COOPERATIVE EDUCATION IN CIVIL ENGINEERING TECHNOLOGY

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Abstract

Cooperative education began in an engineering program at the University of Cincinnati in 1906 where the program continues to exist and be used as a model for others. Cooperative education and engineering technology has a common focus in preparing graduates for a successful professional career. Examining the cooperative education component in the Civil Engineering Technology program at Murray State University offers comparisons to the more established programs.

This paper reports on an innovative work-study program financed by local builders and contractors that attempts to overcome some of the obstacles found in creating a co-op program at a small rural university. While the benefits of the work-study program are consistently mentioned by the students, employers, and educators their statements are purely opinion. There is little data about the effects of the work-study program concerning graduate placement rates or subsequent patterns of promotion and earnings.

Introduction

Cooperative education programs have been in existence for over 90 years and nearly one-third of the over 3,000 colleges and universities have some form of a co-op program (Woolridge, 1987). The traditional form of co-op involving alternating semesters of work and school, following the traditional ABET format, is not the most popular. Only eight engineering schools make co-op in the traditional form mandatory. The Civil Engineering Technology(CET) program at Murray State University(MSU) requires a one semester co-op or work-integrated learning experience. The co-op requirement has been in place since the CET program's inception in 1970.

Many schools offer co-op in some form, however, most often they are programs involving small enrollments (Stern, Finkelstein, Stone, Latting, and Dornsife, 1995) and therefore the programs are not expanding or evolving. Irrespective, co-op benefits are well documented (Dubick, McNerney and Potts, 1996; Wagstaffe, 1995; Wessels and Pumphrey, 1995). MSU survey results show employers and students confirming numerous benefits for all involved; students, employers and educational institutions. With over two hundred students involved annually in the MSU program it has attracted more than enough success. According to annual surveys, over 70% of the students participating in a work-integrated experience felt that their job experience lead to an employment offer.

Their annual starting salaries were 9% higher than students who did not have any career-related experience. The advantages of a co-op experience to the students, faculty and employers in the MSU program remain substantial. The main benefit in examining the co-op program in CET is not to describe once again the benefits of co-op or work-integrated learning but to describe the conditions present as well as the problems that remain.

Background

Each student in the CET program is required to complete a one semester work-integrated learning experience. The administration of this experience is accomplished through the Career Services Office or the CET program coordinator. Employment opportunities are developed in a variety of ways, some formal some informal. A potential employer may be identified by a student, a faculty member or a Career Services Office staff member. Students are identified for placement by filling out the co-op application form and submitting their resume. The application form requires CET program coordinator approval. Copies of student's resumes are also available in the CET program coordinator's office. Cooperation between the CET department and Career Services Office is excellent and enhances the successful placement and work experience.

Prior to the actual employment phase, the student does not obtain any formal instruction in work-related expectations. No seminar class is offered that would provide an arena for students to explore workplace expectations and culture. Some students are not prepared for what will be required of them once they enter the workforce. An on-campus seminar prior to the work assignment is one method of introducing students to important aspects and expectations about the co-op experience. Resume writing, interviewing skills and job requirements are a few of the topics that may be discussed. This has been neglected in the work-integrated programs at MSU in the past. These seminars can bridge the gap between the classroom and the workplace, while the co-op provides the opportunity to develop a "work ethic".

At the conclusion of the co-op, the employer routinely fills out a Student Evaluation Form covering characteristics such as; work performance, employability, and personal qualities. The MSU staff encourages the employer to discuss this evaluation with the student. The student also completes a report describing job duties, self evaluation and comments on the assignment both positive and negative. All of these reports are reviewed by Career Services staff and CET faculty.

Due to economic restraints, much of the placement involves companies in the student's home town. This lowers housing and travel costs but hinders involvement in some local western Kentucky companies. In addition, most of the work-integrated experiences are not repeated by the student. Multiple co-ops by the students may be advantageous but are rare.

Work-Study Program

In 1982 the Department of Industrial and Engineering Technology offered a unique program to CET students. The Work-Study program was introduced by the local Associated General

Contractors(AGC) in Paducah, Kentucky. They borrowed the concept from the Michigan Chapter of the AGC.

The purpose of the program was to attract more students into co-op positions with local construction companies. It was intended that the resulting relationship would lead to technically qualified college graduates with practical on-the-job training, benefiting both contractor and student.

The framework of the program is based on a period of employment, lasting a minimum of twelve weeks, with a local AGC member firm. Students are paid at the prevailing wage rate for their job classification and experience. In addition, the local AGC Foundation awards a tuition grant to Murray State in the student's name, to be used for school-related expenses the following semester. To be eligible, students must be full-time CET majors with a minimum of sixty semester hours including course work in surveying and blueprint reading. The CET program coordinator collects the applications and arranges interviews for all participating contractors. The students involved obtain job assignments that may include assisting field or office staff in: estimating, scheduling, job layout, shop drawing approval and job cost control.

The contractor is responsible for the interviewing and selection of the student employee. Job assignments that lead to a variety of career-related functions are encouraged. Typically the contractor will assign an advisor or mentor to the student employee through whom communications can be referred and to whom the student can turn for assistance. At the conclusion of the twelve week assignment the student’s supervisor is responsible for the completion of an evaluation form.

In addition to promoting the program and arranging interviews for the prospective students, the CET program coordinator is responsible for continuing coordination of the program. This includes maintaining necessary correspondence with all participating parties. A written report is prepared by the CET program coordinator at the conclusion of the program providing an overview and evaluation.

The student employee is required to complete the twelve week program in a professional manner. A written evaluation by the student concerning the work experience is mandatory. The tuition grant presented by the university in the student’s name for use of school-related expenses is not automatic, but is conditional upon the successful completion and verification of the program.

The program is limited in size, involving only 2-4 students per year, due to economic constraints. However, the value of the program is not measured in mere numbers alone. The positive relationship between students, contractors, Murray State and the local AGC is worth all the time and money expended. Even though a work-integrated experience is required of all CET students it is still difficult to convince all students of the benefits. This program provides necessary economic leverage to attract qualified students into local firms. It also provides leverage for the local AGC when soliciting member firms to participate. AGC member firms are encourage to participate then discover that there are many benefits in the relationship that encourages repeat involvement and good publicity for prospective employers.

This is a unique co-op program that is centered in the involvement of a professional organization and its' membership. Their enthusiastic commitment, not only economically, is the real key to the successful relationship.

Conclusions

The CET program at Murray State is located in the rural setting of extreme western Kentucky. Establishing meaningful local co-op relationships are difficult at best. Students are given opportunities away from campus that involve additional travel and housing expenses, reducing the attractiveness. With a small student body it remains difficult to develop traditional co-ops with companies that are not local and as yet do not provide attractive wage offers. Unfortunately, many opportunities go unfilled due to these constraints. The work-study program provides a small but significant help in this regard. Students are provided local job opportunities involving responsible positions and an attractive wage incentive.

The success of the work-study program is admirable and a well-documented benefit to all participants. The active and committed efforts of the local building industry and the AGC has been essential to the success of the program. Cooperation from MSU, the students, and the AGC can further enhance the program to include more students, more employment and more success.

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