

Cooperative Education in the Associated Schools of Construction

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The purpose of this paper is to present the extent of cooperative education within construction management programs in the Associated Schools of Construction (ASC). The extent of cooperative education was determined through a survey of all ASC construction management programs. This paper presents a brief history of cooperative education, research methods, cooperative education survey findings, and a tabulation of survey results. It was determined that the majority (91%) of ASC colleges and universities within the Associated Schools of Construction have some type of cooperative education program.

Key Words: Cooperative Education, COOP, Internship, Work Study

History of Cooperative Education

Formal cooperative education was innovated at the University of Cincinnati in 1906 by Professor Herman Schneider (Collins, 1986). He envisioned the kind of collegiate institution that would offer a combined theoretical and practical education. After the University of Cincinnati started a cooperative education program in 1906 the number of college cooperative education programs throughout the United States has increased tremendously. According to Henry (1954) the following colleges, in order, started cooperative education programs between 1906 and 1921: Northeastern University, University of Detroit, Georgia Institute of Technology, University of Akron, Drexel University, Massachusetts Institute of Technology, and Antioch College.

Between 1921 and 1943 at least one college per year started a cooperative education program. College implementation of cooperative education programs increased after 1943. Two or three colleges started cooperative education programs each year between 1943 and 1963. The pace of cooperative education implementation accelerated after 1963 through the efforts of the National Commission for Cooperative Education. The number of cooperative students in 1960, 1970, 1980, and 1990 were approximately 50,000, 100,000, 180,000, and greater than 200,000 respectively. Government financial support has been one factor in the recent growth of the cooperative education movement.

Introduction

Many construction education and industry leaders realize the value of cooperative education. The industry can screen prospective employees from a pool of cooperative education students and

collaborate with education faculty to influence the undergraduate programs to further meet their needs in a future employee. Faculty members can better explain concepts in the classroom to students, who have experience in the construction industry. Understanding the degree to which the university and industry benefit in mutually meeting each other's objectives through a cooperative education program was one purpose of this research project. The main purpose of this research project was to determine the extent of cooperative education within colleges and universities in the Associated Schools of Construction (ASC).

During the fall of 1996, a survey questionnaire was sent to 88 schools that are ASC members. The purpose of the survey was to assess the extent of cooperative education as a recognized segment of the various curriculums. The need for such a survey existed from the fact that this information did not exist and that it would assist ASC programs to know what other universities were doing when making decisions about cooperative education in their curriculum. Of the 88 surveys mailed, 43 completed surveys were returned. In order to answer the basic question of whether a program had a cooperative education program or not, an e - mail follow - up questionnaire was sent to those who did not respond to the mailing. Eleven additional responses were received for a total of 54 responses of the 88 surveys sent out (61%).

One of the concerns in developing this questionnaire was the definition of cooperative education (coop). For this questionnaire, the word "coop" was any work experience that is recognized by the school as part of the expected education experience. We found that even with this definition there was some confusion over the term "coop." Some respondents were more accustomed to "internship" or "work study." Although there is an official distinction between these terms we have used them interchangeably.

Research Methods

The following process was used to develop and distribute the survey questionnaire to determine the status of cooperative education at ASC schools:

1. A brief telephone and e - mail inquiry was done with approximately ten ASC members to find out whether a need existed for such a survey, whether such a survey had previously been done and whether ASC would have an interest in the results. The response was positive on these points.
2. The questionnaire was developed by the Construction Management and Technology (CM&T) faculty in consultation with the College of Technology's Cooperative Education Office.
3. The questionnaire was sent out and reviewed by about ten ASC members. Their concerns, corrections, and comments were considered and incorporated into the questionnaire where appropriate.

4. The questionnaires were distributed in October to the 88 ASC schools as shown in the membership directory of 1995 - 96. A self - addressed, stamped envelope for return to BGSU was included.
5. To facilitate questionnaire tracking, consecutive numbers were assigned to each questionnaire in the order they were received.
6. The questionnaire responses were reviewed and interpreted by the CM&T faculty. Most of the questionnaires were thoughtfully completed. In a few cases partial information had to be disregarded.

Major Findings

The major finding of this research project is that most Associated Schools of Construction (91%) have some type of coop program for their students. A majority (58%) of the programs required this formalized experience. Most programs have two work terms (either quarters or semesters) of coop earning three to four credit hours per work term. The student generally pays tuition for the credit hours earned, works about 400 to 500 hours per work term and earns between \$7.50 to \$10.00 per hour. Coops are generally done during the summer (74%). The coops are evaluated in numerous ways and the coop programs are administered with several combinations of university staff. Contractor demand for coop students generally exceeds the number of students available. The level of satisfaction among the participants, students, faculty and employers, is very high with an 8 out of 10 approval rating.

Tabulation of Results

The following is a tabulation and discussion of the 24 fill - in - the - blank questions and a summarization of general comments resulting from the narrative questions, 25 through 29. As in any survey, which includes opinion, this survey required some interpretation of the responses. Some of the returned questionnaires were not complete, therefore some of the tabulation of numbers does not add up to the total number of respondents. Eighty-eight questionnaires were sent out with a response of 54 (61% response rate). Forty-three responses were for completed questionnaires returned via mail. The other 11 were e - mail responses to the basic question of whether the construction management program had a cooperative education program and if it was required.

1. *What is the degree that your students receive?*

Two of the programs were two - year associates, 40 were four - year bachelor degrees, and one school was a master's degree. Some of the bachelor programs were combined with either an associate's degree and/or a master's degree. Five schools indicated that they had a master's program. There may have been more masters' programs but this questionnaire did not specifically ask for this information.

2. *Is your university on semesters or quarters?*

Of those responding, 13 were on quarters and 30 were on semesters.

3. *What are to total hours required for a degree?*

For those programs that are on semesters, the hours ranged from 124 up to 144 credit hours with the average being 130. For those programs that are on quarters, the hours ranged from 181 to 205 hours with the average being 195.

4. *Does your program have one of these formalized programs; work study, internship, and/or cooperative education? The other option was none.*

Of the 54 schools responding to this question, 49 (91%) indicated that they had one or more of the formalized programs while 5 (9%) did not.

5. *If you have a recognized work - study program, then how many terms and academic credit hours are required?*

From this question, we not only received the requested information but also determined the number of schools requiring a work - study program and how many did not. Of the 45 schools responding to this question, 26 (58%) required the program and 19 (42%) did not. The number of required work terms varied from one to six with an average of 2.1. The credit hours for a single work term varied from 0 to 12 with an average of 3.8. Three credit hours per term was the most common number of credit hours. This indicates that 2 terms of 3 to 4 credit hours per term is typical for those programs that require the work - study experience.

6. *How many work terms and coop credit hours does the program permit as electives?*

The responses to this question were rather inconclusive and in some cases made little sense. We decided not to present any findings on this other than determining which programs required work - study and which did not. These findings have been tabulated in narrative for question #5.

7. *If coop is an elective, what percentage of your graduates goes through the coop experience?*

Seven schools responded to this question. The percentage of graduates going through the elective coop experience varied from 1% to 80%. The average was 32%.

8. *What is the average total amount of credit hours of cooperative education for a degree?*

The responses to this question were rather non - responsive. As indicated in #5 above, the typical program has 2 terms of 3 to 4 credit hours per term for those programs that required the work - study experience.

9. *How many employment hours and employment weeks are required in a single work experience?*

The schools primarily answered in total number of hours. The total hours varied from 70 (next lowest was 240 hours) to 640 hours with the average being 411 work hours. The employment weeks were as low as 8 and as high as 16 with the average being 10 weeks.

10. *What percentages of the coops are taken during summer versus other times?*

Seventy - four percent are taken during the summer. Three programs have exclusively a summer program coops exclusively in fall and spring with none in the Summer.

11. *What is the average pay for a coop employment?*

of responses
8.4 No pay, done for experience
9 Less than \$7.50
10 \$7.50 to \$10.00/hr
11 \$10.00 to 12.50/hr
12 More than \$12.50/hr

12. *How much do students pay the university for each coop work experience?*

The most common response was that the student paid the usual tuition for the credit hours taken. The average was \$258 per experience. This ranged from \$0 to \$832. If the five schools that do not charge for coops are deleted from the tabulation, the average for those schools that do charge is \$330 per experience.

13. *Coop systems are administrated by various units or a combination of units within the university structure. What percentage of your coops are administered under the direction of the following units: university, department, college, and/or program.*

of responses
8 By University Only
5 By College Only
8 By Department Only
6 By Program Only
5 By Combination of University and Department
1 By Combination of Department and Program

14. *How many equivalent full time staff administers the coop program (remember this is only for construction and you might have to prorate the entire staff between programs)?*

The average of the 29 responses was .43 with the range going from 0 to 1.

15. *In the past year, how many coop students participated in the coop program and how many total students were eligible?*

Once again the responses were incomplete and inconclusive. No general summary could be made from the information.

16. *What percentages of the coop assignments are found by the student through their own efforts or contacts (in lieu of the paid university staff or contractors contacting the university)?*

of responses

9 less than 10%

6 11% to 25%

5 25% to 50%

10 more than 50%

17. *Contractor demand far exceeds the students that are available.*

The response was a Likert scale of 0-to-10 with 0 indicating strongly disagree and 10 indicating strongly agree. The average response was 6.7 indicating a general agreement.

18. *Some coop programs formulate an ongoing agreement between the coop employer and the university. In these agreements, the employer is obligated to provide employment positions for coop students and the university is obligated to provide students for these positions. What percentages of coop employers meet this arrangement?*

Twenty schools indicated that 0% of the employer were obligated to hire students. Six schools indicated that they had such an arrangement. The average of these schools was 45% with a range from 4 to 100%. The response of 100% indicates that, at least, one school has an arrangement by which the coop employer and student employee is very much controlled by the school's program.

19. *Coop jobsite visits of the student are done by:*

of responses

11 Construction Faculty Only

0 Coop Staff Only

15 No one

4 A Combination of Faculty and Staff

20. *How are students evaluated?*

of responses

4 Only by Evaluation Form done by Employer

0 Only by Coop Jobsite Visit

1 Only by Written Report by Student

- 9 Evaluation Form by Employer and Written Report done by Student
- 2 Coop Jobsite Visit and Written Report done by Student
- 12 Combination of all three methods

21. *How many type written pages are in the average student report?*

- # of responses
- 10 1 to 5 pages
- 13 6 to 10 pages
- 5 11 to 20 pages
- 1 21 or more
- 3 N/A

22. *Are the students required to keep a journal or diary?*

- # of responses
- 14 Always
- 6 Sometimes
- 9 Never
- 1 Yes, a brief one

23. *Do you believe that cooperative education helps graduates find employment?*

- # of responses
- 22 Always
- 10 Sometimes
- 1 No effect

24. *Receive higher starting salaries?*

- # of responses
- 11 Always
- 18 Sometimes
- 2 No effect

This has been examined closer by (Wessels and Pumphrey, 1996), who found that there was really only the benefit of increased wages for females and those that have the least experience. Experienced workers' wages are less affected by cooperative education. Also asked in this question was the percent hired into a permanent position from their coop employment. There were five responses and they were 100%, 90%, 50%, 33% and 10%.

25. *On a scale from 1 to 10 (with 10 indicating satisfied) what is your perception of the level of satisfaction with the coop program of each of these groups at your institution?*

- 8.4 Students
- 8 Faculty

8.5 Employer

The satisfaction level that the respondent reported was actually lower than other studies. While the faculty who answered this questionnaire perceived that there was an 8.4 level of satisfaction with students, studies on disciplines other than construction have shown that 95% of the students would recommend cooperative education to other students (Dubick, 1996). In addition to the above fill - in the - blank questions the following narrative questions were asked. The responses have been summarized in the next section of general findings of narrative. The complete reporting of these narratives are shown in Appendix A.

26. *Please elaborate on any information to demonstrate that a formal internship or coop experience is an important aspect of a construction education.*

A major portion of these responses discussed the value of improved classroom participation of the students after the coop experience. Others endorsed the value of exposing the students to “real life” construction experiences and the opportunity for the employer and student to assess the possibilities of permanent employment without the pressure of making a long-term commitment. A couple of schools responded that they had little support from the construction industry. This is contrary to the favorable response found in question #17. One school suggested that ASC fund a coop education-training program for the member schools.

27. *Do you feel that a formal internship or coop experience is unnecessary because most students work construction without it being a university requirement?*

More than three - quarters of the respondents indicated that they felt that a formal internship or coop experience was necessary. One school brought up that students hate to pay the tuition for construction work that they probably would have done anyway. Another indicated a concern that coops force students to take work that may not be convenient to the demands of their personal life.

28. *What are the biggest barriers to the administration of a coop program?*

By far the most common barrier was time and money. Other problems that were highlighted were the lack of quality placements, lack of support by the university and the difficulty of restructuring the curriculum to accommodate coops. Two respondents indicated that there were no barriers to coop.

29. *What unique characteristics have you found beneficial in a coop program?*

Many of the responses were reiterations of points previously mentioned. A couple of new points were made. The opportunity exists for networking between the university and the construction company. There is the obvious value of student networking but it also exists for the university. In addition, one school brought up the fact that coops provide financial support that can be used for summer support for the faculty.

30. *What other information about cooperative education would you like to share that might be helpful in this survey?*

Several schools had various comments but one that was noteworthy was that one of the schools has a special three credit hour class in which students are found positions and are taught interviewing and resume writing skills.

Discussion of Results

Most schools (91%) have some form of coop program. Of these, 58% are required programs while 42% are electives. For those which are elective, a significant portion (32%) elected a coop program. The range for electing coop varied from only 1% to 80%. A typical coop included 2 terms of 3 credit hours each. Some did not give credit while others gave 12 hours credit for a single work experience. The duration of the employment was around 400 hours per work experience (range from 70 to 600). The rate of pay for the coops is certainly above minimum wage with most getting between \$7.50 and \$10.00 per hour. About three - fourths of the coops are taken in the summer. A few schools indicated that coops alternated semester to semester with class work. The students typically pay tuition rate for the hours taken in coop.

Although there is always some university structure by which the coop is administered, many of the students find their own coops. The administration structure within the university for coop doesn't have a typical format and is administered by every unit and/or combination of units. Though some programs mentioned that industry support is not available, most said that finding jobs is not a problem and they are available. However, few contractors are obligated to hire coop students regardless of the job situation.

Review and evaluation of the student during the coop varies dramatically. About half of programs don't provide a jobsite visit by a member of the university. In the situation where there are jobsite visits, the visiting individual may be either coop staff or construction faculty. There were no predominant means by which evaluations were done. Evaluation forms by employer, student reports and jobsite visits all made up the possibilities. The BGSU student performance evaluation profile (completed by the employer) is shown in Appendix B. In most cases, some type of written report was required with 6 to 10 pages being the most common length. In most cases, the student was required to keep a journal or diary of their activities. Most schools were confident that coops helped the student, not only find permanent employment, but also at a higher starting salary.

Finally, it is the perception that all the participants, i.e. students, faculty and employers were pleased with the coop programs. It should be pointed out that a few schools were not impressed with coop programs and gave them low marks.

Summary

Hopefully, this paper provides a perspective of how coops are incorporated into the curriculum of most of the ASC schools. From this perspective the reader can address the strengths and weaknesses of their individual programs. Although this paper has not been an instruction manual on how to set up a coop program, it should give the reader an understanding on the magnitude of many aspects of a cooperative education in the Associated Schools of Construction.

References

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Appendix A

Responses to questions 25 to 29

(The number prior to the comment is simply the number assigned to the questionnaire at the time it was received. This helps in tracking the responses.)

25) *Please elaborate on any information to demonstrate that a formal internship or coop experience is an important aspect of a construction education.*

1 - Quite valuable

3 - Students find what real life is all about first hand. Employers offer higher salaries to graduates with “real” experiences. That is what “industrial technology program” is all about: hands - on.

5 - Give sound experience to the education being received. Most demonstrate improved classroom performance as a result of the experience.

8 - Employers for the most part place great emphasis on construction experience. The coop program does an excellent job in providing opportunities for experience.

11 - Employers can hire without a permanent job commitment. Great experience for the students.

12 - Students come back more motivated.

16 - More and more firms are using coop as a pre - employment screening process.

21 - Only way to truly expose students to industry demands.

22 - Important that it takes place between junior and senior year. Changes quality of the performance in Capstone course required at the end of the senior year.

24 - This is the way to have student really learn and apply and relearn such that true mastery occurs of the subject.

25 - Each company has a formal agreement with the university and my program.

27 - You should ask students. It's one of the greatest experience in their careers.

29 - I believe it is very important. Implementing it is a major problem. Contractor response is very poor to non-existent.

30 - We are an evening and weekend program primarily. We do have one or two courses during the day. Our students are working by the time they are juniors.

31 - Industry advisory committee meets twice/year. Employers are willing to spend minimum possible for on - job training.

32 - We are firm believers in formal required internships before graduation.

33 - Provides direction to student. Helps motivate students when returning to classroom.

34 - We have no coop program. Credit is allowed for internship by student petition. It is not required.

37 - Great. Brings student to the realization that classroom activities are relevant.

39 - You summarized this well in your abstract. Coop fills the void that the very ineffective standard hiring practice leaves.

41 - When the experiences provide responsibility, the student matures in his discipline.

42 - Absolutely necessary. We would like ASC to fund training for member schools. We'd like to do it.

26) *Do you feel that a formal internship or coop experience is unnecessary because most students work construction without it being a university requirement?*

1 - No - It should be required

2 - The experience is what's important.

3 - Coop Experience MUST be a requirement of all construction programs regardless.

5 - Not unnecessary; Just not required. Good student's understand the value and take advantage while others do not.

8 - No. We require all of our construction students to in a construction related job for at least 12 weeks. The formal coop program meets and greatly exceeds this minimum requirement. Participants are highly sought by construction firms.

11 - Disagree.

12 - No

- 15 - No, very necessary for our students. 50% of our majors have no construction work experience.
- 16 - Yes. Most students see the value and participate voluntarily.
- 21 - Partly agree. Depends on the individual.
- 22 - No. The organized process, follow - up reports and contact with industry are very important parts that mature students.
- 24 - No. Structured internships are the best way a achieve educational and professional objectives.
- 25 - No. They need the final application of all their experience and it needs to be structured over a broad spectrum of knowledge base.
- 26 - No. It's often easier for students to have other jobs and work around their schedules than to construction job.
- 27 - Internship is a 14k Gold arrangement. All parties feel it enhances value of the student. It weeds out those who are not really going to stay in construction.
- 29 - I feel it is highly desirable. The problem is in the implementation.
- 30 - I believe a program should require some work experience before their senior year. 800 hours was adopted here because industry felt it would be the minimum needed, i.e. 2 summers. How the students get that experience is up to them.
- 31 - No. Faculty acts as job exchange for willing students to find internship employment. Such employment is highly recommended by the faculty.
- 32 - No. Lots of time previous experiences are (quality) questionnaire. Also, we found that it is beneficial for faculty supervisors to visit these construction companies for various reasons.
- 33 - No.
- 36 - Yes. Our internship requires that the employer give the student management experience. Most construction work by students outside college is typically labor experience.
- 37 - No. A different prospective that it generates.
- 38 - Hate the collection of the fees by the university.
- 39 - Absolutely not! Coop is the single most important component of our program.
- 41 - We believe in the formal experience but may reduce to 3 hours/work experience. Still would make money under present system.
- 42 - No.
- 44 - This is not the point. Employers of graduates know our graduates have already been through the wringer. It's not left to choice or chance.

27) *What are the biggest barriers to the administration of a coop program?*

- 1 - Faculty not having time or financial support to visit coop sites.
- 3 - Experienced personnel, needs a full - time faculty, and resources.
- 8 - Reluctance of students to commit to the extra time required for coop and distance involved in visiting students while they are working.
- 11 - Finding appropriate quality placements
- 12 - Non - English speaking permanent residents.
- 15 - Money and Time
- 16 - Resources
- 22 - Lack of adequate developmental support from the engineering dominated college.
- 24 - Time required and lack of resources.
- 25 - Hard work and time.
- 26 - It's volunteer work which is not rewarded by the university.
- 27 - Commitment of a faculty member to operate it. But answering this would require a journal article of 20 pages.
- 29 - None - administratively.
- 30 - Time!
- 31 - None.
- 32 - Everything seems to work well at our program.
- 33 - Time. We are in the rural setting. Other demands on faculty.
- 35 - Budget and time for internship coordinator to travel to internship sites. A lot of paper work and preplanning.
- 37 - College arrangement of our institutes; should be administered by the program.

- 38 - that is my off quarter.
- 39 - Lack of commitment by our president.
- 41 - Need larger staff.
- 42 - Work commitment, cost, inability to restructure curriculum.
- 44 - Establishing enough reliable repeating coop sites. Construction runs hot and cold in the northeast. When it's cold, it's tough to place everyone.

28) *What unique characteristics have you found beneficial in a coop program?*

- 1 - Students appreciate the need to learn classroom material to be able to perform on the job site
- 3 - Provides graduates a unique real experience, links class - rooms to real life, and gets faculty to seek "real" experience.
- 8 - Having the central coop office assist students in finding coop jobs,. And the significant change in attitude and confidence exhibited by students after one or two coop terms.
- 11 - Having students seek their own placement.
- 12 - Interview process, Networking.
- 21 - Real Life.
- 24 - Employers get closer to the university.
- 26 - It brings the relevance to the student's classes.
- 29 - Ability to obtain "real world" experiences.
- 31 - Students familiarize themselves with real life situations. Tests reflect such situations. All curriculum tests reflect practical applications.
- 32 - Helps to get the "PR" out regarding our construction program and graduates.
- 33 - Learning contracts. Feedback systems.
- 35 - Future employment opportunities for student and "real world" experience.
- 37 - Professional quality of the activity.
- 38 - Students explaining program to potential employers.
- 41 - Summer pay for faculty. Several unique construction sites of interest. Some better interaction in teaching with experience.
- 42 - Structure, structure, structure. Substantial portion of the curriculum mandatory, alternating with classes.
- 44 - Diversity. We are not construction only. We are civil with design and facility jobs as well as construction.

29) *What other information about cooperative education would you like to share that might be helpful in this survey?*

- 3 - Graduates with coop experiences obtained higher entry - level salaries and were promoted much faster.
- 8 - Written requirements of other programs. We require a 5 to 10 page report on some aspect of the work experience, a daily dairy entry, and a summary report that goes on file in the central coop office.
- 11 - Students can sign u for a special 3 credit hour course in which they are found positions for them. They also are thought interviewing, resume writing skills.
- 12 - Ours is a required program. We have a formally established, large coop office. Student reports are discussed with the coop staff.
- 21 - Difficult to monitor, service and maintain.
- 31 - Personal endorsement in writing by faculty if student has B+ average.
- 33 - All win - students, university and employer.
- 39 - My program is the largest 2 - year civil program in the country and the college is the largest 2 - year college in coop in the country (seventh overall). I would be glad to chat about our experience. I look forward to reviewing the results of this study.
- 42 - Keep excellent statistics and survey reports.