Professional Development For Electrical Engineering Students

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Overview

Today's graduating students in engineering disciplines face an increasing number of non-academic challenges after graduation. These challenges require students to acquire skills ranging from early financial panning to dealing with the effects of globalization on the employment market.

The Milwaukee School of Engineering (MSOE) has implemented a professional development course in the core curriculum for students in its Electrical Engineering and Electrical Engineering Technology programs, which addresses these challenges. Students are exposed to a variety of topics in a multitude of fashions.

This paper describes the objectives of this class and the methods of coverage. Assessment of sessions for each individual topic within the course clearly indicate that students not only realize the value of professional education before graduation but also their desire to learn more about professional life after graduation.

Course description and objectives

The following excerpt from the official course description clearly indicates intent and layout of the course. The professional development course (GE300) is "designed to provide career guidance to electrical engineering and electrical engineering technology students who are completing their junior year. The course serves to prepare students for professional issues arising during the senior year and for entry into a professional career following graduation. Guest speakers from several major areas of electronic and electrical technology help provide insight into industrial careers. … Students also learn about graduate school opportunities and the mechanics for applying to graduate school. … Placement office personnel discuss how to prepare a good resume, placement office procedures, interviewing skills, and use of the Internet to find employment opportunities. Students prepare a resume, do research on a company in which they are interested and submit their resume with an appropriate cover letter seeking employment. Finally, the process of professional engineering registration is presented."

Even though the above course description suggests a rather long list, it is possible to summarize the course objectives as follows:

1. Be able to write a resume and cover letter.
2. Have a perspective of various areas of the electrical engineering field.
3. Have a perspective of various functions within the engineering team.
4. Be aware of various professional issues facing engineers and engineering technologists.

Course layout

In order to cover the course objectives the course has been split into three areas:

A. Aspects of gaining employment, including resources on the Internet for position openings and company profiles, usage of MSOE's own placement office, guidelines for good resumes and cover letters, and finally techniques for successful interviews.
B. Different disciplines and career choices in Electrical Engineering and Electrical Engineering Technology, advantages and disadvantages. Engineering professional discuss different career choices and present reasons to select a specific career option. These presentations and discussions give a vital overview over the many different career options in EE and EET.
C. Aspects of professional registration, professional and honor societies. Graduate school opportunities and the mechanics for applying to graduate school are discussed. Long term financial planning is also introduced.

The above areas are then covered by one ore more individual sessions as follows:

Area A:

1. Gaining employment
   Presentations are given by in-house placement office staff. Placement office procedures, guidelines for good resumes and cover letters, interviewing styles and techniques, and internet resources for company profiles and position openings are discussed.
2. Live-Audience interview
   A student volunteer is interviewed by a professional engineer for a real job-opening. This interview is then discussed by the interviewer and the audience for strengths and weaknesses of the answers of the interviewee. Potential pitfalls are also presented.
3. Feedback on Cover Letters and Resumes
   Faculty present strong and weak examples after evaluating student resumes and cover letters.

Area B:

1. Quality engineering is presented by a professional quality assurance engineer.
2. Communications and consulting engineering is presented by a professional communications and consulting engineer.
3. Engineering in the automation industry is presented by a professional automation engineer.

4. Careers in the military is presented by a USAF ROTC recruitment officer.
5. Teamwork concepts and team building is presented by senior design faculty.
6. Digital design, analog design, and outsourcing trends are presented by professional engineers in their fields.
7. Sales engineering as a career is presented by a professional sales engineer.
8. Consulting engineering is presented by a professional consulting engineer.

Area C:

1. Graduate school is presented by the graduate program director.
2. Professional registration, professional and honor societies are presented by licensed professional engineer faculty and student officers.
3. Financial planning is presented by a professional licensed financial advisor.

Assessment procedures and results

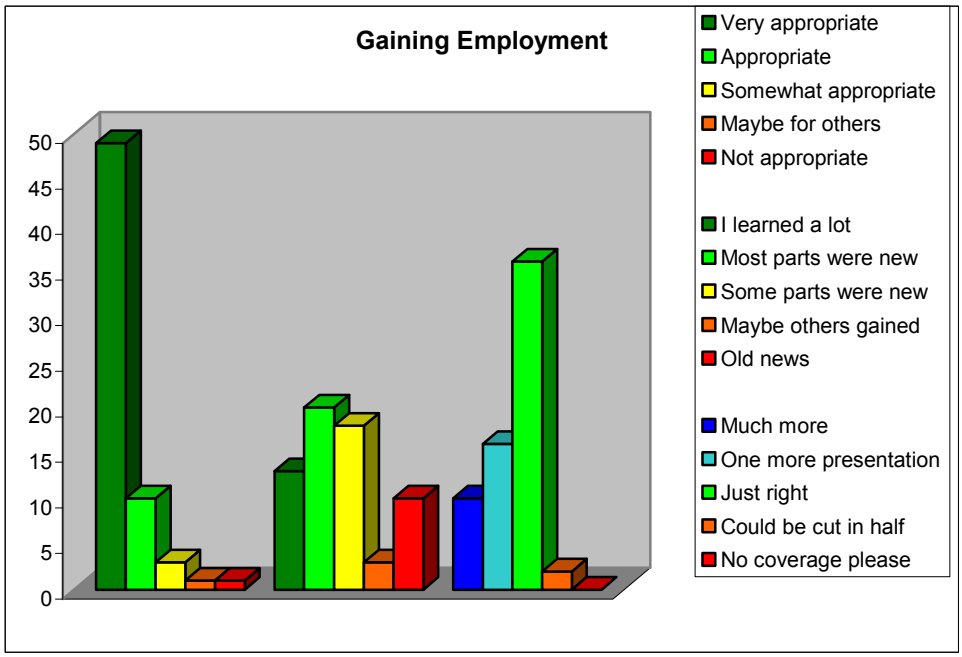
Each session of the course is evaluated by the students on a variety of aspects, such as:

1. Do you think this presentation is appropriate for GE300?
   Possible answers: Very appropriate, Appropriate, Somewhat appropriate, Maybe for others, Not appropriate.
2. How much did you gain from this presentation?
   Possible answers: I learned a lot, Most parts were new, Some parts were new, Maybe others gained, Old news.
3. Would you like to see an increased coverage of this topic?
   Possible answers: Much more, One more presentation, Just right, Could be cut in half, No coverage please.

Students are asked not to evaluate the presenter but rather the content of the session. A comment section provides space for any type of written feedback. In general, app. 75% of the students returned feedback, already indicating a high interest in the topics of this course.

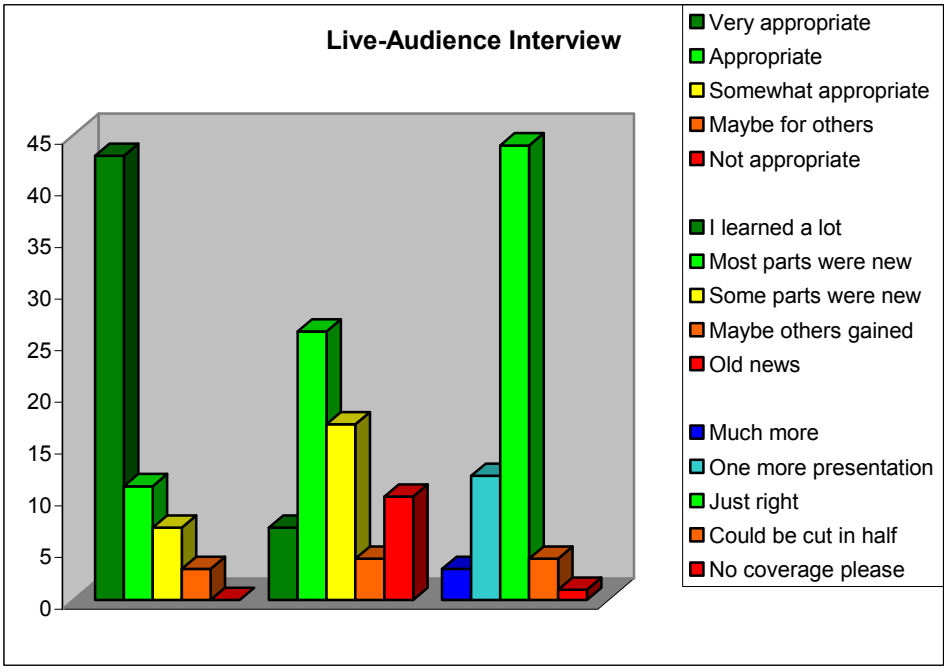
The following graphs show the results of the student feedback for the individual sessions. The figures are divided into three individual graphs, showing the results of aspect 1 on the left (graph) and top (legend), the results of aspect 2 in the center (graph) and center (legend), and the results of aspect 3 on the right (graph) and bottom (legend).

A.1: Gaining employment



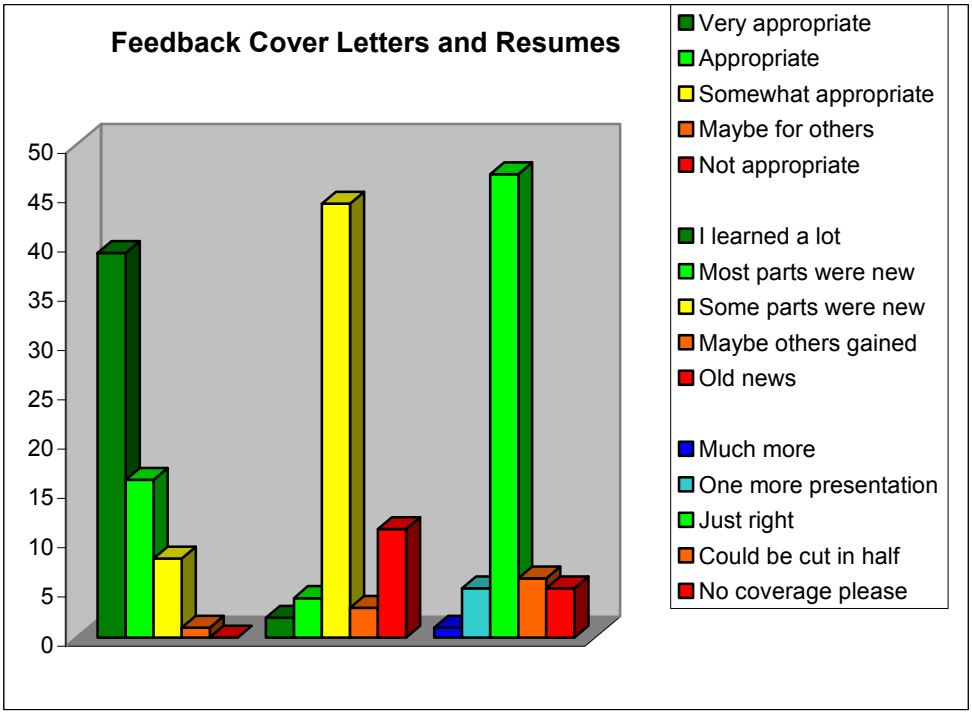
This session is not only viewed as essential for this course, but more so that students would like to see an increased coverage of this topic. This increase already has been implemented and the current version of the course has two sessions devoted for this topic. It must be pointed out that approximately 10% of the students are in their senior year and, therefore, already have utilized the on-campus and on-line resources, which explains the relatively high percentage of "Old news" feedback.

A.2: Live-audience interview



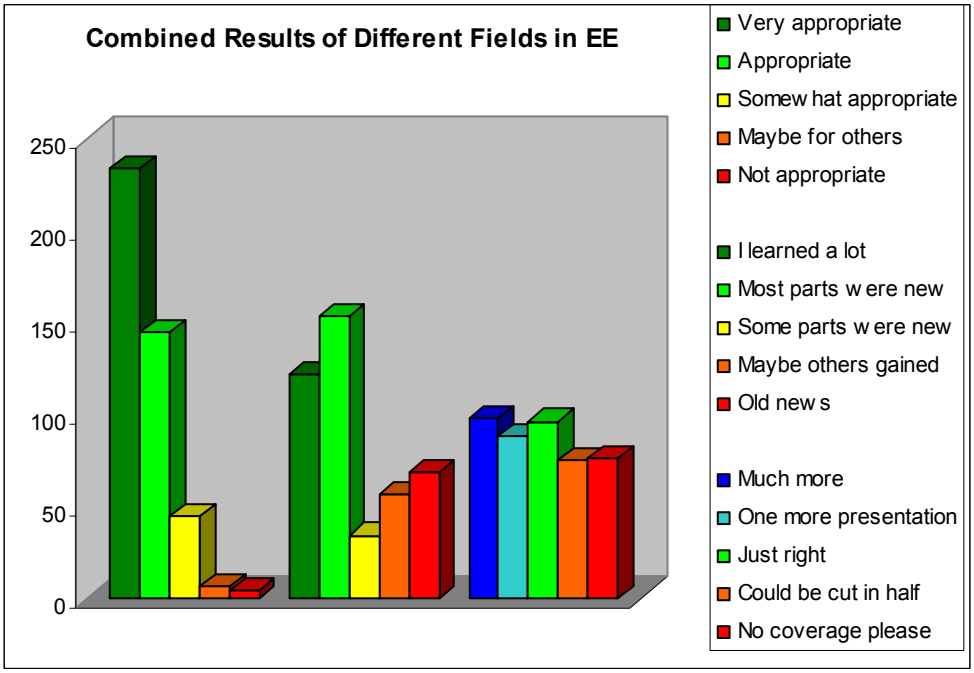
This session provided the most positive feedback. Clearly, observing both sides in a real-life interview gives students a unique opportunity to learn from. Students also indicated on their comments that observing the interviewee provided insight into positive and negative body language and the resulting effect on the interviewer. This session resulted in a very lively post-interview discussion about interviewing techniques of both parties.

A.3: Feedback on cover letters and resumes



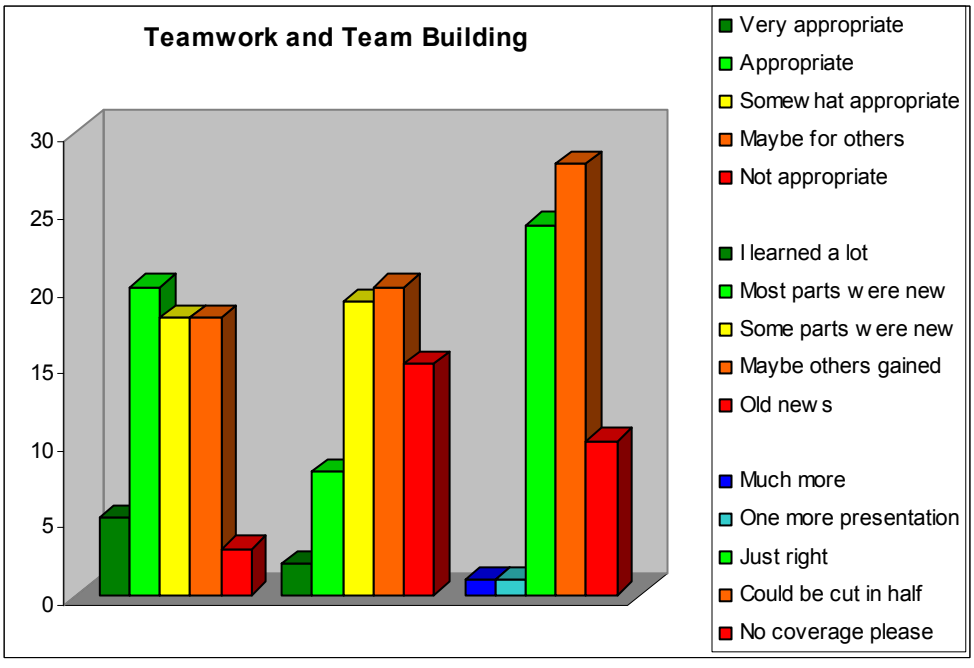
The feedback on cover letters and resumes shows a mixed result. This is possibly due to the fact that approximately 25% of the students in this course are enrolled in the Electrical Engineering Technology program and are mostly so-called “non-traditional” students. Most of these students already have had experience with writing cover letters and resumes and, therefore, do not gain a significant amount of knowledge. Nonetheless, it must be pointed out that a clear majority of the students feel that this segment is appropriate.

B.1: Combined results of different career fields in Electrical Engineering



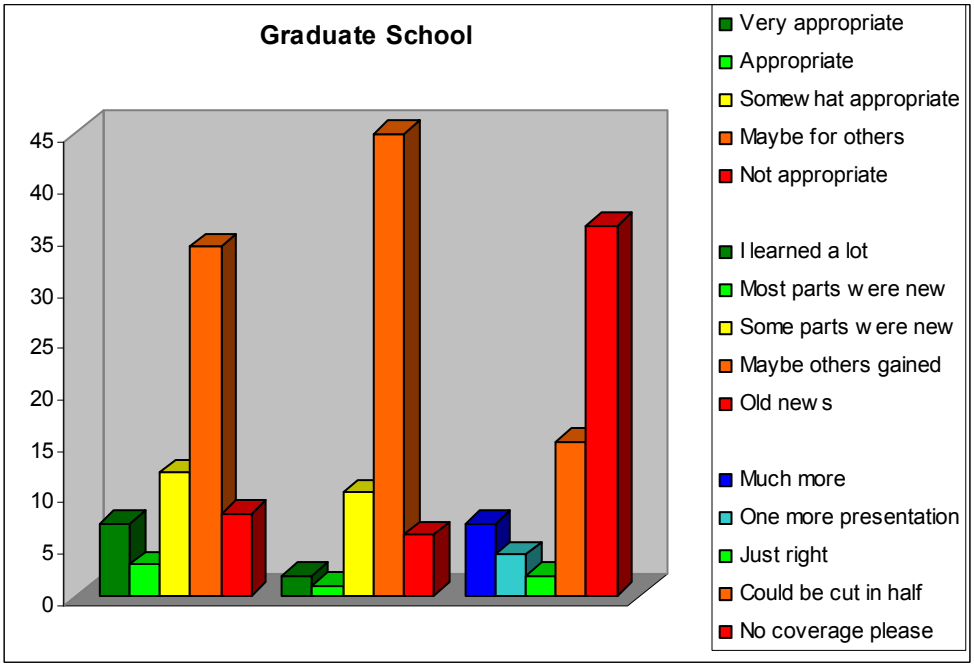
This graph shows the combined results of all sessions covering the different fields and career options in Electrical Engineering and Electrical Engineering Technology. These results have been combined because of the fact that each individual career option clearly only is interesting to a (sometimes very small) minority of all students. This conclusion is indicated by the high percentage of votes for "No coverage please". However, the majority of the students gained career perspectives that they felt were at value from presentations even of fields they were not interested in at all.

B.2: Teamwork concepts and team building



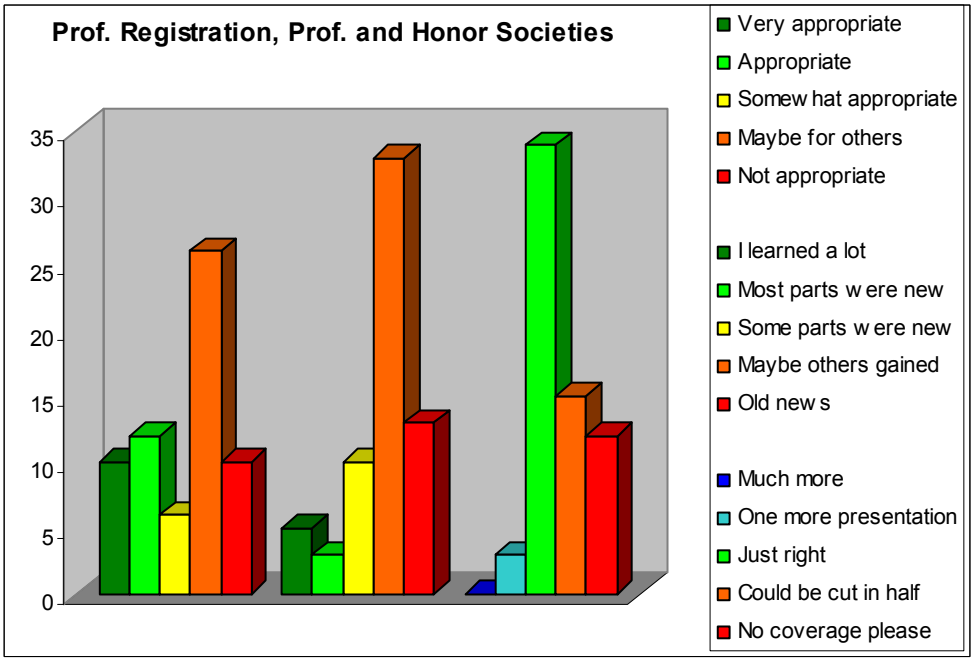
The coverage of teamwork and team building also showed very mixed results. This is possibly due to the fact that these topics already had been introduced several times in other classes and also due to the fact that the majority of EET students already had experience with teamwork. The faculty need to readdress the content and format of this coverage in GE300.

B.3: Graduate school



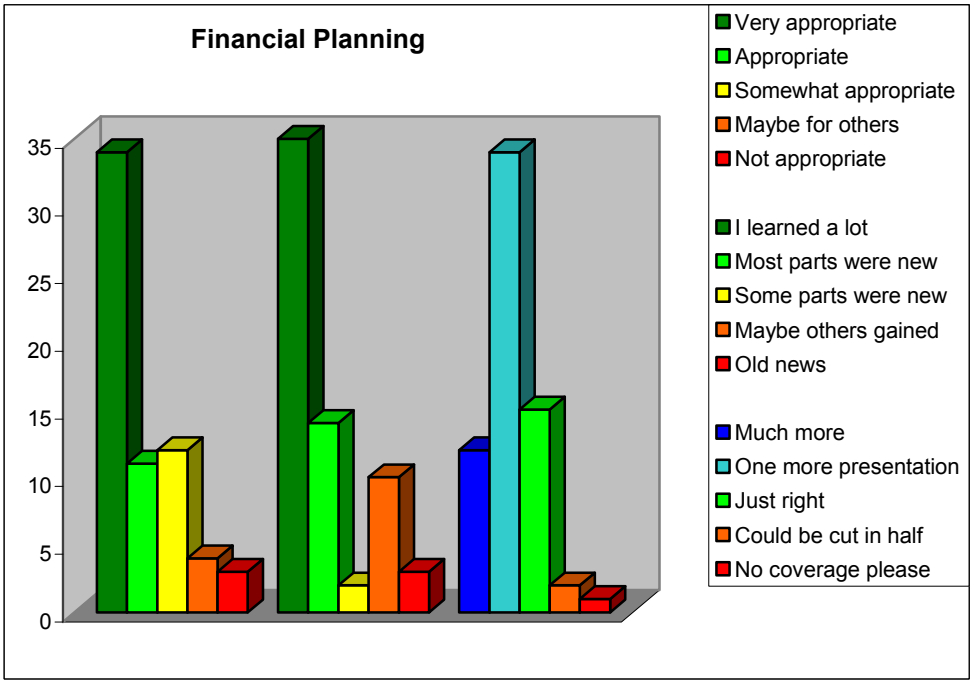
The presentation of graduate school opportunities and mechanics for applying to graduate school clearly interested only a minority of the students. However, it is the conviction of the faculty that this topic is essential in a professional development course.

B.4: Professional registration, professional and honor societies



The presentation on professional registration, professional and honor societies also showed mixes results. The majority of the written comments clearly indicated that these topics are either already known for the case of professional and honor societies, or that students do not feel the need to think about professional registration until after graduation. These topics are collectively covered in a one hour session, so the burden on the course schedule is deemed acceptable.

B.5: Financial planning



The results of the assessment on financial planning were the most surprising. Almost all students not only gained knowledge by this presentation but also requested additional coverage. This has been implemented in the current course offering where this presentation has been doubled.

Summary

Students in Electrical Engineering and Electrical Engineering Technology clearly perceive a professional development course as beneficial as indicated by their feedback. Topics dealing with gaining employment, the different fields in EE and EET, and different career choices are desired to receive an increased coverage, clearly indicating the interest of students in these topics. Sessions regarding interviewing techniques and current expectations on cover letters and resumes provide vital information. Presentations on financial planning underscore the student's understanding and desire when to start with professional development – before graduation.

Biographical Information

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