**TOWARDS A BETTER INTEGRATION OF THE CLASSROOM AND CO-OP EXPERIENCE:**

**INSIGHTS FROM PLASTICS ENGINEERING**

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**PROGRAM AND STUDENTS**

As part of the Higher Education Vision Grant, we assessed the integration between the co-op experience and classroom. Specifically, we focused on the plastics engineering department:

- 149 undergraduates enrolled in Plastics Eng.
- 108 of whom participate in Professional Co-op

In managing these plastic co-op students, UML works with approximately 50+ organizations.

**APPROACH AND OBJECTIVES**

Two prong approach – interview students and employers to ascertain program effectiveness from two unique stakeholder perspectives.

**Student assessment objectives -**

- The level of integration between the co-op and classroom with regards to technical development
- The level of integration between the co-op and classroom with regards to professional development
- The affect of the co-op on individuals’ career strategies
- Avenues for improving the integration of the co-op and classroom learning

**Employer assessment objectives -**

- To better understand the integration of the co-op experience and the academic curriculum and how the curriculum supports co-op employment and industry needs.
  - To determine the skills that employers expect students to acquire prior to co-op and skills they expect to teach on the job
  - To understand and recommend potential avenues for improvement—in the integration of co-op with curriculum, the co-op employment experience and the co-op

**Focus Groups**

Two student focus groups were conducted; 12 students in all

One employer focus group was conducted; six employers participating.

**EXAMINING STUDENT PERSPECTIVES**

**INTEGRATION OF CLASSROOM AND CO-OP ON TECHNICAL DEVELOPMENT**

- Students felt classroom learning was important to co-ops. To a large degree they felt the labs needed to incorporate more hands on time, smaller group sizes, and more open-ended problems
- Co-ops created a “light bulb moment” a time when the co-op brought the classroom into the real world
- Students reported that they were “expected to be engineers”—on day one
- To a person, the co-ops provided students with a real world perspective; shared this with classmates.

**INTEGRATION OF CLASSROOM AND CO-OP ON PROFESSIONAL DEVELOPMENT**

- Students had more fulfilling experience when the co-op organization was experienced with co-op students. Conversely, students also tended to benefit on their second and third co-ops.
- Co-op students recognized firsthand that being an engineer meant being part of a team. They saw the importance of being a team player; realized the critical importance of communication skills.
- Students developed an appreciation for organizational culture, and the effect it had on their ability to be effective in the organization; importance of networking and reaching out beyond your immediate department.
- Each student stressed that they needed to better learn self-management & reliance skills and understand the large degree of variability inherent in real world engineering.

**EXAMINING EMPLOYER PERSPECTIVES**

**UNDERSTANDING CO-OP EMPLOYERS’ MOTIVATIONS AND GOALS**

- Reason for Partnering with UML/Plastics Department
  - UML’s new co-op program offered innovative approaches that employers could impact
  - New skill-sets offered by UML students; complementary to other schools
  - Reputation of the program: plastics program is world class
- Goals for participating in Co-op Education Program
  - Help meet short term business objectives
  - Create a talent pipeline, next generation of engineers
- Meeting Goals in the Co-op Education Program
  - Each employer stressed that the short term goals were being met; long term goals were evolving

**ASSESSING STUDENTS’ TECHNICAL AND PROFESSIONAL COMPETENCIES/DEVELOPMENT**

- Understanding Attributes/Skills that Make for an Ideal Co-Op Student
  - Well refined soft skills, stronger critical thinking skills, high level of professional maturity, & international perspective and cultural diversity
- Employers are very satisfied with UML students’ technical skills
  - Lowell students were quick studies.
  - Minor issues
    - Timing of co-ops, i.e. juniors vs. seniors
    - Statistics skills lag those at peer institutions
- Professional skills appeared to be a bigger issue than technical skills.
  - Students often failed to see big picture of business
  - Failure to understand/satisfy professional norms
  - Need more training in regulatory issues and confidentiality

**EMPLOYER TAKE-AWAYS**

• Co-op employers shared best practices across the employer group; incredibly valuable experience suggesting that such sharing should occur on a more frequent basis.

• To an organization, each employer stated that they had one primary concern
  - Ensuring that the organization and co-op student both reach their potential. Such a concern offers a tremendous opportunity for UML

• Focus group participants were very complimentary to the plastics department, but the focus group offered some areas for improvement.

• Potentially enlist employers when curriculum is being reevaluated

• Employers required a higher degree of stats/math and lean manufacturing

• While not tied to the plastics department, another concern was writing skills.

• Focus group participants were very positive about UML’s co-op program, stating that its size, its newness and flexibility were significant competitive advantages over competing programs.

**STUDENT TAKE-AWAYS**

• Students needed more scheduling options and flexibility around 3 months vs. 6 months

• Overwhelmingly, co-op students spoke favorably of their time spent with the plastics faculty. Some minor recommendations emerged
  - More of a focus on Six Sigma.
  - Reassessment of course and lab credit
  - Teaching assistants need evaluation

**EXAMINING EFFECT OF THE CO-OP ON INDIVIDUALS’ CAREER STRATEGIES**

• Co-op students had a deeper appreciation for the importance of coursework; More effective capstone experience as a result of their co-op.
• Co-op experience increased students’ desire to get into the real world; helped define “What they did and did not want to do”

**EXAMINING EFFECT OF THE CO-OP ON PROFESSIONAL DEVELOPMENT**

• Students felt classroom learning was important to co-ops. To a large degree they felt the labs needed to incorporate more hands on time, smaller group sizes, and more open-ended problems
• Co-ops created a “light bulb moment” a time when the co-op brought the classroom into the real world
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**EXAMINING EFFECT OF THE CO-OP ON TECHNICAL DEVELOPMENT**

While overwhelmingly positive about the co-op experience, both groups offered strong support for specific areas of improvement for better integrating the classroom and the co-op:

**IMPORTANT TAKEAWAYS AND INSIGHT**

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  - More of a focus on Six Sigma.
  - Reassessment of course and lab credit
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