

Work In Progress - Progression of an Engineering Leadership Program for the Future

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Abstract: The Engineering Leadership Program at Iowa State University was launched in 2006 to inspire altruistic leadership in engineering students leading to greater civic and political engagement. The first cohort of freshmen scholars experienced a structured set of common leadership learning experiences, designed and implemented primarily by upper-class scholars. To guide the process of leadership development and create a standard of excellence, a set of outcomes and related competencies with key actions are being articulated in an iterative team process involving the scholars, faculty, staff, and advisors from across campus.

Index terms – Leadership model, civic engagement, student centered.

INTRODUCTION

The College of Engineering at Iowa State University established its Engineering Leadership Program (ELP) with initial funding from 3M in 2006 to develop engineers with the characteristics outlined in the *Engineer of 2020* by the National Academy of Engineering [1,2,3].

The overarching goal of the program is to develop future leaders within the engineering community who are committed to civic engagement. The objective is to increase the involvement of engineers in public life. This could be through activities such as participating in the policymaking process at state, national and international levels, or establishing non-profit organizations serving society. The long term metric for success is the social contributions graduates of the program make above and beyond their contribution as leaders in traditional engineering roles.

PROGRAM OVERVIEW

The ELP began its first full year of operation in August 2006 with a freshman cohort of 17 scholars selected from a pool of 110 applicants. Scholars were selected based on their past leadership experience, academic excellence, and written response to an essay question by a committee of faculty, staff, and students. The program is student centered and student led.

Scholars are responsible for program design, implementation and continuous improvement [3].

The first-year experience is devoted to community building and leadership development, through a set of structured, shared activities. Currently, upper-class students are teaming with first-year scholars to develop and refine elements of this experience. The first-year experience focuses on introducing scholars to theories of leadership and critical leadership competencies. Each scholar is then challenged to take on an active leadership role, applying the theories and competencies learned to a service learning project.

Current program elements include a leadership retreat, a credit bearing leadership seminar class throughout the first year, a service learning project, a common reading experience, multiple networking and skills development events and weekly reflection journals. The ELP has also been instrumental in creating some additional curricular opportunities that are open to all engineering students.

Within the first year of the program, there have been several instances of scholars seeking out greater challenges. One example is that of a first-year scholar taking the lead in developing marketing and recruitment materials for the program. With mentoring from upper-class leaders, he has made the recruitment process more streamlined and inclusive.

First-year scholars are also representing the ELP on a task force to create a broad-based, campus wide leadership model. They are sharing the ELP model with the team and working on optimal alignment.

These are examples of how ELP scholars are making a difference on the local level. The expectation is a scaling up to state, national, and international levels over time.

LEADERSHIP MODEL DEVELOPMENT

As program activities are implemented and improved upon, work is in progress to create a customized leadership model that incorporates the desired learning outcomes for the scholars. These outcomes are linked to associated competencies, supported and assessed, in turn, through key actions. The process used to develop this model has been an iterative team exercise involving faculty, staff and students at various levels to incorporate multiple perspectives and

establish a broad base of stakeholders on campus. Several existing leadership and assessment models contributed to the ELP model. The model also provides a framework to measure leadership development. Along with model development, a dynamic library of leadership resource materials is being developed for scholar use.

Through the discussions in model development process the team recognized several parallels between the competencies and characteristics of social leaders and abilities identified in the outcomes statements defined by the Accreditation Board for Engineering and Technology (ABET). Several of the ABET program outcome statements (specifically, d,f,g,h,i) are therefore incorporated into the ELP leadership model along with three additional outcome statements focused on diversity of thought, influence and visionary leadership [4]. These three additional statements are: students will demonstrate 1) an ability to create a vision, articulate it, and inspire others to share and implement it, 2) an ability to effectively influence and innovate to deliver results, and, 3) recognition of the need for actively encouraging diversity and an ability to create an inclusive environment. In the next step, the team identified the competencies and associated key actions supporting the ELP outcomes to create a matrix of outcomes versus competencies [5].

This model is a guide for the ELP scholars to develop their leadership throughout their participation in the program. Scholars will utilize leadership portfolios in years two through four to track their development. A locally developed electronic portfolio system tailored to their personal and professional development goals will be used for that purpose.

EVALUATION

The program evaluation activities are being conducted through the Research Institute for Studies in Education (RISE) at Iowa State University. Multiple surveys and interviews were conducted throughout the first year of the ELP. Feedback from these sources is currently being used to make improvements to the program.

Research is also under way for comparative assessments of ELP scholars with a control group of students who are not in the program.

In order to achieve the learning outcomes articulated in the ELP model, each student will submit a proposal for a leadership learning portfolio for years two through four. A team of advisors from the campus community and beyond are being recruited to assist in portfolio assessment. Self assessment and reflection are key elements for achieving the desired learning outcomes. The portfolios will be assessed and revised at the end of each academic year.

As the ELP matures and more data becomes available, the overall effectiveness of the program in student leadership development will become clearer. The ultimate proof of effectiveness will be significant public engagement and leadership from the ELP graduates after graduation.

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