Career Development Activities in a Required Engineering Course

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Abstract

This paper describes several career development activities that are part of a required sophomore course in electrical engineering. These career development activities take place over several weeks prior to engineering career fairs held every fall and spring on the New Mexico State University (NMSU) campus. The activities include a 1-hour workshop on resume writing and a documented visit to the engineering career fair. The goals of the career development activities are to: 1) help students prepare a polished written resume, 2) give students experience talking with recruiters, and 3) help students obtain co-op or summer internship positions. The first two goals relate directly to ABET Criterion 3 (g) outcome [1], that graduates have "an ability to communicate effectively." The last goal is consistent with a published outcome of the NMSU Electrical Engineering Program [2], that our graduates are "given opportunities to experience the profession first-hand through co-ops or internships." Student evaluations of the career activities in the course demonstrate their effectiveness and suggest ways to improve the choice and scope of activities.

I. Introduction

Career development is often an activity that escapes the undergraduate engineering curriculum, or else, is confined to a technical writing course taught by non-engineers. With the trend to reduce four-year engineering programs to 128 student credit hours, it is hard to imagine a 1- or 2-credit course devoted exclusively to career development. Thus, another means of accomplishing it is to include career development activities in one or more required engineering courses. As such, all students in the program are obliged to participate in and, presumably, benefit from these activities.

The six career development activities described in this paper are a small fraction of all that is needed to prepare students for entering and staying in the workforce. Certainly, the bulk of the responsibility and drive for developing one's career must come from the individual, not from required assignments. Nevertheless, evaluations indicate that, on average, students participating in these six career development activities found each activity to be at least of minor help in their own career development.

II. Career Development Activities

Only one lab period and one homework assignment is spent on career development activities, as the primary purpose of the required course is to cover topics in electronics. In particular, we devote the majority of the first lab period of the semester to career development. Prior to 1998, electronics laboratories did not even meet during the first full week of the semester. We often spent that week organizing our laboratory equipment, supplies, and assignments. In addition, one might argue that students lack sufficient background material to undertake a significant lab assignment after only one or two lecture periods. On the other hand, career development activities require no particular knowledge of electrical engineering. Thus, students are ready to participate by virtue of being at least sophomores in the electrical engineering program.

Here we list the career development activities every student is asked to undertake. These activities factor into their final grade for the course in a minor way.

1.   Give a 1-minute oral introduction
2.   Participate in a 1-hour, interactive resume-writing workshop
3.   Write a draft resume
4.   Write a polished resume
5.   Attend an engineering career fair
6.   Document discussions with at least three recruiters

These activities occur at a strategic time in the electrical engineering program, usually three-to-five semesters before students receive their baccalaureate degree. Based on interviews of graduating seniors in the electrical engineering program from Fall 1998 to Spring 2000 [2], approximately 70% of our students participate in at least one co-op or summer internship program.   The stated goal of the NMSU Electrical Engineering Program is to increase this number to more than 75%. Students receive no credit for participating in a co-op or summer internship. Instead, students are motivated to participate in these programs in order to 1) gain experience, 2) try out specialties in electrical engineering, and 3) earn real money.

1-Minute Oral Introduction

Prior to the first laboratory meeting, students are asked to prepare a 1-minute autobiographical introduction. They begin by stating their name and where they graduated from high school. Next, they describe any major work experience, emphasizing experience they may have had in engineering. Finally, they state their major strengths as engineers-in-training. For a non-exhaustive list of qualities of practicing engineers, I turned to a description offered by the U.S. Department of Labor [3]:

"Engineers should be creative, inquisitive, analytical, and detail-oriented. They should be able to work as part of a team and be able to communicate well, both orally and in writing."

The instructor and graduate laboratory assistants are first to introduce themselves, followed by the students in no particular order.

Resume Writing Workshop

The resume-writing workshop uses information from the Placement Manual[4], a booklet updated yearly by the NMSU Placement and Career Office. In the fall of 1998, when I began career development activities, I invited the Assistant Director of Placement and Career to conduct three 1-hour resume-writing workshops for each of the three lab sections in my required electronics course. Confident that I understood her message to the students and armed with material that she authored from the Placement Manual, I began leading the workshops myself in spring of 1999.

The first half of the workshop is akin to a tutorial. We discuss in detail "Qualities of a Winning Resume," such as a visually inviting appearance and balance between print and white space. Next we go over the "Checklist of a Traditional Resume." Sample items in the checklist are[4]:

5. The job objective should logically connect with the balance of the resume.
6. Eliminate facts not directly related to your specific objective.
7. If you have had experience, start with the your work history, but if you have just graduated from college, start with your educational background.

Finally, we quickly review the "Checklist for a Scannable Resume," as more and more large company recruiters are requesting scannable resumes.

During the second half of the workshop, students critique a fictitious resume concocted by the instructor, but based on resumes I graded in previous semesters. The fictitious resume contains several grammatical, spelling, formatting, and traditional resume writing errors. Students gain experience marking up and making suggested improvements to a resume and then share their criticisms with the class. As the students are leaving, I hand them a good resume, again concocted by the instructor but based on resumes I graded in the previous semesters. In that way, students have another point of reference toward which to aim.

One week later, students are required to turn in an up-to-date traditional resume based on guidelines from the workshop. This draft is carefully critiqued and graded by the instructor, with average scores near 70%. Students are required in a later assignment to correct their resume based on instructor criticism. In that way, students may present a polished traditional resume to recruiters at the career fair.

Engineering Career Fair

Two engineering career fairs occur annually at New Mexico State University. The first occurs in mid-September and is part of the 2-day Career Expo sponsored by the College of Engineering and Placement and Career Services[5]. The second day of the Expo is devoted to companies recruiting engineering students at all levels: undergraduate, graduate, co-op, or full-time. The second career fair occurs in late January and is sponsored by the Society of Hispanic Professional Engineers (SHPE). During the 2nd day of the Fall 2000 Career Expo, 108 recruiting companies talked with a total of 1580 students in attendance. Given the total number of engineering students at NMSU in Fall 2000 is 1874, and assuming that the overwhelming majority of the students attending were from the College of Engineering, perhaps 80% of our students attended the 2nd day of the Career Expo. From past experience, we anticipate the size and scope of Spring 2001 Career Fair to be roughly two-thirds that of the Fall 2000 Expo.

While at the career fair, students are required to talk with at least three recruiters, although they may certainly visit with more. Evidence of talking with a recruiter could be in the form of a recruiter business card, recruiter signature, or a brief narrative describing their conversation. I favor the last method of reporting, as I am made aware not only of the different recruiters and the job opportunities but also the unique reactions of my students. I, too, attend the career fair each semester, hunting especially for companies that are new to our campus. In that way, I am able to recognize almost every company that students learn about and the names of perhaps one fifth of the recruiters.

III. Student Evaluations of Career Development Activities

During the Fall 2000 semester, I asked students in the required electrical engineering course to anonymously evaluate the career development activities. I let them know that the aim of evaluating these activities was to make improvements for upcoming semesters. Table 1 is a

Activity	Number	Average
1-minute oral introduction of yourself, work experience, and strengths	26	3.0
1-hour workshop on preparing a resume	25	3.4
Writing first draft of resume	26	3.5
Correcting resume based on instructor feedback	26	3.4
Talking with at least three recruiters at the engineering career fair	27	4.0
Writing a short summary of talking with three recruiters	25	3.1

Table 1: Total number participating in each career development activity and average response, where 1 is Detrimental, 2 is No Help, 3 is Minor Help, 4 is Helpful, and 5 is Major Help.

summary of the numerical results. As per their request, I shared these results with the class. In Table 1, students numerically evaluated each activity in terms of its relative importance to their career development. A response of 1 meant the activity was detrimental to their career development. A response of 2 meant it was no help. A response of 3 meant it was some minor help. A response of 4 meant it was helpful. And a response of 5 meant that it was a major help in their career development. Average responses indicate that students found that talking with three recruiters at the career fair (4.0) was "helpful," whereas giving a 1-minute oral introduction (3.0) and writing a short summary of talking with three recruiters (3.1) were "minor help."

As part of the evaluation, students were given the freedom to make any suggested improvements, additions, or deletions to the career development activities in the required engineering course. Table 2 summarizes the most repeated suggested improvements. The total number of comments was 12 out of 27 students who were surveyed. From Table 2, the three most requested changes were: add training on how to interact with recruiters, reduce the amount of instructor feedback on resumes, and omitting career development activities from the course.

Suggested Improvements in Career Activities	% of Total
Add training on how to interact with recruiters	16.7 %
Reduce the amount of instructor feedback on resumes	16.7 %
Omit career development activities from the course	16.7 %

Table 2: Highest scoring suggested improvements in career activities. The total number of responses was 12.

Finally, students were asked to state any strengths or positive outcomes of the career development activities in the course. In Table 3, we summarize the positive outcomes. The total number of comments in this category was 19 out of 27 students who were surveyed. The most repeated positive outcome (36.8%) was that students felt that their resume was improved. Other positive outcomes were obtaining job interviews, having job opportunities, and viewing the job market.

Positive Outcomes of Career Activities	% of Total
Improved my resume	36.8 %
Obtained interview(s)	10.5 %
Have job opportunity(ies)	10.5 %
Allowed me to look at job market	10.5 %

Table 3: Highest scoring positive outcomes of career activities. The total number of responses was 19.

IV. Discussion

The aim of each career development activity is that students, on average, find the activity helpful (4.0) to their career development. As we see in Table 1, only one activity was rated "helpful," talking with at least three recruiters at the career fair. On the other hand, the amount of time and effort students invest in an activity generally correlates to the benefit they derive. Thus, a 1-minute introduction might require only 10 minutes of preparation, whereas going to the career fair and talking with three recruiters might occupy one or more hours of their time. In addition, recruiters offer students a perspective on the working world that is rarely seen in the undergraduate curriculum. Thus, the experience of talking with recruiters is more real or relevant to their goal of obtaining employment, than, say, giving a 1-minute oral introduction for your peers and instructor.

During the resume-writing workshop, I think it would not be too much trouble to address the first suggested improvement from Table 2, "how to talk with recruiters." Several students in the course have already attended one or more career fairs. They might have some good recommendations for their peers. For example, students might start by introducing themselves, telling them their major and class standing. Next, students might ask questions about the company, their location(s), products, and available positions. Finally, students might want to hand the recruiter a copy of their resume and highlight some of their major experience or accomplishments, especially as they relate to the needs of the company.

Another possible improvement to the career development activities would be to provide students with mock interviews. The NMSU Klipsch School of Electrical and Computer Engineering has an Academy of alumni who support and periodically review our undergraduate and graduate programs. When told about these career development activities, one local member of the academy offered to provide mock interviews for the students. Considering that the course has 40-60 students each semester, interviews for each student might take several days to complete. In addition, many of the students have already been interviewed and have participated in summer internships or co-ops. I believe that these mock interviews would be of most benefit to first-time engineering job hunters. As such, I favor not making it compulsory. Rather, students who wish to take advantage of this opportunity could sign up on a first-come first-served basis.

V. Summary

This paper described some career development activities that are part of a required sophomore course in electrical engineering. The goals of the career development activities are to: 1) help students prepare a polished resume, 2) give students practice talking with recruiters, and 3) help students obtain co-op or summer internship positions. These goals are consistent with the published outcomes of ABET and the NMSU Electrical Engineering Program. Student evaluations of the career activities in the course demonstrate their effectiveness and suggest ways

to improve these activities.

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