

AC 2008-1689: THE ROLE OF INSTITUTIONAL COMMITMENT IN THE UTILIZATION OF COLLEGIATE SWE SECTIONS AS A RECRUITMENT AND RETENTION STRATEGY

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The Role of Institutional Commitment in the Utilization of Collegiate SWE Sections as a Recruitment and Retention Strategy

Abstract

Women currently make up 56% of the undergraduate student population in the United States, but only comprise 17.4% of engineering undergraduate programs. In response to this fact, many science and engineering colleges have indicated that they want to increase the number of women on campus, but often do not provide the infrastructure to achieve this goal.

To successfully recruit and retain female students in these fields, some of the more effective methods often include a strong commitment at the institutional level rather than making it the responsibility of a single department, organization, or office. At Colorado School of Mines (CSM), an example of this approach involves utilizing the many assets of their Society of Women Engineers (SWE) collegiate section, which include their members, activities, and corporate contacts, to attract women to the institution, as well as retain them once they enroll.

Colorado School of Mines has had an active and successful SWE section since it began in 1978. Starting with just a few students, it has grown to over 360 members and is the 3rd largest section in the nation. In the fall of 2002, the new Society of Women Engineers (SWE) faculty advisor and the Executive Director for the Women in Science, Engineering and Mathematics (WISEM) Program recognized that the organization could be a vital resource in recruiting and retaining female students at CSM. They began working on developing partnerships with decision makers and key personnel in the areas of Academic Affairs, Student Affairs, Admissions, Career Services, Institutional Advancement and the Engineering Division. By doing so, they were able to secure both the institutional commitment and the financial resources needed to provide prospective and enrolled female students with the information, opportunities, and academic and professional development needed for women to feel part of a connected learning environment.

Because of efforts like this, combined with other institutional recruitment and retention strategies, female undergraduate students at CSM continue to persist and graduate at a higher rate than their male counterparts, and the number of undergraduate and total female undergraduate students enrolled has been trending upward for more than 10 years.

Introduction

Many factors influence female student enrollment, retention, and graduation rates in science and engineering. One activity that appears to have a positive influence on the retention of these students is being part of campus-based organization. Hartman and Hartman found that 67.7% of the females who “stayed” in engineering were members of discipline-specific engineering organizations compared to 33.3% of those who “left.”¹ Seymour and Hewitt discovered that women who belonged to women’s societies found

them helpful in finding mentors, building professional networks and preparing for transition into work or graduate school. Their research also concluded that women in engineering were commonly more aware of the existence of SWE than they were of any other women's programs offered on the campuses they studied.²

While not the primary reason, Colorado School of Mines has found that SWE is one of the contributing factors in the success of attracting and retaining women to the institution. Undergraduate female enrollment percentages have been above the national average for over 15 years. In the fall of 2006, women comprised 21.97% of the undergraduate student population, which was higher than the national average of 17.42%.³ CSM also ranked 57th out of 331 engineering colleges in the United States in reference to undergraduate female enrollment percentages.⁴ While these gains may be modest, they have played a role in making the SWE section at CSM the largest professional organization on campus and the 3rd largest in the nation.

In order to fully utilize the SWE section as an important recruitment and retention tool, it was important to secure institutional commitment from key decision makers on campus. The process, examples, and data supplied in this paper will hopefully provide a model for other SWE sections to consider when developing strategies for obtaining more broad-based support on their campuses.

SWE Previous Structure Overview

The Colorado School of Mines SWE student section was founded in 1978. Since that time, it has increased its membership from six (6) to over 364 at the end of 2007 fall semester. The first SWE advisors were volunteers from the Career Center staff and the Mathematics Department faculty. In 1991, the Career Center Assistant Director became the SWE advisor. This, like many advisory positions, was in addition to her regular job responsibilities, and she did not receive any additional compensation. As the membership and program offerings of SWE grew, so did the time commitment. While this was not an issue in the beginning, by 2001 SWE had grown to over 250 members making the management of the section a considerable responsibility.

Having the Career Center Assistant Director serve as the SWE advisor was beneficial to both the members and the Career Center. The advisor used her corporate connections to schedule speakers, secure funding, and offer networking opportunities for the members. In this role, she could provide businesses with the opportunity to recruit female students at special SWE events such as *Evening With Industry* and *Networking Reception*, as well as enable them to gain name recognition among the members through sponsorships and financial support.

Since the Career Center reports to the Vice President for Student Affairs, the principal institutional commitment for the section was provided through his office. In fact, due to his support of the organization he was (and still is) deemed by the members as the SWE Mascot. This support base began to extend outside of the Student Affairs area when SWE began partnering with the WISEM Program, which was established in 1997. With

the WISEM Program reporting to the Vice President for Academic Affairs, the process of increasing institutional support began (see Figure 1).

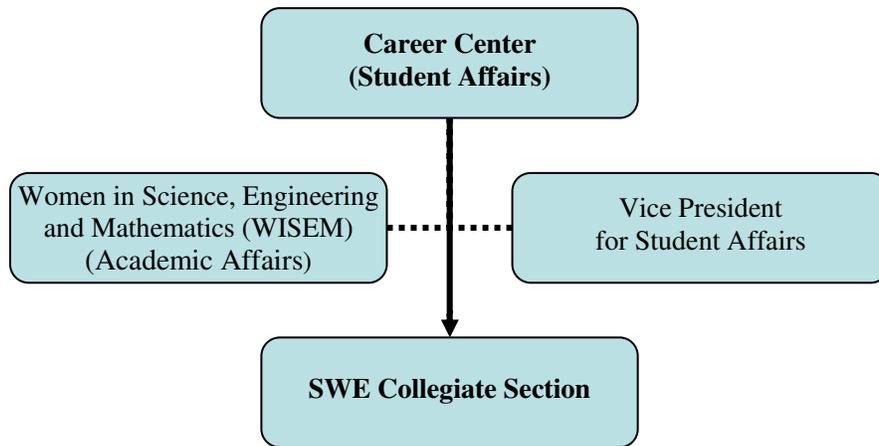


Figure 1
Previous Colorado School of Mines SWE Reporting and Funding Structure Chart

Strategies for Change

An opportunity to change the SWE student section’s reporting, funding, and leadership structure occurred in 2001 when the advisor announced she was retiring. When discussing possible replacements, one change she recommended was that the next SWE advisor be compensated for her time. Since the WISEM executive director had experience with negotiating and managing resources in an academic environment, the two of them decided to work on a strategy regarding compensation that would be beneficial to both the institution and to the new SWE advisor. They also understood that in order to secure broader institutional support for the SWE, it was imperative that key decision makers from both academic affairs and student affairs be part of the process.

In the Harvard Business Essential series *Managing Change and Transition*, seven steps are recommended to consider when managing a change or transition. They are:

1. Mobilize energy and commitment through joint identification of problems and their solutions.
2. Developed a shared vision of how to organize and manage for competitiveness.
3. Identify leadership.
4. Focus on results, not activities.
5. Start change at the periphery, then let it spread to other units without pushing it from the top.
6. Institutionalize success through formal policies, systems, and structures.
7. Monitor and adjust strategies in response to problems in the change process.⁵

Meeting Participants and Agenda

Using the steps listed above as a guideline, in December of 2001, the WISEM executive director convened a group to discuss appointing a new SWE advisor and to talk about the role of SWE on campus. This group included the following people:

- Vice President for Academic Affairs
- Vice President for Student Affairs
- Career Center Assistant Director and current SWE Faculty Advisor
- Director of the Engineering Division
- Engineering Division Lecturer
- Senior Female Professor
- WISEM Executive Director

The goals of the meeting were to acknowledge the success of SWE under the leadership of the retiring SWE advisor, to discuss the selection of and compensation for the next SWE advisor, and to talk about the role SWE plays in the recruitment and retention of women at CSM. Prior to the meeting, the participants did some work to prepare for these discussion points, particularly in the area of compensation.

Since this was the first time for the group to meet, and since change was involved, the WISEM executive director emphasized that they should not focus on making a decision at this meeting. If they did, that was fine, but the emphasis should be on discussion and problem-solving. This allowed the conversation to be less territorial and more collegial.

Location and Seating Arrangements

The meeting was held in a conference room in a neutral location in the career center. By having a neutral location, the participants were free from their normal distractions and less likely to protect their “turf.”

In order to create a more conversational and cooperative atmosphere, the primary decision makers, the Vice President for Academic Affairs, the Vice President for Student Affairs, and the Director of the Engineering Division, were seated across from or next to one another.⁶ The WISEM executive director served as the facilitator, taking the seat at the head of the table.

Issues to be Resolved

There were three primary issues that needed to be addressed:

- Change in organizational and reporting structure. The retiring SWE advisor reported to an administrative department in the Student Affairs area. The recommended SWE advisor reports to an academic division in the Academic Affairs areas.
- Unpaid appointment. The recommended SWE advisor indicated that she would not accept the role without compensation.
- Career Center Function. The retiring SWE advisor had job responsibilities and expertise that benefited the SWE membership. The potential SWE advisor would not have this connection.

Discussion and Outcome

The discussion began with thanking the retiring SWE advisor for her outstanding service. The WISEM executive director then acknowledged that each person at the table had a stake and position to maintain in the outcome of this discussion, but requested that they suspend that stance for now and look at the situation from an institutional perspective.

The retiring SWE advisor reviewed the current structure of SWE, adding that it was unlikely that this model would work in the future. She also indicated that the current SWE advisor responsibilities required a minimum of 20-25 hours a month to perform. The key decision makers began discussing how they could provide compensation for the new SWE advisor. By the end of the meeting, it was decided that the SWE advisor would receive a stipend and release time for her appointment. The Vice Presidents agreed to split the cost and the Director of the Engineering Division said she would provide the release time. The end result provided the new SWE advisor with a course release of one class per academic year and an extra month of salary. It also created a new reporting and funding structure for SWE and the SWE Advisor (see Figure 2).

The change in the reporting structure did not become a territorial issue because the key decision makers took on the responsibility of sharing the funding and resources needed to secure the new SWE advisor. By increasing the scope of institutional commitment, as well as partnering across areas of responsibility, each entity had the opportunity to benefit from its association with SWE student section.⁷

In addition, the WISEM executive director agreed to serve in an advisory capacity to both the SWE advisor and to the SWE membership. This included such things as co-sponsoring events, providing funding, and serving in the absence of the SWE advisor. In 2003, the institution made the commitment to establish the WISEM House. The WISEM House is also the home of SWE. WISEM provides office, meeting and storage space for SWE, a SWE computer and printer, and other office-related items. This interconnectedness between WISEM and SWE enables each organization to utilize the resources of the other. For example, WISEM recruits SWE members to serve as team leaders for K-12 outreach programs and SWE uses the expertise of the WISEM executive director to present on business etiquette and negotiation strategies.

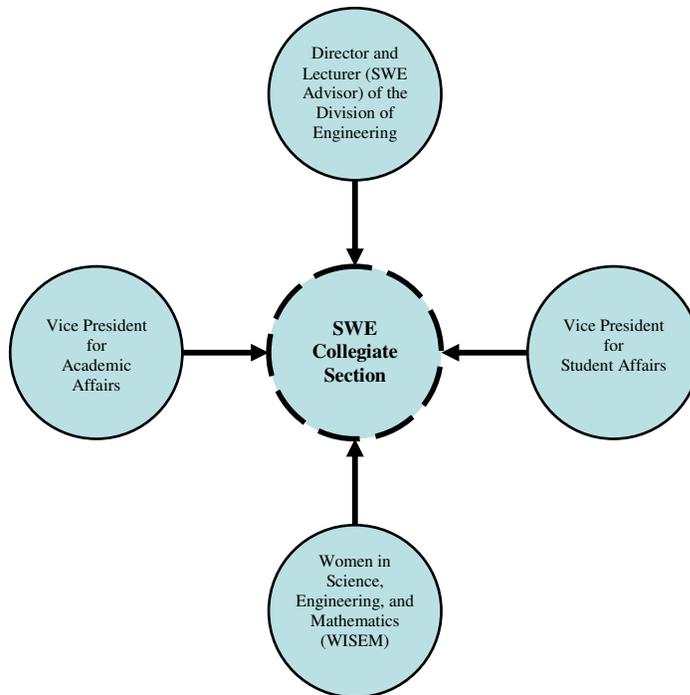


Figure 2
Current Colorado School of Mines SWE Reporting and Funding Chart

With the change in SWE advisors, the Career Center would no longer be as directly involved in the day-to-day management of SWE, but it was important for the organization to stay connected to this office. In the spirit of cooperation, the Career Center Director indicated that he wanted to continue to work with SWE, particularly in relationship to their special events and corporate fundraising opportunities. This allowed the SWE officers to gain experience working with the Career Center staff and the participating businesses.

Expanded Institutional Commitment

Since 2001, the role of SWE as a recruitment and retention tool has expanded across the campus. While there are many SWE supporters on campus, the offices and areas of responsibilities listed in Figure 3 are the current contributors of institutional resources allocated to the section by way of funding, marketing, professional development opportunities, and space.

This interconnectedness between SWE and various campus units has created a stable infrastructure for the section. It is no longer dependent on just one area for institutional support. Additionally, SWE is involved in a number of cooperative efforts across campus that positively influence the recruitment and retention of women at CSM. Listed below are a few examples of some of these activities:

- Academic Departments/Divisions frequently request to speak at SWE’s weekly lunch meeting (150+ attend each week) to talk about their majors and research.
- The Undergraduate Admissions Office reimburses the cost and sends the annual SWE Newsletter to prospective female students to illustrate that there is a strong community of women at CSM.
- The Institutional Advancement Office staff attends the annual *Evening With Industry* event to strengthen relationships with the businesses, as well as encourages them to fund the section.
- The Chemistry Department provides SWE with space and a lecture hall for their weekly lunch meetings.

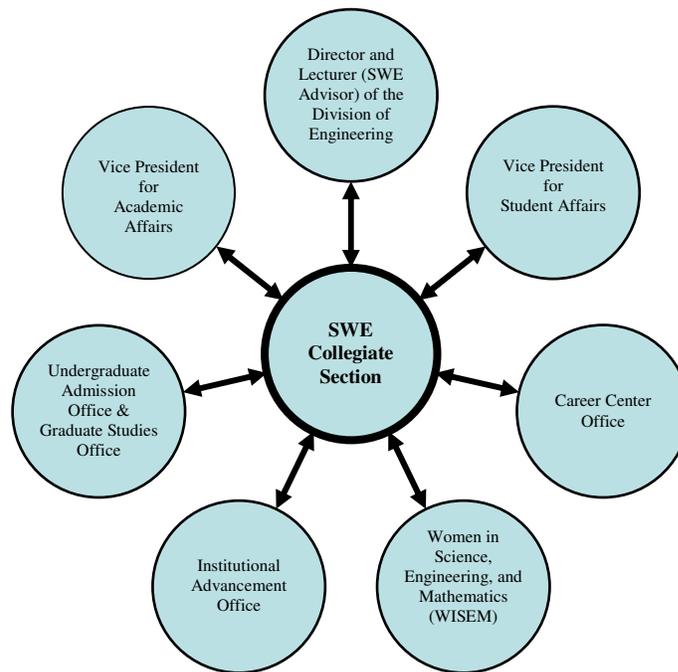


Figure 3
Colorado School of Mines Institutional Commitment Chart

Enrollment and Retention Data

One of the byproducts of a successful SWE section is the effect it can have on female student enrollment and retention. Data was collected from CSM Registrar’s Office reports and the national SWE organization to see if there was any correlation between these factors. Chart 1 shows how female student undergraduate and total enrollments have steadily increased from 1992 to 2007. Undergraduate female students increased from 445 in 1992 to 719 in 2007 and total female enrollment increased from 620 to 947 during the same time period.

Female graduate student enrollment, however, does not reflect this trend (see Chart 1). It may be useful to explore the development of a graduate student section of SWE in the future to see if this type of campus community building promotes female graduate student recruitment and retention.

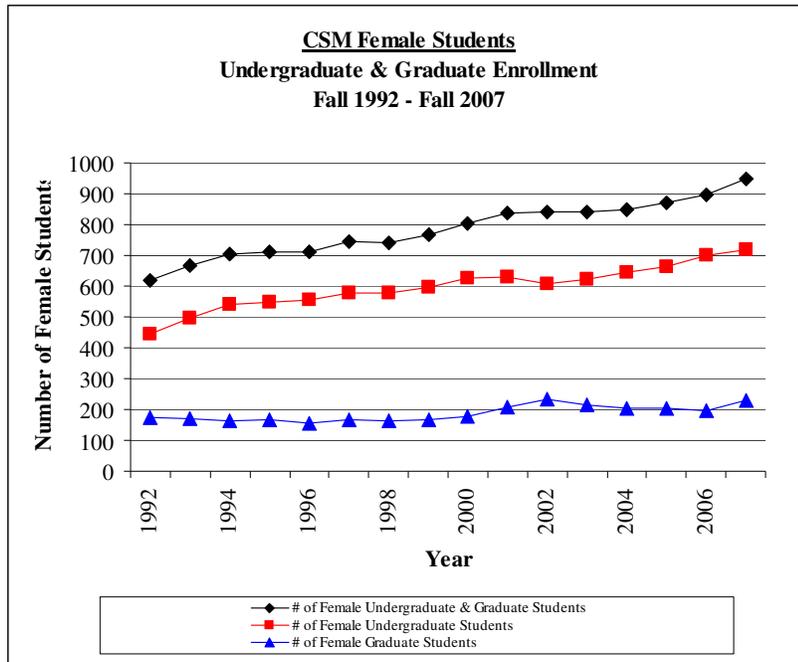


Chart 1
Undergraduate, Graduate, and Total Enrollment
 Source: Colorado School of Mines Registrar Enrollment Report

The most recent retention data for female and male undergraduate students at CSM also shows that women continue to persist at a higher rate than their male counterparts (see Chart 2). Retention rates for this analysis involved using freshmen cohorts and measuring the percentage returning each year. Looking at the most recent sophomore to junior retention rates, females students continue on at a rate of 75% compared to men at 70%.

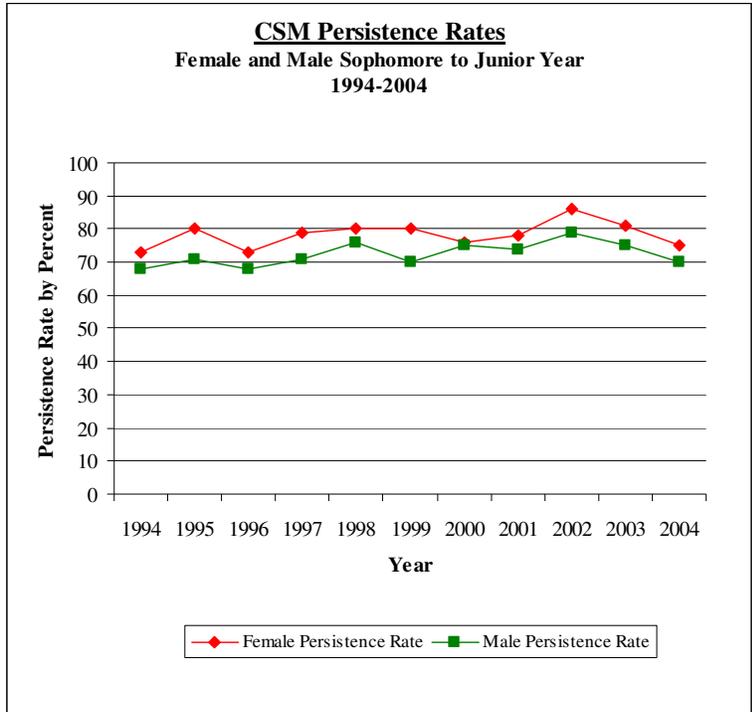


Chart 2
Undergraduate Persistence Rates
 Source: Colorado School of Mines Registrar Retention and Graduation Report

Consequently, female undergraduate students graduate at a higher rate. The most recent six year graduation data for students graduating in 2000 show women completing their degrees at a rate of 72% compared to men at 67% (see Chart 3).

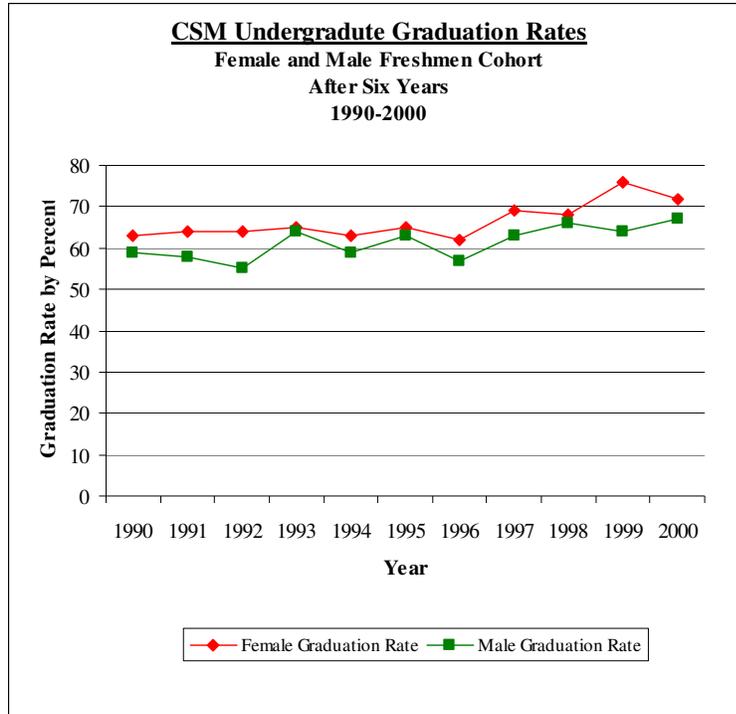


Chart 3
Undergraduate Graduation Rates
 Source: Colorado School of Mines Registrar Retention and Graduation Report

Another interesting piece of data involves the percentage of female undergraduate students in relationship to SWE membership. You will notice that the SWE membership declined at the beginning of the new SWE advisor’s appointment in 2002-2004. While the reasons are not clear why this happened, it is interesting to note that according to the *Commission on Professionals in Science and Engineering*, the percentage of undergraduate engineering female students started to decline in 2002. This, combined with the appointment of a new advisor could have contributed to membership decline. But after a couple of years, the numbers and percentages of undergraduate female students who are also SWE members have risen to an all time high.

Year	# Female UG Students	# SWE Members	Percent UG Female Student SWE Members
1993	496	122	24.60%
1994	542	141	26.01%
1995	547	143	26.14%
1996	557	195	35.01%
1997	578	200	34.60%
1998	577	207	35.88%
1999	598	193	32.27%
2000	625	231	36.96%

2001	631	252	39.94%
2002	606	249	41.09%
2003	623	213	34.19%
2004	645	205	31.78%
2005	664	281	42.32%
2006	701	314	44.79%
2007	719	364	50.63%

Table 2
Undergraduate Enrollment and SWE Member Percentages

Source: Colorado School of Mines Registrar Enrollment Report
National Society of Women Engineers

Conclusion

The strategy to broaden the base of institutional support and commitment has been a win-win for all parties involved. The SWE section has been able to secure support from both the college and corporations which allows the organization to provide a “community” for women on campus, as well offer professional and personal development opportunities to its members. The institution also sent a message that the SWE advisor is an important position on campus, and reinforced this by committing funds and release time from Academic Affairs, Student Affairs, and the Engineering Division. The relationships between offices like WISEM, Admissions, and the Career Center also provides a support system for the section.

By the institution committing its time and resources to the success of the SWE, it in turn created an environment which the data have shown attracts and retains female students at Colorado School of Mines. While there is still much work to do to increase the percentage of women attending Colorado School of Mines and other engineering colleges, making programs like SWE and WISEM a vital part of the institution’s culture is a positive step in promoting this change.

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