

A Cooperative Co-op Experience

**James L. Hales, Stanley J. Pisarski
University of Pittsburgh at Johnstown**

ABSTRACT

The University of Pittsburgh at Johnstown (UPJ) is a branch campus of the University of Pittsburgh system. Engineering Technology in three departments--civil, electrical, and mechanical--was commenced in the early 70's. The BSET degree is offered exclusively on the Johnstown campus. Engineering programs are offered in Pittsburgh.

In 1977, a co-op program was implemented on the Johnstown Campus for ET students. After four years, it was terminated. The reasons are discussed. Subsequently, the School of Engineering in Pittsburgh developed and implemented a co-op program for its engineering students in various disciplines. In 1995, the ET departments at UPJ began using the School of Engineering's Co-op Program in Pittsburgh to place ET students in co-op assignments.

The paper discusses the challenges of interfacing with and logistics of utilizing a co-op office which is seventy miles away. The success and failures in placing ET students in co-op assignments are discussed.

INTRODUCTION

The objective of this paper is to present the results of experiences with cooperative education in the Engineering Technology Division of the University of Pittsburgh at Johnstown (UPJ). The University of Pittsburgh has four branch campuses. UPJ is the largest of these and is approximately seventy miles east of Pittsburgh on the Laurel plateau in the Allegheny Mountains of western Pennsylvania. The Engineering Technology Division is one of five divisions on a campus of just under three thousand students.

History of the Engineering Technology Program at UPJ

As part of the initiation of four-year programs at the University of Pittsburgh at Johnstown, agreement was reached in 1970 between the Johnstown campus and the School of Engineering at the University of Pittsburgh to establish a Bachelor of Science Degree program in Engineering Technology exclusively in Johnstown. Prior to 1970, the Johnstown campus served essentially as a two-year feeder program to the University of Pittsburgh School of Engineering. At that time approximately fifty students transferred annually to the various engineering departments at the University of Pittsburgh, with a few transferring to other schools such as the Pennsylvania State University and West Virginia University.

With the decision to commence the four-year Engineering Technology program at UPJ, an Engineering Technology freshman class of sixty students was enrolled. Civil, electrical, and mechanical engineering technology degree options were established. At the start of the program, the Engineering Technology faculty consisted of four professors. The first class of sixty-five students graduated on April 27, 1975. Planned growth in the program brought the peak total full-time day enrollment close to 550 in 1982 with twenty-one faculty members. In the most recent school year (1996-97) there were 257 students enrolled. The faculty consists of eighteen members. There are more than 1900 total graduates of the three programs working throughout the United States and in foreign countries.

History of Cooperative Education at UPJ

In 1976 the University of Pittsburgh received a grant to implement cooperative education programs. A decision was made in 1977 to extend the grant to include UPJ with the primary intent to provide a co-op program for the Division of Engineering Technology. Funds from the grant were used to establish a co-op office at UPJ. A full-time coordinator and support staff, with supply and travel budgets, coordinate the program, contacting, selecting and qualifying potential employers, and arranging placement of the students in co-op positions.

Because of the relatively small size of the Engineering Technology Division, the summer course offerings had been limited. The co-op program would require a much more comprehensive complement of offerings during the summer semester.

The program commenced with students placed in co-op assignments in the summer of 1978. An early decision was that the program would be voluntary. A comprehensive mandated option was considered and rejected. After several years some students completed the program, which required that they complete three semesters in co-op assignments. At the peak approximately forty students were participating. We were surprised, however, to find that our biggest problem was encouraging students to become a part of the program. We had students begin the program who would not complete all three rotations. The most significant concern was students who would start with a summer co-op assignment, return to school for the fall term, then not accept a second co-op assignment in the spring (formerly winter) term. This left us with employers expecting a student and we had no one to send. Students did not want to be on campus during the summer. They felt that it was a time to work and play. There were fewer classmates and even fewer extra-curricular activities. This problem reached a climax with the fall term of the senior year (after the second summer) when the majority of the co-op jobs went unfilled. The co-op program was abandoned, primarily due to insufficient student interest.

A NEW BEGINNING

The School of Engineering began a co-op program in the summer of 1987. It developed into a successful program with significant numbers of students participating. Because of the larger student complement in the School of Engineering and their strategic location in a large industrial area, the critical balance of co-op students and jobs was reached.

In August of 1995 the School of Engineering invited the Engineering Technology Division at UPJ to participate in their co-op program. This invitation was accepted, and the co-op administrators came to UPJ that fall to explain the program. In the spring of 1996 students made application to participate; the first group of students were placed in co-op positions. Although not large in number, a group of students are enjoying the benefits of a co-op program. The first UPJ student has completed the program.

PROGRAM REQUIREMENTS

Much of the success experienced is a result of carefully thought-out requirements and the insistence on a signed commitment by the students. They are given three credits for the total co-op experience, one for each three- or four-month work period. They must complete all three rotations, however, to receive credit. Each rotation requires a written report by both the student and the employer. A co-op adviser from their department is assigned to work with the students from the time they begin to make application until they complete their final rotation and have received a grade. Much of the success seems to be associated with a clear understanding with students from the beginning, including the signed agreement which delineates what is expected.

Students that participate in the co-op program at UPJ receive a formal detailed introduction to the program at a seminar for ET students during the last half of each term. Maureen Barcic, the program director, and her staff travel approximately 150 miles round-trip to present these seminars. At these seminars, the students are shown a videotape of interviews of co-op students working at various companies. The intent is to show how the program can benefit the individual both financially and academically. It gives the student a view of the valuable job experience and learning that can occur which would be difficult to obtain any other way.

The advantages and disadvantages of the co-op experience are discussed during the seminar, and many questions ranging from potential participating employers, salary ranges, job responsibilities and student housing are addressed. Although the advantages of co-op far outnumber the disadvantages, many highly qualified students do not participate. The students' primary concern with the program is that it extends the time to graduation by approximately four months. Another concern is that during some part of the three-rotation sequence, the student is expected to attend academic classes during the summer months.

PROGRAM RESULTS

Although we have had only a small percentage of students enter the co-op program, it appears that the completion rate will be high. Several are currently on their final rotation. Most express overall satisfaction with the program even though some may have had one experience which was difficult.

Students interested in the program are given a packet with the necessary paperwork to fill out and a co-op adviser located at UPJ in the student's discipline is assigned at this time. The adviser reviews the academic record and works out a rotation schedule that is suitable for the student to follow during the remaining terms through graduation. The student must complete three work rotations in order to receive academic credit for the co-op work completed. The credits can be used to fulfill free elective requirements toward graduation. The packet the students receive instructs them to provide the co-op office with thirty-five copies of their resumes, a completed interest form and a copy of the student work-rotation schedule that was approved by their adviser. The students are asked for information on companies for which they would like to work. This gives the co-op office a large database of potential companies not participating in the co-op program. The students also register for a co-op class in order to receive academic credit. The ET office at UPJ forwards all of this information to the co-op office in Pittsburgh.

Lists of participating companies that have job openings for co-op students are forwarded to UPJ. These lists are posted in the Engineering and Science Building, and interested students contact the co-op office either through e-mail or by phone to allow their resume to be forwarded to the participating organizations. Students are encouraged to locate information on each company they would like to interview with in literature such as the Thomas Register. Once an employer decides they would like to know more about the co-op student, either an on-campus (Pittsburgh), phone, or company interview is set up through the co-op office. Students are expected to attend these interviews. Any job offers the student receives are tracked by the co-op office. When the student accepts a position, the co-op office and the student's adviser are notified of the details. Other potential employers that were reviewing the student's qualifications are also notified. At this time the students are again apprised of their responsibilities toward their employer and the co-op office. Continued communication between the prospective company, the student and the University assures that requirements have been completed before the work assignment begins and that the plans for employment are suitable for both student and company.

At the end of each work experience the students inform the co-op office and their adviser of their intentions to either continue with the same company during the next rotation, try to obtain experience with a different participating company in the co-op program or discontinue.

CASE HISTORIES

A student that has completed one co-op experience wrote, “I personally feel that the co-op program is a fantastic opportunity for any engineering student. It provides invaluable experience that will make my qualifications more desirable to companies upon graduation. Having the opportunity to enter the workforce before graduation instills confidence in my ability and skills.” The student’s first rotation was very basic in nature. He performed basic duties and worked on projects that helped him become adjusted to the company and its working procedures. He has indicated a strong desire to return to this company for the remainder of the rotation sequence and is eagerly looking forward to further exciting experiences.

Another student in the program stated: “I was overwhelmed when I started working at my first co-op assignment. I had never been in a major manufacturing environment and I was worried that I wouldn’t be able to complete the projects I was given to work on. All of the manufacturing engineers that I worked with were very helpful and in a few months I was programming CNC lathes to produce actual jet engine parts. My communication skills improved dramatically since I had to interact with all of the lathe operators.” This student was trained to use various software packages such as CAPP-2, and PWLATHE during his internship. This student found out what was expected of manufacturing engineers, decided that it was not for him, and chose not to return to this company for the remainder of his co-op rotations. His concluding remarks are “My co-op job has been an important part of my education and I will be reaping those benefits for years to come.”

A student that has currently completed two co-op rotations commented: “The program is an excellent opportunity. I’ve obtained valuable work experience before graduation, developed new technical skills, and made new friends.” His experiences include providing guidance to operations, and interfacing with subcontractors in the receipt, assembly, test, and shipment of company products. He initiated engineering change orders, and build/ship deviations and developed a bill of material standardization procedure to be used by the company’s new product manufacturing engineering group. This student plans to return to this same corporation to finish his last assignment.

One co-op experience completed by a student did not turn out favorably. The student wrote, “I was not at all pleased with the type of work I was doing; however, it was a great learning experience. I didn’t gain much financially, but professionally I grew by leaps and bounds. A mentor of mine observed that the experience gave me the knowledge of what it is that I do not want to do for a career. It was just a shame that I couldn’t have spent my time doing something that I enjoyed and was professionally interested in.” This particular student was hired for a position to process meteorological weather data. His position as a data processor required him to modify existing FORTRAN programs to process raw data from the database into useful information used in a weather-related project and store the modified data onto magnetic tape. His additional job-related duties were to enter information into spreadsheets, and prepare and present weekly progress reports at the staff meetings. This student requested a transfer into another department at the company but his request was denied. Unfortunately, this individual had a bad first co-op experience and decided not to return to the same company and to drop out of the program. He is currently in an internship with another corporation that better suits his needs and talents.

CONCLUSION

As of this writing, the Engineering Technology Division is very pleased with the results to date. The co-op program as instituted and administered by the School of Engineering has corrected the problems and deficiencies encountered in the earlier experience at UPJ. Even though only a small number of students participate, they are happy and very positive about the program.

The logistics of sending paperwork back and forth between Johnstown and Pittsburgh have been resolved with only occasional minor frustrations. The co-op administrators have been very diligent in coming to Johnstown several times each year to explain the program to prospective participants and help those who are applying. Although in most cases the students must go to Pittsburgh to interview with prospective employers, this has not been found to be an onerous burden. With the success experienced to date it is expected that the participation at UPJ will grow as new students are apprised of this opportunity even before matriculation into the Engineering Technology Division.

BIOGRAPHICAL INFORMATION

JAMES L. HALES is associate professor and head of EET at the University of Pittsburgh at Johnstown. He has been with the university for 24 years. He taught in Jilin, China, in 1992-93. Prior to joining the university he was an application engineer in the industrial power systems department for six years and a field service engineer for two years with the General Electric Company in Schenectady, NY and Beaumont, TX.

STANLEY J. PISARSKI has been an instructor of EET at the University of Pittsburgh at Johnstown for 18 years. He received a BSEET in 1977 and has worked as a project engineer for Robicon Corp. in Pittsburgh, PA, consulting engineer for Ocenco, Inc. in Blairsville, PA, and a research and design engineer for K.H. Controls, Inc. in Blairsville, PA. He is a Licensed Professional Engineer in Pennsylvania.