

AC 2008-567: INTERVIEW SKILLS TRAINING IN THE CHEMICAL ENGINEERING LABORATORY: TRANSPORTING A PILOT PROJECT

Julie Sharp, Vanderbilt

Julie E. Sharp, Associate Professor of the Practice of Technical Communication at Vanderbilt University Engineering School, co-ordinates and teaches technical communication courses for all engineering majors and co-teaches combined chemical engineering lab/technical communication courses. In addition to publishing papers on communication and engineering education topics, she has published a book chapter and numerous papers in refereed journals and conference proceedings on learning styles. She won the ASEE Southeastern Division's 2004 Thomas C. Evans Award for the Most Outstanding Instructional Paper Pertaining to Engineering Education in 2003. An active ASEE member and technical communication consultant, she is a member of the Association of Professional Communication Consultants, the Middle Tennessee Chapter (past chapter president) of the Society for Technical Communication, and the National Council of Teachers of English.

Interview Skills Training in the Chemical Engineering Laboratory: Transporting a Pilot Project

Introduction

Engineering students entering the workforce must be prepared with excellent technical communication skills. Obtaining a desirable job requires certain skills in job search communication, one subset of which is interviewing. In addition to being prepared for the standard face-to-face interview, graduates need, now more than ever, to be prepared for the telephone interview. Companies have increased their use of the telephone interview, particularly as a first screening to select job candidates.

For the last six years, job search communication has been a part of technical communication instruction in a senior chemical engineering laboratory (ChE 229w). A new project was recently initiated to improve students' interviewing skills, providing a transition from school to the workplace. While engineering educators have devised several ways for tapping the resource of industry,¹⁻³ this project, a mock telephone interview, paired engineering students with engineering alumni in the workforce to prepare students for the job search.

This newly initiated project, conducted for two semesters currently, was adapted from a pilot project in a technical communication course (ES 210w) for all engineering majors, composed of students at all levels with the majority being juniors and seniors. The purpose was to train students in the interview process and to give them practical experience, particularly in answering behavioral interview questions by telephone. A secondary purpose was to provide opportunity for future networking with alumni should the students so desire.

This paper describes the ChE 229w mock interview project and briefly compares the current two-semester pilot project to results from four semesters of the ongoing ES210w project. The project includes students' e-mail correspondence with alumni, an interview training workshop, an interview chart assignment for skills analysis, the telephone interview including questions and a critique, a memo summary of the interview (first semester only), and the student's thank-you note to the mentor. The following report describes the partial results currently available: participants' ratings and the students' self-assessment of instructional objectives, specifically those pertaining to interviewing skills.

Questions Considered

The two-semester pilot project in the technical communication class (ES 210w), previously reported, received high ratings from students and alumni. Both groups recommended continuing it in the future with a student rating of 4.6 and alumni rating of 4.9 on a 5-point scale. Some students suggested that in the future, students and alumni should be matched by major.⁴ Since all students in the chemical engineering lab had the same major as the alumni mentors, it was expected that these students would highly value being matched by major and interest.

The following questions were considered:

1. Is this project as successful in the chemical engineering laboratory as in the technical communication course?
2. Is having a matched major highly rated by the participants?
3. Does the fact that the ChE students are all seniors have an effect on the participants' assessment or the project's success?
4. Has this project been more difficult to implement and sustain than in the technical communication course?
5. What are the challenges and lessons learned from transporting this project from the technical communication classroom to the senior chemical engineering laboratory?

Original Assignment in the Technical Communication Course (ES 210w)

The chemical engineering project was derived from the ongoing project introduced three years ago in the technical communication course. Results from four semesters of the first project are compared to the new two-semester chemical engineering project.

In the technical communication course, the Engineering Alumni Council (EAC) assisted in recruiting and assigning volunteers mentors to conduct the 30-minute interviews. Two council members selected appropriate interviewers from the alumni pool. Usually approximately 20 alumni in different locations and with various majors and jobs volunteered each semester. These mentors had experience in interviewing and/or being interviewed. A good portion of them were former ES 210w students. Volunteers specified the number of students they would interview. After receiving a list with each student's name, year in school, major, and future interest (job or graduate school), the designated two council members assigned students to mentors. The two alumni tried to match job/graduate school interest or major when possible. Since, however, the project relied solely on volunteers, matching most students was not possible. On the other hand, as one EAC leader stated, a job candidate in the workforce does not always interview with someone having the same major. The interviewer could be a human resources person with an entirely different major.

Alumni received e-mail attachments with information about the assignment, the interview workshop, and sample questions. They could use the sample questions and/or their own questions as they saw fit.

The main goal of the assignment was to provide practice in real-world interviewing. For the first 15 or 20 minutes, the interviewer asked pertinent questions. He or she spent the remaining time discussing the interviewee's strengths and weaknesses. A few alumni waited until after the interview to e-mail their critiques.

In the technical communication course, an alumnus guest speaker introduced the project each semester. The students received a handout describing the assignment. The project included the professor's training workshop in interview techniques, an interview chart assignment, the telephone interview with an assigned alumnus/alumna, a memo summarizing the experience, and, as recommended by alumni in the pilot project, a thank-you note from students to alumni. During the semester, there was usually an opportunity for students to meet a few alumni who came to campus for a council meeting or other event.

Assignment in the Senior Chemical Engineering Laboratory

The new project paired chemical engineering seniors with chemical engineering alumni in various jobs and locations. As in the technical communication course, students were allowed approximately three weeks to complete all aspects of the project. Similarly, the 30-minute interview contained two parts. The first part was devoted to the actual interview while the remaining time was taken up with the mentor's critique.

With the same procedure as in the technical communication course, the alumni received e-mailed course materials presenting the assignment, content covered in the workshop, and sample questions, both questions used in the workshop and other questions commonly asked.

Recruiting Alumni. Unlike in the first project where two Engineering Alumni Council members recruited volunteers and matched students with alumni, the instructor was responsible for contacting chemical engineering alumni. Although it was rewarding, this task was the most time-consuming portion of the project: accumulating accurate contact information for alumni, selecting alumni to contact, sending the information, responding to numerous e-mails, creating charts with information about both alumni and students, matching students with alumni, and managing the process.

STAR Method. The in-class workshop presented the STAR method for answering the behavioral type of interview question (e.g., What are your strengths?).⁵⁻⁷ It is an effective method for handling the job interview. Sample questions, therefore, were behavioral. Behavioral questions required a description of qualities, characteristics, and/or achievements that might qualify a person for a particular job. The alumni were free, however, to use their own judgment and experience in selecting their own questions to ask.

STAR is an acronym for **S**ituation, **T**ask, **A**ction, **R**esults.⁵⁻⁷ When asked an interview question, the interviewee should think of a specific situation to describe. Then he or she must define the task or goal to be accomplished. Next, the interviewee should describe actions taken to achieve that goal. These specifics show to the interviewer the person in action. The final step is to explain the positive results of these actions. In this way, the interviewee guides the interviewer to see the interviewee as a proactive worker who gets things done.⁸

For example, to show evidence of initiative, a chemical engineering student might think of a time when he or she came up with the idea to streamline a procedure for testing air pollutants. The student would describe the procedure, the persuasive explanation to team members, and the results of implementing the procedure. By analyzing these situations or events, the interviewee might be able to use one situation to answer several kinds of questions. In the above example, for instance, the student could use the same situation to describe his or her influence on the team members.⁸

Interview Chart. After learning the STAR method, students prepared an interview chart to help them analyze their strengths and to serve as a guide during the phone interview. They were to think of five or six scenarios or situations from their experience to illustrate such strengths as

initiative, leadership, persistence, etc. The situations could be from school or personal life. The chart had to contain at least four columns and five rows. Students used verb phrases to provide the information. In the first column, they listed the scenarios; in the second, the goal to be achieved; in the third, the actions taken to reach the goal; and in the last, the positive results of those actions.⁸

Students' Initial E-mails. In their first e-mails, students contacted mentors to decide on a mutually agreeable time for the interview. Subsequently they decided together whether the interview would be for a job, internship, or graduate school. The student could simulate an application to the mentor's company or to business, law, or medical school, provided the mentor had a graduate degree and expertise in this area.

Thank-You Note. After the interview, students e-mailed thank-you notes to their mentors and posted copies online in Blackboard for the instructor to view. Originally, in the technical communication course, students were simply advised to send a note. However, in subsequent semesters the note became a graded requirement.

Memo. The technical communication students and the chemical engineering students in the first semester wrote a one-page, single-spaced memo, summarizing and analyzing the interview. In it the students described the interview, the types of questions asked, their application of the STAR method, and their mentor's critique. The interview itself was not graded. During the second semester of the chemical engineering project, the memo was deleted because the technical communication professor co-taught the course with a new chemical engineering professor. The course was revamped and the memo deleted because of scheduling issues. The thank-you e-mail and interview chart became the only graded assignments for this chemical engineering project, seemingly without any negative effects.

Resources for Students. Students received an assignment sheet describing the parts of the assignment and listing due dates and resources. As with the pilot project, the entire chemical engineering project took place in approximately three weeks. Resources for writing the memo were the course ClassPak⁸ and the textbook, *The Technical Writer's Companion*.⁹ Students also received a handout giving phone interview tips. Other sources for more tips could easily be found on the Web.¹⁰⁻¹¹

Evaluation Methods

Assessment of both the ChE 229w and ES 210w projects consisted of students' and alumni's numerical ratings of various aspects of the project, their written comments, and students' self-assessment ratings of achieving instructional objectives. Because final data collection and assessment are still in progress at the time of this writing, only partial results can be reported in this paper.

Current Results

Technical Communication Course Project. The current student assessment in the technical communication course occurred during four semesters of the mock telephone interview project.

Of the 172 students participating, 148 respondents recommended that the project should be continued with a 4.7 rating.

Students' Ratings in the Technical Communication Course. Table 1 presents the students' ratings, showing that they considered the project helpful and recommended repeating it in the next semester. Their lowest ratings related to networking.

TABLE 1
STUDENTS' ASSESSMENT OF ES210W PROJECT ON A SCALE OF 1 TO 5. N=148
OF 172 STUDENTS PARTICIPATING IN 4 SEMESTERS.

| Statement | Rating |
|---|--------|
| 1. Continue this project next semester. | 4.7 |
| 2. This project was helpful. | 4.5 |
| 3. I learned something useful or interesting about the interviewing process. | 4.2 |
| 4. Through this project, I improved my interviewing skills. | 4.2 |
| 5. The contact with alumni was beneficial and provided a good networking opportunity. | 3.5 |
| 6. I plan to contact one or more of these alumni again. | 2.5 |
| 7. I enjoyed participating in this project. | 4.0 |
| 8. Alumni responded in a timely fashion. | 4.3 |
| 9. Sufficient time was allotted for this assignment. | 4.6 |
| 10. I met with one or more alumni in person. | 1.9 |
| 11. My assigned alum and I have had additional communication for other reasons besides the interview and alumni campus event. | 1.2 |
| 12. The networking workshop was helpful (semester 1) or should be offered (semesters 2-4 | 3.9 |
| 13. I did well in my interview (added for semesters 2-4 | 4.1 |

Additionally, in their end-of-semester, anonymous student self-assessment of meeting course objectives, the technical communication students in the four semesters (N=142 of 178 enrolled) rated their pre-course knowledge of effective interview techniques, including the STAR method, with a mean score of 2.0 and their post-course knowledge with a mean score of 4.4. A second objective about interviewing techniques was added in the fourth semester: that students should gain expertise specifically in handling the telephone interview. The 33 fourth-semester students responding (of 39 enrolled) rated their pre-course expertise as 2.4 and their post-course expertise as 4.2. The ES 210w students, therefore, thought that the course had increased their knowledge of interviewing techniques.

Alumni's Ratings for the Technical Communication Course Project. Table II presents the alumni's evaluation of the technical communication pilot project. With a top rating, 4.9, alumni concurred with students that a mentoring project should be repeated in ES 210w. Surprisingly, continuing the networking relationship did not receive a high rating by alumni even though their leaders had mentioned this as one reason for initiating a project in the ES 210w class.^{3,4} The Engineering Alumni Council leaders recommended that alumni should not be asked to fill out questionnaires every semester since some alumni continued participating. The alumni results, therefore, are from the first semester.

TABLE 2

ALUMNI'S ASSESSMENT OF ES210W PROJECT ON A SCALE OF 1 TO 5.
N=18 OF 21 ALUMNI PARTICIPATING IN THE FIRST SEMESTER⁴

| Statement | Rating |
|---|--------|
| 1. A mock interview project should continue next semester. | 4.9 |
| 2. This project was helpful for students. | 4.7 |
| 3. I think I helped my interviewee(s). | 4.3 |
| 4. Use the same assignment again. It worked well. | 4.4 |
| 5. Use a different assignment. | 1.9 |
| 6. The student contacted me in a manner that showed respect for my time. | 4.3 |
| 7. The student/alumni phone contact was beneficial and provided students a good networking opportunity. | 4.2 |
| 8. Sufficient time was allotted for the assignment and my response. | 4.5 |
| 9. I have had additional communication with one or more of my assigned students about topics other than this project. | 1.9 |
| 10. I will contact one or more of my assigned students again. | 1.9 |
| 11. Continue to provide interview handouts as resources for alumni. | 4.7 |
| 12. I met with one or more of my assigned students during the reception (semester 1). | 2.2 |
| 13. Always include an opportunity for the two groups to meet, such as a reception or luncheon. | 3.5 |
| 14. I enjoyed participating in this project. | 4.7 |
| 15. I am willing to participate again. | 4.9 |
| 16. My assigned interviewee(s) did well in the interview. | 4.0 |
| 17. The alumni/student networking reception on campus was helpful and/or a good idea. | 4.1 |

The alumni's highest rating was 4.9 for continuing the project and for their willingness to participate again, almost 100 percent showing enthusiasm for the project.

Chemical Engineering Senior Laboratory Project. The project in the senior chemical engineering laboratory was conducted over two semesters with a total of 54 seniors, 24 in the first semester and 30 in the second semester.

Chemical Engineering Students' Ratings. Results show that these students definitely favor continuing the project (Table 3).

TABLE 3

STUDENTS' ASSESSMENT OF CHE 229W PROJECT. N=48 OF 54 ENROLLED.

| Statement | Rating |
|---|--------|
| 1. Continue this project next semester. | 4.7 |
| 2. This project was helpful. | 4.4 |
| 3. I learned something useful or interesting about the interviewing process. | 4.3 |
| 4. Through this project, I improved my interviewing skills. | 4.1 |
| 5. The contact with alumni was beneficial and provided a good networking opportunity. | 3.9 |
| 6. I plan to contact one or more of these alumni again. | 2.9 |
| 7. I enjoyed participating in this project. | 4.2 |
| 8. Alumni responded in a timely fashion. | 4.5 |
| 9. Sufficient time was allotted for this assignment. | 4.4 |
| 10. I met with one or more alumni in person. | 2.6 |
| 11. My assigned alum and I have had additional communication for other reasons besides the project. | 1.9 |
| 12. A networking workshop or other on-campus activity should be offered for students to meet alumni | 4.3 |
| 13. I did well in my interview. | 4.1 |

Responses from the chemical engineering students seemed to follow the trends of the previous students' responses in the technical communication classes. The scores of this second study, however, were somewhat higher for items 3 through 8 and 10 through 12. The chemical engineering students' age could be a factor affecting the slightly higher scores for valuing networking. Since they were seniors, they could be expected to be more concerned with networking for the job search than some technical communication students who were juniors and sophomores.

Table 4 presents three extra questions added in the second semester for the chemical engineering students.

TABLE 4

CHE QUESTIONS ADDED FOR SECOND SEMESTER STUDENTS ONLY.

N=27 OF 30 PARTICIPANTS

| Statement | Rating |
|---|--------|
| 14. This project helped me get a job. | 1.9 |
| 15. It is important that my interviewer have a major in chemical engineering. | 3.6 |
| 16. My assigned interviewer was a match for my area of interest. | 3.6 |

The chemical engineering alumni were asked to help prepare students but were not asked to recruit them as prospective employees. During the first semester, however, one person was hired because her mentor encouraged her to apply to his company and provided practice in answering the case interview question. In the second semester, two students earned real interviews, one with a mentor's company and one with a company through a mentor's colleague.

Surprisingly, the students did not seem to value highly having an interviewer with the same major. Additionally, even though all alumni were chemical engineering majors, some students did not think alumni's jobs matched the students' areas of interest.

Future analysis could possibly include assessing differences between students' responses from one semester to another. In that way, one might determine if one class influenced subsequent classes by commenting on the project. The chemical engineering laboratory is offered only once a year while the technical communication course is offered each semester of the regular school year. That fact also may or may not have a bearing on students' conversations.

The results from the chemical engineering students' post-course self-assessment of meeting course objectives concur with the technical communication students' results. The ChE 229w students (N=48 of 54 enrolled) rated their pre-course knowledge of/expertise in effective interview techniques as 2.1 (0.1 higher than their ES210w counterparts) and their post-course expertise as 4.4 (the same as the ES210w students). For the objective about expertise in conducting a telephone interview, the 48 chemical engineering students rated their pre-course expertise as 2.3 and post-course expertise as 4.1.

Chemical Engineering Alumni's Ratings. Thirteen chemical engineering alumni participated for the first semester although one was unable to complete the interview, and twelve responded to the assessment questionnaire. Their responses indicate that, like their counterparts in the technical communication course, they enthusiastically support the project. Table 5 presents their responses. Question 17 from the ES 210w questionnaire for alumni is omitted since the previous networking reception was no longer offered, so Table 5 only has 16 items.

TABLE 5

ALUMNI'S ASSESSMENT OF THE CHE 229W PROJECT ON A SCALE OF 1 TO 5.
N=12 OF 13 CHEMICAL ENGINEERING ALUMNI PARTICIPATING THE FIRST SEMESTER

| Statement | Rating |
|---|--------|
| 1. A mock interview project should continue next semester. | 4.9 |
| 2. This project was helpful for students. | 4.4 |
| 3. I think I helped my interviewee(s). | 4.0 |
| 4. Use the same assignment again. It worked well. | 4.5 |
| 5. Use a different assignment. | 2.1 |
| 6. The student contacted me in a manner that showed respect for my time. | 4.7 |
| 7. The student/alumni phone contact was beneficial and provided students a good networking opportunity. | 4.3 |
| 8. Sufficient time was allotted for the assignment and my response. | 4.8 |
| 9. I have had additional communication with one or more of my assigned students about topics other than this project. | 2.3 |
| 10. I will contact one or more of my assigned students again. | 2.5 |
| 11. Continue to provide interview handouts as resources for alumni. | 4.3 |
| 12. I met with one or more of my assigned students during the reception (semester 1). | 1.8 |

| | |
|--|-----|
| 13. Always include an opportunity for the two groups to meet, such as a reception or luncheon. | 3.5 |
| 14. I enjoyed participating in this project. | 4.7 |
| 15. I am willing to participate again. | 4.8 |
| 16. My assigned interviewee(s) did well in the interview. | 3.7 |

These alumni rated most highly the same two items as their counterparts did in the technical communication course: recommending continuing the project and indicating their willingness to participate again. The number of chemical engineering alumni participating increased from 13 the first semester to 20 the second semester. Ten alumni participated both semesters.

Conclusions

Agreeing with results indicated in the technical communication project, chemical engineering alumni and student ratings indicate that the project was a success and should be continued. Students gained interviewing skill and confidence. Future networking was not ranked highly as a major benefit. The most important benefits seem to be the alumni-student interaction during the project, the practical experience in interviewing, and the advice about job search communication offered by alumni professionals.⁴

Currently, the data analyzed thus far indicates the following responses to the initial questions about the chemical engineering project:

1. Is this project as successful in the chemical engineering laboratory as in the technical communication course?
Answer: Scores from both alumni and students indicate that the project has been successful.
2. Is having a matched major highly rated by the chemical engineering participants?
Answer: Having a matched major did not earn a high rating from the chemical engineering seniors. It seems to be less important to them than to the technical communication students.
3. Does the fact that the chemical engineering students are all seniors have an effect on the participants' assessment or the project's success?
Answer: It is unclear yet from the students' responses what effect senior status had. Maybe a more complete analysis of written comments will give an indication. An immediacy and a stronger student focus were seemingly added because these students had to plan immediately for either a job or graduate/professional school.
4. Has this project been more difficult to carry out and sustain than in the technical communication course?
Answer: The main difficulty was managing the communication tasks of recruiting and assigning mentors. Most chemical engineering alumni, not being involved in the original Engineering Alumni Council project, were not asked to facilitate these tasks. Otherwise, the project was worthwhile and practical.
5. What are the challenges and lessons learned from transporting this project from the technical communication classroom to the senior chemical engineering laboratory?
Answer: The initial recruiting and assigning of mentors created the biggest challenge. The major lesson learned is that transporting this project worked well. This project could

be included without much difficulty in other courses provided the instructor had help in managing the recruitment. Deleting the memo did not seem to affect negatively the value students placed on the project.

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