

AC 2007-885: HELPING LOWER DIVISION ENGINEERING STUDENTS DEVELOP A GOOD RESUME

Mary Anderson-Rowland, Arizona State University

MARY R. ANDERSON-ROWLAND, PhD, is the PI of three academic scholarship programs and a fourth program for transfer students. An Associate Professor in Industrial Engineering at Arizona State University, she was the Associate Dean of Student Affairs in the Fulton School of Engineering at ASU from 1993-2004. She received the ASEE Minorities in Engineering award 2006, the SHPE Educator of the Year 2005 and was given the National Engineering Award in 2003, the highest honor given by the AAAES. In 2002 she was named the Distinguished Engineering Educator by the Society of Women Engineers. A SWE and ASEE Fellow, she is the Chair of PIC IV and a frequent speaker on career opportunities in engineering, especially for women and minority students.

Patti Culley, Arizona State University

PATTI L. CULLEY holds a Master of Science in Bioengineering and a Master of Counseling. She worked 6 years as a Research Engineer in the medical device industry, and 5 years as a university career counselor and internship coordinator. She developed the career decision-making model used in the ASU Career Services Career Guide and currently works extensively with engineers, freshman through Ph.D, teaching career management and coordinating the university internship program at ASU. She also consults regularly with industry partners to develop internship opportunities across the university. She is a member of NCDA (National Career Development Association), NSEE (National Society for Experiential Education), and MPACE (Mountain-Pacific Association of Colleges and Employers).

HELPING LOWER DIVISION ENGINEERING STUDENTS DEVELOP A GOOD RESUME

**Mary R. Anderson-Rowland and Patti L. Culley
Arizona State University**

Abstract

Many students need a good resume in their first year of engineering. Most students have a high school resume complete with all of their awards, music and athletic accomplishments, but now they need an “engineering” resume for an internship, a scholarship, or a research position in engineering. The resume can also serve as an excellent career-planning tool, establishing a framework on which to build and a guideline for gap analysis. Creating this new resume is difficult for most students. They need help translating and prioritizing their previous experiences into “skills” that are useful in engineering. With the help of a Career Services representative, who is in close contact with what industry wants on a resume, and the director/mentor of academic scholarship programs, who follows through to make sure that the students write good resumes, lower division students are able to develop excellent resumes. Since checking resumes can be a tedious task, a Resume Checklist was created to empower the students to develop their own good resumes and to show them when revision was needed. This paper will include the main suggestions for a resume given by a Career Services representative, the Checklist, and an evaluation of this Checklist activity. The paper will also include an explanation of how a good resume can serve as a career-planning tool.

I. Introduction

In the Ira A. Fulton School of Engineering, over 100 students are in three academic scholarship programs that target women and underrepresented minority students, sponsored by NACME (National Action Council for Minorities in Engineering) and the National Science Foundation CSEMS and S-STEM program. In addition to the scholarships, academic workshops help the students with time management, academics (how to learn), resources, and other challenges; especially those faced by lower division students and transfer students. The students in each of these programs meet at least six times per semester. The students are encouraged, beginning in their freshman year, to go to career fairs, to consider internships, and to consider writing a proposal for a research award. For these activities, the students need a good resume.^{1, 2, 3} The resume needed for an internship or research position is more demanding than the resume used in high school to apply for scholarships. The high school resume is often two pages and predominately a list of activities in which the student participated and honors that the student has received in high school. Now the resume must reflect the skills and knowledge of a promising engineer. Since the lower division students do not have many college-level activities, honors or technical experience, they are often at a loss on how to translate what they do have into a competitive college-level, pre-professional resume.

Minority students as a group do not usually have any distinct needs when it comes to putting together a resume. Minority students may be more likely to come from a school that did not stress a good, professional resume. Lower division minority students have the same problem with resumes as every other lower division engineering student: changing a high school resume to a college engineering resume. One special bit of advice, though, is that no matter how American sounding the name, they are advised to put U.S. Citizen or Permanent Resident on the resume, if this is the case. These classifications are very important for many employers. In many cases, employers are under pressure to increase the diversity and multiculturalism of their workforce. Because of this, we recommend that students highlight any affiliation that indicates their minority status, and to continue involvement with organizations that provide support and networking opportunities for underrepresented populations.

Usually two meetings in the spring for freshmen and at least one meeting each year for the rest of the students is devoted to resumes. A representative from Career Services comes to the hour meeting and gives general guidelines and resource material for a good engineering resume. The representative also answers questions that the students have and may also critique resumes, as time permits. The students are encouraged to take advantage of Career Services and to make an appointment to have an expert look over their resume. A few students do take advantage of this service.

The academic programs' director follows up by having the students submit their resumes as part of the required assignments for the scholarship. In reviewing the resumes, one by one, the director learned that many corrections usually had to be made, most of which fell into common categories. In order to save time going over resumes and to empower the students, the director created a Resume Checklist. The students are required to check their own resume using the Checklist and then to submit, as an attachment, both the completed Checklist and their resume for credit. The use of the Checklist has helped the students and the academic scholarship director by reducing the amount of time needed to go over resumes until they are finally of professional quality.

A major problem of the students is that they have not had engineering experience. It is quite common that their work experience has been limited to fast food or customer service. Students often feel that this is of no value and that they have nothing to offer. What we emphasize is that while these positions do not involve technical proficiency, they are opportunities to describe the 'soft skills' that engineers often lack. Even the most generic 'Burger Land' job may require such skills as communication, team work, integrity, trustworthiness, leadership, or work ethic. The students simply need to emphasize the aspects of the job that demonstrated them on the resume. This experience is usually placed in the lower half of the resume, following the engineering related items such as education, technical skills, coursework, projects or any technical experience.

Since students are continually joining these scholarship programs, new students may not have had instruction in writing a new resume. By using the Checklist, the new student can quickly develop an excellent resume without first having to go to a workshop on resumes.

II. Requirements of a Good Resume (and How a Freshman can Write One)

The Career Services representative is in constant contact with industry and stays up-to-date on what industry wants to see in a resume.^{4,5} Industry wants a short, concise, one-page resume unless the student is near graduating or is a graduate student and has enough pertinent information to fill most of two pages. Industry wants to know: the objective, the major, the graduation date, the GPA, the appropriate skills (especially technical, communication and teamwork) resulting from projects, work experience or extracurricular involvement. All of this is difficult for a freshman or sophomore. During the freshman year, it is understandable that the resume will contain a summary of the high points of high school achievement including the GPA and scholarships and awards, but the goal is to translate that experience into the new engineering framework.

Formatting

The students are encouraged to demonstrate individuality with the resume while making it professional at the same time. The students are strongly discouraged from using ready-made resume templates. To the trained eye they are very easy to spot and are frowned on by industry as an “easy way out”. They also make it virtually impossible to utilize space efficiently, or represent the students’ individual experiences in the best light possible. At first formatting guidelines are given; margins no less than 0.5”; one style and size of font throughout between 10 and 12 point, with no fancy script, italics, shading, or underlining. Times New Roman, Ariel or Garamond is recommended. Space utilization and consistent organization are critical to make it simple to navigate and visually inviting.

Heading

Next, the name of the person should be the predominant piece of information on the resume. The name should be larger than anything else on the page. Along with the name, the student’s address, email address, and phone contact(s) should be given. Now is the time to change that cutesy email address to something more professional, and make sure the greeting on their phone is suitable for potential employers to hear.

Objective

There is some disagreement about the use of an objective on a resume. Some hold that the cover letter can convey the individual’s objective and it need not be on the resume. Others prefer a summary section. While a summary can be highly effective, we find that undergraduates, especially lower division, do not have the experience to create a good one. Good summary sections should represent levels of proficiency gained through experience. Since the professional and technical experience of these students are so limited, they end up listing soft skills, such as “Team Player” or Organizational Skills”, which are important to include on the resume, but are better demonstrated through examples and experience.

We advocate an objective. It helps the student clarify the focus of the resume, which is extremely important for an effective resume. It also lets the employer know that the student is focused. Even a freshman resume can give the objective (to obtain an internship where they will be able to apply their skills to help a company). It is strongly recommended that students avoid stating what they want from a position such as “an opportunity to learn and grow” or “gain real-

world experience”. They are reminded that employers are interested in what they have to offer, not the areas in which they need improvement.

Education

Students are directed to spell out the degree, major, graduation month and year, university, city, state and GPA. The student knows their major, but a GPA will not be known until the end of the first semester. Although the graduation date is an estimate, the date should be given with no “expected” or “anticipated” attached. If the date needs to be changed on a later resume, so be it. Students should also note on their resume if they are working to support themselves in college. Employers are empathetic to working students and can understand if their GPA is not as high as it should be. Engineering classes can also be listed in this section.

Skills

Demonstrating “appropriate skills” is the heart of a good resume, and usually the most difficult task, especially when college-level and engineering-related experience is so limited. This involves helping them to understand that skills can come from academic projects, extracurricular activities, as well as employment. Students are encouraged to start with a “Skills” section listing the relevant computer applications, platforms, hardware, tools, languages (programming and/or verbal), equipment etc. with which they are proficient.

Projects and Experience

Academic or technical projects are often of great interest to potential employer which comes as a surprise to most students. (It is emphasized that since this is often the source of their engineering-related skills, it is appropriate at this early stage of their degree, but that more professional experience will be required to be competitive at graduation time.) Project descriptions should include an overview of what the project was about, what engineering analysis was involved, and what (analytical or technical) tools were used. Work experience should include their title, organization name, city state and dates. When describing work or project experience, students are encouraged to first reflect on what skills, knowledge or qualities they want to convey, and decide what specific tasks demonstrated this. In describing the tasks, it is strongly recommended that they use first-person action verbs to start each statement, and to include any accomplishments or recognition. Action-verbs convey skills in a clear, concise manner (“Set and achieved monthly sales targets for drive-thru and front counter”), while passive voice is vague and not conducive for communication of skills and accomplishments (“Responsible for drive thru and front counter sales”). Work completed in the past should be described by a past tense verb and on-going work needs to be described by a verb in the present tense. The language also needs to include jargon of the field. First, this conveys a certain comfort and implied proficiency with standard concepts in the field. Second, it increases the likelihood that the resume is selected for review via electronic scanning for keywords.

As an example, consider the student who worked for ‘Burger Land’ for a summer. If the student was responsible for supervising the night shift, keeping customers happy during this shift, was responsible for the cash register and closing the store each night, the resume could read:

Burger Land

Summer 2006

- Trained and supervised four employees creating a cooperative team environment.
- Ensured high level of customer satisfaction and personalized service during night shift.
- Accurately managed the cash register balancing up to \$4000 nightly.
- Instituted new procedure for cash tallies at the end of the shift.
- Entrusted to close and thoroughly prepare restaurant for the next day.

Now the resume shows that the student has management skills, works well with people, is trustworthy, creative, and a responsible person. These are good skills for an engineer.

Awards/Activities

One particular challenge for freshmen students is how to appropriately present awards and community involvement, which typically dominate high school resumes. While these are significant as an indication of well-roundedness and academic aptitude, they are not the recommended focus of a professional engineering resume. Choices (sometimes difficult) must be made regarding which ones best represent the desired qualities without redundancy. When describing awards and activities, it is sometimes adequate to simply name the award or organization. If exemplary skills were involved, it may be advisable to elaborate using the same approach described in the experience section. Critical examination of activities and awards is an important step in helping shape the mindset of the student to that of a young professional. Here they begin to realize the value in all kinds of experience, and that academic success is necessary, but not sufficient to compete in the real world.

References

References should not be given on the resume nor is it necessary to state “References available on request”. It is expected, however, that if an employer should ask for them, a list can readily be given. Three to five references are standard, and should be listed on a separate page. It is best that students choose references that have been in a supervisory role and maintain contact to make sure they will give a good recommendation and keep them informed. References should include name, title, organization, address, phone number and e-mail.

III. Resume Checklist

During the several years that the director has run academic scholarship programs, a lot of time was spent on going over resumes. In spite of the clear instructions and materials given by a representative from Career Services, students still missed major points to be made on their resume and were often not careful to use parallel phrasing and consistent tenses when describing their work experience. Therefore, to help solve this situation and to empower the students to write a better resume, a Resume Checklist was created. It has been revised and will continue to be revised, but it currently covers most of the common errors made by the students when composing or updating a resume. Each semester starting with the second semester of the freshman year, the academic scholarship students are required to submit an updated resume. The hardest resume is always the first college resume and the Checklist has helped make that task easier for the students.

The Checklist is given in Figure 1.

RESUME CHECKLIST

Name: _____

Template:

1. I did not use a template to create my resume. Yes No

Format:

2. Margins are no less than 0.5" and
Font is between 10pt. and 12pt. for everything except my Name (Which is between 14 & 18) Yes No

3. I have chosen one basic font (no fancy script or serif) Yes No

4. Resume is one page Yes No

5. I have no italics, underlining or shading Yes No

Top of resume:

6. My name stands out on the resume Yes No

7. I included my address, email address, and phone number after my name. Yes No

Objective:

8. I have an objective in the resume. Yes No

Dates:

9. I have listed my education, work experience, and awards all with the most recent dates first
 Yes No

Education Section:

10. I spelled out my degree: "Bachelor of Science in Engineering" Yes No
If no, as a CS major, did you give your degree as Bachelor of Science Yes No

11. I gave a graduation date. Yes No

12. I did not use the word "expected" or "anticipated" before my graduation date Yes No

13. I only list a GPA of less than a 3.0 if I have put myself through school and list that with the GPA
 Yes No

Skills

14. I have listed the relevant technical, computer and language skills in which I am proficient with separate subheadings where appropriate Yes No

Work Experience, Projects, or Experience:

15. For my work experience, I have included my title, place of employment, city & state Yes No

16. I gave the date of each item. Yes No

17. When I described the skills that I have acquired in each projects and work experience,
I used action verbs to start each bulleted item Yes No

- The verbs are all in past tense if the action was in the past and in the present tense if the action is current. Yes No

Volunteer Experience, Awards, Activities

18. All Honors, Scholarships, Awards, and Society membership or active participation include the date of occurrence. Yes No

19. I included: "Selected for the National Action Council for Minorities in Engineering (NACME) Academic Scholarship Program 200x-200x" Yes No*

*Or other appropriate honors

20. References are not included nor is any reference to them Yes No

21. The resume is one page unless I am an upper classman and the second page is mostly full
. Yes No

I checked my resume and checked all 21 questions "Yes," except for when I gave an explanation as to why I could not comply.

Figure 1. Checklist for the Resume

IV. Career Planning and Gap Analysis

Besides the practical need for developing a freshman resume, the process can also serve as an excellent career-planning tool. As students are asked to define an objective and reflect on their skills and experience, they become keenly aware of the ambiguous nature of their career goals and shortage of engineering skills. At this time, the career planning process is introduced by guiding their thoughts toward defining what they want and what it will take to be competitive. Resources, including the *Career Guide*⁶ from Career Services, are provided and the students are invited to take advantage of the resources at Career Services for further help with decision-making and implementation. Beginning this process as freshmen provides ample time to research, plan and gain the necessary experience to achieve their goals by graduation. Excellent examples of highly competitive resumes are provided, allowing students to identify what they want their resume to look like and what is missing. In addition, the *Career Guide* and checklist facilitate self guidance and independent thinking which are critical for long-term career management. The key ingredients that make this exercise so effective are time and motivation. Typically, college students are not motivated to begin the career development process until the junior or most often, senior year. Requiring that they create a resume early engages them in the process while there is still time to do it right. Often the anxiety they experience when realizing their technical deficiencies can serve as motivation to get the skills and experience that will make them highly qualified for the job they really want when they graduate.

V. Discussion and Conclusions

The Resume Checklist has served as a good tool for both the student and the program director. The checklist is a good tool as far as the student truly uses it as a checklist and not just a list with all "Yes" check marks in order to get credit on an assignment. Although the Resume Checklist was primarily developed to help with lower division engineering and computer science students, the Resume Checklist is also very helpful for upper division students. The director currently uses a student to check the academic scholarship programs assignments including a resume. The

following are comments from this student who has checked many resumes (there are about 100 students in the three programs) and Resume Checklists:

I think that the Career Services presentation is very informative on how to write resumes and that the students are more convinced of the information when it is presented by a professional. I think those booklets that Patti brings with her are great- I took one on a plane ride with me and came off with a great revised resume. The most helpful components in the book are the resume format examples- to see how a technical resume may differ from a liberal arts student and also the pages in the book with the list of action verbs to choose from. It's hard to think up words like that on your own, but seeing a list makes it easy to just pick a word and ask yourself if you've done anything like that.

I think the resume checklist has worked great, and its easy for me to just tell students to make sure they've done everything on there, rather than try to explain all of that to them (which some I do that with also:). The checklist does a good job of covering the key points that the students should have taken away from the Career services presentation. It's hard to tell whether the students benefit from the checklist or if their resumes were like that already. I think some do, but mainly due to the career services speech, I don't think just the checklist alone is enough to write a resume without any other knowledge on them. I think students have a hard time understanding what should be written in the objective and with using action verbs to describe the various sections. I also get complaints about the not using a template or the 'expected graduation", about the resume only being one page, and not putting any references on there. I think students don't understand why they shouldn't do these things. Hope this helps!

Using a Career Services representative to talk "resume" with the students, giving the students a copy of the *Career Guide*, and then giving the students the Resume Checklist work well together in enabling a student to write a good resume. The student has been empowered to write a good resume by being reminded of the proper formatting and items that should be included and not included in a resume.

The students report that the Resume Checklist helps them:

The checklist was helpful to remind me the specification and requirements my resume should have

The Check List was very helpful because it helped me organize all of the lists

Reminded me of all of the things I need to improve

I used the Check List as a kind of guide line

The checklist is awesome and I still use it. It is essential for proper resume construction

Since the Resume Checklist contains most of the important points in a resume, a supervisor or grader can scan the resume and easily spot check items on the Checklist to see if the resume has been done properly or improvements can be made. Many students after having done their resume according to the Checklist have reported being hired for an internship or a job, as well as being accepted into graduate school. Their resume passed the ultimate test.

References

1. Anderson-Rowland, M.R. and Newell, D.C., "Lessons Learned in a Successful Underrepresented Minority Retention Program," Proceedings of the 2005 American Society for Engineering Education Annual Conference, Portland, Oregon, June 2005, CD-ROM, 10 pages.
2. Anderson-Rowland, M.R., "Evaluation of a Program to Encourage Underrepresented Minority and Women Students to Become Interested in Research and to Attain Graduate Degrees," Proceedings of the 2006 WEPAN Conference, Pittsburgh, PA, June 2006, CD-ROM, 13 pages.
3. Anderson-Rowland, M.R., "Evaluating an Academic Scholarship Program for Engineering and Computer Science Transfer Students," 36th ASEE/IEEE Frontiers in Education Conference, San Diego, CA, October, 2006, CD-ROM, 8 pages.
4. Crosio, P. (2000). *Designing the Perfect Resume*. Colorado Springs, Colorado: ProType Ltd.
5. Thompson, Mary (2000). *The Global Resume and CV Guide*. New York, New York: John Wiley & Sons.
6. Culley, P., et al. (2006). *Career Guide; Strategies Toward Enhancing Professional Success*. Tempe, Arizona: Arizona State University Career Services.