



# Chapter 9

## AIChE Student Programs

*By Gordon Ellis*

**B**etween AIChE's 75th Anniversary in 1983 and its 2008 centennial, the student program was characterized by constant change. The student member dues structure, for example, was in ongoing flux; the period began and ended with a no-dues policy, bookending experiments with one-time fees, annual dues, and tiered membership rates. High-profile activities and services were inaugurated, including a student magazine, awards and competitions, a student Web site and expanded programming at national and regional student conferences.

One factor that did not change was the Institute's attention to the problem of student member retention after graduation.

In 1983, AIChE's Council (later the Board of Directors) was concerned about the declining number of students who were continuing national membership after graduation. National student membership was

dipping below 3,000 from highs of more than 7,000 in 1958. By the mid-1980's, only half of senior chemical engineering students (who had always made up the largest segment of student members) were joining as undergraduates, and only 25% of them were transitioning into professional membership after graduation, which was a considerable downturn compared to the 50%–60% transition rate of earlier years.

A 1987 task force, chaired by Thomas F. Edgar, polled student chapter advisors about students' perceptions of the national organization. The results suggested that the Institute's profile and prestige might not be as evident to undergraduates as had once been the case. The national organization made little direct contact with students, and "local" activity at university student chapters seemed more relevant. Also, with industry changes leading to fewer traditional chemical engineering jobs, AIChE's employment services were viewed as not particularly helpful. The task force also recommended more active role of the student chapter advisor — the professor at each school most responsible for acting as an AIChE mentor to students. Young and new advisors in particular needed better orientation and support to effectively represent the Institute to their students.

### **Expansion of Student Activities**

Realizing that the Institute needed a more conspicuous presence in students' lives, AIChE, in 1987, launched a new National Student Program. Student members would be entitled to all the benefits and opportunities (aside from voting rights) of professional members. Council members and other national leaders embarked on a student chapter visitation program, traveling to student chapters and talking to students and advisors about AIChE membership and how to strengthen AIChE's presence and activities on campus. At the same time, national student member dues were instituted as a one-time fee of \$15, covering the undergraduate years. (At the time, AIChE was the only one of the sister engineering societies that had not yet established a membership fee for student members.)

Council had established three general objectives for the new National Student Program:

- Increase the frequency of contact with student members,
- Provide students with a view of AIChE as they would experience it as working professionals, and
- Provide editorial content directed specifically at students.

The large professional member attendance at the Annual meeting presented an excellent opportunity to integrate undergraduates with professionals (including the Institute's leaders) and to get students accustomed to involvement in a national-level AIChE activity.

Undergraduate programming had been part of the Annual meeting for some time, but it was not until 1988 that a formally programmed National Student Conference took place. Hosted that year by University of Maryland, College Park, and attended by 500 students, the conference dominated the weekend leading into the Annual meeting. The first conference contained components that were already standard for the student member, such as an awards brunch, a session for National Student Design Competition winners, and a souvenir tee-shirt. New elements including a reception with Council, technical presentations, and a workshop in which students from successful chapters presented advice to other student chapter leaders.

Another program added that year was the first National Student Paper Competition, featuring the finalists from the ten spring regional student competitions. (Regional reorganization in 2001 reduced the number of student regions to nine.) The Paper Competition — which from 1989 on was underwritten by Omega Chi Epsilon — was scheduled for the Monday of the Annual meeting to allow professionals to attend. A Monday venue was also arranged for the Design Competition winners' session.

The Student Conference continued to grow in scope and popularity. Program additions in subsequent years included: an Undergraduate Student Poster Competition (begun in 1990); career path discussions

(1991); and, beginning in 1992, career skills workshops. These workshops were aided by AIChE's Department of Career Services and the Professional Development Committee, with important contributions from volunteer leaders like William Hencke, who for several years conducted career skills sessions at the Student Conference.

A first student career fair was held at the 1990 Annual meeting in Chicago. Students within eight months of graduation were also eligible to participate in AIChE's employment clearinghouse. The student career fairs were successful for several years, but industry's participation in the undergraduate fairs declined with the changing hiring trends of the 1990's. In 1995, graduate school exhibitors supplemented the decreasing number of industry representatives. By 2002, a career fair was no longer offered at the Student Conference — though the graduate school fair had become well-established, drawing 50 exhibitors per year by 2006.

Cyclical changes in hiring would eventually prompt companies to seek career fair venues with students again, and companies began returning as Student Conference exhibitors in 2006.

### ***ChAPTER One Magazine***

Council's objective to provide editorial content specifically for students was fulfilled by the debut of a flagship publication for the National Student Program. Launched in Fall 1987, *ChAPTER One* was a colorful and lively student-oriented counterpart to *Chemical Engineering Progress (CEP)*. (Student members did not receive *CEP* until 1990.) The 64-page magazine, started as a biannual, was expanded to four issues per year by 1990.

Edited and nurtured across its history by AIChE staff editor Lois Anne DeLong, *ChAPTER One* was written with a students' point of view and concerns in mind. It gave students timely information about the profession, as well as ideas to help students make productive use of their school years. Each issue contained original articles on career and technical topics, student member profiles, promotion of AIChE student activities, advice columns, and offbeat and humorous features.

Popular with students and teachers, it remained a full-length, stand-alone publication through 1993. In 1994, cost-cutting scaled down the publication; the “Footnotes” newsletter replaced the magazine and was distributed eight times per year as a supplement to *CEP* and the *AIChExtra* member newspaper. After a tenth anniversary retrospective issue in 1997, *ChAPTER One* and *Footnotes* were phased out.

### **Student Award Programs**

Prominent student member benefits like *ChAPTER One*, enhanced national and regional activities, and the chapter visitation program were successful in raising the national organization’s profile. National student membership under the one-time dues fee had been growing steadily and markedly — from 3,000 in 1988 to 6,000 in 1996. In subsequent years, however, national student membership continued to decline (in approximate proportion to Institute-wide membership decline), eventually reaching less than 4,000 student members in 2007.

While member recruitment and retention challenges continued, other developments in the student programming arena were often bright.

Student award programs received a great show of support in 1994, when the Donald F. and Mildred Topp Othmer Foundation made a bequest to fund the Sophomore Academic Excellence Award. Presented to the outstanding sophomore chemical engineering student at each school, the prize included a copy of *Perry’s Chemical Engineers’ Handbook*. (Prior to 1990, the award had been a subscription to *AIChE Journal*.) The prize was formally renamed the Donald F. Othmer Sophomore Academic Excellence Award, and the “Perry’s Handbook Award” remained popular, with approximately 50% of student chapters participating in the program each year.

An additional boost was provided by the Othmer Foundation in 1997, when a bequest of \$150K was granted in Othmer’s memory to fund AIChE’s National Scholarship Award. Renamed the Donald F. and Mildred Topp Othmer National Scholarship Award, the program presented fifteen \$1,000 scholarships per year to student members, as

nominated by their chapter advisors. The National Scholarship and the Sophomore Awards had previously been subsidized through the AIChE Foundation and voluntary member contributions.

Eligibility for student awards, competitions and scholarship remained among the most valued student member benefit. Long-established programs — such as the National Student Design Competition (first held in 1931) — remained fixtures of annual activity for some schools. A brand new student member competition, however, ushered in the 21st Century and generated perhaps the most excitement and wide-reaching popularity of any student activity.

### **The Chem-E-Car Competition**

In 1993 and 1994, AIChE and the Partnership for Plastics Progress sponsored a Plastics Recycling Competition, in which students described a process to recycle mixed plastic waste into marketable products. This project inspired AIChE to look for a signature annual competition that might bring favorable public attention to chemical engineering — in the style of the egg drop contests and cement canoe races conducted by engineering students in other disciplines.

In 1998, the Institute challenged undergraduates to devise a novel competition that demonstrate chemical engineering principles to the public. One of the creations was a small chemically-powered car, constructed by student members at Washington State University. This idea won the approval of students and professionals at that year's National Student Conference.

The Student Chapters Committee, with support from H. Scott Fogler, launched a new Student Chapters Competition, involving the creation of model autonomous vehicles (no larger than a shoe box) that were fueled to carry a variable load over a variable distance, powered by a precisely controlled chemical reaction. At the Fall 1999 National Student Conference, the first “Chem-E-Car Competition” took place — with national prizes sponsored by General Mills (Chevron took over

sponsorship in 2008). The Competition soon became a highlight of the Annual meeting and the Institute's activities for students.

Ten competitions were held each year: nine qualifying events at spring regional student conferences and a final contest for the 31 top regional teams at the National Student Conference. A preliminary poster session allowed teams to illustrate the construction, safety factors, and chemical reaction involved in each car's design. Prizes were presented in recognition of excellence in both performance and design.

Student Chapters Committee leaders coordinated the competitions and maintained the rules, which were revised annually to address safe design and operating standards, and to better instruct competition organizers and participants. Charter members of the rules and supervision committee included David Dixon, Robert Ofoli, George Roberts, Skip Rochefort, and Richard Zollars.

This competition gradually captured global recognition. In 2005, an International Chem-E-Car Competition, modeled on AIChE's competition, was held in Glasgow, Scotland in connection with the IChemE-sponsored Seventh World Congress of Chemical Engineering. The AIChE team from University of Tulsa won that competition. By 2008, nearly 100 schools had become involved in annual Car Competition activities.

In early 2006, the Student Chapters Committee and the Board of Directors received reports of inconsistent safety supervision at some Car Competitions. The Board suspended the competition until a plan could be activated to address the problems and prevent possible future mishaps. In addition to ensuring participants' safety and better supervising the competition series, AIChE saw an opportunity to educate students about safe practices. The Board of Directors formed a Chem-E-Car Safety Task Force, led by SACHE member Ron Willey of Northeastern University. It was decided students and advisors attend periodic AIChE-sponsored safety training, submit Job Safety Analysis reports for examination prior to each competition, and received onsite safety inspections. Willey and Dan Crowl of Michigan Tech supervised

the safety network from 2006 to 2008, and were also involved in establishing the safety workshops conducted by SACHE member Randy Freeman. Freeman's Fall 2006 workshop was videotaped and became the preparation module for subsequent Web-based training sessions.

### **Student Outreach Program**

In 2004, new outreach efforts similar to the chapter visitation program of the late 1980's got started. AIChE's Young Professionals Advisory Board — composed of young Institute members who were working to increase involvement by young engineers in local sections — began conducting sessions at the National Student Conference and visited student chapters in their home regions to encourage students to transition to professional membership. Also, a Student Chapter Ambassador program, launched in 2006, saw tenured members and Institute leaders visiting student chapters to discuss the benefits of active membership.

The Institute was by now relying more on the Internet and the AIChE Web site to communicate with and provide benefits to members. Some of these online offerings included publications and resource available to members only. (For student members, this included access to *CEP* online; its print version was no longer mailed to students.) In 2003, AIChE experimented with a two-tiered student member dues system, whereby students paying the higher fee (\$20 vs. \$10) received access to the online publications. The plan was abandoned the following year, and the annual student dues rate of \$15 returned.

Participation at national and regional student conferences expanded — perhaps in part because of the growing popularity of the Chem-E-Car Competition series. By 2005, about 110 of the 155 student chapters were participating at regional and national conferences, and National Student Conference attendance was regularly exceeding 1,000 students.

The AIChE Foundation, which in the 1990's had helped to arrange the Othmer Foundation's support for the National Scholarship and Sophomore Awards, was instrumental in arranging a new scholarship. First presented in 2003, the John J. McKetta Undergraduate Scholarship

awarded \$5,000 to an AIChE student member planning a career in the chemical process industry. The program received initial funding through the Dekker Foundation, which selected McKetta as a namesake for the award. McKetta presented the first scholarship at the 2003 National Student Conference.

Even with the array of new student initiatives and the improved communication between national AIChE and students, transitions from student to professional membership continued to fall, with fewer young members joining the professional member ranks after graduation. Meanwhile, student program costs — particularly those associated with the National Student Conference — were rising, with insufficient subsidy from dues and corporate sponsors. AIChE once again looked for new ways to successfully promote student membership, with hopes to significantly enlarge the undergraduate member base and mentor it toward professional membership. The Board sought to remove any impediment to joining the Institute, including elimination of the \$15 student member dues.

To do this, funds from other sources would be needed to replace the dues income. Launched in September 2007, the Scale-Up student membership initiative offered complimentary national student membership to interested undergraduates. This was made possible by corporate sponsor donations that replaced (and, in fact, improved upon) the income that had been received from student membership dues. BP was the lead “platinum” sponsor for the inaugural year of the initiative, along with the following “gold” sponsors: Air Products and Chemicals, Dow, DuPont, Merck, Praxair, Rohm & Haas, and UOP. The corporate funding covered the cost of student member services; one of the most prominent new benefits being access to the Internet-based Knovel science reference book library.

Under the program, students were required to communicate with national AIChE at least annually to maintain their member profile and reconfirm their undergraduate status. Scale-Up funding allowed AIChE to launch an intensive student member outreach effort — including new national staff devoted to member recruitment and retention. Outreach in

the first year included visits to 90 student chapters, helping to promote membership and establishing a more personal connection between national AIChE and students.

By Spring 2008, national AIChE student membership had grown to over 8,000 — more than double the total in July 2007. The largest membership gains were among freshman and sophomore students, relatively few of whom had traditionally established national AIChE membership. Continued student membership gains were expected to continue beyond 2008, providing the large base of undergraduate members — and potential member professionals — that the Institute had been seeking.

The challenge in the first years of AIChE's second century would be to continue stimulating interest among the Institute's youngest members and to rebuild AIChE into a modern "home" for the new generation of chemical engineers — just as the Institute had served as a professional home to traditional engineers over its first 100 years.