

# Work in Progress - Engineering Leadership Program: The First Year Experience

Elif Eda Miskioğlu, Krishna S. Athreya, Nidhi Bhandari, Michael T. Kalkhoff, Diane T. Rover, Alexandra M. Black, Nathan D. Meisgeier

Iowa State University, eemiskio@iastate.edu, ks1@iastate.edu, nidhib@iastate.edu, mikekalk@iastate.edu, drover@iastate.edu, qbcsphd@iastate.edu, nmeisg@iastate.edu

**Abstract - The Engineering Leadership Program (ELP) founded at Iowa State University in 2006 is a four year student run leadership development program for undergraduate engineering students. The ELP is continually adapting to feedback from the scholar community, however the first year experience has emerged as a well structured learning experience. The first year ELP experience is designed to create a close knit community. Following a community building retreat, first-year scholars meet weekly in a credit bearing seminar taught by upper class scholars. In their second semester, scholars design and implement a service learning project, following a six sigma process. In the four years of ELP, the first year experience has led to a strong community within each cohort, which is highly valued by the scholars. As they progress through the program, they continue to seek opportunities to strengthen their relationships across cohorts. This model could be replicated more broadly within engineering and beyond for enhancing student engagement and retention.**

*Index Terms* – Community, Development, Leadership, Service Learning

## INTRODUCTION

The Engineering Leadership Program (ELP) was founded at Iowa State University in 2006 as a four year leadership development program for undergraduate engineering students inspired by the Engineer of 2020 attributes identified by the National Academy of Engineering [1]-[3]. As a pilot program, the ELP is continually adapting to formative feedback from the scholar community, however the first year experience has emerged as a fairly well structured learning experience in the course of the past four years.

In the first year of the ELP, scholar experiences are designed to create a close knit learning community through a series of cohort activities. In their first weekend of class, scholars take part in an off-site community building retreat where they begin their transformation from strangers into a close knit community. The retreat activities are designed to build trust and emphasize self awareness as an essential component of evolving as a leader. It also lays down the

expectation of personal commitment from scholars to the goal of leadership development for the purpose of meaningfully contributing to improving their communities.

The retreat includes opportunities to interact with upper class scholars and program affiliates, participate in team building and trust building activities, and motivational speakers on leadership. There are opportunities for introspection through a Myers-Briggs Type Indicator feedback and activity session, based on their MBTI results from surveys submitted prior to arriving on campus [4]. Scholars are able to learn about themselves and about the value of differences when problem solving in teams. They are also introduced to the ELP Leadership Model with its eight learning outcomes that are based on developing in 19 competencies, with defined supporting key actions. These learning outcomes are closely aligned with ABET outcomes, the first five mapping exactly and three new ones articulated specific to leadership [5].

The first year scholars are all registered for a weekly credit bearing seminar taught by upper class scholars where they are exposed to a variety of topics related to leadership theory and development. Seminars are both lecture based and hands-on. Students are challenged to experience important concepts such as coaching and developing others through projects and activities. Oftentimes they are thrown into an activity with little thought as to the leadership theory it involves, later being required to reflect individually and as a whole on what competencies they utilized. As part of this seminar, scholars are required to do weekly reflection journals to develop self awareness.

With the focus on personal growth and leadership development, one-on-one interaction with other program members is crucial. Thus, scholars meet with either the course instructor or TAs twice monthly to personally discuss their development and personal goals. These discussions are guided by, but not limited to, their weekly reflections. Such a meeting provides the scholar with an opportunity to not only discuss program related concerns, but also seek advice on decisions such as whether to change majors or to simply share the personal challenges of transitioning from their home communities to a large college setting. Scholars are continually reminded to look for the learning opportunities in every difficulty as they forge their path at Iowa State.

In their first semester, the heart of the seminar experience comes from a common reading assignment, *Free the Children*. Through this story of a 12-year-old Canadian

boy who became an activist against child labor and a notable change agent, scholars are exposed to qualities of a successful leader as well as encouraged to believe that if they desire to, they can have a global impact. So often students feel confined and limited in their aspirations, when all that is necessary is the desire and utilization of the right resources.

### SERVICE LEARNING PROJECT

In their second semester, scholars are challenged to design and implement a service learning project of their choice in which they are required to follow a six sigma process. This strict adherence to a process with the challenges of effective peer communication and teamwork, where scholars are called upon to follow as well as lead, creates some very interesting and sometimes uncomfortable learning dynamics for self identified leaders who are just beginning their college experience.

The ELP first-year cohort is required to follow the Design, Measure, Analyze, Improve and Control (DMAIC) process when designing and implementing their service learning project, with gate reviews after each stage [6]. An upper class project mentor is available to the scholars but the project manager(s) are from their own first-year cohort. A fairly high level of support is available to the cohort; however, they have to recognize their needs and initiate the requests for support. This forces scholars to identify the level and timing of project support needed and the professional manner to seek it. The group actually passes through the Storming, Norming, Forming and finally Performing stages of group development which creates palpable levels of frustration before they emerge as a tightly knit community [7]-[8]. It forces them to develop communication skills related to giving critical feedback to peers while establishing their personal accountability to a team and project. The journal reflections and upper class mentors get used very effectively by the scholars in negotiating the challenges of effective teamwork.

Near the end of the second semester, the cohort is able to present their Service Learning Project to other ELP scholars and campus leaders at the annual Leadership Engineering Networking Symposium. The cohort is required to prepare a poster for the event's poster session, where they have the opportunity to present their project, and share reflections related to the learning from the process they followed as a group.

### SCHOLAR SELECTION

Scholars are selected in the spring for the following fall. There are two categories of applicants: first-year and upper scholar. The first-year applicants are incoming freshman to the Iowa State University College of Engineering, while the upper scholar pool consists of current Iowa State students and transfer students.

The application itself is provided on the Engineering Leadership Program website. It is designed to gather a variety of information from the potential scholar, including

academic, extracurricular, and leadership experience. For the first-year scholars, the focus of the application is towards understanding the reflective tendencies of the applicant through questions that ask them to elaborate upon difficult experiences and leadership challenges they have faced.

Applications are initially evaluated by a team of reviewers consisting of program staff and leadership, industry representatives, and faculty members. Once narrowed to the top fifty, the available reviewers meet to generate a top twenty-five list and then again to choose the final group of approximately fifteen. Scholars are evaluated based on their breadth of involvement, leadership experience, utilization of opportunities present, and most importantly potential for growth and development.

### NOT LIKE OTHER PROGRAMS

Leadership programs are becoming increasingly popular. While many universities host such programs, the Engineering Leadership Program at Iowa State University is distinctly different for one reason: it is student led. Northwestern University's Center for Leadership is led by a director and associate director, both of whom are faculty [9]. The Hart Leadership Program at Duke is led by ten faculty and staff members [10]. The leadership team of the Engineering Leadership Program at Iowa State is composed of one faculty director, one advisor, one staff, a student director, and approximately five associate student directors. The students of the leadership team have large responsibilities, such as teaching the first-year seminar, teaching the second-year seminar, on-campus relations, and external relations. Additionally, there are students in charge of all events and initiatives of the program. These include planning the fall retreat, coordinating peer and faculty mentor programs, organizing dinner and discussion, and public relations. It is this student led nature of the ELP that distinguishes it, and maximizes scholar growth as students are able to take their development into their own hands.

### CONCLUSION

In the four years of ELP, the first year experience has led to a very strong sense of community within each cohort [11]. This community aspect of ELP is highly valued by the scholars. As they progress through the program, they continue to seek out opportunities to strengthen their relationships and build strong connections to the other cohorts.

This is a reflection of the effectiveness of the first year experience in networking and community building, and evidence of scholars' personal growth as they seek out a variety of campus leadership roles. This intensive first year cohort model could be replicated more broadly within engineering and beyond for values based community building that enhances student engagement and retention.

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### AUTHOR INFORMATION

**Elif Eda Miskioğlu**, Engineering Leadership Program  
Student Associate Director—Year 1, Iowa State University,  
[eemiskio@iastate.edu](mailto:eemiskio@iastate.edu)

**Krishna S. Athreya**, Engineering Leadership Program  
Director, Iowa State University, [ksa1@iastate.edu](mailto:ksa1@iastate.edu)

**Nidhi Bhandari**, Engineering Leadership Program Advisor,  
Iowa State University, [nidhib@iastate.edu](mailto:nidhib@iastate.edu)

**Michael T. Kalkhoff**, Engineering Leadership Program  
Student Director, Iowa State University,  
[mikekalk@iastate.edu](mailto:mikekalk@iastate.edu)

**Diane T. Rover**, Associate Dean, College of Engineering,  
Iowa State University, [drover@iastate.edu](mailto:drover@iastate.edu)

**Alexandra M. Black**, Engineering Leadership Program  
Student Associate Director, Iowa State University,  
[qbcsphd@iastate.edu](mailto:qbcsphd@iastate.edu)

**Nathan D. Meisgeier**, Engineering Leadership Program  
Engineering 150 Student Teaching Assistant, Iowa State  
University, [nmeisg@iastate.edu](mailto:nmeisg@iastate.edu)