Faculty Internship In The Telecommunications Industry

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Abstract

Excelling in the categories of research, teaching and service in one's area of specialization ultimately results in a new faculty gaining tenure. There are many approaches one can take to satisfy the requirements in any one of these categories. One approach is placement in industry. Industrial placement is a component of life-long learning plan that helps to maintain and expand technological skills[1]. Through industrial placement, one can maintain currency in one's field. Also, the opportunity of research comes up either on a new piece of equipment, or an idea that can be brought to reality that will contribute to the body of knowledge. Gaining expertise in current technology can translate to confidence of the faculty in the classroom, as well as confidence of the students in the faculty member.

This paper examines how internship in industry can facilitate activities in the three categories and how these activities will benefit new faculty members. It also discusses the need for new faculty members to get involved in internship early on in their teaching careers.

Introduction

One of the aims of all tenure-track faculty members is to make tenure at the end of the period stipulated by the respective academic institution. Each university or college has its unique requirements for tenure. The requirements for many universities and colleges fall into three major categories. These are research, teaching and service. The requirements are influenced by factors such as whether the institution is a 4-year or 2-year college, and whether their mission is only teaching or teaching and research. Schools that have technology programs may have other factors such as Engineering and Engineering Technology that will also impact the requirements.

Whatever the requirements are, it is always useful for faculty members to have some industrial experience. To gain entry into the profession as a faculty teaching in a technology program, the Accreditation Board for Engineering and Technology (ABET) stipulate that one must have some industrial experience, among other expectations. The value of this lies in the fact that it helps in bringing aspects of the real world to the classroom. This helps the students to appreciate how the theories and principles learnt in the classroom relate to practices in industry.

Proceedings of the 2002 American Society for Engineering Education Annual Conference & Exposition.

This project was sponsored by the Minority Office and SETCE of Penn State University.

Industrial internship ensures continued link with industry for faculty members. New faculty members will be well advised to consider industrial internship at an early stage of their career as a viable option due to the numerous advantages that may result from a work period in industry.

One way of obtaining an internship opportunity is by approaching organizations in the industry of interest with a request. One such organization is the Pennsylvania Association of Broadcasters (PAB). PAB in conjunction with its member TV stations organizes Summer Faculty Fellowship Program in Broadcast Engineering. Through this program, a faculty member applies for a grant to be placed in the broadcast industry for a period of 4 weeks. From July 2 to July 27, 2001, the author was placed at New Century Productions field shop in South Hampton, NH, where mobile TV broadcast trucks are built. The opportunities to televise two events using a mobile truck were also taken. This paper discusses some of the advantages gained from the work period in relation to some of the requirements that have to be fulfilled for tenure.

Industrial Activities

EET graduates generally find employment in the service and maintenance industry. Most service and maintenance oriented companies do not engage in research, nor do they manufacture the equipment they use. Other industries design and manufacture the equipment used by the service and maintenance industry.

The broadcast industry's main activity is telecommunications, and provides service in the form of information dissemination. This industry is one of those that depend on other industries to manufacture the equipment needed to broadcast information. TV station WFMZ in Allentown is unique in that it has a sister company New Century Productions (NCP) in South Hampton, NH, that provides all their engineering needs. PAB initially assigned the author to WFMZ who in turn, placed him with the NCP field shop in South Hampton.

In addition to providing engineering services to WFMZ, NCP build and rent mobile TV production trucks. The mobile units are used to televise events (such as sporting events) at the sites where they occur. While with NCP, the opportunity to be involved in the building of a digital mobile truck NCP-V was taken advantage of.

The NCP-V digital truck can be sub-divided into 5 major sections as follows: -

Audio - All audio is patched into this section, and can be controlled here. A typical piece of equipment housed in this section is the Digi-Cart that contains a CD of frequently used sounds such as advertisements that can be inserted in programs at set periods of time.

Production - The Producer and Director have their communications stations in this section. The Producer provides the broader concepts of the event, and the

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Director decides the sequence of shots for the event, and controls the timing of the sequence.

Tape Room - The event is recorded in this section. Two important pieces of equipment, the Router and the LSM (Linear Slow Motion produced by EVS) are found in this section.

The Router (not the same as used in connecting Local Area Networks) allows all available audio and video sources to be fed to recorders, either Digital-Beta or EVS-LSM. The tape operator makes the selection of recorder, either by experience or by direction of the show producer. The Router can continue filming with one camera while it edits the recorded event.

The EVS-LSM can record 2 sources and simultaneously playback 2 feeds. The parts used in the playback are selected while the event is being recorded, and are played back subject to the producer's decision. The Tektronic Profile is a similar device. Both store the information on hard drives thus are called disk recorders. The selected parts can be played back in slow motion (SLO-MO) with very smooth action (Super SLO-MO).

Transmission - This section has connectivity to all other sections. All transmissions into and out of the mobile unit go through this section.

Video - Quality of the video is checked in this section.

Assignments

The tasks assigned were carefully selected to provide an appreciation of the amount of work that goes into building a digital mobile truck from the initial stages to the finish. This included soldering pieces of wires to DB-9 connector blocks that are either loose or mounted on front panels. The wires were laid from pieces of equipment they originate to those they terminate at. The work also included connecting equipment in different sections of the truck together with either coaxial cable or twisted pair of copper wire. Going through this process helped to understand how the units came together to form one system. It also showed how certain pieces of equipment were strategically placed within the overall circuit. The importance of this arrangement was in supporting the functions of the producer and the director. Some of the connections were made to SLO-MO (Slow Motion) ports, power ports (for 5 V and 12 V dc), controllers, Digi-Cart, Router, EVS-LSM, and ADAM (Advanced Digital Audio Matrix).

Research

Pennsylvania State University is one of the academic institutions that have research, teaching and service requirements for gaining tenure. Penn State Wilkes-Barre has both Electrical Engineering (EE) and Electrical Engineering Technology (EET) programs and

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Telecommunication Engineering Technology is an option in EET. Research is highly valued in Penn State.

Some of the various types of research undertaken by faculty are scientific, analytic and pedagogical. Developmental work on an existing piece of equipment can also be considered as research, particularly in the case where application of the equipment is extended to provide a new function (or functions). This type of research is favored by industry due to the profit may result.

Exposure to expensive equipment that is not generally found in college and university laboratories sometimes generates thought processes that lead to creative activities[2]. Cooperative effort between the industry and a faculty member may produce results that are mutually beneficial. This type of outcome at the beginning of a new faculty member's career may help in establishing a line of research at an early stage, hence lead to accumulating an impressive list of publications.

Teaching

As stated before, ABET stipulates that faculty members who teach in technology programs should have industrial experience. With the fast pace of technological development, it is important for faculty members to update their skill in new developments to stay current. Internship provides immersion in the new technology. This accelerates the learning process[3]. NCP provided the concentrated environment in which the author learned the complexities of building a digital mobile TV production truck. The mobile unit in which the equipment was installed was rather small in size relative to the amount of equipment and copper wire that needed housing. Planning had to be done from architectural point of view to fit the equipment and the wire into the five sections described above. This demonstrated integration of engineering disciplines. Teamwork skills and communications skills were crucial for the work to progress efficiently. The employees either as individuals or in teams exhibited these skills to a high degree of competence.

Through involvement in the two shoots, the author learned how the truck is interfaced with a TV station so as to broadcast the event to all the station's subscribers. The interface to the station is done through cable if the station is within close proximity to the site of the event, or by satellite if the station is at a great distance from the site.

The work period with NCP afforded the author the opportunity to upgrade aspects of the Telecommunications program that covered TV broadcasting. The benefit extended to the EET program while teaching Digital Communications. The experience also led to livelier class discussions in which students' internship experiences were involved. The discussions motivated the students to want to learn more about the TV broadcasting industry. As a result, five students accompanied the author to a PAB annual conference. By involving their internship experiences the students became active participants in the learning process[4]. Through the discussions, the classes gained new insight to the broadcast industry and became aware of recent developments in that industry. The

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teamwork and communications skills that were experienced were other factors that were brought to lecture classes, during laboratory classes and when the students began their senior projects.

Service

Of the three requirements for tenure, service may be the least emphasized by some universities and colleges. Even so, a desirable amount of service is required to promote the university or college by word of mouth. This helps in many instances to attract high school graduates who may otherwise end up terminating their education. The benefits of the internship are classified into two areas. These are benefits to the industry and benefits to the college.

i) Benefits to the Industry

During the four-week work period with NCP, contributions were made in two ways. One was by helping with the work that needed to be done to complete the mobile unit. The worked performed was in all five sections described above. Before the four-week period was over, part of the unit that had been worked on in the video section, was tested and proved to be working efficiently.

While there, the author discussed with two of the employees their interests in returning to college to complete their degrees in electronics. They would then be able to take up responsibilities at higher levels, and that would make them more useful to the company.

ii) Benefits to the College

On the first day at the premises of NCP, the author was taken round and introduced to the employees. These were going to be working colleagues for the next four weeks. Many of them engaged him in discussions at different times during the four weeks. The discussions centered on two points. One of these points was the types of programs run at the Wilkes-Barre campus, the courses taught and the possibility of some students joining their company after graduation. The other point concerned the types of mobile units NCP had built in the past and the plans for the future as well as the types of events they televised. These formed part of the discussions with the classes.

As part of the program, the faculty member was invited to attend the PAB annual conference. He was given the option to bring some students to the conference. As stated above, five students participated. The president of PAB acknowledged Wilkes-Barre campus for participating in the Faculty Internship Program in his introductory remarks. He also acknowledged the presence of the faculty member and the five students. During the break some representatives of some member companies talked with the group. Some of the companies showed interest in the

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students in joining them after they graduated. The author established some industrial contacts at the conference.

Conclusion

Faculty internship in industry has many advantages. It helps the faculty member to maintain currency in one's field, and it can also extend the faculty member's experience into new areas that are related to one's specialty. Internship can help the faculty member to produce the amount of work needed to satisfy the requirements in research, teaching and service to gain tenure. The benefits lead to improved performance by the faculty member in class. This results in better-prepared students, who upon graduation will become better employees both as a technicians or engineers and as team players. As presented above, industry also gains some benefits. This makes faculty internship a winning proposition for all concerned.

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Acknowledgement

My appreciation to Pennsylvania Association of Broadcasters (PAB) for their faculty internship program, to Mr. Barry Fisher of WFMZ and Mr. Mike Mundt of New Century Productions (NCP).

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This project was sponsored by the Minority Office and SETCE of Penn State University.