



## **”STEP-ing” Up: Building a Successful Student Leadership Program**

**Adrienne Steele, Louisiana State University**

Adrienne Steele has over 18 years experience in STEM education. Currently, Adrienne works at Louisiana State University, managing all aspects of the STEP project that consists of a large-scale peer mentoring program in the College of Engineering. Previously, she founded and coordinated the Scope-On-A-Rope Outreach Program (SOAR) in the Department of Biological Sciences, where she worked for 10 years. Prior to her positions at LSU, Adrienne was the Science Education Curator at the Louisiana Art and Science Museum in Baton Rouge. Adrienne has a Master of Science degree in zoology from LSU, where she studied in the Museum of Natural Science collections, and an Education Specialist Certification in science education.

**Dr. Warren N. Waggenspack Jr., Louisiana State University**

Warren N. Waggenspack, Jr. is currently the Undergraduate Program Director and holder of the Ned Adler Professorship in Mechanical Engineering at Louisiana State University. He obtained both his baccalaureate and master’s degrees from LSU ME and his doctorate from Purdue University’s School of Mechanical Engineering. He has been actively engaged in teaching, research and curricula development since joining the LSU faculty in 1988. As Associate Dean in the College of Engineering (2004-2014), he acquired significant funding from NSF to support the development of several initiatives aimed at improving student retention and graduation rates as well as supporting faculty with development of effective learning and teaching pedagogies.

## **“STEP-ing” Up: Building a Successful Student Leadership Program**

### Abstract

The College of Engineering (CoE) at Louisiana State University has built a highly successful student mentoring and leadership program over the past ten years initiated with support from the NSF STEM Talent Expansion Program (STEP). The peer mentor program evolved from the STEP 1a grant in response to a need for upper-level students to assist with the freshman bridge camp. Starting the camp with five mentors in 2008, it now engages over 160 (2017) and encompasses significant leadership training. Peer mentors are undergraduates from all majors within the College of Engineering including second semester freshmen through graduating seniors. In 2012, the students at LSU established a new organization, the Society of Peer Mentors (SPM) to formalize their efforts at the university. SPM fosters a hierarchy of upper-level students serving as leaders to mentor new members and to create and deliver programs. Peer Mentor Leaders (PML) facilitate the recruiting, application and interview process for new SPM members; they develop and lead projects during the freshman camp as well as supervising other mentors, and they often serve as officers and chairs of the student organization.

Mentors participate in at least 12 hours of leadership training each year, which in the past two years has grown to include an off-campus, overnight retreat. At these leadership trainings, they learn about mentoring and leadership principles while bonding through team building activities. A strength of this program is that students quickly put their skills to use through developing and leading a wide variety of activities. Mentors serve as engineering supplemental instructors (initiated with the STEP 1b award), work in K-12 schools as mentors for robotics teams, perform several hours of outreach to K-12 students each semester, and mentor incoming freshmen during the bridge camp and introductory courses. Mentors are also encouraged to pursue their own ideas and passions, and they are given support to plan and carry out novel programs. Mentors have written proposals and been given seed funds for innovative activities such as a the first 24-hour computer hackathon in Louisiana, a weekend bootcamp for sophomores in chemical engineering, and a 3-day robot build, each demonstrating leadership and commitment to the community.

Analyses have shown that mentors are retained and graduate in engineering at a 30-40% higher rate than their CoE peers. Over 80 mentors have graduated since the beginning of this program and are now employed across a spectrum of engineering industries. They continue to serve as important role models for our students, returning to share their stories and experiences starting engineering careers.

### Program History

In 2007, the College of Engineering at Louisiana State University was granted its first STEP award from the National Science Foundation. The focus of STEP 1a was to improve engineering student retention through freshman initiatives including a bridge camp and an introductory course. The first freshman bridge camp, Encounter Engineering (E<sup>2</sup>) was held in 2008, and five upper-class students were hired to serve as mentors for this program. Having a mentor for the week was, and continues to be, the highest rated part of the program according to

feedback from participant surveys. The success of the E<sup>2</sup> camp was a catalyst that fueled the expansion of the peer mentor program, growing the program to 163 students in 2017. In 2012, these students formed their own student organization, Society of Peer Mentors. They have elected officers, a constitution, and monthly meetings. That same year, SPM was nominated and chosen as the best new student org at LSU. The peer mentor program has evolved a lot over the years to accommodate the large number of students and to challenge them in new and creative ways. Experienced peer mentors became leaders within the group (PML) over time, assisting with all aspects of the program. This hierarchy of mentors, leaders, and officers has made a big impact on the success of the program and has allowed it to grow to its current size.

### Current structure & activities

In order to become a peer mentor, a student needs to have a major declared in the College of Engineering at LSU, to have completed one semester of coursework, and to be in good standing with the university (not on academic or behavioral probation). Applications to join SPM open at the beginning of the calendar year, and all prospective mentors are interviewed by current members. This scheduling process is time intensive and primarily coordinated by the SPM President with help from the other officers. Each applicant is assigned a 30-minute interview time of their choice and is paired with two mentors who conduct the interview. They are asked to dress in business casual attire and to bring a resume. The officers prepare questions to ensure consistency between interviews using examples that are commonly asked in industry internship interviews. This is meant to be a learning experience for all involved—it can be the first real interview for many younger students, and the interviewers appreciate the perspective gained from sitting on the other side of the table. In January 2018, mentors conducting interviews also completed a feedback form at the end of each interview in order to give constructive criticism and advice to the prospective members. The newly inducted mentors were given their interview feedback forms and edited resumes at the first leadership workshop held the first weekend in February.

All peer mentors undergo at least six hours of leadership training per year; new mentors must participate in 12 hours of training. Two leadership workshops are held each spring, and these workshops are facilitated by the staff advisor and peer mentor leaders (PMLs). The main purpose of these workshops is to go over roles and responsibilities, to learn important mentoring and leadership skills, and to build community among the members. For the past three years, the first workshop was an overnight retreat at a local state park. The second workshop is usually held one month later on campus with faculty and staff partners from the College of Engineering. Returning mentors can choose to attend one of these two trainings, while new mentors are required to attend both. The mentor retreat includes several teambuilding activities and provides social time for the group to get to know each other. The workshop portion of the retreat is meant to inspire students to be good role models and to reflect on what it means to be a mentor. A few PMLs conduct activities and give presentations on topics such as making the most of LinkedIn, preparing for internship interviews, leading K-12 outreach activities, and doing what's right instead of what's easy. Having student leaders present these activities not only builds their own skill sets, but also inspires newer mentors of the organization to become more involved. SPM alumni who recently graduated have also come back to share their experiences with the program and how it helped to prepare them for careers in industry. Leaders of other engineering student

organizations, summer camp counselors, and college ambassadors are invited to participate in the second leadership workshop with the peer mentors. A team of staff plan activities and presentations with input from the students. Past topics of this workshop include intergenerational communication, cultural awareness, DiSC<sup>®</sup> leadership styles, personality type assessments, and conflict resolution. Many of these workshops have been supported by industry partners, and they have sent representatives to help deliver some of the activities.

Once the leadership trainings are completed, there a number of ways for mentors to get involved in the organization. The most popular activity is working the Encounter Engineering (E<sup>2</sup>) bridge camp. More than half of the new members who join SPM were participants in this camp as incoming freshmen. Their experience with having a mentor during E<sup>2</sup> imparts a strong desire in many students to want to do the same for the next class. This is an important step, as the college is striving to expand E<sup>2</sup> each year, with a goal to reach as many incoming students as possible. In 2017, 94 peer mentors were hired to work with 330 participants, just below one-third of the incoming freshman class. These freshmen were placed into teams of four to five, each with a team leader. These teams were divided into six groups, each with two to three group leaders. Other mentor positions are logistics leaders, program leaders, and design leaders. The mentors truly run most aspects of this camp!

Mentors also perform many hours of K-12 outreach each year. These outreach events include Family STEM Nights at local schools, summer camps, school presentations, and special events such as Ocean Commotion held at LSU every fall. The SPM Advisor and mentors come up with engineering-themed activities that are engaging, informative, and easy to replicate. The organization has a “menu” of activities from which to choose for each event. Training on how to lead these activities takes place at the mentor retreat. In addition to these activities, about 20 students each year serve as robotics mentors. These mentors are interviewed for paid positions and go to local K-12 schools to assist with their robotics teams. Two PMLs serve as Robotics Co-Chairs, acting as school liaisons and coordinating student and school schedules.

In order to encourage active participation by all members, Society of Peer Mentors instituted a points system in 2014. Mentors earn participation points for attending meetings, participating in trainings, going to outreach events, working E<sup>2</sup>, and serving as robotics mentors. Mentors have to get 20 points each year to be considered an active member. Mentors with two or more years of active membership earn honor cords at graduation. Points are tracked through the university’s Community Moodle system; the Secretary makes sure all members are in the Moodle group and enters their points. This system has proven to be quite effective. In the formative years of SPM, only a handful of mentors were truly active; i.e. the same students were always volunteering to do everything. Over 50% of mentors earned 20 participation points in 2017, thus achieving active status, and 65% earned at least 15 points. (87% of the mentors who rejoined in 2018 earned at least 15 points.) Nearly one-third of mentors went above and beyond, achieving anywhere from 25-52 points last year! This is especially impressive due to difficult course loads and the other demands facing engineering students.

Students who join Society of Peer Mentors become true leaders in the College of Engineering. They often become officers of other student organizations, they are asked to represent the college at recruiting events, and several of them have initiated new events and

groups. With industry donations, a Leadership Legacy account was created in 2013 to fund seed projects and to give awards to outstanding graduating seniors. As of January 2018, five seed projects have been funded. To qualify for funding, mentors have to write a short proposal that includes a budget, expected deliverables and a brief plan for quantifying the return on this investment. They are also expected to provide a written executive summary at the end of their project. Recent projects include: a 3 Day Robot build, a 24-hour computer programming event (Geaux Hack), a sophomore-level chemical engineering boot camp, a workshop for high school teachers to help them improve their robotics teams, and the formation of a new student organization that focuses on building combat robots (Bengal Reauxbotics). The donations in this account also fund the Leadership Legacy Award. This is a highly coveted award given to outstanding graduating seniors who have left a lasting impact on SPM. They are nominated by their fellow mentors, and a staff committee chooses the final recipients. A small award ceremony is held each semester to honor these student leaders. Fourteen graduates have won this award since December 2013.

### Assessment

Students who join Society of Peer Mentors are 30-40% more likely to be retained and to graduate with an engineering degree from LSU (Figure 1). Preliminary analyses reveal that they aren't the best students in their class—mentors are representative of the college as a whole regarding GPA (except that there are proportionately more females in SPM than in the college, about 45% vs. 20%). The authors attribute these high retention rates to the community built among these students and the hierarchy of experienced mentors serving as true role models for the newer members. Many SPM alumni have contacted the staff advisor after graduation to relay how being involved in this organization helped them make it through the challenging engineering curricula as well as helped to prepare them for their careers.

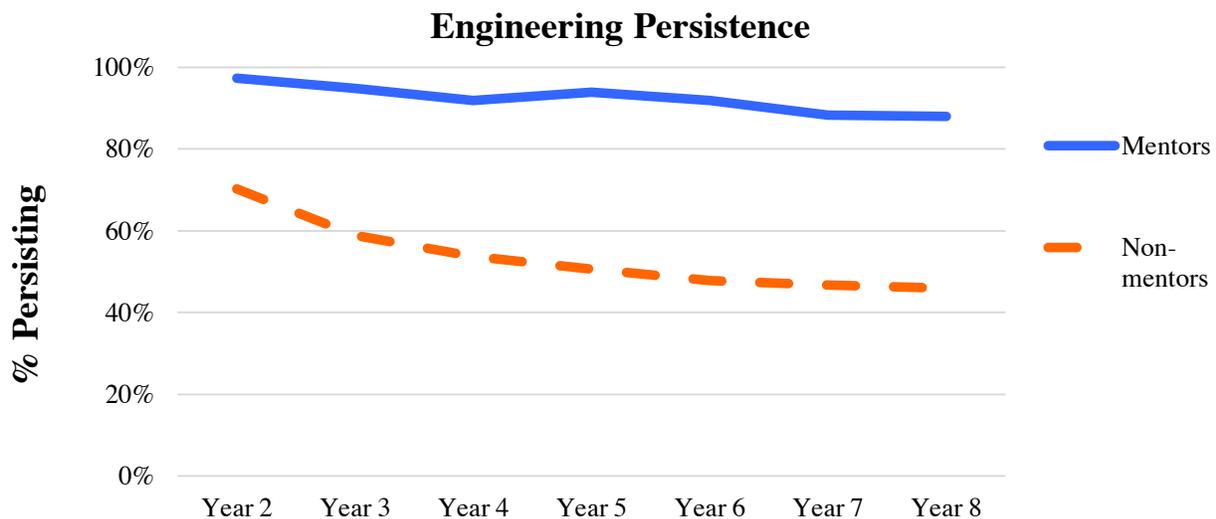


Figure 1. Engineering retention and graduation rates for peer mentors compared to other students in the college. Students included in this analysis are from the 2007-2015 cohorts, which is made up of over 11,000 students, 262 of which are peer mentors.

## Lessons learned

A large-scale mentoring program is not built overnight. Many years and staff-hours have gone into developing, refining, and improving the peer mentor program at LSU. Some of the lessons learned over the years include:

- Get students' feedback and to listen to it. Faculty and staff will have to make some decisions, but the more ownership the students have over the program, the more they will be invested in its success.
- Encourage students to try new things, to really push themselves out of their comfort zones. Leadership skills don't develop by listening to someone talk about it—they have to do it themselves. Mistakes will be made, but the lessons learned are invaluable.
- Develop and make clear guidelines. Having clear, detailed rules will enable the advisor and others to treat all students fairly without showing favoritism. This also helps mentors understand what is expected of them, so there are no surprises.
- Recognition is important. Students love to see their names on the “graduation board,” to receive a certificate for going above and the beyond the required participation points, being chosen for “mentor of the month,” having the chance to earn honor cords to wear at graduation, and possibly being recognized as an outstanding graduate by receiving the Leadership Legacy Award.