

CEED SESSIONS – CIEC 2020

Engineering Education in an Era of Change

Tuesday, January 28

1:00 PM

CEED Workshop: Co-op in a Box

Presenters: Kim Demko, University of Cincinnati
Aaron Burdette, University of Cincinnati

As we seek to expand the number of opportunities available for students to engage in that provides a meaningful, impactful, and educational experience, we must understand the limitations of what resources are available to train employers. Organizations new to this work have neither the time nor the expertise to develop a plan to engage students in meaningful ways. Existing organizations and larger employers with established programs may be looking to refine and grow their programs. If we are to create a “sticky pipeline” for start-ups, nonprofits, or other businesses, the businesses will need specialized support. Workshop fee: \$75

Wednesday, January 29

11:00 AM

Entrepreneurship and Experiential Education

Entrepreneurship, Experiential Education and Industry Engagement: Innovative Partnerships to Help First-Generation Engineering Students Thrive

Presenters: Robin Hammond, Arizona State University
Jason Rubadue, Texas Instruments
Anthony Kuhn, Arizona State University
Tirupalavanam Ganesh, Arizona State University

Moderator: Angie Gorny, University of Toledo

This session will address how one institution applies entrepreneurial mindset within experiential education practices to provide work-like immersive experiences for first-generation engineering students. Rising sophomores engage with alumni, industry professionals, faculty, career and academic success staff in a week-long program that starts with a hands-on technical build using the Texas Instruments Robotic Systems Learning Kit, and advances to challenges, which creatively address complex transportation problems using entrepreneurial mindset skills. The outcome of this resume-building experience is to launch women, under-represented minorities, and first-generation students into additional internship, leadership, and career building experiences.

Utilizing Co-ops as an Effective Workforce in Manufacturing

Presenters: Michael Adams, Cleveland State University
Andy McCartney, Bowden Manufacturing
Sandra English, Cleveland State University
Trevor Caskey, Cleveland State University

Moderator: Angie Gorny, University of Toledo

An Ohio manufacturing company with a permanent workforce of approximately 70 employees also employs up to 25 co-ops and interns each semester. This would normally sound like a recipe for disaster, however this is actually a mutually beneficial situation. The company has developed an effective training and mentoring process that enables the students to become productive within one week, with no prior work experience. At the conclusion of their co-op experience, the students will have learned to operate CNC machinery, to design for manufacturing, and to enjoy a highly energized, collaborative, and positive

work environment. In return, the company benefits from a low-cost labor solution. This paper and presentation will describe the process for successfully utilizing co-ops and interns as an effective workforce, but it will also go beyond that. This is an example of how we can re-energize engineering interest in American manufacturing.

2:00 PM

Gen Z and the Future of Work

Real Talk: Do You Speak Emoji?

Presenters: Kalen DeCant, University of Toledo
Geoffrey Humphrys, University of Toledo

Moderator: Maureen Schomaker, University of Cincinnati

Supercharge your Gen Z knowledge and learn what sets this generation apart from previous generations. This presentation is a beginner's guide to Gen Z and will go over current Gen Z facts and trends. The information provided will strengthen your knowledge of Gen Z and will provide you with valuable information that will benefit your institution or company.

Addressing the World of Work

Presenters: Mary Andrade, University of Louisville
Richard Robles, University of Cincinnati

Moderator: Maureen Schomaker, University of Cincinnati

Given the changing demographics and generations of the workforce, institutions must now consider how they will meet and prepare future students. Likewise, industry must now consider how to best integrate a new generation of talent in the workplace and the implications of meeting mutual work expectations. This session will expand this developing conversation and present possibilities of the new workplace. Participants will engage in conversations to generate possible strategies to address the changing world of work.

4:00 PM

Co-op Conversations on Disabilities

Voices of Accommodations: Developing Dialogue Tools for the Co-op Experience

Presenters: Nancy Chase, University of Dayton
Elizabeth Harrison

Moderator: Julie Nguyen, Northeastern University

In this interactive session we will bring together voices of students, employers, and academic program administrators on the topic of accommodations for students with disabilities in relation to the co-op experience. We will explore the expectations of all three of these co-op stakeholders and introduce effective dialogue tools for establishing professional success from all three perspectives. We will share data collected from students who use classroom accommodations and employers who have experience in creating successful work assignments for students with disabilities. The session will address questions students often ask, such as "When should I disclose a disability?" or "How can I bring up the subject?" or "Who should I ask for an accommodation?" Employer questions, such as "What can I expect a school to provide with regard to accommodations?" or "Are there legal guidelines for us?" or "Should we mention our position with regard to disability accommodation in the interview process?" will also be addressed. Our plan is to use the session to address these questions and provide responses and tools which will be useful in working with all student co-ops, including students with disabilities.

Thursday, January 30

11:00 AM

Diversity Issues in Co-operative Education

Women in Engineering: Are We Ready?

Presenter: Mary Andrade, University of Louisville

Moderator: Kyle Liechty, Michigan State University

Just over 22% of the University of Louisville's engineering student population is female, just over the national average of 20%. While we are able to slowly increase the number of students that we recruit, this also means that because of our mandatory co-

op program, we are sending record numbers of female engineers into working situations where no female engineers have been. Are these engineering sites ready to accept female engineers? How do we respond when something goes wrong? This presentation will address some of the concerns about sending females into male-dominated work situations, the responsibility of the co-operative education program and the employer's role. Be ready for a large group discussion.

The International Engineering Model that Develops “Global Engineers” with Cultural Competencies for the International Workplace

Presenter: Brian Schwarz, University of Connecticut

Moderator: Kyle Liechty, Michigan State University

The International Engineering Program at the University of Connecticut expanded to include three more programs based on the same model. In this presentation, we will go over all the key components that you will need to develop your own international engineering program at your university. EUROTECH is a five-year program at the University of Connecticut which includes a six-month co-op in Germany and leads to a dual degree: a BA in German and a BS in Engineering. The cooperative education experience in Germany is structured in such a way that students become familiar with the internationally admired German apprenticeship system ("Lehrlingsausbildung"). EUROTECH graduates will have the knowledge and experience to compete in a global marketplace and truly become "Global Engineers." In this presentation, you will discover all the key components that need to be in place to launch a successful program that truly provides a comprehensive language and culture education with an included cooperative education experience abroad that truly develops "Global Engineers" that companies want to hire upon graduation.

2:00 PM

Industry Partnerships and Engagement

Employer Engagement, Industry Partnerships with Co-op and Academic Units

Presenter: Susan Mahoney, University of Cincinnati

Moderator: Sandra Leon-Barth, University of Central Florida

Are you working with a student population that desires "different" co-op opportunities where your partnerships may not exist? We found this instance happening at UC with our Information Technology students studying cybersecurity and seeking employment in the information security sector. In an effort to improve opportunities in such a highly skilled field, we developed two specific programs including a cyber domestic study tour to the DC/MD/VA area and a pilot co-op program with the Ohio Cyberrange to help narrow the gap. The session will provide an outline and the outcomes of the two new programs. Since the first year of the domestic study tour to the DC/MD/VA area, we have seen more students leverage the new relationship built and co-op with federal agencies and government contractors in the security space. Following our pilot co-op program, students involved as co-ops in the virtual learning environment secured direct cybersecurity roles in their subsequent employment opportunity.

Industry Panel

Moderator: Sandra Leon-Barth, University of Central Florida

Panelists representing a variety of industries will discuss linking the co-op sessions breath vs. depth. Panelists will share their company's programs, recruiting co-ops vs. interns, and best practices.

4:00 PM

Ethical Behavior and First-Year Success

Ethical Behavior, Day to Day

Presenter: Frank Falcone, Villanova University

Moderator: Kate Caliel, Rochester Institute of Technology

Ethical Behavior in the Engineering Profession can be discussed from various distinct, historical perspectives. These perspectives will be presented in detail. Also, ethical behavior, on a day-to-day basis, from a student oriented academic institutional perspective is much more valuable for students than discussing abstract case studies. Student oriented case studies will be presented.

First Year Engagement Means Ongoing Success

Presenters: Rachel Mangiavellano, Michigan State University
Bernadette Friedrich, Michigan State University
Moderator: Kate Caliel, Rochester Institute of Technology

Co-operative education (co-op) can provide valuable learning experiences for students that go beyond the classroom. Studies indicate students who have participated in co-op programs typically graduate with higher GPAs, have an easier time transitioning into full-time work, and begin working at higher starting salaries. Researchers and administrators have postulated that co-op provides these benefits through many different pathways which may include improvements in skills (technical and professional), refinement of identity, and increases in self-efficacy, among others. The purpose of this embedded mixed-methods study is to systematically document student perceptions of how they are learning while on co-op in order to identify applicable learning theories and language in future co-op studies. This will be done using a method developed in educational psychology but is relatively unknown in the field of engineering education research: The Q-methodology is an analysis approach that is intended to systematically measure and document perspectives or viewpoints. Twenty-five students will sort a set of statements related to learning on co-op and then be interviewed to better understand their perspective. Data will be analyzed by grouping participants and descriptive profiles will be developed for each group using the interview data. The outcomes of this study will be discussed with specific attention to actionable opportunities that co-op administrators or industry professionals can implement to improve student learning in the co-op environment.

UCF Case Study: Building an On-Campus Sustainable, Socially Responsible Company where Engineering Students Gain Real-World Skills

Presenter: Sandra Leon-Barth, University of Central Florida
Moderator: Kate Caliel, Rochester Institute of Technology

UCF is the second largest university in the U.S. with an enrollment of over 67,000 students. In this session, we will cover the creation of Limbitless Solutions, a non-profit direct support organization on-campus that specializes in creating and donating personalized 3D-printed bionic arms for children. From the organization's inception, undergraduate student internships have been a cornerstone, using project-based learning that relates to bio-mechanical engineering, art, training/game design, public relations, and administration for over 25 students a semester. The internship experience offered at Limbitless Solutions is a unique opportunity for students from varied disciplines to work together to advance the shared mission of accessibility technology. Through collaboration and project-based learning, the goal is to nurture the professional development of all students from learning interview skills to complex interdisciplinary research tools.

Friday, January 31

9:00 AM – 12:00 PM

Reflections on Co-op and Learning

Documenting Student Perceptions of Learning on Co-op

Presenter: Katherine Ehlert, Clemson University
Moderator: Geoffrey Humphrys, University of Toledo

Studies indicate students who have participated in co-op programs typically graduate with higher GPAs, have an easier time transitioning into full-time work, and begin at higher starting salaries. Institutions assume that co-op provides these benefits through many different pathways which may include improvements in skills (technical and professional), refinement of identity, and increases in self-efficacy, among others. The purpose of this embedded mixed-methods study is to systematically document student perceptions of how they are learning while on co-op in order to identify applicable learning theories and language in future co-op studies.

Confidence: Its impact on Securing a Co-op

Presenter: John Bleakney, Northeastern University
Moderator: Geoffrey Humphrys, University of Toledo

As students search for a co-op, does their perceived confidence have any impact on their success? During this session, the speaker will show the results of a survey that was taken by international graduate engineering students in a career preparatory class as well as to advisees of the speaker across several semesters. The survey asked about students' perceived confidence in

job search skills including resume writing, networking, and interviewing. Questions pertaining to the co-op search will be discussed such as: Does a student's confidence increase over the course of the semester? Does a student's confidence affect his/her job search activities such as applying for jobs or meeting with his/her advisor? Does a high confidence strongly correlate to the success of securing a co-op? The speaker will then discuss the impact of the results by sharing strategies used to help increase a student's confidence.