

## Chapter 28

### What do chemical engineers want?

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**T**he needs of chemical engineers are as diverse as the industries in which they work. As with many other professions, chemical engineers working in academia have somewhat different needs than those working in industry. In addition, depending on industrial segments they work, practicing chemical engineers have to adapt to different requirements.

As part of the 2007 AIChE strategic review, a team was established to better understand these needs. Relevant research studies from 2000 to 2008 were reviewed in two parts: a small-scale qualitative phase with a focus group and a larger-scale qualitative phase with in-depth interviews. The findings of this study reported here represent a good snapshot of

chemical engineers' needs, and monitoring of these needs is ongoing to continuously keep abreast with changing needs.

### **Technical Information**

The 2000 study indicated and subsequent studies (2004 and 2008) have reinforced the finding that easily accessible, reliable and up-to-date technical information is the most important need chemical engineering professionals have.

As a measure of fulfilling this need, AIChE revamped its website in 1999 to become more user-friendly and functional, and to enable members to have easy access to Institute services anywhere in the world. Since then, the website has been continuously updated with the mission to make it more useful to members.

In the most recent survey of chemical engineers, nearly 50% of respondents valued easy access to useful technical information as the most important factor for helping do their job better.

The online editions of all of the AIChE journals and magazines are available, together with their print editions. A searchable online content of Chemical Engineering Progress is currently available from 2000, but in a foreseeable future you will have access to all of its content starting from Volume 1. All of the electronic backfiles for the AIChE Journal, Biotechnology Progress, Environmental Progress & Sustainable Energy, and Process Safety Progress, for which John Wiley & Sons provides publishing services, are available from volume 1 to current volumes.

In 2005, AIChE launched its eLibrary, which is an interactive, online collection of titles and databases that AIChE members can log in to and search for information they need at the moment they need it. Advanced functionality enables equations to be run using actual data so that the time spent searching is maximized when it counts. Moreover, the collection is adaptive and has been improved over time to reflect the types of information most sought by chemical engineers.

## Access to Experience and Expertise

AICHE meetings and symposia have long served as a forum in which professionals can meet and share their experiences with colleagues in addressing technological challenges and other job-related issues with one another.

In the most recent survey, 15% of respondents indicated that their primary need is to meet and connect with other chemical engineers working on the same or similar challenges through such vehicles as conferences. Many of them also expressed that the exact form of delivery has not been crystallized in the chemical engineering community.

Some respondents believe that already available third-party offerings such as LinkedIn may be able to satisfy this need. Others are looking for a solution more tailored to chemical engineers including the formation of “a network of experts” or “access to live experts on technical questions.” There were also suggestions that this need could be satisfied with a mechanism by which members “ask the membership technical questions,” while others prefer a more tailored approach of receiving expert input on technical questions by the web or e-mail within 24 hours of submitting a question. A need for a mentoring program to help younger professionals with the technical and nontechnical aspects of their jobs was also expressed.

Not every chemical engineer is looking to connect only for technical reasons. Nearly one third of respondents who indicated a need for increased peer interaction noted that they also would like to receive nontechnical advice from a network of experts about their jobs and building networks for chemical engineers who are on alternate career paths.

AICHE has been working to facilitate more member interaction online using both third-party and AICHE-specific solutions. AICHE maintains a presence on both MySpace and Facebook, and there is an AICHE group on LinkedIn. Additionally, in 2008 AICHE launched an updated Member Center that offers the advanced search and outreach capabilities.

Members can now build a detailed profile on the AIChE website, exchange messages, post documents, and join in discussions. These tools in the Member Center exist solely for chemical engineers to provide them with the opportunity for improved and profitable interaction.

## **Education and Professional Training**

Chemical engineers realize that they need to keep up with ever-changing technology throughout their professional life. More than 10% of surveyed chemical engineers reported a need for ongoing education--training in both technology and soft skills. The range of technical skills training sought carried widely. Some respondents sought refresher courses in fundamentals, while others cited the need to become conversant with fast emerging areas such as environmental/sustainability engineering, biological engineering, and nanotechnology. Others sought training on equipment, simulation, process development, petrochemical processing, and others that are useful to their current job. Many also expressed need for chemical engineers with Professional Engineer (PE) licenses to maintain and advance their technical knowledge and skills to satisfy the conditions of maintaining PE license.

A cross-section of responding chemical engineers indicated a need for training in soft skills related to professional ethics, business analysis, leadership, workforce management, dealing with nonengineering management, responsibilities involved with transition from engineer and project management to general management, and communications. A general Survey respondents also pointed to a need often expressed by engineers of all stripes: training in how to deal with non-engineering management.

AIChE has long provided members with technical continuing education courses, which currently are offered through ASME and continue to be popular with participants. By popular demand, however, AIChE launched a webinar series in 2008 that delivers a mix of technical content and soft-skills training. These one-hour sessions have enabled hundreds of chemical engineers to gain knowledge in technical areas ranging from process safety to nanotechnology and green engineering. Soft skills

sessions offered range from job hunting strategies to career advancement techniques and strategies for young professionals. There has even been a webinar delivered entirely in Spanish for AIChE members residing in Spain and Latin America.

### **Diverse Needs**

The needs and interests of chemical engineering professionals are as diverse as the industries they serve and represent. Career services are another need expressed in the survey such as access to employment and comparative information. AIChE Career Fairs and online job listings have been expanded in recent years to help address this need. In addition, AIChE's biennial employment survey provides an accurate barometer of how the market is pricing the experience of talented professionals.

Among survey respondents a solid number showed interest in outreach and advocacy. Chemical engineers, by dint of their education and training, are certainly in a position to help society address the seemingly conflicting demands of energy, environment, stewardship and responsibility. These same attributes lend themselves to helping address the needs of science educators in bringing classroom science to life in an exciting and stimulating manner. AIChE members are involved in all of these areas from the AIChE Energy Task Force to an increased Washington presence to developing K-12 programs that are both classroom- and web-based. Late in 2008, AIChE also entered into an agreement with Engineers Without Borders to help coordinate student and volunteer efforts with new and ongoing projects that have a direct impact on individual lives.

Another area singled out for mention was improved interaction between academia and industry. In part to facilitate more interactions, AIChE ScaleUp was launched in 2007. This innovative program provides all undergraduate students taking a chemical engineering course with sponsored membership in AIChE and allows companies to develop their talent pipelines for internships and entry-level positions. As a result, chemical engineering professors have more frequent contacts with industry.

Chemical engineers will continue to need a way to connect across distance and time to solve problems and help one another. They will need to collaborate on the major challenges society faces and to share ideas and experiences. In an effort to help AIChE members achieve these needs, the Institute has been offering the most up-to-date information through technical journals and magazines, meetings and sessions, continuing educations, and functional website, among others.