

FINAL REPORT

Plan for

Cooperative Education in Supply Chain Management
at the Undergraduate Level

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Overview

By 2020, the amount of freight moving across the various modes of transportation is expected to increase dramatically. Who will manage these flows? As the level of trade (regional, national, and international) increases, it is essential that the U.S. produce more graduates who are trained in supply chain management, logistics, and transportation.

Our region, Northwest Ohio and Southeast Michigan, is at the center of one of the largest and most productive areas in the world, which depends on inbound and outbound trade. It is also located at an important population and consumption center, which requires sophisticated distribution systems. Given this critical location, this region must produce additional graduates with supply chain management training who can start new companies, develop new ideas, and manage expanding commodity flows.

Cooperative education enables undergraduate students to work in the environment that they will face when they graduate. It integrates hands-on business experience with academic training, and it provides students with an understanding of how concepts that are discussed in the classroom are used in the business world. It also provides students with motivation and a willingness to learn that is difficult to establish without this experience. The project enhances the students' experiences thereby making them more productive and more marketable and attracts more students thus increasing enrollment.

Goal and Objective:

This report describes a cooperative education program for the Supply Chain Management Area of Specialization within the College of Business Administration at the University of Toledo. The principal goal of this project is to design and assess the feasibility of such a program. The intent is that the coop proposed in this report becomes a model that other colleges and universities could use to attract new students to this important area and increase the graduate's capabilities. The specific objectives are to:

1. Enhance students' experiences, making them more marketable, and increase enrollment
2. Develop goals and objectives that drive next steps in program development
3. Develop an organizational structure that enables students to graduate in a timely manner
4. Make a recommendation for successful implementation

During this process, meetings were held with managers and staff in the College of Engineering at the University of Toledo, where a mandatory cooperative education program exists. Other business schools offering cooperative education programs were reviewed and summarized, meetings were held with students and with private sector companies through the local APICS chapter and the Information Operations and Technology Management (IOTM) Department's Supply Chain Advisory Committee.

Cooperative Education versus Internships

After initial discussions with potential employers, one of the initial questions that had to be addressed is: what are the similarities and differences between cooperative education and internships? While the differences are not universal, the following represents the essential differences. Cooperative education is usually full-time, compensated work that does not carry college credit but is often required for

graduation. Students are usually required to engage in more than one “coop” (a minimum of three is often cited) with each engagement lasting 3-6 months. Students can be placed anywhere including internationally. In a significant number of cases, students are offered relocation fees and/or a housing subsidy. An internship is usually for-credit, paid work experience that is not required for graduation. There may be a limit on the number of internships that students can take for university credit, but there is usually not a limit on the number of internships in which a student may participate. An internship can occur in a semester or quarter while the student is taking other courses, so the work is often part time and the geographic location is limited. It can also take place in the summer, when students are not typically in class. In this case, the internship usually involves full time work that can take place at any location. This information is summarized in the following table.

Comparison of Cooperative Education Programs and Internships

	Cooperative Education	Internship
University Credit Offered	Usually not offered for credit, but it is often required for graduation	Usually offered for credit, but it is often not required for graduation
Compensation	Paid	Usually Paid
Timing and Work Load	Usually offered in 3-6 month segments at any time during the year including summer (corresponds to semester or quarter) – full time work – usually requires more than one engagement	May be offered in two ways: <ol style="list-style-type: none"> 1. Within a semester or quarter as part of the students credit hours – part time work – student has options of 0, 1, 2, or more engagements 2. In summer – full time work – student has options of 0, 1, 2, or more engagements
Geographic Assignments	Can be anywhere including international	<ol style="list-style-type: none"> 1. If taken for credit as part of normal load, geography may be limited 2. If taken in summer without student credit hours it is not limited

Benchmarking Business Schools with Cooperative Education Programs

To understand what is currently available in cooperative education in business, a literature review and Internet search were completed. Only a few universities offer cooperative education in business

administration and only some of these offer cooperative education programs in operations and supply chain management. Of the universities in the US that offer cooperative education programs in business, three of the best know are Northeastern University, the University of Cincinnati, and Kettering University (formerly the General Motors Institute). Others were noted at California Polytechnic State University, Robert Morris, Eastern Kentucky University, and Sam Walton College at the University of Arkansas. Most of these programs do not offer cooperative education degrees in supply chain management. Many business schools with supply chain management majors, including the University of Toledo and Bowling Green State University, offer internship opportunities during the academic year and in the summer. Some universities in Canada offer co-operative education in business, but these are not well known and do not attract a significant number of US students.

Northeastern University has a comprehensive coop program in business that includes accounting, finance and insurance, entrepreneurship and small business management, human resource management, management, management information systems, marketing, and supply chain management. The coop is mandatory and includes 4.5 semesters that last for 1.5 years.

The University of Cincinnati has a mandatory coop in engineering, but the coop in business is optional. The coop is available in accounting, finance, industrial management, information systems, marketing, operations management, and real estate. The industrial management program is a BSIM that is jointly offered with the College of Engineering. This program has a supply chain option. Students must have a cumulative quality point grade average in the College of Business of 2.5 or above. They are expected to complete 75 quarter credit hours before they can begin one year of cooperative education.

Kettering University has a mandatory coop program, but it does not have a program in supply chain management. It has concentrations in engineering, automotive design, and some fields of business including accounting/finance, general business, information systems, manufacturing management, marketing, and quality assurance. The coop is not for credit and begins in the freshman year. The class is divided into an A- and a B-group with each group having alternate 3-month periods of class work and coop. The groups alternate with the A-group in class while the B-group is working. The total program is 4.5 years with 2.5 years of coop. This is the most coop intensive program among those reviewed.

California Polytechnic State University offers an optional coop in a wide variety of fields. While the website does not specifically mention supply chain management, it does indicate that the coop can be in any area of business. This program is an exception because the coop can be taken for credit. A maximum of 16 credit hours can be earned. Like most coop programs, students are compensated for their work. Because credit is offered, the program can be finished in 4-years.

Robert Morris University offers an optional coop program that focuses on accounting. It does not offer credit for the program. Students can take up to four semesters of coop work during their four years.

Eastern Kentucky University has an optional, non-credit coop program in supply chain management. Students, who select the program, must complete three or more semesters of coop education, which can be done in four years. Students can select the alternating plan, which is similar to most coop programs with students working one term and attending class the next, a parallel plan, where students

can be a part-time worker and a part-time student during the same term, or they can combine these options, so some is alternating and some is parallel.

Sam M. Walton College of Business at the University of Arkansas offers an optional coop program that can be taken for credit. The program is normally taken in the summer between the junior and senior year. Students can also earn up to 3 credits hours of junior/senior elective through the coop program.

Business Schools with Cooperative Education Programs

	Supply Chain Management Coop Program	Req'd	For Credit	Schedule	Total Time Coop Time (with summer)
Northeastern University	Yes	Yes	No	Six month Coop A-Group Jan - June B-Group June - Dec	4.67 years 1.5 years (coop)
University of Cincinnati	Yes, BS in Industrial Management – hybrid business and engineering	No	No	Begin after earning 75 quarter credit hours	4.67 years 1.0 years (coop)
Kettering University	No	Yes	No	Two three month coops each year with an A Group and a B Group	4.5 years 2.5 years (coop)
California Polytechnic State University	Yes	No	Yes (16 hrs.)	No fixed schedule	4.0 years 1 term (coop)
Robert Morris,	No, primarily accounting	No	No	Alternating terms with a maximum of 4 semesters	4.0 years 1.33 years (coop)
Eastern Kentucky University	Yes	No	No	Alternating terms, part-time, and combination plan	4.0 years 1.0 years (coop)
Sam Walton College at the University of Arkansas	Yes	No	Yes	Summer Coop	4.0 0.5 years (coop)

Based on this review of other programs, the typical coop program is optional and does not carry course credit. The most common method is the alternating term method with students taking courses one term

and working the next. The most common starting time is late in the sophomore or early in the junior year. The average coop time seems to be about one year or 3-4 semesters. These coop programs delay graduation minimally.

Survey of Business Interest in Cooperative Education

To evaluate the interest that businesses may have in supporting the cooperative education program in supply chain management, meetings and presentations were arranged with business oriented groups. A meeting was held with the Advisory Board for the Supply Chain Management Area of Specializations, which is offered within the IOTM Department at the University of Toledo. A copy of the membership is provided in Appendix A, and a copy of the presentation is provided in Appendix B. Also, a meeting was held with the Toledo Chapter of the American Production and Inventory Control Society (APICS). The power point slides in Appendix B were also presented to this group. As a result, the Executive Committee of the APICS chapter agreed to survey its members.

The survey questions and results are provided here. Most of the respondents (70% to 92%) strongly agree or agree that a coop experience allows the new employee to be productive sooner, apply concepts learned in the classroom more easily, require less training, and make a contribution more quickly than non-coop graduates.

When compared to non co-op, graduates with co-op experience						
Answer Options	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Response Count
Make the transition from student to productive member of the workforce easily.	12	7	5	0	0	24
Make it easier for students to learn and apply concepts taught in the class room.	13	9	2	0	0	24
Require less training.	6	11	7	0	0	24
Make a contribution to our company quickly.	9	12	3	0	0	24
<i>answered question</i>						24
<i>skipped question</i>						0

Nearly 80% prefer to hire graduates with co-operative education experience even when the experience is with another company. However, it is interesting to note that only 35% of the companies that responded felt that they had an active cooperative education program. This would seem to be inconsistent with the claim that companies prefer to hire graduates with coop experience. The reason for this inconsistency may be explained by the fact that there are relatively few coop programs in business and even fewer in operations and supply chain management as illustrated by our benchmarking efforts.

We prefer to hire graduates with co-operative experience, even when the co-op is with another company		
Answer Options	Response Percent	Response Count
Strongly agree	33.3%	8
Agree	45.8%	11
Neither agree nor disagree	20.8%	5
Disagree	0.0%	0
Strongly disagree	0.0%	0
<i>answered question</i>		24
<i>skipped question</i>		0

Our company has an active co-operative education program		
Answer Options	Response Percent	Response Count
Strongly agree	21.7%	5
Agree	13.0%	3
Neither agree nor disagree	39.1%	9
Disagree	13.0%	3
Strongly disagree	13.0%	3
<i>answered question</i>		23
<i>skipped question</i>		1

Cooperative Education Program Design

A primary intent of the design is to allow students to graduate in four years while participating in three semesters, approximately one year of cooperative education. These coop experiences will be full-time, paid assignments, and students will not attend class during the coop. The coop experience will not carry college credit, which simplifies that process by eliminating the need to verify the intellectual content of the job and to have faculty evaluate performance for the purpose of assigning a grade. This allows students to be placed in coop positions anywhere in the US and even to be placed internationally, which is a highly desirable outcome. Initially, the coop will be optional for the students. Depending on the response from businesses and students during this initial period, the coop may become mandatory pending faculty approval. The curriculum content for the coop student and the non-coop student is the same, and graduation is expected to be extended by as little as one summer semester, which would allow a coop student to complete the program in four years.

As part of this effort, meetings were held with the University of Toledo's College of Engineering to discuss the implementation of its cooperative education program, which began as an option for students and eventually became mandatory. The College of Engineering currently places approximately 1,000 coop students each year, mostly in Ohio and the Midwest, although some students are placed at other locations. The program has been very successful in placing graduates and has developed effective

policies when a coop experience cannot be arranged. This has been a minor problem. The coop schedule used by the College of Engineering is similar to Option 1 described in the next section.

Schedule:

Two options for the schedule will be considered. In both options, the students would be divided into two groups designated A and B, with half the students taking courses while the other half is on coop. This rotation would begin in the summer prior to the junior year (third year). It should be noted that no changes to the curriculum are required to offer the coop, but it is necessary to change the way courses are scheduled to implement either Option 1 or 2 because both require some courses to be offered in the Summer Semesters.

In option 1, shown here, students would have three coop experiences that coincide with the start and end of a semester beginning with the A-group in the summer semester of the second year. The A- and B-groups alternate semesters until all three coops are complete. This alternative tends to be typical of what most coop programs do.

Scheduling Option 1:

Year	Fall Semester	Spring Semester	Summer Semester
1	Full-time	Full-time	Vacation
2	Full-time	Full-time	Full-time (B1) Coop (A1)
3	Full-time (A1) Coop (B1)	Full-time (B2) Coop (A2)	Full-time (A2) Coop (B2)
4	Full-time (B3) Coop (A3)	Full-time (A3) Co-p (B3)	Full-time

Scheduling Option2:

Year	Fall Semester	Spring Semester	Summer Semester I (eight weeks)	Summer Semester II (eight weeks)
1	Full-time	Full-time	Vacation	Vacation
2	Full-time	Full-time	Vacation	Full Time (B1) Coop (A1)
3	Full-time (B1) Coop (A1)	Full-time (A1) Coop (B1)	Full-time (A1) Coop (B1)	Full-time (B2) Coop (A2)
4	Full-time (B2) Coop (A2)	Full-time (A2) Coop (B2)	Full-time (A2) Coop (B2)	Full-time

In option 2, shown previously, students would have two coop experiences that last for six months each. The A-group coop coincides with the start of the Summer Semester II (roughly July 1) prior to their junior year and includes all of the Fall Semester (roughly December 31). The A- and B- groups alternate six month periods until the two coops experiences are complete. An alternative similar to this one is used by Northeastern, which is the best known and largest business coop program in the US.

While Option 1 is more traditional and gives students the chance to work at three different companies, Option 2 has certain advantages including lower administrative costs, because each student has to be placed only twice, and greater continuity for the company because the student is available for six months at a time rather than about four months.

Curriculum Change

After careful study, curriculum changes are not needed to support the coop program. Curriculum will change as the field expands its knowledge base.

Recommendations

1. A pilot program is needed to determine the value of the coop program to students and to businesses.
2. The IOTM should proceed with the implementation of an optional cooperative education program for its Operations and Supply Chain Management Areas of Specialization. The goal should be to have 3-5 students placed or scheduled to be placed in coop assignments by the Fall semester of 2009.
 - a. To accomplish this, a faculty member should take the responsibility to locate students and companies that are willing to participate in this coop experiment. For this work, the faculty member should be given appropriate release time. A small amount of travel money (\$1,000 to \$1,500) should be made available from the College or the IOTM Department to support trips to companies in the area.
 - b. As part of this effort, exit interviews should be held with both the students and the companies to determine the value of the coop program and to determine its long term viability.
 - c. In the pilot project, the coop experience should coincide with a semester. During the exit interview, information about the length of the coop experience would be collected from both students and employers to determine which scheduling options would be preferred.
 - d. For the pilot program, no changes in curriculum are planned .
3. If the pilot project demonstrates that both students and employers are satisfied with the experience, then a larger and more widely available coop program should be launched in the

Fall of 2010 or 2011. Determination about whether the program would be mandatory at this point would be based on interest expressed by the students and the employers. There appears to be limited advantage in moving to make the program mandatory at this point. That decision should only be made for the Fall semester of 2010 or 2011 if there is evidence to support this decision.

4. If a decision is made to make the program mandatory, then approval from the College of Business Administration faculty must be sought.

APPENDIX A
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Rev: 3/26/08

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SUPPLY CHAIN MANAGEMENT CO-OPERATIVE EDUCATION INITIATIVE

The University of Toledo
College of Business Administration

What is Co-operative Education

- ▣ Most common in engineering
- ▣ Opportunity to earn and learn
- ▣ Full time work – no coursework
- ▣ Not-for-credit work experience
- ▣ But required for graduation
- ▣ Usually 3 or more work segments lasting 3-4 months each
- ▣ Co-op work can be anywhere including international

Advantages for Students

- ▣ Learn what is expected in the world of work
- ▣ Integrate hands-on business experience and academic training
- ▣ Understand how concepts discussed in the classroom are put to use
- ▣ Provides motivation and a willingness to learn

Benchmarking

	Co-op Program	Req'd	Schedule	Total Time Co-op Time
Northeastern University	Yes, in business	Yes	A-Group Jan - June B-Group June - Dec	4.67 years 1.5 years
University of Cincinnati	Yes, BS in Industrial Management – hybrid business and engineering	No	Begin after earning 75 quarter credit hours	4.67 years 1.0 years
Kettering University (GMI)	No, in business			

Recommendations for UT's Co-op Program

- ▣ Initially, focus on Supply Chain Management
- ▣ Initially, program is optional for graduation
- ▣ Co-op must be for pay and not-for-credit
- ▣ Will not take classes during co-op
- ▣ Three co-op experiences lasting about 4 months each
- ▣ Extends graduation by as little as one summer semester
- ▣ Co-op can be anywhere including international

Tentative Co-op Schedule

Year	Fall Semester	Spring Semester	Summer Semester
1	Full-time student	Full-time student	Vacation
2	Full-time student	Full-time student	Full-time student Co-op A1
3	Full-time student Co-op B1	Full-time student Co-op A2	Full-time student Co-op B2
4	Full-time student Co-op A3	Full-time student Co-op B3	Full-time student

Survey of Potential Co-op Employer

- ▣ Graduates with co-op experience
 - Make the transition from student to productive member of the workforce more easily than non-co-ops
 - Make it easier for students to learn and apply concepts taught in the class room
 - Require less training
 - Make a contribution to our company quickly
- ▣ We prefer to hire graduates with co-operative experience, even when the co-op is with another company
- ▣ We prefer to hire graduates with co-operative experience, when the co-op is with our company
- ▣ Our company has an active co-operative education program
- ▣ We are interested in discussing the co-op program and whether it makes sense for us to participate