They left with hopes, dreams, and aspirations. They left with some skills in their toolbox, a bit of money in the bank (hopefully), a full tank of gas, and a wide open road. And where that road ultimately leads, is just as fascinating as the journey itself.

Each semester, approximately 1000 engineering students venture beyond the confines of UC’s main campus. Our role in ProPEL is to assist in this exploratory process. This structured program (aka co-op) enables the students to start taking an active role in their professional development. Every term the students are reminded that we do not have 1000 jobs for them to sign up for, as if it were a job board. In fact, we have much more than that. ProPEL has established relationships with over 600 active engineering firms. Our role is to engage and introduce those students to these firms so they can begin developing their own individual relationships and connections. They begin their journey not only with a job, but with a budding relationship as well.

The ProPEL Fall 2015 Summary is an attempt to share some of these student stories and relationships with employers. The ProPEL faculty have a unique role of bridging the gap between the classroom and commercial enterprise, straddling the theory and practice domains.

And because engineers enjoy data, the last section, By the Numbers, has specific data on the respective programs.

Jim Tappel
Assistant Director, CEAS & IT Programs
University of Cincinnati
The fall term, for the class of 2017 is an opportunity for the students to finalize their co-op rotation with a double section, Spring/Summer prior to their senior year. Because of the double section, many students view this opportunity to think ahead towards graduation and think about where they want to be at graduation. Working with students in this framework poses both rewards and challenges as they wish to change employers. Several students have been very engaged in their personal search for opportunities.

Students in the class of 2018 are all on co-op this term and I’ll be meeting with them when they return in January. This is the first time they are together in one cohort on co-op, completing their second rotation. Students in the class of 2019 are still in split sections with some students on co-op in the fall and the remainder schedule to co-op in the spring.

Job development efforts have been active both regionally, nationally and international. The aerospace industry employs engineers from every engineering discipline, so this industry still continues to be a primary focus.

Largely based on student initiative, there was one aerospace co-op student working at Space X in the Fall, bearing witness to a historic milestone. As the old aeronautical saying goes, take off is optional, landing is mandatory. In the case of first stage rocket boosters, the landing is usually harsh and unforgiving. Space X, in December, 2016, successfully landed the booster stage after propelling a commercial satellite into orbit. The real story here is that the student pursued her dreams and landed a co-op opportunity with one of the premier aerospace firms in the world.

The key challenges that lay ahead is the skill set demands that understand this and financially support technical training that is specific to their business. Small to medium size firms struggle with the financial stress of training and rely on a trained workforce hire. Encouraging these firms to consider co-op is possible, and the interest is there with upperclassmen who have several years of classroom and a few semesters of experience. A harder sell is for them to consider a sophomore candidate one their first rotation.
The Class of 2019 and 2017 are going out for co-op for the Spring Semester 2016. The Class of 2017 will be co-oping for both Spring and Summer while 2019 will be going out for the first time. All of the students in the Class of 2017 have been placed in a position for their last two and I have only 5 AE’s left to place in 2019. I am not worried about getting these students a position by the end of the semester. We have 5 new employers that have hired for the upcoming fall and our top employer is KLH Engineers located here in the Cincinnati regional area. AE students are performing well while out on co-op!

Matt Baker is returning to Helix Electric for his last two co-ops and will be located in Hawaii. He will be working in operations building a solar farm for Helix. Matt worked his first two co-ops designing electrical systems for PE Services—one is Lebanon, Ohio and one is Dallas, Texas. He then accepted a position with Helix in San Diego, California working in the main office with their virtual group in preconstruction. He did such a great job that Helix asked Matt what part of the business he wanted next and this is the opportunity that was offered.

Challenges: Increase in number of students every year since the first class of AE’s went out on co-op keeps me in constant job development. Market is good and students filling the designing mechanicals void.

Damien Rushing put together this model for Messer Construction for a bid at the University of Tennessee. Company said Damien’s 3D modeling helped them secure the project. [CLICK HERE FOR VIDEO]

As of the start of the Spring 2016 academic semester, 90% of the 92 biomedical engineering students actively seeking spring co-op positions have accepted positions. The details of these positions are provided in the table below. This compares with a 98% placement rate for the spring 2015 semester. There were 97 students available last year for spring 2015, as compared to 108 this year.

Collaboration continues between Propel faculty and BME faculty to develop a competitive BME curriculum that is attractive and convincing when discussing potential opportunities with employers.

Biomedical engineering students continue to show interest in international opportunities and have consistently supported the Joint Co-op Institute (JCI) through pursuing the opportunity to be a full-time teaching assistant at Chongqing University for a semester. While the JCI does not offer a biomedical engineering course of study, the students find the teaching experience valuable in discerning graduate school pursuits. Additionally, the immersive international experience is one of a kind and the student reflection following the experience is rich with personal and professional learnings as well as the beginnings of cultural competency. To date, 6 of the 17 undergraduate teaching assistants at CQU since spring 2014 have been BME students.

Challenges
- Approximately 135 biomedical engineering students require summer co-op positions.
- Increasing the number of relevant opportunities in the medical device industry.
- Developing a more straightforward process for students and faculty interested in academic research as a part of the co-op experience.
- Spiking enrollment compounds challenges already existing in the co-op program and job market and also presents a challenge in delivering meaningful reflective learning practice to students during and following the semester.
Students completing a summer 2015 co-op were evaluated by employers as having an average overall performance of 4.4 out of a possible 5. Chemical engineering students are doing fantastic work while in the field! I’ve created new course materials to support reflective process strengthening the teaching of ethics during the second semester co-op. This was well received by student participants. The largest co-op employer is BASF – The Chemical Company and I am excited to welcome Solvay as one of our newest employers.

Student Profile: Nathalia Backeljaw returned from a two co-op rotation in Brussels, Belgium where she worked on hydrogen storage tanks for fuel-cell vehicles for Toyota Motor Europe. She worked with people from 65 nationalities and presented the results of her project to interested parties at Toyota Motor Europe headquarters as well as Toyota Motor Corporation in Japan. She is in the market for a full-time job for after graduation in April 2016. She is interviewing with SpaceX as well as Toyota Motor USA.

Challenges: The rapid growth of the program presents challenges with regard to providing enough job opportunities for students. Fall 2015 saw a 30% increase in the number of jobs over Fall 2014; however, the number of students in the class of 2019 is more than 50% larger than the class of 2018, so this increase fell short of the job need. The class of 2020 is another large class so I anticipate continuing to put many hours into job creating over the next several semesters and years.

Civil engineering had 107 students co-oping for the 15 Summer Semester term. There are 84 students co-oping for 16 Spring Semester term for a 100% placement for both 15 Summer and 15 Fall Semester terms. Employers hiring the most students include: Walsh, Messer, Kleingers, Duke, Kokosing, Danis, Kroger and Bayer Becker. I would like to acknowledge their strong support of our Civil Engineering program.

Challenges: Efforts are being made to improve the PAL reporting system and we hope to have a new and improved version of PAL available for summer term. We are also working with larger employers to make the registration process as painless as possible. The number of civil students continues to rise and we continue to provide students with challenging co-op opportunities. Moving forward focus will be on providing students with more co-op opportunities in structural engineering, transportation engineering, and geotechnical engineering.

Students: Many of our seniors have already been hired for permanent placement upon graduation. These early hires speak highly of our students and our co-op program. Our Civil Engineering students are high performers who represent the University of Cincinnati very well. We had two students, Samantha Zogheib and Jeff Head participate in the International Co-op Program in Germany for two semesters. Jeff Head shared with me that he was able to leverage his ICP co-op to visit multiple cities in Europe and Russia. Jeff had co-oped for First Energy for his second and third co-op terms. His interest in energy inspired him to visit the deserted Chernobyl nuclear energy site in Russia. Jeff has been hired by Shell Oil for permanent hire and will be moving to Houston after graduation. Congratulations to all seniors!
There were 73 students searching for a co-op position during the fall 2015 semester. As of the date of this report (12/8/15) 57 students have been placed (78%). Of the students seeking a spring co-op, 11 (15%) were in the class of 2017, 23 (32%) from the class of 2018, and 39 (53%) from the class of 2019. A majority (75%) of the students still seeking a spring co-op (unplaced students) are from the class of 2019. It is anticipated that an additional 12-14 Computer Engineering students from the remaining 16 currently unplaced will be placed prior to the start of the spring term.

There are currently 74 students out on co-op this fall 2015 term, of which 84% are on co-op within the Cincinnati region. We have students on co-op as far as Washington D.C., California and Singapore. As with most terms, Siemens PLM Software and Intelligrated are our top employers having employed 22% of all students on co-op in the fall term. ABB, Inc. (Robotics, Automation, Controls) was added as a new employer this fall and hired 1 student for the fall and 1 student for the spring semester. PFP Cybersecurity, located in Washington D.C., was added as a new employer for the fall and so far has hired 1 student and is currently interviewing for the spring. The NSA was added as a new employer last year and has hired their first UC student for the spring term. ProPEL continues to develop new jobs for students in Computer Engineering, with a particular focus on hardware-oriented jobs, opportunities in Silicon Valley, and expanding further into newer industries such as cyber security, wearable technology, and automotive software engineering.

PREMIER System Integrators was founded in 1991 and is headquartered 20 miles southeast of Nashville, TN. Since it’s founding, PREMIER System Integrators has grown to employ over 170 employees. PREMIER has a local Cincinnati branch office, which employs 15 full time professionals and between 4-6 co-op students per semester. PREMIER System Integrators, Inc. offers a variety of services to its clients including industrial controls, factory automation, technical support, plant-wide information systems, panel fabrication, employee placement, and total facility integration.

Co-op students are offered free housing and a competitive salary. The work atmosphere is very family-oriented and students remark that they feel like they “belong” there. PREMIER has a world-class mentoring system for students. Each student is matched with a supervisor, a mentor, and a career coach. At any given moment, students are working on dynamic projects that range from $150,000 to multi-million dollar installations. Students in Computer Engineering can work on automation and controls as well as human interface design, making a co-op position at PREMIER a perfect blending of both software and hardware.

Stefan Apostoluk (2018): Computer Engineering student, Stefan Apostoluk, class of 2018, is on co-op with Diebold, Inc., an ATM manufacturer located in North Canton, Ohio. His projects this semester made national news as Diebold is set to unveil its next generation of ATMs, which feature a cardless cash dispensing system. The ATM was featured among other places in Fortune Magazine [http://fortune.com/2015/10/26/atm-eye-scan/].

Plans and challenges for the coming term: While the job market for Computer Engineering co-op employment is large, the number of students enrolling in computer engineering majors both here at UC and at other universities has grown substantially. The class of 2017 had only 23 students co-op their freshmen year (96% placement rate). Contrast this with the class of 2019, of which 67 students were eligible to co-op, and if 96% were to be placed, would be an increase of almost triple from the class of 2017.

The challenge is that the number of local, Cincinnati region employers has not grown as substantially and current employers are being asked to hire more and more students. Thus far, this has worked out for the most part. However, employers are beginning to tighten their budgets and limiting the number of co-op students they are hiring. Furthermore, fewer and fewer employers are willing to hire International students for co-op, citing that their co-op programs are designed to create a pipeline to full time employment. They do not wish to sponsor students after graduation, thus making it challenging to place current international students. The solution to these problems is an increase in job development of employers outside the Cincinnati region. These employers need to be in locations attractive to students (e.g. California, D.C., Chicago, Boston, etc.), provide a housing allowance, willing to hire international students, and would have an established co-op/intern program and could hire multiple UC students per term.
Employer Highlight – Scotts Miracle-Gro hired their first co-op student for the spring semester. This is a great example of the diversity of our co-op employers for CS.

The Scotts Miracle-Gro Company is the world’s leading lawn and garden company with trusted brands in every category in which we compete. With that success comes a big responsibility, which we embrace: A commitment to provide products, services and information that will help our consumers be successful—growing beautiful gardens, strong trees and healthy lawns. A true partnership with our retail customers—taking their lawn and garden departments to new heights and contributing to their overall profitability. A dedication to a beautiful world through innovation partnerships, resource conservation, and environmental stewardship. A focus on achieving sustainable growth and profits that enhance shareholder value. The Scotts Miracle-Gro associates worldwide are passionate about this business because, every day, they see the benefits of their work in the beauty that surrounds us. We believe there is no better business to be in—and there’s no better company than Scotts Miracle-Gro.

Upcoming Semester Plans – In an effort to increase student participation and communication, the CS Co-op Program will move from traditional email and Blackboard-based communication to communication through Slack, “A Messaging App for Teams.” This will roll out with the class of 2020, and future use will be determined by student feedback. Slack is available to students at no cost.

The Class of 2019 and 2017 are going out for co-op for the Spring Semester 2016. The Class of 2017 will be co-oping for both Spring and Summer while 2019 will be going out for the first time. All of the students in the Class of 2017 have been placed in a position for their last two and I have only 2 CM’s left to place from 2019. I am not worried about getting these students a position by the end of the semester. We have 1 new employer that has hired for the upcoming Spring, Brasfield & Gorrie from Atlanta and our top employers are Walsh Construction and Messer Construction.

Brasfield & Gorrie Profile:

Brasfield & Gorrie is one of the largest privately held construction firms in the nation. Headquartered in Birmingham, Alabama their annual revenue is approximately $2.2 billion, and they are a nationally respected general contractor with 2,600 employees and an average project value of $12 million. They have been doing quite a bit of work on the Banks over the last few years and recently have been taking CE and CM students for co-op. This semester they are hiring not just for Cincinnati but for their Atlanta office. This past year they were named the “Contractor of the Year” by the national construction association ABC-Associated Builders and Contractors.

Challenges: Job market is good in the Construction Industry for co-ops and full time. Only challenge is the changing number of students per Class year.

Video of Senior CM student, Shane Fagan from Helix Electric-day in the life of a CM student on his 5th co-op in LA: https://youtu.be/cJ3IBR1OLYU
Students from the classes of 2017, 2018 and 2019 will be on co-op Spring 2016. About half of the 2017 class will begin a double co-op section for their last two co-ops. Approximately half of the classes of 2018/19 will be on co-op. Thirty students are unplaced for Spring semester, but there is a lot of employer activity so I am hopeful that they will find positions. There are three waivers for students intending to complete their masters degree through ACCEND. The class of 2020, another record large class, will start the search for their first co-op. GE, Duke Energy and Marathon Petroleum are hiring the greatest numbers of EE students. With the transition of advisers three companies made a point to personally connect with me: Avery Dennison, The Modal Shop and IAP Research. All have structured co-op programs with support for individual co-op development.

Student Profile: Shane McCoy, class of 2016 – Completed his first three co-ops at Mitsubishi where he was responsible for design and construction of a welding repair station. Shane’s final two co-ops were at Atricure, assisting the lead manufacturing engineer on building pilot projects. He received very strong employer reviews from Atricure. According to Annie Straka, Shane is highly motivated, has a great personality and is hard working. Shane was one of two Herman Schneider nominees from the EECS cluster.

Challenges: 1) Transition to new co-op adviser is going well for the most part; some challenges in reaching all students (or in getting their attention/moving them to action). 2) Class sizes are increasing, leveling off next year; transfer students continue to increase the class sizes.
Environmental engineering is a new program and the class 2019 represented the largest cohort thus far. There were 21 students, from the 2019 class, certified to begin the job search process in the fall. This increase in student enrollment presented challenges but we were able to overcome. We witnessed established coop employers like Duke Energy continuing their efforts to hire environmental students and we welcomed new employers like CDM Smith.

Student Highlight: Natasha Sutton is the first environmental student to engage in our partnership Chongqing University. Natasha expressed her international ambitions early in the job search process. From the onset, Natasha communicated her interest in cooping in either Chongqing, Singapore or Hong Kong. She is excited to represent the University of Cincinnati and the College of Engineering and Applied Science at Chongqing University.

Employer Highlight: Kroger expressed a strong interest to reengage and employ environmental engineering students for the foreseeable future. Historically, Kroger has hired UC students from a variety of coop and non-coop majors. They hired their first environmental students fall 2014. The student was only employed one term and they haven’t hired any environmental students since that time. It was exciting to work with a CEAS alum energized to reengage with the environmental program and welcome new students to the Kroger family.

Challenges: Environmental Engineering is a single section coop major. The environmental co-op schedule prohibits freshman students from entering into the job search process until the fall. This provides an opportunity for strategic partnership development. Developing learning/job opportunities is a long and arduous process. There aren’t many pre-junior students entering the job search so more time can be allocated in developing opportunities for the upcoming freshman class.

This spring, mechanical engineering will be sending out the second half of the Class of 2019 for their first co-op rotation and half of the Class of 2017 for their final two co-op rotations. Including the students in the International Co-op Program (3), there are 19 students remaining.

PERFORMANCE ELECTRONICS, LTD is a new co-op partner starting this fall. PE is a company specializing in the design and manufacture of embedded electronic control systems for use within various industries. The company is an industry leader in the development and production of high performance, competitively priced electronic control units for unmanned vehicle applications.

Emily Yeatts has joined Aimee Frame and Bob Rost in advising the ME and MET students. We look forward to working with her next semester.
There were a total of 64 MET students out on co-op during the Fall 2015 semester. In comparison, there are currently 63 MET students placed in Spring 2016 co-op assignments, with 5 still seeking placement. Of those 5, two have been interviewing actively and I am hopeful for placements to continue until the deadline.

There has been a significant challenge in finding opportunities for the two Saudi Arabian students that I am working with. I have worked with the limited resources available to me for these students without success. The development of positions for international students is an opportunity for growth.

Fall semester also presented new transfer students to the program, with several requiring placement for spring 2016. Despite the very short time frame, all received co-op job offers.

ThyssenKrupp Bilstein of America has continued to increase its presence in the UC ME/MET co-op program. This employer hired two of my students in the Summer 2015, three in the Fall 2015 and currently has four this Spring 2016. It is my hope this relationship will continue to strengthen and the development of MET co-op experiences will continue to increase as well.

Overview of the program and activities: I’ve been in the role for almost six months now. During my first six months, I have worked hard to leverage my existing relationships with UC alumni and colleagues across campus here.

Here are a few new programs that I’m working on:

1906 Society: A new concept that we are developing to annually recognize our top-120 employers. We hosted 40 companies at the UC-UCF Football game on 10/31 and had overwhelmingly positive feedback from employers who attended. Our employers have expressed interest in more of these ‘appreciation’ style events where they can meet and learn from fellow employers.

Alumni Relations:
In the coming term, I would like to work on a new co-op alumni program with the expectation that this will lead to long-term job creation. Our alumni of the program are the best chance we have to create new opportunities. I plan on starting with a heavy focus on Chemical, Aerospace, Biomedical, and Computer Engineering alumni.

What do I sell when talking about our program?
- Affordable/Energetic Students
- Pipeline Development
- Some of the ‘well known’ companies that we have existing partnerships with (GE, etc.)
- The fact that we invented co-op and have been running the model for over 100 years (Employers love the 5 semester model)
Employer Spotlight: Lubrizol (Cleveland)
Lubrizol will be coming to campus with a team from January 26-28. They have gone from 5 co-ops in 2013 to 12 in 2014 to 19 in 2015 and have already hired 5 for Spring, 2016. This is the growth model we want to see happen for companies that are currently hiring 1-5 co-ops. I’ve invited them to campus to talk about our partnership, why they continue to increase their opportunities, and what we can do to help them (University wide) in the future.

This was recently finalized, but their visit will look something like this:

Wednesday morning --
Meetings with ProPEL Engineering Team

Wednesday afternoon --
Meeting with Career Services/Engineering Tribunal and other student leadership groups

Thursday morning --
Speaking to my Marketing class in the College of Business
Meeting with College of Business Career Services

The overall placement rate CEAS students was 94% for the Spring 2016 term.

This is only one number that represents the megabytes of data that we have on all 13 programs, but it is the most important number as it collectively demonstrates how we (ProPEL and CEAS) have performed. Although that number only looks at the placement of the students, it is only one of the functions and responsibilities of the ProPEL faculty.

Placing students in discipline-appropriate opportunities is actually a fairly complex process. Independent external variables, such as market economy, government research and funding, and location of opportunities, are just a few that lay beyond our control. Internal to the University, variables such as program creation, program growth, student certification, mid-curricular job changing, and single section programs, all factor into the job development equation. Job development is a dynamic and complex organism.

Over the past year, ProPEL has reorganized internally to meet the specific demand and challenges facing the wide variety of programs it supports. Three teams were created within our division, namely CEAS&IT, DAAP and EL (or Experiential Learning). Twelve ProPEL faculty are aligned with the CEAS&IT co-op program.

As ProPEL begins our second semester functioning as a team, there are signs that we are beginning to operate as a team rather than 12 individual faculty. Specific actions undertaken over the last six months that support the team approach include:

• Hiring a job developer with a focus on assisting faculty with their employer relationships,
• Working with employers to broaden the scope of current job positions,
• Collaborating with the respective academic departments for specific industrial connections.

The re-structuring of our unit was relatively straightforward. However it takes more than that to begin functioning as a team. Culturally, there are some changes as well.
For example, if an aerospace firm is seeking an engineer, there are likely several disciplines that would meet the needs of the employer. Mechanical, Electrical, Computer Science and Chemical Engineering quickly come to mind. The employer may not realize this and seek only aerospace majors. In turn, there is really no motivation for the aerospace faculty advisor (me) to open this opportunity up to additional majors, as it undermines their individual placement rate. Placing emphasis on TEAM placement and EMPLOYER needs rather than specific placement numbers is better for the program overall.

Additional Placement Data Analysis

The actual dates of spring 2016 placements were reviewed and they are shown in the graph. There are several observations from this date:

- Close to 1000 students are working this spring.
- The number of unplaced students continues to increase until week 5. This means that we don’t really know how many and who are required to work.
- By exam week, as a team, only 80% of the spring placements were booked. This is certainly undesirable from a student, employer, or faculty perspective.

ProPEL’s team approach has only just begun and it will affect not only student placement, but instruction, reflection, and program assessment as well. We look forward to continuously increasing cooperation with the CEAS faculty in co-developing ‘our’ students to their fullest potential.

* I will be sharing with all Department Heads the specific breakdown of placement data, by major along with growth trends.
PROPEL
PROFESSIONAL PRACTICE AND EXPERIENTIAL LEARNING