



**SPE 124200**

## **Designing a Successful Training Class: Benefits and Challenges of Knowledge Transfer from Chemists to Engineers**

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### **Abstract**

We are currently entering a crisis point in the petroleum industry. The cost and complexity of acquiring hydrocarbons is increasing while the pool of experienced personnel shrinks. It generally takes years of real world experience to create an expert field engineer capable of handling all the factors involved in getting the goods out of the ground. Mentoring and specific on-the-job training/classes helps bring new engineers up to speed, but often these lessons are limited to how and when to do something, especially in the area of chemical products. Understanding the mechanics of their chemical tools empowers engineers.

Lacking both general experience and knowledge about their chemical tools, field engineers require more support both from their supervisors and from their tech support laboratory. These technology support requests translate into time lost, money spent, and customer dissatisfaction. Laboratories are being overrun by requests that would not have been asked a few years ago. To combat this more actual chemistry is being taught to both our new and older engineers. The goal is to replace experience with knowledge, to give them a deeper understanding of what their chemicals are doing to the formation, to the equipment, and to each other. By understanding the why, they can figure out the how and the when.

The benefits of such training are presented in this paper. These include such things as increased confidence, quicker problem solving, improved customer trust, and more. Suggestions on how to teach chemistry to engineers are included. Presentations, homework and tests must be worded in “Engineerese” rather than “Chemical Mumbo-Jumbo” to maximize transfer of knowledge. The end result of all this is improved response times, improved customer relations, reductions in technology support requests, and assorted other benefits. In other words, it makes the company more money.

### **Introduction**

There is no denying that the petroleum industry is undergoing tremendous upheavals. The technology of oil and gas extraction grows more complex as wells get deeper and hotter or enhanced oil techniques come into play. International and domestic politics are changing who has access to what fields, placing extra fees, taxes, and other limitations on production and usage of hydrocarbons. At the same time we are facing an unprecedented loss of skills and experience as the employment void caused by previous industry downturns bubbles to the surface.

There has been a strong push for companies to set up mentoring programs. (Redshaw, 2007; Arango, 2006; Badruzzaman, 2003; Edwards, 2008; Edwards, 2006) The goals of these programs is to transfer all the knowledge and experience acquired through the years from the old-timers to the new crop of field hands, engineers, and laboratory personal. It is easy to understand why this knowledge transfer is a good thing and in an ideal world there would be the time, resources, and management support for such comprehensive training. While much has been written about why to have these programs little has been said about what exactly should be taught.

By its very nature, training on how to do something is straightforward. How to run a mixer, how to dilute acid to the required strength, how to measure viscosity, etc... These mathematical and mechanical tasks are precisely defined and so are easy to teach to people with engineering degrees.