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While e-learning initiatives abound, traditional methods still form the core of training for maintenance personnel.

Training professionals generally agree that different people learn in different ways, and the most effective training matches the delivery method with the needs of each student. But whatever the method, the best technical training encompasses four key factors: interaction, application, practice, and feedback.

At one time, it was thought that on-the-job training (OJT) offered the best way for people in industry to learn a job and become really proficient through practice under a watchful eye. But many of the veteran workers who were expected to train newcomers either were not very good trainers—or did not want to be. As a result, erroneous “tribal” information frequently was passed down from generation to generation.

When new technologies come into the plant, OJT is often inadequate. Some type of formal training is necessary to ensure that a plant gets the most from its technology investment. For this, companies have developed a blend of instructor-led training to impart essential technical information followed by hands-on workshops designed to help students learn the skills needed to do a job.

A variety of approaches

Still, this combination of personal instruction and hands-on experience may not be the best way to present every subject, appropriate for every circumstance, or the most economical approach. Plant managers and maintenance supervisors are seeking less costly ways to train as many employees as possible, and those of us in the business of training continue to look for alternate solutions to the ever-growing need in industry to upskill a downsized workforce for improved job performance. Of course, the ultimate objective of industrial training must be to enhance performance in the workplace.

With the advances in Internet technology, several training methods have evolved in recent years that offer specific benefits for maintenance personnel. Let’s take a look at what seems to work best with certain topics or for various types of jobs and what employees can expect when they participate in an instructor-led course emphasizing hands-on learning, take self-paced training using a CD, take a course based on process simulation, or get training via the Internet.

Instructor-led training

A maintenance engineer who just completed a 3-day class commented, “I learned more today than I ever imagined. If I had come here for this training three years ago, I could have been doing a better job.” That’s a typical reaction, because instructor-led technical training provides a special learning opportunity that just does not exist elsewhere.

The highly qualified instructors, other experts, and facilities equipped for hands-on training provide a unique environment for learning advanced maintenance procedures and techniques. Students learn what it feels like to tear down and set up control valves, configure field instruments, troubleshoot control loops, etc., while receiving continuous feedback from the instructor. Many classes can be packaged and shipped, allowing the training to take place at a customer’s site or some other convenient location worldwide.

Among the compelling reasons to enroll employees in this type of training are the wealth of application information available, the opportunity to learn and practice essential skills, feedback from experts in the field, and interaction with others doing the same kinds of jobs with other companies.

Of course, the instructors are the heart of this training. They must possess a deep knowledge of their subjects and an ability to connect with classes. It takes an exceptional individual to tailor presentations to the level of the trainees in each class while making certain that all learn and understand the material. Instructors sometimes must win over a reluctant participant or tone down a “know-it-all” student without causing embarrassment. However, persons attending these courses are generally very receptive because they know it is important to their careers back home.

Hands-on workshops

Jobs that require manual dexterity and good hand-eye coordination are generally best learned through experience, including almost all mechanical maintenance and repair jobs. It seems easy enough to find a piece of equipment that is not being used, and let people tear it down and put it back together.

However, once they get it apart, will they know where to look for signs of wear or fatigue? How will they know what to fix on the inside? And will they be able to figure out the tricks involved in getting a complex assembly back together and functioning? Capable mechanics generally can do these things through trial and error, but most manufacturers cannot spare the time for

on-the-job tinkering, and they cannot afford the possibility of an error causing a serious production problem.

Training courses designed to teach the skills needed by maintenance personnel must provide an opportunity for application of the information, practice, and feedback. This requires making available all the components personnel will encounter along with an instructor who can lead them through step-by-step procedures and be there as they practice. This is true whether the components are mechanical, i.e. valves, motors, pumps, etc., or electronic. Training equipment is continually updated with newer models, and the necessary tools, test equipment, and software also must be provided.

eLearning

One of the newest approaches to training is eLearning, using the computer as a means of conveying information to individuals and helping them learn. Among the characteristics of eLearning are speed of delivery; message timeliness, accuracy, and consistency; and overall convenience, because the information can be accessed at any time from nearly any place. Many people can be trained at a relatively low unit cost without sending anyone away to attend a training program.

eLearning can be applied to a variety of general subjects with broad applications as well as specialized technical topics. Thus it can be used for management and supervisor training as well as for operators and technicians. In many cases, trainees can select specific topics from a menu, rather than having to take an entire course. Students can refresh their memories by referring back to the training materials at a later time.

eLearning methods include CD-based or self-paced training, distance learning, simulations, and Internet-based training.

CDs are a very effective medium for teaching individuals how to use software or to learn new versions of software with which they are already familiar. They can be mass-produced inexpensively and are compatible with any computer equipped with a CD-ROM drive. All the tools and resources necessary to learn and use a new technology are provided, enabling trainees to make the most of their training time. Sometimes whole classes can take self-paced training under the guidance of a certified instructor, who answers questions, provides feedback, and helps each student move ahead.

Distance learning involves establishing an interactive learning environment between an instructor in one location and students gathered at a remote site. In some cases, they communicate via simultaneous two-way video and speakerphone hookups. Students and the instructor can see one another and engage in normal classroom activities. Distance learning can be especially beneficial for crews in remote locations, and when employees cannot leave the plant, distance learning is a good alternative to classroom programs.

The use of computers to simulate plant conditions and events is a more promising idea, and computer-based simulations for training on specific processes are available. These tend to be in the area of operator training, where a number of individuals must learn to interact with a process by observing a display and using a keyboard and mouse to respond. Students can be exposed to a wide range of conditions, including emergency situations, to which they must react, and they can practice over and over until they learn how to respond quickly to whatever the process throws at them. Simulations also may be useful for maintenance personnel, especially for troubleshooting, but a hands-on element must be added to enrich the learning experience.

Using the Internet for training may be the most promising advance in the realm of eLearning. Internet-based instruction is not expected to replace currently available training courses, but it will augment those offerings. It can be an instant source of “help” information on a specific process or type of equipment and can be especially useful to refresh individuals following an in-depth course.

The Internet is a perfect medium for transmitting newly developed information quickly to a widespread audience. This could include the latest engineering information, technical advisories, or troubleshooting tips.

The online format also allows more interactivity than other forms of eLearning. A person can communicate with an expert, ask a question, make a comment, or even enter a chat room set up for individuals interested in a specific issue, with the Internet serving as the medium for learning.

Blending the methods

Internet-based training offers many benefits and can be used to complement traditional

instructor-led, hands-on classes, but eLearning will never replace the classroom experience.

One way to blend the best of the Internet with expert hands-on training would be to create core courses of basic subject material and make them available to the widest possible audience via the Internet. This could provide a uniform foundation for individuals who later will pursue higher-level courses in the classroom/workshop environment. **MT**

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