

e-Learning: Using Technology to Effectively and Efficiently Train Rural and Volunteer Departments

By Mark Sprenger

The Internet provides an incredibly efficient and effective vehicle for knowledge-based training through e-learning. Almost all major business, universities and institutions — particularly those without the resources to continue to throw money at problems — are using the Internet to optimize their training and education practices. If implemented appropriately, rural and volunteer fire departments can learn a valuable lesson from the business and academic communities.

Training Challenges

Today's volunteer and rural responders no longer just fight fire. Since the early 1970's, the breadth of service delivery and the degree of complexity associated with the services has grown exponentially. Volunteer and rural responders are responsible for a host of highly technical and demanding rescue and suppression tasks that demand a high degree of knowledge and skill. These services include hazardous materials response, advanced emergency medicine, local disaster management, terrorism intervention, and response to highly technical and varied rescues including: high-angle, confined space and water rescue, wild land suppression and numerous other services. Because of this, the sheer volume of NFPA- and OSHA-mandated training topics has mushroomed in recent years. Without effective and efficient training, emergency responders put themselves and the public at risk.

The fire service has relied predominantly on two methods of training; namely, knowledge (classroom) delivery and skills (hands-on) demonstration in the field. These types of training have well served the volunteer and rural fire service needs in the first several hundred years of its history. However, today's fire service is vastly different from its predecessors and it is time for the all areas of the service to upgrade its training methods to meet the ever-increasing risks and responsibilities inherent to the job.

Traditionally, knowledge training has been delivered through instructor-led, classroom-based training, which has inherent weaknesses because it is difficult to tailor the program to the skills, needs, and schedules of individual volunteers, and it cannot be easily reviewed or assessed by training officers, chiefs, or any other administrative personnel. Furthermore, the classroom training often takes away from the valuable skills (hands-on) training which should be more widely delivered.

Rural/Volunteer Training Challenges

Training requirements are increasing while volunteer recruitment is declining. More than 30 states now require an excess of 200 hours of training for Firefighter 1 certification — no small feat even for a full-time professional. The trend of growing training demands is causing volunteer and rural firefighters to spend an ever-increasing number of nights and weekends training at the station. This is creating pressure on responders who are already

balancing family commitments, varied work schedules and their commitment to the fire service.

The training demands alone are often sufficient enough for responders to rethink their role as a volunteer firefighter. In fact, the National Volunteer Fire Council (NVFC) states the number of volunteer firefighters in the United States has declined 5-10% since 1983. The NVFC attributes this decline to the increase in the time demands associated with being a volunteer, namely “increased emergency calls and increased training hours to comply with training standards.”

Consequently, to recruit and retain volunteers, it is imperative that fire departments start modernizing training programs and supporting delivery methods which will provide the most effective learning environment – in a timely manner – without sacrificing quality or skills-based training time.

Training Metrics

Delivered training must be measured for overall quality, effectiveness, and efficiency. Future training considerations for volunteer and rural fire departments should be measured and evaluated on the following criteria:

Effectiveness: Training must possess a high degree of quality and effectiveness. It must be interesting, engaging and insightful. All firefighter training must result in an improved degree of learning and retention of both skills and knowledge.

Efficiency: Training must be time efficient (for both the trainer and the volunteer) as well as cost efficient. For future training technologies to be successful, each department must evaluate the technology to determine its efficiency in terms of time, money and successful outcome. Areas of consideration include: preparation time and expense, delivery time and expense, firefighter/training officer time, direct and indirect support expenses, etc.

Solution: E-Learning

Through the use of new technologies, namely e-learning, knowledge-based training can be delivered more efficiently and cost effectively to volunteer and rural responders. Just as corporate America has discovered, e-learning is one of the most effective training tools ever developed.

Currently, there are three types of learning technologies being deployed for the fire service:

- *CD-ROM-based learning* - Courseware delivered through a CD-ROM has the benefit of multimedia and interactivity, but is not connected to an outside network and cannot be tracked or updated by a Learning Management System (LMS).
- *Web-based learning* - Most Web-based applications are delivered solely over the Internet, which makes the system easy to update and manage. However, today's

speed of the Internet severely limits the ability to deliver fast paced multimedia and graphical elements. Thus most Web-based applications are essentially static online “textbooks” because they are limited in the use of enhanced graphics, video and audio. Download times for responders in rural areas using dial-up modems and telephone lines can be a very slow and frustrating, resulting in a poor educational experience.

- *Hybrid learning* - Internet connected CD-ROM applications are also called “hybrid applications.” The hybrid applications most often store all of the course content and information on a CD-ROM, also known as a Web-ROM. These Web-ROMs seamlessly connect to the Internet to deliver updated information and student tracking. Web-ROMs have the ability to deliver courses with full motion video, audio, text, high-resolution graphics, and virtual reality scenarios. Even more important is that hybrid applications are not restricted by modem speed. The course experience is the same on a 14.4k connection as it is on a high-speed Internet connection such as a T-1 line. Simply put, hybrid applications run faster and provide a better experience than Web-based training. Hybrid application training combines the best features of CD-ROMs – the benefits of interactive multimedia learning, with the best features of Web-based applications – the ability to offer consistent training materials and firefighter tracking anytime, anywhere regardless of modem speed.

Benefits of e-Learning

Through hybrid e-learning systems, rural and volunteer departments can train responders quicker, better and more cost effectively than through traditional knowledge training methods.

Classroom-independent learning provides savings in personnel total training hours, travel, instructor costs, training materials, and wear and tear on company equipment. It also offers greater convenience to volunteer responders and training officers. Volunteers with already full schedules can benefit from individually set training schedules, location of training, and pace of study. Courses can be taken at home, during lunch hours at work, at computers in the station, or anywhere a computer and Internet connection are available. Additionally, e-learning training technologies offering Learning Management Systems provide instructors, chiefs, and state certifying agencies the ability manage and track each responder’s progress and course certifications via the Internet. More importantly, this can be accomplished at anytime at any location. LMSs also provide documented proof that volunteers have met mandated training guidelines.

Hybrid learning applications using Web-ROM technology creates the following benefits:

- **Increased retention** – Government and other industry studies have proven that student retention rates increase 30-50% through the use of interesting and engaging interactive training. Through the use of full-motion video, audio, graphics, virtual reality scenarios, animation, tests, and games, student learning comes alive and delivers outstanding results.

Several corporate and government training sites found that computer-based training (CBT) had a 25-50 % higher content retention rate over classroom instruction. Since CBT training is interactive, students engage with content, then immediately learn to apply it during hands-on exercises. Periodic quizzes throughout the courseware measure comprehension and retention. Learners can repeat difficult portions until the material is mastered.

- **Reduced knowledge-based training time** – Each student controls the pace of learning throughout each course. Students can repeat any sections not understood, while receiving immediate feedback on any questions or misunderstandings. In addition, they can use the system at their convenience. These benefits ultimately will reduce training time up to 50% in comparison to conventional classroom-based training methods.
- **Documentation** – LMSs provide documented proof that NFPA, OSHA, and state standards have been met. Each student's course records are tracked individually, reflecting training duration and scores. In addition, course managers can track and print responders' performances.
- **Practice through simulation** – Through the use of virtual reality scenarios, instructors have the ability to teach physical skills in an environmentally safe and cost-effective manner. This process speeds skills retention and makes hands-on training more effective and efficient.
- **Reduced hazards/Increased safety** – Topics dealing with dangerous materials and procedures are presented in an interactive format, without subjecting the responder to unnecessary physical risks. Conducting initial training using the interactive, scenario filled, multimedia courseware can substantially reduce safety risks, training accidents, and time lost due to training injury. Responders train in a non-threatening environment that is more conducive to learning before they go into the field to perform their hands-on skills.
- **Decreased training costs** – Training is available on-site 24 hours a day, 7 days a week, resulting in little or no travel costs or overtime expenses as applicable.
- **Eliminates equipment and personnel travel costs** – Training can be performed in house, at any station, simultaneously, limiting training that needs to be performed at the station to skills (hands-on) training only.
- **Reduced equipment costs** – The system simulates equipment that would typically be very expensive for the departments to provide to responders. In addition, utilizing interactive multimedia training conserves costly fuels and firefighting apparatus, thus minimizing environmental impact.
- **Reduced instructor costs** – Instructors can use their time more efficiently to provide additional remediation for slow learners or motivation for more advanced responders. They can also concentrate their efforts on mandated skills training exercises and other required training topics.

- **Turnkey implementation** – Most off-the-shelf products do not require any programming or proprietary software. Simply load the provided Web-ROM or go to the Website and begin training.

Availability of E-Learning

Off-the-shelf systems for today's emergency responders deliver high-quality, NFPA- and OSHA- compliant e-learning. Hybrid applications can access, print and track a firefighter's records through an LMS. Currently, a host of courses are available. Titles include Terrorism, HazMat, Confined Space, Driver Operator and First Aid/First Responder. Using a hybrid application delivery system allows departments to follow NFPA guidelines for hours of mandated training delivery. For example, a HazMat Awareness course is 8-12 hours long depending on the student, while a HazMat Technician course can be 40+ hours in length. Each course engages responders with an array of sight, sound and motion. Video simulations and real-life case studies bring responders into the center of the action. Three-dimensional virtual reality helps responders explore confined spaces and learn to identify hidden dangers. Interactive exercises provide hands-on experience and let responders test their knowledge in a safe environment before performing their hands-on skills training.

Conclusion

It's a matter of safety and survival. Rural and volunteer fire departments need to act accordingly to reverse the trend of rigid training hour requirements in the face of decreasing numbers of volunteers. It is often jokingly said, "To get the job done, the fire service relies on 200 years of tradition unhampered by progress." Whether or not this stereotype accurately depicts the field of rural or volunteer firefighter training, it is an accepted fact that training delivered to rural and volunteer firefighters has been slow to adopt technology and change to meet the needs of today's firefighters. In reality, however, the world in which the firefighter responds is anything BUT slow to change, and the personal risks are daunting. Being properly trained is the first step in mitigating the risks inherent in the job.

Hybrid e-learning systems available today offer an efficient and effective means for departments to keep up with the growing training demands placed on them, which means departments can more effectively recruit and retain needed volunteers.

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