

Summer Internships in the Construction Industry; NJIT and NJBCA, Partners in Education

John A. Wiggins, J.D., P.E.
Assistant Professor
Department of Engineering Technology
New Jersey Institute of Technology

Abstract

The focus of an undergraduate engineering technology education should be geared to meet the requirements of industry and impart real-life skills. In an effort to expose students to real-life work experience, the Department of Engineering Technology of the New Jersey Institute of Technology and the New Jersey Building Contractors Association have developed a partnership over the past fifteen years to offer summer internships in the construction industry.

The scope of the program is a twelve-week placement of the student in a construction firm. During this period, the students are mentored by the contractor, a representative from the New Jersey Building Contractor's Association and a department representative from the New Jersey Institute of Technology to assure that the student is exposed to the full range of activities of a construction firm, both in the office as well as in the field.

As the program has reached its fifteenth year of participation, the results of past and present participants have been reviewed to offer and insight to the positive and negative aspects and impacts of running an internship program.

Introduction

The link between the classroom and the real world is an essential one for any student. This is particularly true for those students studying construction engineering technology where the focus of the curriculum as well as the interest of the student is on the application rather than theory.

For the past 15 years, the New Jersey Building Contractors Association (NJBCA) and the New Jersey Institute of technology (NJIT) have acted as partners in an endeavor to address the needs of the students as well as the needs of the local construction industry. This has been accomplished through the implementation of a summer intern program, enabling students in the construction Engineering Technology (CET) program the opportunity to serve a 12-week internship with building contractors on projects the contractors are currently constructing. The intent of the program is to provide students with a "real life" work experience by interfacing with members of the construction industry to supplement the academic experience received at NJIT. The students are paid for the work they perform but receive no academic credit for participation in this

program. The NJBCA, as the conduit for the program, is investing in its own future by providing the construction industry with new, qualified professionals.

Program Description

The Department of Engineering Technology at NJIT is a "plus 2" type program where students enter NJIT as transfer students at the conclusion of their academic career at a community college. As such these students, who have completed their requirements for an Associate Degree, enter NJIT with the status of a junior into one of five separate options in electrical, mechanical, manufacturing, surveying and construction engineering technology in both day and evening divisions. The current total program enrollment is approximately 500 students. Through careful student advisement, day students are able to complete the requirements for a Bachelor's Degree within two years of entering NJIT while evening students may complete the program in four years. The Construction Engineering Technology program at NJIT program from consists of approximately 150 students in both the day and evening sections.

Over the past 15 years, the intern program has involved 150 NJIT students and 35 contractors. These contractors have ranged from large general contractors to subcontractors to firms specializing in construction management and the projects that have been constructed have included the full range of projects including such projects of note as the New Jersey Performing Arts Center.

In order to participate in the program, students are required to complete an application that is returned to the faculty member who, in turn, reviews and forwards all the applications to the NJBCA. After an initial screening and review and ranking of the applications, a preliminary list is prepared of internship recipients. Not all students who apply for the program are accepted and receiving an internship is based on academic performance.

It has been the experience of those administering the program that in order for the students to perform satisfactorily, it is necessary for them to perceive that this is a valuable program worthy of their best efforts, and, therefore the process must be selective. Based on exit interviews with the contractors participating in the program, Awarding internships to all students lead to a decline in student interest and performance, and, accordingly, a negative reaction on behalf of the contractor employers.

After the initial selection, the NJBCA attempts to preliminarily match students to construction projects geographically near their residence. As the students are required to provide their own transportation, it is hoped that the matches obtained will ease the student's transition into the contractor's operations. Due to the rather extensive membership of the NJBCA within New Jersey, this geographic match is usually accomplished.

After the initial selection and review, an orientation meeting is held with the NJBCA and the students. The students are instructed to contact their prospective employers for an

interview, in the same manner as they would if they were seeking employment. As part of the interview process, the students establish the elements of their internship such as the date of the start of their assignments for their 12-week internship, hours of work, expectations for the program as well as any particular interests they may have.

The students bring to the program their "book smarts" and, hopefully, their enthusiasm. During the intern period, the students are asked to be exposed to the full range of duties that might be expected of a regular employee including, where possible, both field and office tasks. The students are encouraged to listen, watch and ask questions, as this is the best approach to learning in the real world.

The assignments that the contractor-employers are asked to expose the students to include the following:

Field Assignments

Assist in Project Layout
Safety Inspection
Material Inventory & Expediting
Laboratory/Test Report tracking
Attendance at progress meetings

Office Assignments:

Cost Estimating
Quantity Takeoff
Shop Drawing Approval
Scheduling
Value Engineering

During the internship the students are paid a weekly salary. In addition to the weekly paycheck, the students receive a grant toward their tuition upon their return to NJIT at the conclusion of the summer.

In an effort to constantly improve the program, at the conclusion of the internship the students are asked to supply a short report on their experiences in the program, highlighting both the plusses and the minuses of their experience as well as suggestions for improvement of the program in the future.

Program Results

As students returning to NJIT for their final year, participants in the internship program seem to have grown both intellectually and emotionally. In the classroom, these students seem more focused on their studies, which represents an interesting challenge to their Instructors to make each class interesting and informative. This challenge is further buttressed by the students' practical knowledge and experience gained during the summer program.

Looking at the overall academic performance of all the students participating in the program, the cumulative effect on the student's cumulative grade point average grade is a somewhat positive one, adding a tenth of point to the cumulative grade point average of all students participating in the program.

The students who have participated in the program have been predominantly male although 11 women, (7.3 %), have participated in the program with success. While this number may appear low, it should be pointed out that no women participated in the program in its first few years due to a lack of enrollment of women in the CET program, The average final cumulative grade point average for all students was 2.95 on a scale where 4.0 is an "A" and 0.0 represents failure. Of all the students involved, only 4, or 2.67 %, have failed to graduate, a percentage much lower than the average for students at NJIT. Similarly, the same number of students has gone on to successfully complete a Master's Degree in Civil Engineering with a specialization in Construction Management at NJIT. This does not include students currently engaged in the Master's program as well as those who may have obtained a Master's Degree at another institution.

Further, it is interesting to note that the majority of the students who successfully complete the program remain with their contractor-employers on a part-time basis during the remainder of their senior year at NJIT. This is a partial explanation for the students' performance during their last year at NJIT. Apparently a number of the students who are now working on a part-time basis during their senior, remain dedicated to complete their degree requirements but do not perform as well academically due to the conflict with their work schedules. This conflict is particularly strong in an application-based program such as Construction Engineering Technology.

Upon graduation, a great number of the students completing their internships remain with the contracting firms after graduation and successfully make the transition from academic life to the "real world". Additionally, several contractors have conveyed in seeking new employees, the experience gained during the internship program is an extremely important asset for both the experience gained as well as the references that may be obtained about a student's work habits and character.

Conclusion

In conclusion, the past fifteen years have proven to be a success for the students, the New Jersey Building Contractors Association as well as for the New Jersey Institute of Technology. The NJBCA has provided a vehicle for its membership to meet and interface and mentor with potential employees and, hopefully, enter the ranks of successful building contractors within New Jersey while NJIT has provided an educational experience that extends beyond the classroom for the student. Additionally the program has been an enticement to students entering the Construction Engineering Technology at NJIT. Judging by the academic and personal success of the students as well as the professional success attained by these graduates, the summer intern program has proven to be a success for all concerned.

Biographical Information

JOHN A. WIGGINS is an Assistant Professor of Construction Engineering Technology at the New Jersey Institute of Technology. He holds a B.S.C.E. degree from the Newark College of Engineering (1973) and a M.S.C.E. degree from the New Jersey Institute of Technology (1981) as well as a Juris Doctor degree from the Seton Hall School of Law (1980). A licensed professional engineer and planner as well as admitted to the New Jersey State Bar, Mr. Wiggins has over 25 years of experience in the field of municipal engineering and infrastructure rehabilitation and planning