders to help them craft appropriate changes to the GIS track of the Geography program and thus improve the quality of the labor supplied to the United Arab Emirate (UAE) job market.

Objective

This paper discusses the challenges facing UAEU GIS graduates in the job market, and answers this question: does the GIS track in the Geography program at the UAEU prepare students well for the various challenges of the job market? The issue is assessed based on the responses of the alumni of the GIS track, who graduated in the past three

years, and employers, who were asked to provide their input on the program and its output. Building on that, the study evaluated the weaknesses of the program that needed to be improved, focusing on re-structuring it so as to prepare its graduates to build on the knowledge they acquired so that they would be able to grasp advanced, unique and multi disciplinary GIS systems.

Methodology

Two questionnaires were prepared by the author and circulated to the GIS track alumni and organizations in the UAE that used GIS applications. The first step for the alumni survey was to contact the 151 students who had graduated from the GIS track in the past three years. These former students were asked if they were working in a job which required GIS skills. If so, they were asked to reply to a series of open-ended questions about their positions. The questionnaire sought to surface the quality of the knowledge they received during their studies and whether it had been useful for their jobs.

A separate questionnaire was sent to public and private sector managers from all over the Emirates who had been identified as being involved in the GIS field. Ten companies were contacted initially and replies were received from seven of their management-level staff. Next, in-depth interviews were conducted with six of them. The aim of this survey and the interviews was to investigate the views of employers on the qualities that GIS alumni brought to their organizations and which of these were most useful to them.

Once the data was gathered, it was analyzed in the fall of 2006 to highlight the GIS program's strengths and weaknesses, the opportunities and threats it faces, and the proposed improvements.

Results and Discussion

The GIS track was established in the 1999- 2000 academic year. The study surveyed alumni who graduated in 1999- 2000, 2000- 2001, 2001- 2002 and 2002- 2003. 151 students graduated during this four-year period. Out of them, 51.6 % (78) were unemployed, 15.2% (23) do not use their GIS education in their jobs, and 19.2% (29) work in GIS-related fields. There was no response from the rest (13.9% or 21 individuals).

There are inconsistencies between the number of GIS professionals required in the UAE job market, which is very high, and the level of employment of the UAEU's GIS-track alumni. Among the respondents who use GIS in the field, 44% work in the federal government, 40% in local government, and 16% in the private sector. 6% of the alumni rated the quality of their under-graduate education as 'excellent', while 56% rated it as 'very good', 31% as 'good' and 7% as 'marginal'.

25% of the alumni pointed out that they were only marginally prepared for the job market. Several of them also indicated that some courses were tangential to the program's focus and that, relative to the core courses required by the university and the college, more weight should be given to specialization courses. More than 87% of the alumni

pointed out that additional practice in the English language, statistics, computer science, and surveying would have improved their undergraduate education. Finally, the alumni reported that, out of the 132 credit hours in the curriculum, only 45 credit hours (made up of 15 courses) were given up for GIS courses, which was much less than was required. This issue needs further consideration, taking into account the diversity of program specializations.

69% of the respondents rated the current internship as being inadequate. Many of the alumni stated that they had not interned in relevant organizations, nor did they have a sufficiently long period of internship. Students possess high energy, ambition and a willingness to work to gain valuable experience. They often provide new ideas and new ways to look at a company's initiatives (Jennifer, 2004). The contribution an employer makes to a student's professional development through an internship is invaluable (H. Frederick, 2003). The time and guidance given to a student during their internship experience is often influential in their career choices and future plans (Reeve, 1999). In addition, the alumni indicated that there was a gap between what was happening in the real world and what they were learning. Therefore, alumni who continued studying after receiving their undergraduate degrees believed that graduate studies were very meaningful, as they bridged this gap and led to a better understanding of real-world problems and their job.

The study identified a number of weaknesses, such as the relatively low involvement of UAEU students in conference presentations and technical papers. Also, negative comments were received about certain courses that needed to be modified and certain other courses that should be introduced. 62% of respondents related that their preparation for getting a job after graduation did not target the job-market's requirements well. 45% of the administrators who responded to the survey considered that the GIS track's students were extremely well prepared for their first job, while 55% felt that their preparation was only adequate. 75% of the administrators rated the alumni as "good" or higher in GIS fundamentals. In terms of software skills, 62% of the administrators rated UAEU alumni as "good" or higher, while 38% considered them "marginal". Most of the administrators described the ability of the program's alumni to conduct research using advanced geo-informatics tools as adequate. These GIS administrators also indicated that with GIS being used in more and more areas, specialization in particular components of GIS, such as networked systems, data management and computer systems administration, was an industry trend. 50% of the administrators indicated that their organization needed specialist GIS technicians and GIS programmers, while 12% of the administrators needed GIS project manager, GIS database managers and GIS software engineers. 38% of the administrators indicated that they needed specialists in all these roles.

The complex computer technology used in the GIS field requires several different types of professionals to support its maintenance and use (Shepherd, 1998). Many different GIS vocations or professional activities involving GIS can be recognized which require different knowledge areas that might be addressed in GIS education, such as systems operation, computer science, management skills, information systems, spatial information

science, and geographic science (Marble, 1999). These are the three key areas where expertise is needed:

- Management of GIS projects (GIS project managers).
- GIS database skills (database administrators) and
- Application development for database and users (GIS software analysts).

GIS users are now more interdisciplinary than ever and their applications come from a wide variety of subjects (Phoenix, 2000). The GIS course curriculum can thus cut across different subjects and become part of the following five faculties at the undergraduate level in UAEU:

- College of Humanity and Social Sciences: Geography, and Urban Planning.
- College of Science: Environmental science, Water resources and Geology.
- College of Business and Economic: Statistics.
- College of Information Technology: Computer Science, Computer System Engineering, Information Systems, Software Engineering, and Network Engineering.
- College of Engineering: Civil and Environmental Engineering, and Architectural Engineering.

The challenge then was to design a curriculum that incorporated sufficient coverage of the core knowledge domain, while allowing students the freedom to experiment in different areas of emphasis and ultimately choose a specialization.

Conclusion

In general, the alumni were dissatisfied with their graduate school experience. Both the alumni and the administrators identified some weaknesses in the program and suggested some improvements. If these concerns and suggestions are taken seriously, the students' academic experience will be much more satisfying, and they will also be better prepared for the job market.

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