

Work-in-Progress – Development of a student-based mentorship program for first-year environmental engineering students

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Abstract - We have recently completed the second year of a mentorship program for first-year students (~50) in the environmental engineering (EVEN) program (~200 students), in which senior environmental engineering students volunteer their time to mentor the incoming students. The program is introduced through the fall semester Introduction to Environmental Engineering course which is required for all incoming students. The objective of the program is to support first-year and transfer EVEN students as they gain their footing in the EVEN Program and in life at CU Boulder. The approach is to assign each senior mentor five to six mentees. This is a volunteer effort. Mentors are also volunteering their time, but get a couple of free meals as a token. The mentor's objectives are to provide student-student mentoring, while increasing interactions between upper-class and newer EVEN students. In the first year of the program we divided up the first-year students by an academic measure: their interest in one of the seven EVEN tracks. The mentors were then assigned based on their EVEN track. In the second year of the program we divided up the first-year students by their residence hall assignment (including an off-campus category). The mentors were then assigned based on their first-year residence hall. The mentors are introduced to the first-year students in class. It is made clear to the first-year students that they are not required to participate. We have analyzed the results of both the mentee and mentor post-class surveys. We increased the participation from 20% the first year to 30% the second year, but we expect more.

Index Terms – Mentorship program, senior-first-year, student-student

The environmental engineering (EVEN) program at the University of Colorado- Boulder graduated its first-class with BS degrees in 2002 and became ABET accredited in 2003. The first-class 14 years ago had 5 graduating members. The EVEN program has grown rapidly, with an anticipated incoming first-year student class of 70 students for fall 2016. This growth has changed the culture in the program from one where the faculty know all of the students in the entire program to one where the many EVEN students

go unrecognized by most faculty. In response to this growth and the associated change in the faculty-student dynamic, we initiated a mentorship program for first-year students (~50) in the program (~200 students), in which senior environmental engineering students volunteer their time to mentor the incoming students. The mentorship program is introduced through the fall semester Introduction to Environmental Engineering course which is required for all incoming students. The objective of the program is to support first-year and transfer EVEN students as they gain their footing in the EVEN Program and in life at CU Boulder. The approach is to assign each senior mentor five to six mentees. They first meet with the first-year EVEN students in our EVEN 1000 lecture, then meet/ communicate with them two to three times throughout the semester. Our initial design was to carry this through the spring semester. This is a volunteer effort. EVEN first-year students are not required to participate. Mentors are volunteering their time, but get a couple of free meals as a token.

The mentor's objectives are to provide student-student mentoring, while increasing interactions between upper-class and newer EVEN students; to aid in the academic, emotional and social adjustment of first-year students; to grow a culture of giving and volunteerism at CU Boulder; to encourage the development of student relationships with other engineering students and staff and to provide consistent, reliable sources of support, information and inspiration. The mentors are trained in a 2-hour session in which their roles and responsibilities, including ethics, are stressed. They are also provided a 7-page manual that draws from the College of Engineering Peer Advocates manual. The mentors are enthusiastic students and for the most part committed to the program. Both years we had 12 senior students volunteer as mentors. The gender makeup both years was 75% female. The gender make-up for the first-year students is 60% female and for the faculty it is 50% female.

In the first year of the program we divided up the first-year students by an academic measure: their interest in one of the seven EVEN tracks/options. The mentors were then assigned based on their EVEN track/option; air quality, applied ecology, chemical processing, energy, engineering for developing communities, remediation, and water resources and treatment. In the second year of the program

we divided up the first-year students by their residence hall assignment (including an off-campus category). The mentors were then assigned based on their first-year residence hall. The mentors are introduced to the first-year students in class. It is made clear to the first-year students that they are not required to participate. We have a break-out session in which contact information is exchanged on a volunteer basis. The mentors then try to set up meetings outside of class. In the first year the introduction took place in the 7th week of the semester and in the second year in the 3rd week.

The program has not met our expectations as we have had low participation. At the end of both the fall semester we conducted a 15 question survey on the mentorship program as part of the final exam in the Introduction to Environmental Engineering course. Students were given extra points for taking the survey. Both years we had over 90% survey participation with 55 EVEN students taking it in 2014 and 51 in 2015.

The survey results are summarized in Table I and confirmed our assessment of low participation. Only 18% participation in the first-year and increasing to, but still low, 29% participation in the second year. We introduced mentors in the 7th week of the semester in the first-year. The results from the first-year showed that 83% of the students wanted the program introduced earlier, so in the second year we introduced the mentors in the 3rd week. Even then the 2015 results showed that the 65% of the students want the program introduced earlier.

Both years two thirds of the students that did not utilized the program listed 'no time' as the reason and less than 20% said that they were not interested. About 20% said that they were not contacted (which contradicts what the mentors reported, less than 10% not contacted). For those that did participate more than 50% evaluated the quality of their experience as 'good to great' in the first year and that increased to 73% in the second year. When asked for suggesting for improving the participation in the program a range of responses was received, including: more emails, try texting, an action item that will force a response, extra credit, make the first-contact part of a homework assignment, make it fun, have it as part of a tutoring program and multiple emails.

We also surveyed the mentors after the 2015 course with only a 60% response rate (some had graduated). The mentors said the most difficult part was the initial communication with the first-year students. They tried both email and text, and often needed three contacts to get a response. They met students both as groups and individuals, and sometimes just communicated via email or text instead of meeting. Most questions that the first-year students brought up were focused on which courses to take, how to handle the stress, does it get easier, how to interact with faculty, and what is it like to be a senior. The mentors all felt it was a good program to continue and many wished it had been in place when they were first-year students. They offered a range of suggestions to make the program more successful. These included meeting the first-week of classes,

making it a course assignment to have at least one meeting, and screening out students that don't want to participate.

We are evaluating the suggestions from both the first-year students and the mentors for the upcoming semester.

Summary of mentor survey

Six of the 11 mentors responded to survey.

What did you do to contact your mentees?

Combination of emails and texts with occasional in person contact (e.g., at student meetings)

How persistent did you have to be?

Most mentors contacted them more than 3 times to set up a meeting, but others only once.

Was it difficult to get responses?

No response was received for most emails and texts.

How many times did you meet or talk with a mentee or your group of mentees?

This ranged from zero for two groups to 6 meetings for two groups, with the others at 2 or 3 or not reporting.

Did you interact with your mentees on an individual basis or as a group?

Only one group reported meeting as a group, the others met as individuals.

What sort of questions/conversation topics did your mentees have for you?

Classes- What classes to take, which professors, what certain classes are like, which option courses and tech electives, how a certain class was in regards to difficulty.

Their concern about doing poorly in classes and their ability to be an engineer.

What it's like being an upperclassman.

How to approach professors.

Stress -Asking of ways to cope with stress... stress about midterm grades. Does it get easier?

I enjoyed getting to know them in regards to their hobbies, and interests outside of classes.

Is this program something you believe should continue?

How could it be made more valuable?

Yes, but I think it's really challenging to coordinate meeting with them. Meeting with mentees is where the best conversation happens, but it's so difficult to get them to commit to a date and time. I think introducing the mentors the first-week of class would be helpful as opposed to waiting until several weeks in. I think it's just so hard to get students interested for an extended amount of time.

Yes, I think it's helpful to those who actually use it. Though many students may not take the opportunity to talk with us it seems worthwhile for those who do.

Also it may be helpful to provide the students with some incentive for being in the mentor groups

Yes, but the low participation makes it difficult and somewhat discouraging for mentors. It might be better to have students actively sign-up to participate and then divide them up into mentor groups.

It may make sense for at least one meeting with a mentor to be mandatory and an assignment for the Intro to EVEN class.

I feel that the hardest part between mentees and mentors is

the age/year gap. Freshman see us as people who are above them and cannot really relate to them because we've already been through what they are currently going through.

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TABLE I.
MENTORSHIP MENTEE SURVEY RESULTS

	2014			2015				
	ARE YOU A FIRST-YEAR, FIRST-SEMESTER EVEN STUDENT?	Yes	No		Yes	No		
	83%	17%		88%	12%			
IF SO DID YOU UTILIZE THE PROGRAM?	YES	NO		YES	NO			
	18%	82%		29%	71%			
SHOULD WE START THE PROGRAM EARLIER IN THE SEMESTER?	Yes	No		Yes	No			
	83%	17%		65%	35%			
IF NOT WHY?	NOT INTERESTED	NO TIME	NOT CONTACTED	NOT INTERESTED	NO TIME	NOT CONTACTED		
	14%	65%	20%	17%	63%	20%		
IF YOU DID UTILIZE THE PROGRAM, HOW WAS YOUR EXPERIENCE	BAD	OK	GOOD	GREAT	BAD	OK	GOOD	GREAT
	0%	45%	27%	27%	0%	27%	40%	33%