



Introduction to Cooperative Education-The Course

Dr. Joy Watson, University of Cincinnati

Joy Watson is an assistant professor in the University of Cincinnati's Division of Professional Practice and Experiential Learning where she is the co-op adviser for chemical and environmental engineering students. She completed her Ph.D. in the College of Engineering at the University of South Carolina in August 2011. Her doctoral work focused on preparing engineering Ph.D. students for careers in industry. She obtained her B.S. and M.S. in chemical engineering from the University of Tennessee, Knoxville with her master's research focusing on the rheology of ionic liquids and cellulose solutions. While at the University of Tennessee, she participated in the co-op program and was appointed a co-op ambassador, mentoring undergraduate students pursuing industrial internships. Most recently she collaborated with B3 Solutions, Temple University, and the U.S. Navy to develop a logistics/IT course for low-income, high potential middle and high school students. Some of her other experiences include working as a processing engineer in the pulp and paper industry, a patent examiner at the U.S. Patent and Trademark Office and a NSF GK-12 Fellow at the University of South Carolina.

Prof. Maureen G Schomaker, University of Cincinnati

Maureen Schomaker is an Assistant Professor in the Division of Professional Practice and Experiential Learning (ProPEL) at the University of Cincinnati, Cincinnati Ohio. Professor Schomaker holds a Master of Education in Curriculum and Instruction with a focus on Instructional Design and Technology and has been teaching in higher education since 1999. Professor Schomaker has been advising cooperative education students since 2008 and currently advises Civil Engineering co-op students at the University of Cincinnati.

Professor Schomaker is an official site reviewer for the Accreditation Council for Cooperative Education. In addition Maureen is Co- Chair of ProPEL's Program Assessment Committee and a member of the Curriculum Committee.

INTRODUCTION TO CO-OPERATIVE EDUCATION: THE COURSE

Introduction

Cooperative education has a rich history of success in preparing students for transition into a work environment. Cooperative education has been utilized as part of the College of Engineering and Applied Science's curriculum at the University of Cincinnati for over one hundred years. Herman Schneider is credited with founding cooperative education at the University of Cincinnati in 1906¹. Schneider's cooperative system of education included linking theory and practice, a methodology that allows students to spend time in the classroom with alternating terms for practice in their specific field². Students who are engaged in cooperative education alternate semesters between academic course work and working full time in a discipline specific workplace setting (co-op). At a few universities, students are required to complete between three and five semesters of co-op to complete their undergraduate degree in engineering. Cates and Cedercreutz state: "The Division of Professional Practice is responsible for the field-based academic instruction of over 4,000 students annually at the University of Cincinnati. Its unmatched, professionally-oriented faculty base, its strong ties to more than 1,500 employers and its 100 year track record of co-op, makes the division one of the leading academic units engaged in cooperative education in the world."².

While students are on co-op, learning occurs in a variety of ways. Because students who are on co-op are not on the university campus, aiding these students in their learning is challenging. Instructors dedicated to learning, struggle with the various pedagogies for delivery as they try to provide the best possible learning environment for their learners. The Introduction to Cooperative Education class assists in learner success in the workplace environment.

Today's learners face many obstacles such as time management, self-monitoring for learning, and encountering problems with technology³. This paper will explore the field of cooperative education and present an outline of the mandatory Introduction to Cooperative Education (Intro to Co-op) class. Additionally, this paper will focus on two specific content areas: creating an elevator speech and professional ethics in the workplace.

Definition of Terms

Cooperative education is somewhat difficult to define and is sometimes used interchangeably with the following terms: work integrated learning, sandwich learning, internship, and experiential learning. At the World Association for Cooperative Education Conference hosted at Victoria University it was defined as follows: "Work integrated learning combines professional work experience with classroom studies in many forms, including research, internships, study abroad, service learning, student teaching, clinical rotations, community service, industry attachments, cooperative education, and professional work placements"⁴. Cates and Cedercreutz definition states: "Cooperative education enables instructors to bring curricula to life in on-campus, blended, and online classrooms through pedagogic principals."². The following

definition attributed to Houshmand and Papdakis states: “Work integrated learning (WIL) or cooperative education is a strategy in which students undergo conventional academic learning, mostly at a higher education institution (HEI), and combine this learning with some time spent in a workplace relevant to their program of study and career aims”⁵. Historically Freund’s description of what the student shall learn from a cooperative education experience follows:

...the cooperative student shall learn how science is actually applied in his profession and in industry; the student shall learn how engineering designs and plans are executed; the student shall become familiar with machines, structures and equipment by use and observation and with and with their construction, capacities, limitations, standards, power, maintenance, cost useful life, operating methods and practices.⁷

For the purposes of this paper cooperative (co-op) education will be utilized as the common terminology.

Methodology

As stated, the cooperative education curriculum is based on two alternating sections where students alternate between terms in the classroom and terms in the workplace. This alteration allows employers to provide more powerful learning with each co-op assignment. Co-ops are typically required to complete several terms of co-op and for many programs it is a mandatory part of their curriculum. At several universities, the students and employers perform on-line evaluations. Grand Valley State University assigns a professor/ advisor to each student every semester. The student submits weekly journals to his/her advisor and the advisor gives feedback. The advisor also performs a site visit about three-fourths of the way through the co-op semester with the student and their direct supervisor. The advisor gives a letter grade for each co-op semester, which is a 3 credit class. At a different university, students complete a self-evaluation of their co-op term, the employer completes an evaluation of the co-op term. A faculty member completes a one on one evaluation of the co-op term with the student utilizing reflective practice. Cates and Cedercreutz cite the following guiding principles as the key foundational concepts of co-op:

- Company selection of co-op students as employees (not placement in positions by the university)
- A sequential training environment in which students come to understand theory through its practical applications
- The critical evaluation of co-op positions by the university and the inclusion of positions with the greatest possible amount of education content
- Condition of actual employment (not artificial conditions imposed upon employers which could reduce the experience to a laboratory experience in a campus environment)
- Co-op position as a paid position because payment is the primary component of work
- Ongoing evaluation of curricular design both on and off campus
- Understanding by the university of the students’ aptitudes, academic preparation and the relationship between classroom theory and practical applications
- Development of methods in which the student is led to observe and think for himself/herself at the work site

- Grading of the students' cooperative education experiences
- The recognition of cooperative education work experiences as part of a students' overall education².

The University of Cincinnati requires students meet with their faculty co-op advisors prior to the job search and are required to meet with faculty upon return to campus for an evaluation of their co-op experience.

Students who are engaged in a co-op placement are faced with an entirely new environment and social situation. They must transition from an academic environment to a professional environment. Students are sometimes overwhelmed as they must navigate their way to becoming a productive employee. Students are confronted with finding their way through the specific project work, social networks, and the political hierarchy of the organization. Vygotsky's theory of social constructivism advocates that knowledge is constructed in a social environment⁸. Students are thrown into this new environment with vague expectations and are expected to perform at a satisfactory level. Vygotsky further explains that learners reach

...the zone of proximal development.(zpd) It is the distance between the actual development level as determined by independent problem solving and the level of potential development as is determined through problem solving under adult guidance or in collaboration with more capable peers⁸.

Mentors or supervisors help students realize what they potentially may be able to accomplish. Students are surrounded by an environment that focuses on their discipline and by the actual work environment. They must adapt to the culture of the environment as well as being able to apply what they have learned in the classroom to the work environment. It could be argued as students are required to go on multiple terms of co-op their zone of proximal development expands as they have been exposed to new curriculum when they return to the university and now are able to apply this new knowledge in the actual work environment. Students construct their knowledge by integrating the theory they have learned in the classroom with the real world problems of the work environment. The literature reveals this integration is a key concept of co-op.

The Introduction to Cooperative Education Course at the University of Cincinnati is a mandatory one credit hour course. College of Engineering and Applied Science students register for this class in the Spring Semester of their freshman year. This course helps students integrate into the professional environment. If students do not pass this class they are not accepted into the co-op program. Introduction to Professional Practice – A Student Text/Workbook is the primary textbook for the Intro to Co-op class which covers the following major topics:

- Overview of Cooperative Education
- Cooperative Education as a Method of Learning
- Components of the Job Search

- Routes to Success of the Co-op Job and Beyond

The Overview of Cooperative Education includes the following areas of focus: the definition and origin of co-op, the evolution of co-op, participant roles, co-op Code of Ethics, and Co-op and Work Integrated Learning. Cooperative Education as a Method of Learning includes: Learning through Cooperative Education including the theory of co-op learning. Reflection and Assessment Tools include student and employer evaluations, specific learning objectives, and student learning modules. Student learning modules include Organizational Culture, Professional Ethics, Corporate and Social Responsibility, Theory and Practice, Components of the Job Search (career planning, goal setting, guidelines for resume preparation, portfolio development, and interviewing), and Routes to Success on the Co-op Job and Beyond (surviving and thriving on the job, working in a multicultural world and sexual harassment). Many of the topics include specific case studies based on real world co-op situations. All of these are key topics for success in a co-op learning experience and the challenge for faculty is to prioritize the material into one hour segments across a 15 week semester. As the scope of this class is very encompassing, the authors will examine two specific pedagogies utilized in this course which are addressed in detail: creating the elevator speech and examining professional ethics.

Creating an Elevator Speech

Creating an elevator speech is vital to student success as it requires students to complete self-reflection, identify areas of strengths, prioritize student involvement, articulate goals and desires all within a 30 to 60 second time window. This exercise requires students to introduce themselves to a potential employer or professional and make a positive impression. As most of our students are freshmen when they complete the Intro to Co-op course this can be a challenging assignment. Students are asked to define an elevator speech and identify opportunities to utilize this tool. One of the main areas in which students utilize the elevator speech is at career fairs.

The University of Cincinnati provides at least two career fairs annually in which many co-op employers participate. This lesson is scheduled so that students are able to use their elevator speech at the spring semester career fair. Students are required to use their self-analysis assignment in creating their elevator speech. Students must define who they are and what makes them unique from their peers. They must also list their accomplishments and activities. Finally they express what they want and what they are hoping to learn and contribute. PricewaterhouseCoopers provides a guideline for creating elevator speeches which was modeled for this Intro to Co-op class (see Appendix) ⁹. Because the majority of students are 18 or 19 years old when take the Intro to Co-op class this task is harder than it may appear. Initially, learners are asked to tell a little bit about themselves before any content regarding an elevator speech is presented. They are asked to stand up and introduce themselves to their classmates. Many learners stumble, have long silences and are very frustrated in trying to define themselves. After completing this exercise they have a much stronger sense of self and are more confident introducing themselves to a potential employer and articulating what they are bringing to the organization. As part of the content delivery for the class, YouTube videos are played which shows three separate “elevator speeches” ¹⁰. The first has the student in an elevator who does not engage in any conversation, the second shows the student engaging in limited conversation but not sharing any detail about who she is and finally the third segment

has the student deliver a confident “elevator speech” where she clearly introduces herself and details her accomplishments. Learners tend to enjoy this exercise and are empowered when they can define themselves in a stressful situation.

Emphasis is placed on practicing their elevator speech until it becomes fluent and natural and not memorized and stilted. Body language is addressed and students are encouraged to be confident. When students attend the career fair they are required to dress in formal business attire to gain confidence and to participate in the culture of the business environment. When they have practiced their elevator speech they are better equipped to make a positive impression on the potential employer.

Professional Ethics

Ethics is part of the student outcomes established by ABET and is one of the learning modules students complete while on their work assignment ¹¹. This module is discussed individually with each student when they return from their work experience. Instructors discovered that students were struggling with the breadth of ethics. Many thought it was “not checking Facebook while at work.” While their idea of ethics in their particular workplace is not incorrect, ethics in engineering is much more encompassing. Therefore, a lesson was developed for the Introduction to Co-op course.

A case study was developed from the 1981 Hyatt Regency Walkway Collapse in Kansas City in which over 110 people died and over 180 were injured. The two-level walkway collapsed due to design change made during the construction phase. The original design had the walkways supported by nuts that were attached to a single rod passing through the upper floor to the lower floor. This design was impossible to install, so it was modified to have the nuts of the upper floor supporting the load of the upper and lower floors. The nuts were undersized to handle the additional load. One evening during a party, the walkways collapsed¹². Blame and liability were distributed to the construction firm, engineers and building suppliers ¹³.

The accident was introduced through a short YouTube video that talks about the horrors of the accident but does not discuss the reasons for the accident. After the video, students typically want to know the cause of the accident. The instructor explains that during the construction phase the walkway was modified from the original design. A simplified diagram is shown to the students of the design, and they are asked why the modified design failed. This question creates a forum to discuss the relationship between ethics (specifically safety) and technical coursework. Additional questions asked of students include topics such as how to avoid the accident, who is responsible for the drawings and ensuring the changes meet code, and what is the engineer’s responsibility. From this discussion, students are asked where they can find some codes of ethics and given an assignment to find the code of ethics for their engineering discipline. Ethics is later revisited while they are completing their ethics module on work assignment where they are asked to describe an ethical dilemma in their workplace.

Student Reaction to Course Content

End of course Student Evaluations revealed the following quantitative data based on a five point Likert-like scale where five is excellent and one is poor as seen in Table 1.

Table 1: Student responses to end of course evaluation.

	n=23 Average score
Amount of knowledge about the subject that you acquired	4.33
Value of assigned projects in my learning	4.33
the amount of effort you put into this course was:	4.45
Extent to which the course helped you to learn about effective participation in the co-op program	4.35
Overall Evaluation of course	4.50

Students were asked about the strengths of the course in a free response format through an end of course evaluation. Some of the responses included:

“Provides students access to the information about co-op.”

“I learned how to do an interview and what employers are looking for.”

“Preparation and understanding of working for a company through the Pro Practice Program.

“Thoroughly introduced the co-op program”

“Informative, instructive and clear”

“Helps prepare for co-op”

“Got me ready for co-op”

“It teaches you how to be professional”

“It give strong information about co-op.”

“Preparing me for the co-op job and helping me a lot in my interview”

”Resume”

“resume, skills, communication skills”

“It helped get ready to get a job.”

“How to represent yourself in the workforce.”

”Present a large amount of information effectively.”

“It teaches you useful skills in an interview, tells you what is required in co-op and how it works, it also shows you valuable life skills.”

“Helped a great deal with understanding co-op and helps with creating a resume and interviews.”

“She [the instructor] seems to know every detail of how the co-op program works and knew how to answer every question. She was also very helpful throughout teaching how to make resumes and interviewing. She really cares about where her students end up for co-op.”

“...is a course to strengthen ourselves in preparation for a co-op...”

Overall, the data suggests that the students valued the information presented in the course because they developed skills that would be applicable as they began their cooperative education experience. Students were expected to create their own learning by participating in class activities in order to invest in their learning and to better retain and apply their new knowledge as they progress through the co-op program and their academic experience.

Conclusion

The Introduction to Cooperative Education course covers extensive content ranging from definition and history of co-op to professional behavior in the workplace. Additionally, learners must understand the processes and procedures associated with the entire co-op process. Learners must become confident in self-assessing their strengths and articulating these strengths in both a verbal and written format.

The two learning outcomes highlighted in this paper are specific examples of how a portion of this content is delivered. The Introduction to Co-op course develops students' transferable skills and met ABET accreditation standards. Additionally, it helps ensure student success in the workplace environment by exposing students to the skills necessary for hire and the skills necessary for success in the workplace.

Appendix

Elevator Speech Exercise

Example:

“Hi, I’m Herman Schneider and I am a Civil Engineering major at the University of Cincinnati. I am a sophomore and a member of the student Engineering Tribunal. I enjoy playing soccer and also enjoy volunteering where I tutor disadvantaged youth. I have a 3.2 GPA and am looking for a co-op opportunity that helps me to enhance my learning and contribute to real world engineering projects. I would like to talk with you about co-op opportunities available within your organization.

Answer the following questions in complete sentences. After you have completed all of the questions combine all of these answers into a paragraph format. Review and revise answers as you create a paragraph that describes your unique strengths, accomplishments, and interests.

Who You Are?

My name is:

I am a:

Major:

What do you do? What do you like to do?

What do you want/where are you going?

References

- [1] Mary Reilly, (2006). *The Ivory Tower and the Smokestack: 100 Years of Cooperative Education at the University of Cincinnati*. Cincinnati, OH: Emmis Books.
- [2] Cheryl Cates & Kettel Cedercreutz, Kettel (2008). *Leveraging Cooperative Education to Guide Curricular Innovation: The Development of a Corporate Feedback System for Continuous Improvement*. Cincinnati, OH: Center for Cooperative Education Research and Innovation.
- [3] N. Vaughn, Vaughn, N. (2007). Perspectives on blended learning in higher education. *International Journal on E-Learning*, 81-94.
- [4] K. Betts. (2010). Bringing work-integrated learning to the classroom through learning simulations. *Journal of Cooperative Education*, 44(2), 9-22.
- [5] Ali Houshmand, and Constatine Papdakakis, . (n.d.). *One century of cooperative education in the United States 1906-2006*.
- [6] Coll et al. et. al., *Journal of Cooperative Education and Internships* 2009, 43(1)-14-35.
- [7] C. Freund. *Journal of Engineering Education*, 1946, 37, 8, 117-135 *The Co-operative System – A manifesto, 1946*.
- [8] Lev Vigotsky (1978). *Mind in society: The development of higher psychological processes*. (V. J.-S. M. Cole, Ed.).
- [9] *What will your personal brand look like?* (2010). [brochure]. PricewaterhouseCoopers.
- [10] Bconnor123. (2008, November 5) *Don't just stand there - say something intelligent!*. Retrieved from <http://www.youtube.com/watch?v=7CkzKMdEeQ4>
- [11] Board of Directors., ABET Engineering Accreditation Commission., (October 29, 2011). *Criteria for accrediting engineering programs*. Retrieved from http://www.abet.org/uploadedFiles/Accreditation/Accreditation_Process/Accreditation_Documents/Current/eac- criteria-2012-2013.pdf
http://www.abet.org/uploadedFiles/Accreditation/Accreditation_Process/Accreditation_Documents/Current/eac-criteria-2012-2013.pdf
- [12] <http://skywalk.kansascity.com/articles/critical-design-change-linked-collapse-hyatts-sky-walk/> (Accessed 1/4/14)
- [13] Thomas Watts., (n.d., October 3) *City in shock*. Retrieved from <http://skywalk.kansascity.com/articles/design- change-was-major-factor-sky-walks-collapse-agency-says/>