

Success Stories – What Works at GWU!

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Success of the D.Sc. Program

The D.Sc. program of the Department of Engineering Management, School of Engineering and Applied Science of the George Washington University (GWU) attracts about 50 qualified applicants per year. Whereas, the Department's Faculty admits to the program between 10 and 15 students per year. This is in contrast to the traditional departments of the School, which admit almost all qualified D.Sc. applicants. The reason for the different outcomes among the departments, the author believes, is the success of the paradigm shift represented by the strategy developed by the Department of Engineering Management.

History of the Department

Over the 45 years of its operation, the Department's program has been very adaptive in terms of course offerings and sources of students. The program was initiated in response to the request of a committee of Navy personnel officers for a program to assist Navy engineers from the Washington Naval Shipyard to transition from design and production positions to project managers, at the closing of the shipyard in 1953. The backgrounds of most of the Navy engineers did not include education in management, communications, accounting, contract law, project management and statistics, which it was expected they would need in their new roles. Through time, the program evolved into a set of core courses and a set of elective courses that resulted in a master degree. The core courses was common to all master degrees and consisted of organization theory, management, quantitative decision-making, systems engineering, engineering economics, and more recently, computer applications. The electives varied widely and were and are designed to meet the needs of specific clients and industries. For example, in addition to the Navy, we have offered courses to meet specific needs of the Corps of Engineers, NASA, the construction industry, DOT, government support contractors, and most recently the systems software companies in northern Virginia. Also, we have attracted significant numbers of international students. Over the 45 years, the Department has granted over 5,000 master and 150 doctoral degrees.

Non-Traditional Doctoral Students

Washington, DC, has one of the largest pools of highly educated, technical people in the U.S. The Metropolitan area has developed world-class leadership activities in telecommunications, biotechnology, systems engineering and technical services. Many mid-career executives in these and other related organizations are interested participating in higher education. Some wish to prepare for teaching careers and others wish to teach in the fields of their expertise. Most of these

executives have been leaders of their technical organizations; hence, have developed significant entrepreneurial and managerial capabilities. They represent a pool of talent that has not been materially utilized in the traditional paradigm.

The traditional way a person aspiring to a university career, after completing the Ph.D., enters the system is as an assistant professor. Through research, teaching, and service, the candidate moves up the academic ranks, acquiring tenure along the way. In this process, barriers are created that make it unlikely that outsiders can obtain professorial rank and/or influence. Thus, the Academy is protected from change forced upon it by external sources. In the traditional passage, graduate students frequently are supported by their professors and/or by the university. The professors hire students to conduct research and to assist with their teaching, and the university provides additional student support through scholarship and fellowship funds.

New Paradigm

The old paradigm generally does not have a place for a 45 year old, executive vice president of a high-technology company, who has acquired a small fortune from the merger of his company with a larger one. In our paradigm, we do. Depending on the circumstances, an executive can pursue the doctoral degree, teach part-time, or join the full-time faculty. These executives bring skills and experiences that make them motivated students and exciting teachers. They also bring contacts with their present and former colleagues in industry. As a result of the contacts of doctoral students, we have developed strategic alliances with two major corporations in the area, and expect to develop others.

Elements of the new paradigm include:

- [1] Viewing engineering management as a field of practice rather than as an academic discipline, and providing an interdisciplinary approach to the education,
- [2] Focusing the mission of the Department on providing education for engineers and scientists to assume or enhance leadership roles in their organizations,
- [3] Taking a non-traditional approach to the sources, support and use of doctoral students,
- [4] Continuously adapting the curriculum to current needs in the Washington Metropolitan area,
- [5] Employing highly qualified, part-time instructors to carry the primary teaching load of the Department,
- [6] Using the full-time faculty principally to conduct research, direct doctoral students, and manage the academic program,
- [7] Developing of educational niches by most senior professors for which they are responsible [Their responsibilities have included directing doctoral students, selecting part-time instructors, designing curriculum, and marketing of the niche],
- [8] Offering the master degrees at off-campus (at present, 7) sites in Virginia and Maryland, using the same faculty pool at all locations (including on-campus).

Strategic Alliances

With the Systems Applications International Corporation (SAIC), we have offered night classes leading to our master degrees in the four of the company's conference rooms at Tyson's Corner, VA. Additionally, SAIC and our Department developed a six-course graduate certificate in the field of information security management, which was initiated in January and open to all

qualified students. The faculty includes world-class experts in the field. Next year, SAIC is starting to construct three additional buildings in northern Virginia. Plans include GWU occupying a floor in one of the buildings in order to provide easy access for SAIC employees and others in the area to our educational programs.

With the Lockheed-Martin Corporation (LMC) in Reston, VA, we have developed another alliance. Initially, an engineering executive at the company entered our D.Sc. program. Later, he suggested to his advisor that they meet with the Company's human relations director to evaluate the Company's educational needs. LMC executives believed that the Company's core competence was in systems engineering. A result of the meeting was the development of a contract to deliver a graduate certificate in systems engineering to be offered at the Company's site tailored specifically to LMC needs. If a certificate student was qualified, with successful completion of the certificate, the six courses could be applied to a master degree program in the Department. Of the first cohort of 25, 18 later entered the master degree program. A second cohort of the certificate in systems engineering started in January.

A recognition, which has evolved from our relations with our alliance partners, is that targeted education delivered on-site is very attractive to many companies and their employees. Unlike our Federal Government clients, the management of some local firms has taken a more short-run perspective on education for their employees. These managers have wished that educational expenses lead directly to increased employee qualifications and performance. The on-site graduate certificate program has been a successful vehicle to meet their requirements. At present, we have three additional certificate programs in the planning stage.

Conclusion

Incrementally, the Department's strategy has evolved. Initially, we offered a traditional off-campus master degree. The addition of the D.Sc. degree in 1970 did not have any material impact until the late 1980s when we began accepting part-time doctoral students. These students have provided three essential contributions to the Department. First, they have provided access to the latest technology in developing disciplines of interest in the Washington, DC, area. Second, they have served as excellent instructors in subject areas difficult to staff. Lastly, they have provided creditable access to the industries in which they had spent many years. There are three parties involved in the strategy, the D.Sc. student, the company, and the Department. Each has different motives. Since economic security is not a consideration, the student generally is interested in participating in academia for the psychological rewards that Maslow has described as self-actualization. The strategic partner obtains access to qualified students in a tight job market, visibility as a source of specialized advanced technology, and the recognition as a participant in higher education. The Department receives qualified and motivated students, teaching facilities at little or no cost, and access to relevant technology appropriate to the Metropolitan area.

The result, in my view, is we have accomplished what many educators have talked about; i.e., we have developed productive strategic alliances with industry. The alliances are based on welcoming of older professionals into the academic enterprise as full partners.

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