

## **AC 2007-606: PERSPECTIVES FROM NEW FACULTY IN A NON-TRADITIONAL ENGINEERING SETTING**

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# Perspectives from New Faculty in a Non-traditional Engineering Setting

## Abstract

Florida Gulf Coast University (FGCU) is the newest public university in Florida. Established in 1997, FGCU attracts thousands of new freshmen each year because of its commitment to academic excellence and an interdisciplinary focus on curriculum combined with a growing, younger regional population. The most unusual characteristic of FGCU, compared to other University systems, is its implementation of a 3-year renewable term contract rather than the traditional tenure system. Despite this non-traditional approach, which has been in place since FGCU was started, there have been and continue to be many exceptional applicants to the new U.A. Whitaker School of Engineering (WSOE). The WSOE, which first admitted students last year, has debuted with three majors leading towards the Bachelor of Science degree in Bioengineering, Civil Engineering, and Environmental Engineering. Given the unusual characteristics of FGCU (new public university, new engineering program, and non-tenure system), a young faculty member starting his or her career is indeed in an unorthodox situation. That is exactly the case for the authors of this paper, who represent all three fields. One of the authors held a non-tenure-track assistant professor position at a different university for the last two years, while the other two held post doc positions in their respective fields. Managing the responsibilities and challenges of our new positions has afforded us lessons that indeed amount to our own innovations in career planning. Cognizant and respectful of the forward-thinking mission and vision of FGCU and the WSOE, the authors will share the methods and strategies used to maintain the balance of scholarship, research, teaching, and service in this non-traditional university setting. Guidelines and recommendations for young engineering faculty are also provided.

## Background

### *Introduction*

Florida Gulf Coast University (FGCU) was established by the Florida Legislature as the tenth public university within the state of Florida system in January 1991, and classes began in August 1997<sup>1</sup>. The university is dedicated to highest quality education that prepares the student for success in life and work. The student population has already reached over 8,000 students, and has continued to grow at an impressive rate with expected enrollment of approximately 12,000 by 2010. This increase is explained not only by the fact that Southwest Florida is among the fastest growing populations in the country but more importantly because the university is committed to excellence in education and is attracting increased student interest.

FGCU has a unique system. Instead of the conventional tenure track system, a 3-year renewable term contract was instituted. The U.A. Whitaker School of Engineering (WSOE) commenced in 2004 with majors leading towards the Bachelor of Science degree in Bioengineering, Civil Engineering, and Environmental Engineering. In 2006 three young faculty (one in each of the departments listed above and who are also the authors of this paper) accepted faculty positions at this flourishing university. Two of the faculty members graduated with their terminal degree

from the University of Florida. The third recently completed his degree at Northwestern University. Both of these universities are among the top research institutions in the nation.

Although the U.A. Whitaker School of Engineering (WSOE) is primarily focused on teaching and service, like most universities, scholarship is also expected. In addition to being new faculty members, given our situation it is not surprising that we were faced with the additional challenges of adjusting to a new public institution with a new engineering program, and a non-tenure system. Although there are materials available that provide help and guidance for new faculty members<sup>2,3,4</sup>; they were generally not specific enough to help us deal with the transition. Therefore, we will discuss our experience of teaching in a unique environment such as FGCU. Emphasis will be given on how we managed the responsibilities and challenges of our new positions. Using tools for time and resource management, we strived for flexibility to balance scholarship, teaching and service as faculty members. While our situation is unique in nature, we believe that our approach presented along with suggestions and guidelines should be of interest to new faculty members at any university.

### **Non-Tenure Track Versus Tenure Track System**

Faculty hired at FGCU are under a 3-year renewable contract. This system has been initiated in only a small number of universities in the U.S. These universities include College of the Ozarks, Evergreen State College, Franklin Pierce College, Goddard College, Governors State University, Hampshire College, and Philadelphia College of Textiles and Science<sup>5</sup>. Under the system at FGCU, each faculty member is evaluated every year. Upon a successful evaluation, the faculty member receives a one year extension on his/her contract. Additionally, every faculty member has a two year period in which to address and correct deficiencies in an unfavorable evaluation. Accustomed to the traditional tenure system, we initially had many questions about this new system including how this system differed from a conventional tenure track system and what were the possible advantages and disadvantages. Although only time can tell, it appears, at least not in the short term, that aspect of the position will not play a role in our advancement at FGCU. While the system at FGCU is unique; we believe there are no fundamental differences on how one should approach this position to be successful in his or her career. As with most universities, FGCU provides job security, promotion, incentives and rewards for superior performance to its faculty. We focused our effort on developing a framework that will help effectively advance the school mission and promote career development. The specific techniques employed are described in these activities below.

### **Teaching**

Forty percent time effort was allocated to teaching and teaching related activities for the 2006-2007 academic years. The objective was to contribute to the teaching mission of FGCU and the U.A. Whitaker School of Engineering to foster excellence in teaching by incorporating innovative, interdisciplinary methods in our engineering classes. The first class of students in the WSOE was admitted a little over a year ago with students no higher than the freshman level. This situation allowed us the unique opportunity to team-teach our first class (Fall 2006) with a multidisciplinary team of faculty (one bioengineer, one environmental engineer, and one civil engineer). This class, EGN1008C Engineering Concepts and Methods, was designed in keeping

with the National Academy of Engineering (NAE) recommendations of introducing engineering design, problem solving, and the concept that engineers are servants of society as early and as interactively as possible.

As the first highly technical course for all three engineering majors, Engineering Concepts and Methods not only introduced freshmen to engineering problem solving and design methods, but also introduced critical software packages such as Excel, MATLAB<sup>®</sup>, and AutoCAD<sup>®</sup> throughout the course. Exercises and problem sets in all three areas as well as in general engineering and physics have been integrated into course delivery. The course has been structured as a three semester-hour combined lecture/computer-lab experience with four total hours of contact time per week. Class sessions typically include mini-lectures and/or tutorials, and brief or extended individual or team problem sets. A semester end project carried out in teams of two with the theme of “Smart Houses” was used to place the overall subject matter of the class within the broad context of multidisciplinary engineering for the twenty-first century.

This is our first success story – the initiation and development of a multidisciplinary, freshman level course devoted to introducing engineering design and problem solving along with integration of Excel<sup>®</sup>, MATLAB<sup>®</sup>, and AutoCAD<sup>®</sup> in a combined lecture/computer-lab environment. From this unique situation we also used our time and resources to have a better understanding of the teaching pedagogy which includes multi-disciplinary teaching and integrated lecture laboratory of the U.A. Whitaker School of Engineering at FGCU. While our primary focus was on student learning, we also conducted surveys to understand the student’s perspective of the WSOE teaching approach. We also had the opportunity to work collaboratively and learn from other faculty’s teaching style. Although our teaching will increase, the information gathered through development and teaching of this course will impact our future classes and our engineering career thereafter.

## **Services**

Given our nascent program, it is not surprising that there is currently only a small number of faculty in the U.A. Whitaker School of Engineering with 8 total faculty members including the school of engineering director. It is important to represent our school on various committees across campus in addition to serving the community of Fort Myers and its surrounding areas. As a result, each of us is involved in many service activities that normally are reserved for more senior members of the faculty. Therefore we need to manage our time and resources to achieve success not only for the program, but also for our young careers. Our overall service objective is to continue the school’s mission by providing professional services to both the university community as well as the professional engineering communities, and outreach services to the local schools and community organizations. Twenty-five percent (25%) of time is now allocated to service activities over the next year.

## ***Senate Committee***

One author of the paper was selected to serve on the Senate Committee. As highlighted in the FGCU Governance Body, the Faculty Senate is an autonomous body representing the collective opinion of the faculty of the university to the administration and to the community. Faculty can

also volunteer as a representative on university-wide committees and task forces within the Senate Committee. The challenge was to select activities that would make a difference primarily to the U.A. Whitaker School of Engineering faculty. The author gathered opinions, suggestions, and recommendations from the other faculty in the WSOE and voiced those opinions in discussions such as those that promote quality in the academic program and research. The author also served on two subcommittees, namely the senate committee to examine the issue of a Travel Ban to Terrorist States and the University Calendar. The author believed that it was important to work closely on these issues as they may impact our new program in research, criteria for promotion, and class structure.

### ***Search Committee***

Another committee that the authors believe is important to our mission as well as our career development is the search committee. Currently, we are interviewing a number of candidates in all three programs in the U.A. Whitaker School of Engineering. Normally, the privilege to serve in a search committee is reserved mainly to senior faculty. At FGCU, we are in a unique situation and have the opportunity to serve on this important committee. Again the emphasis is to use our time and resources in such a way so as to create a well defined path for the school of engineering and our career. These appointees will be our colleagues, some even deciding our promotion status. While the primary focus is to identify superior candidates that can teach our classes, we also want to work together and ensure that the individual has a vision for scholarship, including collaborative research. We, along with the other members of the search committee, successfully appointed the Director for the Environmental Engineering Department. Also, we are finalizing the candidates for one Bioengineering, two Civil Engineering, and one Environmental Engineering positions

### ***Curriculum Committee***

The mission of the Curriculum Committee is to provide guidance, advocacy, and supervision by ensuring that the curriculum is academically sound, comprehensive, and responsive to the evolving needs of the community, thus serving the college's mission, goals, and educational needs of our students. In particular, the Engineering Curriculum Committee at FGCU strives to be innovative and flexible in order to accommodate the growing needs of the Engineering programs. One of the authors of this paper has served on this committee and has thus been able to influence course content and provide the most recent changes and innovations to our curriculum. It is also important to note that with our new program and limited faculty, we are motivated to be flexible and creative in our course design to integrate our curricula and satisfy the Accreditation Board for Engineering and Technology (ABET) criteria as recommended by Felder and Brent<sup>6</sup>, Froyd and Ohland<sup>7</sup> and Nair et al.<sup>8</sup>. These creative efforts enhance the integration of student research in our curricula while helping to identify promising students to aid in faculty scholarship.

### ***Other Activities***

As time permitted, each author of the paper participated in other activities within and outside the university with the same theme of promoting student learning, career development, and

community outreach. We served as mentors for the students in the U.A. Whitaker School of Engineering including those students who are leaders of the student chapter of the Florida Engineering Society at FGCU. Because of time constraints, such activities were arranged as a group mentoring during two afternoons per semester. One of the faculty members is working with the local chapter of the American Society of Civil Engineers to identify strategies to integrate the community and the other professional engineers in developing and building our program at FGCU. These activities included the West Point Bridge Competition for the local Middle and High School students and the establishment of an ASCE student chapter at FGCU. Also the authors continued to stay current with the latest innovation in our respective disciplines, by for example, serving as journal reviewer. Another faculty is working on establishing a student chapter of the American Water Resources Association and the Society of Women Engineers. Her activities have also included co-chairing a conference this year in collaboration with FGCU, the Southwest Florida Water Resources Council, the FGCU Environmental Studies Department, and engineers and scientists in the local community. Participating in these activities provided an opportunity to network and accumulated contacts within government agencies in order to foster research opportunities.

Overall, these endeavors afforded us the opportunity to further our careers by shaping what the future will be like at the WSOE. Through committee work either through the faculty senate or through WSOE committees, we were able to help shape policy that will play an important role in our future at FGCU. Furthermore, through outreach and other activities, we are able to develop personal as well as professional ties not only throughout the university but also throughout our community. As with many schools, service is a required component for all faculty members at FGCU. However, we were able to take this component and not only enhance our school's mission, but also promote our career development at the same time.

## **Research**

We, along with the other faculty and staff in the U.A. Whitaker School of Engineering, recently completed the planning stage for the new engineering building at FGCU. The construction of the building is scheduled to be completed by the summer of 2008. So with no building, limited equipment, and no graduate students putting us at a disadvantage, we endeavored to forge ahead with our research objectives by locating research space and working in collaboration with other departments, government agencies and professional engineering contacts. With a focus then on interdisciplinary and collaborative research, we allocated thirty-five percent (35%) of our time to research and scholarly activities.

One of the authors recently traveled with a group of three FGCU engineering students to Rowan University in New Jersey. One faculty from nearby Florida International University, and a faculty and student at The City College of New York also joined the FGCU group to conduct testing to determine the validity and feasibility of using Recycled Concrete Aggregate (RCA) in Hot Mix Asphalt (HMA). While this exposure may stimulate further research for the faculty, it also exposes the students at FGCU to hands-on experience that would not be otherwise possible. The faculty member, in collaboration with faculty at Rowan University and The City College of New York, recently was awarded a grant proposal for a total of \$100,000.00 (including university cost sharing) from the University Transportation Research Center Region II. Another

author has collaborated on remediation projects with local environmental engineering firms and identified research opportunities in sustainable design at the Babcock Ranch community development project near FGCU. Other efforts are underway to work with the local agencies and companies to identify prospective sources of funding for both research and education development. As the WSOE matures, research opportunities will continue to develop; however, it is these initial steps that will ensure the future success of our research endeavors.

## **Discussion and Conclusions**

The authors of this paper were in a unique position to define and perhaps structure the pathway of teaching, services, and research emphasis in the WSOE of Engineering at FGCU. Founded in late 90's, FGCU is the newest public university in Florida. FGCU can be viewed as a non-traditional university, where the conventional tenure system is replaced by a three-year renewable term contract. In 2006 three young faculty, who are also the authors of this paper, accepted faculty positions in Bioengineering, Civil Engineering, and Environmental Engineering. We were faced with the challenge to balance scholarship, teaching and service as new faculty members at this recently established institution. To overcome these obstacles, we identified a system that centers on using available resources that the position has to offer and managing our time and resources wisely to enhance career development and success. In doing so, the authors made the following accomplishments:

- From the very beginning, the authors of the paper quickly identified that the position at FGCU should be viewed and treated in the same framework as any conventional tenure-track university position. It was key to clearly understand and interpret the school's mission in such a way that we can serve the university while promoting our own career development.
- Successful completion of a Professional Development Plan. This milestone led to a \$1,000.00 grant from the Faculty Senate and the Professional Development Grant Awards Committee.
- Initiation and development of a multidisciplinary, freshman level course devoted to introducing engineering design and problem solving along with integration of Excel<sup>®</sup>, MATLAB<sup>®</sup>, and AutoCAD<sup>®</sup> in a combined lecture/computer-lab environment.
- Served on multiple committees and provided outreach to the community.
- Initiated research collaborations with local companies and organizations and secured grants and work with diverse faculty colleagues.

## **Summary**

Throughout our first year at FGCU WSOE, we have managed our teaching, research and service activities with an eye towards career development, noting that our engineering programs' success and our personal success go hand in hand. We believe that every situation is unique and the intention of the paper is not to answer specific situational problems. The idea is to help new faculty identify his or her unique opportunities and use those opportunities to achieve career success. Each program offers unique challenges. By focusing on opportunities, not on limitations, we have accomplished more than we even anticipated, and look forward to more creative and innovative effort. In summary, we effectively used our time and resources in such a way so as to create a well defined path for the FGCU WSOE and our career.

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