

The Role and Expectations of Industry

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The discussion of industry needs and expectations is complicated by the wide variety of roles technicians play in industry. The wide variety of industrial settings and the broad range of needs in any given industry mean there is no single defined set of duties for chemical technicians. There is not even a single name; they can be called “lab technician,” “process technician,” “lab analyst,” “operator,” “scientist,” “chemist,” and so on.

The status quo

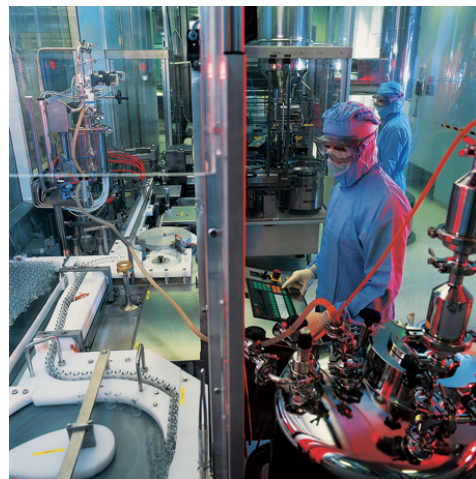
Currently, a person can be hired as a chemical technician by having an associate’s, Bachelor’s, or Master’s degree in some type of science, depending on the company and the position. More routine work is handled by someone with an associate’s degree, while someone with a Master’s degree is prized for specialty work.

Prior industry experience is also highly valued. Technician candidates with hands-on training or an internship experience are favored. In fact, many industries, pharmaceutical manufacturing in particular, favor graduates with Bachelor’s and Master’s degrees, because these graduates are perceived to have broader knowledge, greater flexibility, and more laboratory experience than those with an associate’s degree.

Because technicians are viewed as a commodity, little attention is paid to either their educational background or the nature of their industrial experience. Consequently, a lot of time is spent on training. New technicians are generally trained in-house; if training is performed off-site, it is followed by specialized in-house training.

The next wave

The only constant in industry is change. While 30 years ago, technicians were little more than a pair of hands, today’s technicians must be nimble, independent, and pick up new tasks quickly. In small companies, which hire the majority of chemical professionals, limited staff size requires everyone to cover more duties. Technicians need to be able to troubleshoot system issues, present data and results, and work in both the laboratory and pilot plant as needed.



Pharmaceutical filling unit at Novartis' production plant in Switzerland
<http://www.novartis.com/photos/production1/index.shtml>



Pharmaceutical active ingredient production at Novartis' production plant in Switzerland.
<http://www.novartis.com/photos/production1/index.shtml>

Rapid change in industry means less time to train new technicians and upgrade the skills of incumbent technicians. Increasingly, employers are looking for technicians with a solid foundation in basic science and a broad range of higher-order skills. Higher-order skills, such as work ethics, communication skills, and problem-solving, are the skills possessed by all good employees, but not often developed in training programs.

Moreover, experienced technicians often need to be retrained when they begin a new position, to encourage them to adjust to the protocols of the new situation. Technicians who can make such transitions without extra training are highly valued.

In short, the technical profession needs to move from commodity to specialty.

What industry needs from the rest of the enterprise

Industry needs technicians to have broad science and safety knowledge, plus the higher-order skills, like flexibility, teamwork, and problem-solving. Because less time and money are available for training, higher-order skills will need to be obtained from academia or professional societies.

Industry needs technicians who can fill a variety of niches as needed. Educational and training programs need to emphasize broad knowledge and the troubleshooting skills necessary to apply it. Programs need to be readily available to technicians as well as chemical technology students, so that incumbent technicians can continue their education as needed.



Pharmaceutical production and quality control at Novartis' production plant in Switzerland

www.novartis.com/photos/production1/index.shtml

Follow-up activities

- Have businesses work with the local educational programs to incorporate soft skills and other industry needs into the curricula.
 - In exchange, industry can provide financial and experiential resources to the programs and their students, graduates, and faculty
 - Industry experiences can be incorporated into the classroom by having local businesses supply open-ended problems for student to attempt to solve.
 - Local and regional alliances and professional society meetings (such as ACS and BIOCOM) provide great opportunities for industry and academia to interact.
 - Remember that chemical technology programs are not training programs. By requiring students to learn how to learn, they prepare future employees for industrial careers filled with change.
- Have academia incorporate more soft skills into their programs
 - Problem-solving, troubleshooting, safety, and teamwork skills are particularly important.
 - Some chemical technology programs already incorporate soft skills; for example, the Lab Applications Courses (<http://www.ntid.rit.edu/current/departments/lst/>) require students to take on industrial roles to solve problems.