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Distance Education Technology Empowers the Fire Service

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Abstract

Due to increasing demands, professional requirements, emergent technologies and new threats to public safety, fire service professionals have ever-increasing needs for access to higher education. To aid in this quest, the University of North Carolina at Charlotte has initiated distance education classes as a part of the Fire and Safety Engineering Technology program. Distance Education enables the fire science degree-seeking student to access upper level college fire classes in the fire station or in the comfort of their own home. This paper describes the need for such a program, the strategies and technologies involved at UNC Charlotte, and the favorable outcomes that have resulted from the institution of this program.

Distance Education and the Fire Service Professional

On September 11, 2001, the world changed. In no other profession was this impact greater than in the United States Fire Service. In the past century, the fire service has evolved from primarily fighting fires to the title of "homeland defender", responding to a wide variety of emergencies. More than ever, new emerging focus areas continue to necessitate a better-educated fire service. Unfortunately, due to their long work shifts and geographic constraints, opportunities for fire service professionals to further their education in a traditional University setting are sometimes challenging. The Fire Service would greatly benefit by increased opportunities for Distance Education, however such opportunities at this time are limited. According to our own investigations, currently less than eight accredited four-year institutions

offer a degree in Fire Safety Engineering Technology. Of these, only a few institutions offer fire safety engineering classes via the web.

A 2000 survey of metropolitan fire departments by Sturtevant indicates that approximately three-quarters of fire service professionals currently possess some type of 2-year degree, and that less than 25% of the same group has a four-year degree[1]. However, many of these professionals feel the pressure to obtain a four-year degree in order to increase their opportunities for career advancement. For instance, Deputy Chief Hannan of the Charlotte Fire Department has stipulated that a four year degree is mandatory beginning 2005 for advancement to a chief officer[2].

Distance Education at the University of North Carolina

In the spring of 1999, the North Carolina State legislature provided funding for formation of the University of North Carolina at Charlotte Fire Safety Engineering Technology (FSET) program. The intent of the program was to provide an increased opportunity for North Carolina's approximately fifty thousand firefighters to obtain an advanced fire science degree.

As a rule, firefighters do not work a normal 40-hour workweek schedule. A typical "shift" involves 24 hours of continuous duty, then 48 hours off. Additionally, many firefighters hold a second job. The aforementioned schedule is not conducive to traditional college class offerings. To address this problem, The University of North Carolina at Charlotte currently offers all upper level fire classes via their FSET distance education program, in addition to their traditional classroom offerings.

The UNC Charlotte FSET distance education program effectively accommodates the educational needs, scheduling difficulties and geographic constraints of firefighters seeking career advancement. The distance education classes are designed to be one third synchronous (live) and two thirds asynchronous (non-live), and 100% web-based. The live component is achieved via Centra live conferencing software, and the asynchronous component is offered via the WebCT course management system. To date, this combination has achieved positive results according to student feedback and evaluations.

The FSET program is located within the College of Engineering, at the University of North Carolina at Charlotte. The program is presently designed as a "2 plus 2" program, where graduates of a two-year Associate's fire science degree program can continue their education and ultimately obtain a Bachelors of Science degree in Fire Safety Engineering Technology. Due to the success of this program, two full four-year fire administration and industrial safety program proposals have been submitted and are currently being considered for adoption by the university.

Educational Impact to Management of the Modern Fire Service

The emerging fire service leader of tomorrow will need management skills comparable to those of the average CEO. Modern fire service management is not a static event. Diminishing funds, changes in demographics and growing responsibilities have greatly increased demands

upon fire service leaders. Although funding predictions are made based on previous records, calculating necessary funds for the unforeseen is a tricky business.

Administrative concerns such as recruiting diverse and qualified applicants, employee retention and enhancement programs, and many other dynamics of personnel management also present on-going challenges to fire service leadership. Additionally, there are multiple generations currently in the workplace. Old-time management theory based on authoritarian leadership is no longer effective in the modern fire service. In his 2000 text Fire Service Personnel Management, Steven Edwards states: "Today's workforce doesn't look, think, or act like the workforce of the past, nor does it have the same values, experiences, or expectations" (p.19)[3]. He further summarizes by noting that if your fire service personnel management practices are based upon what worked well in the past, and then your organization is in for some serious confrontations.

Long term strategic planning must take place in a proactive fire department. *Proactive futuring*, a term coined by Mark Wallace in his 1998 book, Fire Department Strategic Planning – Creating Future Excellence[4] essentially means that for the fire service, which is relied upon to anticipate accurately and plan accordingly, the future is right now. Today's world does not allow the luxury of learning "by the seat of your pants". Proactive strategies fostered by higher education will allow the emerging fire service leader to deal with a multitude of ever-changing and increasingly challenging problems. Management classes via distance education, with its networking potential and threaded discussions, will connect fire service leaders across the nation and be a valuable tool in the preparation of these future leaders by increasing opportunities to share planning strategies.

Application to Non-degree Seeking Members of the Fire Service

The overall mission of the United States fire service has noticed a gradual shift in recent past decades. Once, the primary mission was to fight fires only. Nationwide, municipal budget constraints gradually forced the inclusion of emergency medical services. In recent years, fire prevention has become a major focus of proactive departments. The terrorist attacks of September 2001 left an indelible mark within the fire service, calling for a complete refocus on how tactical operations will be managed. Fire department responses run the gamut from the routine emergency medical call to an incident of mass destruction. When an incident occurs, the fire department will be first on the scene, and is expected to effectively handle whatever it encounters.

Current education and training has always been paramount to the success of any organization, and this is also true of the fire service. Each emerging responsibility or refocusing of tactical methodology has perpetuated a need for re-training and a presentation of updated educational concepts. Delivery of modern educational concepts is an ever-present challenge to educators, especially to those in the United States Fire Service. Subsequently, the delivery methodology of these educational concepts is a critical element of the modern fire service.

The majority of fire departments utilize the training officer concept. Courses are prepared and traditionally delivered at departmental or regional training centers. Site-specific

delivered training creates many logistical demands upon the fire department, and due to company displacement, can possibly increase incident response times. During training, engine, truck and rescue companies are routinely taken out of service, or expected to respond from their training session. As a result, maintaining adequate staffing while fulfilling the mandatory fire service annual training requirements presents a major challenge to most departments.

Technological Innovations for Distance Education

Modern fire stations are now equipped with (or have the capability for) internet access or some type of a municipal networking capability. WebCT is the web-based Course Management System (CMS) chosen by UNC Charlotte to provide the bulk of the FSET course delivery via the Internet, providing course access directly to firefighters in their stations or their homes.

WebCT provides both student management and content management in a secure environment. This tool offers unlimited opportunity in the delivery of modern educational concepts via the internet, including information delivery, student tracking, quizzing and surveys, email, live chat and threaded discussion forums.

Centra is the live conferencing tool used by the FSET program in order to provide a synchronous virtual classroom experience while maintaining the convenience of individual web access. Centra allows the students to simultaneously view material presented online by the instructor, while interacting with the instructor and other students. Traditional classroom interaction is simulated in that the instructor can control whether the students can speak in class and when. Computer applications, web cameras and whiteboards can also be utilized via the Centra medium, and the class sessions are recordable for later playback should a student miss class or be obligated to respond to an emergency call during the live session.

Impact of Distance Learning Technology on the Fire Service

Due to having potential access to distance education tools such as WebCT and Centra via the web, individual fire companies can have the ability to participate in mandatory training when it is most convenient. Individual students seeking professional development are able to find more opportunities for choices in education. Injured or vacationing firefighters can access training sessions from home if necessary. Many logistical problems can be alleviated when Distance Education technology is utilized, such as decreased fuel bills and less wear and tear on fire apparatus involved in traveling to a traditional classroom location. As a result, substantial savings, both monetary and time, will be realized.

Distance Education Technology and Andragogy

Pedagogy is the term that represents child-based instructional design and methodology. Distinctly different methodologies must be employed for the adult based learner. Andragogy is the term relevant to adult education methodology. Distance education is particularly suited for andragogical concepts. Simply put, adults learn differently than children. Eduard C. Lindeman, author of the classic 1926 work The Meaning of Adult Education, noted that the most influential factor in an adult learner's education is his or her own experience[5].

Paramount to the adult reasoning process is answering "why do I need to know this"? The fire service is one of the most technically trained and competent public service providers in today's communities (Grant & Hoover, 1994)[6]. Each sophisticated technique learned has sound reasoning behind the methodology. Class design must incorporate a life-centered orientation to learning regarding the educational needs of the fire service, by addressing the internal motivations and "why" questions particular to this group of adult learners.

Another important component of adult education is a desire for self-direction in the learning process, and Distance Education offers an excellent opportunity to address this need. Adult learners are more internally motivated than children, and this is especially true within the fire service community. Fire fighters seek independence and ownership in their educational processes. Distance education technologies provide instructional delivery that can be less restrictive regarding location and time, therefore being very suitable for these self-directed adult learners.

A third and very important aspect of andragogy combines the adult learner's experience with class objectives and material. Instructional design should be goal-based and relevant to the learner's profession. Once again, distance education technology offers the flexibility to incorporate numerous interactive capabilities, allowing freedom, flexibility and opportunities to engage in either synchronous or asynchronous discourse with peers, their instructor, or the course material at their convenience. K. Patricia Cross, author of the 1986 work Adults as Learners, notes that studies show that adult learners generally prefer to retain control of what subjects they'll cover as well as how, when and where they'll cover it[7].

Successful Distance Education Applications of Technology

One of the greatest successes for the UNC Charlotte FSET program has been the use of the asynchronous communication tool known as the threaded discussion board. The WebCT discussion tool allows fire safety students to share their insights from their collective years of experience in fire safety. The discussion board has been a highly effective learning tool, especially when a particular subject is "discussed" asynchronously in WebCT, prior to meeting live during the synchronous Centra portion of the class.

Another benefit is the fact that among the FSET students, whom often vary in professional rank and experience, a virtual "equal playing field" is established and maintained. Students often appear to be reluctant to voice their opinions in person in front of superiors.

However when using the online threaded discussion, students have time to compose their thoughts on any given discussion topic before they are posted, possibly increasing their comfort and tendency to more freely express their opinions, further enhancing the learning process. By providing a less intimidating forum for class discussion, WebCT has enhanced the quality of the learning and sharing of information among the FSET students.

The synchronous tool allows for a more traditional classroom experience for those that can log on simultaneously. Students can virtually "raise their hands" to request a microphone to

speak to the class, which the instructor can grant with a mouse click as desired. The instructor can also solicit and receive private or anonymous feedback during the live Centra class session (unlike a traditional classroom). Centra also provides the opportunity for students to conduct their own presentations and answer subsequent questions during the live session.

WebCT assists in rounding out the educational experience for the student in that it offers many tools not available in the synchronous Centra portion of the class. In addition to the asynchronous threaded discussion tool, WebCT also offers secure delivery of content, student tracking features, quizzing and survey capabilities and a customizable grade book among its options. Together, Centra and WebCT offer many types of interactive experiences to meet adult learners' educational needs and accommodate various learning styles and preferences.

Summary

Increasing demands on the fire service continue to necessitate increased educational opportunities for future leaders of the fire service. However, the fire service professional's access to traditional higher education is limited by availability as well as geographic, financial and time constraints. Distance education technologies can offer unique opportunities for those seeking higher education to control their destiny and achieve their professional goals by providing a learning medium that can accommodate the special needs and internal motivations inherent to the adult learner. As a result of this technology, the fire service will operate more efficiently and be better able to respond to the needs of the public they serve.

References:

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Biographical Information

DAVE MURPHY retired as Assistant Chief from the Richmond (Kentucky) Fire Department and has industrial experience as a safety director with AFG Industries. He is currently an assistant professor at The University of North Carolina at Charlotte where he develops and teaches fire and safety classes in the new and growing program.

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