Student chapters by analogy: Lessons from comparing ASEE student organizations with those of other professional societies

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I. Introduction

Numerous recent developments in engineering education speak to the increasing importance of the scholarship of teaching and learning for current and future engineering educators. Some of these projects identify curricula and learning activities that will be most relevant for future engineering students and practitioners, while others apply lessons from current research in the learning sciences. Some, of course, do both. The most notable efforts include the National Academy of Engineering's "Engineer of 2020" project (National Academy of Engineering, 2004; 2005), the ASEE Year of Dialog (Barr, 2006), and the creation of graduate programs in engineering education at Purdue University and Virginia Tech (Grosse 2006).

As more faculty members and researchers root some or even all of their disciplinary identity in the field of engineering education, ASEE's role may take on a more similar character to other engineering professional societies such as the American Nuclear Society (ANS), the American Society of Mechanical Engineers (ASME), the American Institute of Chemical Engineers (AIChE), the Biomedical Engineering Society (BMES), the Institute of Electrical and Electronics Engineers (IEEE), the Society of Women Engineers (SWE), etc. Among many other strategies for fostering scholarship, outreach, recruitment, and professional development in their disciplines, these societies share a commitment to supporting student chapters based at individual colleges and universities. ASEE shares this commitment, as shown by the recent creation of the Student Constituent Committee (Tatu, 2008) to support increased student involvement. As a group with a greater focus on academic study than the other professional organizations listed, ASEE student chapters share many characteristics with other student organizations but also face unique challenges, including a membership composed primarily of graduate students and a lack of obvious industrial partners.

In this paper we discuss some of the lessons that ASEE student chapters can learn from the successful operation of student chapters of other professional societies and campus organizations. To do so we draw mainly on our own experiences as active members of the University of Wisconsin-Madison ASEE student chapter as well as other student organizations. While being reflective rather than rigorous in nature, we believe that this paper can provide guidance to other student chapters and add to the existing body of ASEE conference literature regarding them (e.g. Mullenax & Dee, 2001; Mullenax 2006). It has also proven to be a useful exercise in plotting the future course of our own chapter. Unless specified otherwise, all descriptions of societies and activities are based on the student chapters of those societies at the University of Wisconsin-Madison.

II. Roles of student chapters in other societies

Student chapters of professional societies perform three major functions: professional development for their members, outreach to younger students and the general public, and building a student community. These functions serve as recruitment tools for the chapters and benefits for their members. They also provide shared experiences, which in turn encourage group cohesiveness. We briefly discuss these aspects of student chapters here to provide a context for our later comparisons.

Professional development activities allow students to learn useful skills not covered in their coursework while gaining information about their chosen area of engineering. This latter feature is particularly important to ASEE, since engineering education is rarely promoted as a career opportunity to either graduate or undergraduate students. Other student societies provide information about their disciplines by hosting speakers from industry and academia, organizing tours of research labs and company facilities, and connecting younger students with older mentors.

Many student societies participate in activities aimed at educating members of the broader community, although different societies have different goals. For example, SWE organizes a variety of workshops and hands-on activities aimed at increasing interest in engineering among junior high and high school girls. In contrast, ANS makes numerous presentations to high schools across Wisconsin, but with the primary aim of increasing public acceptance of nuclear energy. ASME's outreach activities are more general and in the past have included a "high school day on campus." Most outreach activities will also build chapter unity, as members who were not fully committed to the importance of the group or cause but choose to participate will tend to subsequently reform their opinions to better reflect their active support (Michener and DeLamater, 1994, pp. 159-161).

Above and beyond their other functions, student societies serve as social and professional communities for their members. They provide a forum for students with similar interests and experiences to meet, and they can make large colleges or departments seem smaller. Community-building occurs through social activities held by the societies as well as through the shared experiences of professional development and outreach activities. It has been the experience of the authors that societies with active social components tend to be more active in other areas as well.

While other student societies can serve as useful comparisons, few primarily cater to graduate-student membership. Hence we also look to other programs at our university. One such organization is the Delta Program, a program of the Center for the Integration of Research, Teaching and Learning (CIRTL). This program aims to provide an interdisciplinary learning community among current and future STEM faculty, with a focus on preparing graduate students for careers in academia by developing their skills as teachers. Many graduate students participate in courses such as "Diversity in the College Classroom," "Instructional Materials Development," and "Teaching with Technology," which are offered for credit. There are also workshops, roundtable dinners, brownbag discussions, and internship opportunities built on the concept of teaching-as-research. Graduate students can participate in as many or as few of these programs

as they would like, and students who complete all of the requirements can obtain a Delta Certificate in Research, Teaching, and Learning.

III. Framework for Organizational Comparisons

As we discussed in the introduction, we are aware of the limitations of our approach in this paper. Nevertheless, we believe that reflecting on the similarities and differences between students sections of ASEE and other engineering professional societies—and the theoretical and practical implications of those similarities and differences—has the potential to be an instructive, general, and useful exercise for student leaders in a variety of existing and would-be ASEE chapters. It has certainly provided practical suggestions for helping our own chapter to grow. In this section, we present an outline for evaluating professional society student section "practices" for adoption by ASEE student groups. By "practices" we mean not just concrete activities but also motivations, goals, organizing principles, etc. We believe this rubric represents a reasonably systematic and generative approach to informed decision making when determining which practices might translate well to the ASEE context.

Group homogeneity

One of the greatest differences between our ASEE student chapter and those of other societies is the greater homogeneity of both member goals and backgrounds in traditional professional societies. For instance, even though ASME serves an engineering field that is extremely diverse in methodology and area of application, leaders of ASME student sections still serve a fairly unified population: primarily students who want to become practicing mechanical engineers.

ASEE student sections will not generally be characterized by such cohesiveness. For one thing, members are drawn in part from various engineering departments. In addition, ASEE chapters include several membership blocs. Engineering students may join ASEE looking to develop their teaching skills for use in future employment in academia or for more immediate application in courses they TA. Other members are more interested in applying the theory and practices of the learning sciences to engineering education. This latter group may come from inside or outside of traditional engineering disciplines and may or may not have any technical background in engineering. For instance, our section includes several active members who are graduate students in the School of Education's Departments of Educational Psychology and Educational Leadership and Policy Analysis. These members may be more interested in learning and employing skills more closely related to research than to teaching. Of course, the value that each subset of the group can offer the other is exciting and significant, but this diversity naturally presents some challenges for those trying to implement a coherent vision for the section.

Questions for the leaders of an ASEE student chapter to ask themselves and their members regarding their potentially diverse interests might include the following:

- From which disciplines and departments do we draw our members?
- How do the professional development goals of our members differ? How are they similar? How do these goals map onto our section's slate of activities?

Student status

As we mentioned earlier, one of the key differences between an ASEE student section and its analogs in other societies is the former's much greater likelihood of being composed of mostly

graduate students. Our experience suggests that this distinction is a key determinant in a lot of chapter decision making. For instance, the amount of time members have available for the group, when during the week that time falls, and members' level of involvement in other student organizations are just a few of the variables one might reasonably expect to correlate strongly with graduate/undergraduate status.

The answers to the following questions will obviously vary with campus climate. Indeed, the differences in graduate student involvement in student organizations between the undergraduate institutions of the authors are pronounced. Still these questions may be helpful to consider:

- What different professional and social reasons do undergraduate and graduate students have for joining our chapter?
- How might issues of scheduling, family life, professional priorities, research activities, etc. affect our members' motivation and ability to be active in the organization? How might the definition of active membership change in the context of a graduate student majority?

Institutional infrastructure

Most professional societies serve the entirety of the student body in a particular department (e.g., ASME and our Department of Mechanical Engineering) or at least a well defined subset of a department's students (e.g., ANS and our Department of Engineering Physics). The situations of ASEE sections, however, are closer to that of SWE, where potential members come from several departments. We discussed some issues of group homogeneity above, but the lack of a home department also raises more practical organizational problems. For instance, most student chapters get some portion of their funding from a home department; many also recruit potential members at department events and classes. Advisors and other mentors are also easier to identify in a home department. Questions to consider regarding these challenges of institutional infrastructure include the following:

- What other sources of funding, members, and mentors can we seek out in the absence of a home department?
- What other kinds of natural institutional partners exist at our university, both inside and outside of our College or School of Engineering?

As an illustration of the second question, note that our chapter has been fortunate to find an institutional niche that serves some of the purposes of a department home. The UW-Madison Engineering Learning Center (ELC), with its mission of “foster[ing] effective student-centered teaching and learning within the College of Engineering,” (Engineering Learning Center, 2002) is a logical partner for an ASEE chapter. We use the center’s space for our chapter meetings, its director serves as our faculty advisor, and our chapter and the center collaborate on several activities. For example, the ELC recently secured funding—as part of our College of Engineering’s “COE 2010” program—to publish a teaching and learning newsletter. One of the newsletter’s regular features is a faculty profile. The editor organized a series of monthly brownbags with the profile subjects and invited ASEE student members to attend. She benefited from having additional input during her interviews with the subjects, and our chapter benefited from participating in a regular activity that we didn’t have to organize.

IV. Application and Examples

In this section we explore how some of the questions and issues identified above have influenced the self-evaluation of our chapter's practices. The two major challenges we face in planning the future of our group—recruitment and retention of new members and the selection of appropriate chapter activities and goals—are discussed below.

Recruitment and retention of new members

We recognize that any student section needs a sizeable and stable core of active members in order to function effectively. Since our attendance at a typical meeting fluctuates between four and twelve, we know that much of our effort to improve the section should be devoted to first stabilizing and then growing our membership.

One way in which other student organizations generate and maintain this core membership is by continually recruiting new members and encouraging current members to attend activities, primarily through extensive advertising . For example, ANS, ASME, and SWE advertise nearly every event in multiple ways, including verbal announcements at general meetings, email notices to the membership, paper newsletters, activity listings in the weekly and daily College of Engineering email newsletters, and (for larger events) paper fliers posted around the engineering campus. This frequent advertising serves two purposes. First, of course, it informs students of events in which they can participate. Second, over time it creates a positive impression of the organization as an active and stable group, possibly worthy of investing the time to join. Our ASEE section can certainly benefit from increasing our event advertising.

Some of our advertising should be targeted to audiences we expect will be receptive. That targeting is important because, as noted above, our situation is similar to SWE's in that we do not primarily serve students from a single department. However, SWE's ability to identify potential members seems (at least on a superficial level) to be somewhat easier than our own, since their core constituency is women in engineering majors. We look, then, to some natural institutional partners to help us identify potential new members. In particular, we've established a relationship with our College of Engineering's biannual teacher training activities: the New Educators' Orientation (NEO) and Teaching Improvement Program (TIP). All new teachers in the college (teaching assistants as well as incoming faculty and lecturers) participate in NEO, and returning TAs are required to attend TIP in each subsequent semester. As part of the TIP/NEO registration process, participants indicate whether they're interested in receiving information about ASEE activities. Last semester, we received twenty-six names. It seems likely that our typically strong attendance at meetings early in the semester is due in part to this simple recruitment strategy. For future recruiting efforts, we expect that using courses offered by the Delta Program to advertise our group to engineering grad students who have already expressed interest in teaching and learning activities would offer us another opportunity to focus on a target audience.

We also look to other potentially useful models for help with the issue of retention. One such model is the Delta Program. As in SWE and ASEE, the students participating in the Delta Program come from a variety of STEM disciplines. Additionally, most non-faculty participants are graduate students. In order to target these students, participation in the Delta Program is billed as professional development for future faculty members. At an average rate of about thirty per year, the Delta program successfully recruits the kinds of people our ASEE chapter is

interested in: graduate students interested in engineering education. These engineering students represent 18% of the total graduate student participation in the program. The main lesson we take from their work is a deliberate emphasis on the value of the group's activities as professional development experiences. Graduate students participating in Delta Program activities realize that they're developing teaching skills that get little or no attention in their disciplinary curricula. In particular, we note that individual Delta activities add value to a participant's CV. Whereas the CV entry "Member of ASEE student chapter" may be read as vague or filler, the entry "Completed Delta Program internship implementing Web-based practice problems with feedback" is both unambiguous and of obvious value. Thus, we hope to incorporate more opportunities for education research projects and other similarly "demonstrable" activities, such as recording and analyzing feedback from our outreach to elementary school students, or other discrete projects. This adjustment has the potential to improve recruitment and retention because it emphasizes the direct benefits of chapter participation, namely, the opportunity to gain critical skills in engineering education practice.

Choosing appropriate activities and chapter goals

We briefly discussed some issues related to choosing appropriate chapter activities in the previous section, since the act of choosing them has serious implications for recruitment and retention. But there are plenty of other lessons to be learned from other student organizations that have to do with not only choosing activities but also setting appropriate and productive goals for the chapter.

For instance, because their membership includes many graduate students, we looked to our ANS chapter for guidance about how to tailor activities and priorities to that population. To some degree, ANS avoids the problems of a mixed undergraduate/graduate student membership by ignoring them. Instead of trying to be a different organization for each different segment of its membership, they instead hold events of at least some interest to both groups and do not worry about the people who do not attend such events. The level of interest in social activities is generally independent of student status. The same cannot be said of professional development activities, but those span a wide enough range that most members find something useful. For example, the nuclear power industry primarily hires engineers with bachelor's degrees, so speakers from that industry tend to be more popular with undergraduates. Graduate students, however, may still find it useful to learn more about the industry their research supports. In contrast, Department of Energy labs hire primarily engineers with advanced degrees, so speakers from and tours of these labs are more likely to be popular with graduate students.

What lessons can an ASEE student chapter learn from the success of a society with a mixed population like ANS? First, that the relative homogeneity of other student chapters' membership is not simply a consequence of those chapters serving a single academic department, but is at least partially due to self-selection of members who are interested in the activities of the chapter. It may be that the wide range of academic areas, interests, and career goals of our ASEE members is due in part to our lack of well-established and regularly-occurring activities which encourage those with matching goals to join and which discourage others.

We also note that professional societies often rely on industry partners for funding, workshops, site tours, and internship opportunities. Since societies such as ANS and ASME are rooted in a

specific discipline, it is not difficult to make connections with industry because the members of these groups comprise their potential future workforce. And while many industry partners are interested in funding SWE chapters as part of an effort to increase female representation in the engineering workforce, it's not clear whether those same businesses would be as enthusiastic about contributing resources to an engineering education group. However, our ASEE chapter should not discount the possibility of connections to traditional industries simply because we lack a direct association with them. Many corporations have identified the importance of engineering education in the development and training of their future employees, as evidenced by events such as the Conference for Industry and Education Collaboration (CIEC), which is organized and sponsored by various divisions of ASEE. Additionally, industry partners can be incorporated in events advertising the benefits of having advanced degrees in industry. Finally, it is worthwhile to think about non-traditional industry partners who might be interested in supporting engineering education, such as textbook publishers and testing/assessment agencies.

Finally, as discussed above, professional development activities serve both as one of the major functions of student societies and as a way of drawing in and retaining graduate students with busy schedules. We believe ASEE can serve several professional-development-related roles, such as being a conduit for information about finding a job and working in academia. This information can be more difficult to find for engineering graduate students than for other majors, since many engineers leave to work in national labs or the commercial sector. In conjunction with the Engineering Learning Center, our section has participated in numerous interviews with faculty members from UW-Madison over the 2007-2008 school year, mostly regarding their teaching but also about faculty life at a large research institution. Our members have also expressed interest in learning about faculty life at non-research schools. In the past we have also had several talks describe the job search process, which were well attended.

V. Conclusions and Recommendations

Our analysis represents the opinions and conclusions of a group of students in the ASEE student chapter at the University of Wisconsin-Madison. We recognize that the needs and goals of student chapters will vary with their institutional setting as well as with the interests of the individual members. Nevertheless, looking to other student organizations at our own university has proved to be a useful exercise in identifying ways in which we can improve our own group. For example, we will focus on professional development activities that provide direct and obvious benefits: either small projects that can improve a student's CV, or events that disseminate information about faculty careers. We will also seek to advertise these events more actively to both our members and the graduate student population. Seeking inspiration and guidance—from other student societies, from institutional programs, or from other ASEE student chapters—will be an ongoing process as we seek to improve our student chapter. Finally, we hope that our account of this exercise and the process we followed will reach and benefit other chapters seeking such guidance.

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