American Chemical Society Student Affiliates Chapters: More Than Just Chemistry Clubs

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Chemistry educators examine and implement various techniques to advance learning objectives and to equip students with the skills required of chemical science professionals *(1–5)*. Student-oriented and student-run science organizations, such as an American Chemical Society Student Affiliates (SA) chapter, are an additional experiential, educational platform from which to develop a new generation of chemical professionals.

Over 50 years ago, the *Journal* published an article listing the benefits of SA chapters *(6)*, but no recent articles have been published. It is time for an update. And, it is time to encourage chemistry clubs to become affiliated with the American Chemical Society (ACS). The benefits are endless.

Today, the SA program lists over 930 chapters in its database, has over 7500 students enrolled in the program, publishes *In Chemistry* magazine for the affiliates, supports national and regional meeting programming for undergraduates, and publishes a chapter faculty advisor manual *(7)*. Nearly 100 of these chapters have home pages linked to *http://www.chemistry.org* (accessed Jul 2003), the Web portal of the ACS. Chapters are located across the country at four-year and two-year institutions, including predominantly minority institutions and research institutions.

The SA program encourages chapters to plan and participate in a wide range of activities. Through these activities, chapters can:

- Promote intellectual development by actively engaging students in using strategic- and integrative-thinking skills to solve the inevitable problems inherent in projects that are implemented in the real world where uncertainty and change characterize the context.
- Develop entrepreneurial and problem-solving skills by encouraging students to create and implement chapter projects.
- Assist in career development by encouraging networking, teamwork, effective communication, organizational skills, and exploration of career options.
- Develop character by encouraging a strong work ethic, and build self-esteem and self-insight.

In this article we describe how SA chapters can enhance the educational experience of undergraduate chemical science students and assist in developing chemistry professionals who are enthusiastic and committed to being future chemical science leaders.

Student Affiliate Chapter Activities

Community Service

Many chemistry departments are involved in community service and National Chemistry Week activities. However, SA chapters give students the opportunity to plan and implement these activities with guidance from faculty advisors. Students seek opportunities to initiate a project, acquire funding, and solicit assistance from chapter members, thus developing leadership skills.

Through community service, students also have the opportunity to consciously explore and practice professional ethics. As they respond to various societal issues, they experience the role that scientists play in society and see how science shapes society and how society shapes science. Finally, community service can promote cross-cultural awareness and an ability to work effectively within diverse cultures and groups: skills that are critical to successful professionals.

Communication

As many of the community-based projects require the delivery of a formal presentation to an audience that may consist of school-aged children, adults, or chemical professionals, students can improve their communication skills. SA members also gain teaching experience as they explain the techniques and safety procedures required to carry out chemical demonstrations.

Attending and Planning Scientific Meetings

A large number of SA members attend local section activities and meetings, as well as ACS regional and national meetings. By attending these meetings, SA chapters develop partnerships with other SA chapters and other sister societies. Planning or attending scientific meetings gives undergraduates a chance to interact with peers and professionals in the chemical sciences outside of their institution.

Through technical symposia and eminent scientist lectures, students are introduced to professional research talks and career options. Students can participate in résumé reviews, mock interviews, and various career workshops. In addition, undergraduate students who attend scientific meetings are given the opportunity to learn about graduate programs and internship opportunities and to participate in professional interchanges. Some SA chapters also plan meetings-in-miniature in their local area. These meetings normally consist of oral and poster presentations as well as career workshops and are often held in conjunction with ACS regional meetings.

Department and College Service

Some SA chapters have developed tutoring programs while other chapters have cleaned storage areas and coordinated open-house activities for the department and the institution. Chemistry departments have also received benefits as a result of the SA chapters' community outreach. Chapters help to foster relationships with local elementary, middle, and high schools by promoting chemistry and science education. These relationships can increase student recruitment as well as promote student retention.

Speakers, Tours, and Field Trips

By inviting speakers to share their expertise with the SA chapter and other chemical science undergraduates, students are exposed to different topics of interest. SA chapters invite speakers to discuss careers as well as the latest research topics. During tours and field trips, students learn about industrial companies and their chemical processes. These interactions play an important role in the preprofessional development of SA members.

Fundraising and Social Events

Most SA chapters plan fundraisers to support their activities. Chapters can also take advantage of local-section, industry, and university (college) resources or the minigrants offered by the SA program to fund their activities. Not only are the students learning entrepreneurial skills when developing fundraisers, but also they are gaining proposal-writing skills. SA chapters use social functions as a means of networking with peers and professors.

Chapter Business Meetings

SA chapters normally meet at least twice a month to plan activities as well as to evaluate their events. Chapter officers are given the opportunity to develop their leadership skills and to learn to deal with unforeseen circumstances that may have a negative impact on the group if not handled appropriately. The meetings also give the students a chance to interact with their faculty advisor and to receive the latest information from the national SA program. These activities serve as a basis for a chapter award.

Annual Report and Chapter Awards

To keep the SA program office informed of their activities and to maintain their active status with the ACS, each chapter is asked to submit an annual report at the end of the school year. Working together to complete the report encourages the students to work in teams to complete all of the categories. In addition, this process also trains the students to document their work on a regular basis.

Each year SA chapter faculty advisors participate in the annual report review process under the auspices of the ACS Committee on Education. SA chapter awards are a direct result of the review. Three merit designations (Outstanding, Commendable, or Honorable Mention) may be awarded based on the chapters' activities undertaken in a school year. Chapters that do not receive an award are given a Certificate of Achievement.

Impact on Faculty

SA chapters are not only beneficial for undergraduate students, but also for the faculty. SA chapters enhance the professional development of faculty by providing:

- The opportunity to explore innovative instructional techniques if they approach the SA chapter as an educational methodology: faculty can examine and support the student within an active learning environment.
- Projects with students that can advance faculty's interdisciplinary knowledge and extend a professional network of contacts and potential funding sources.
- An opportunity to demonstrate commitment to the service role of faculty as an SA chapter advisor.
- Events that have the potential to be highly visible and widely appreciated, especially by administrators.

Conclusion

The activities of the SA chapter benefit students, faculty, the department, and the institution at large. Chapters give undergraduate students another perspective of the field of chemistry. Chapters allow students to apply their chemistry knowledge in ways that are quite different from the classroom setting. The students may use their chemistry to improve a community, to teach young children that chemistry can be fun, or to use the analytical skills obtained by studying chemistry to solve chapter problems. Students at two-year colleges are introduced to careers and technical areas that may not be addressed in their curriculum. Small institutions may use SA chapters as a means to attract more students to the chemistry department. SA chapters can be useful in encouraging minority students to pursue careers in chemistry.

If you are interested in activating or reactivating your chapter, email *Saprogram@acs.org* for more information.

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Literature Cited

1. Bean, J. C. *Engaging Ideas: The Professor's Guide in Integrating Writing, Critical Thinking, and Active Learning in the Classroom;* Jossey-Bass: San Francisco, CA, 1996; pp 15–36.
2. Bressette, A; Breaton, G. *J. Chem. Educ.* 2001, *78,* 1626–1627.
3. Mabrouk, P. *J. Chem. Educ.* 2001, *78,* 1628–1631.
4. Pickering, M. *J. Chem. Educ.* 1991, *68,* 232–234.
5. Alty, L. T. *J. Chem. Educ.* 1993, *70,* 663–665.
6. O'Donnell, M. L. *J. Chem. Educ.* 1952, *29,* 131.
7. *Student Affiliates Chapter Faculty Advisor Manual;* American Chemical Society's (ACS) Student Affiliates Program; American Chemical Society: Washington, DC, 1999.