User Guide to Simulation-Based and Interactive Training for Preparedness

by the 2005-2006 ASPH/CDC Simulation-Based and Interactive Training Collaboration

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Chair

• Colleen Monahan, University of Illinois at Chicago School of Public Health, Illinois Public Health Preparedness Center

Members

• Mark Alliman, University of Findlay School of Environmental and Emergency Management, Center for Terrorism Preparedness
• Prabu David, Ohio State University School of Public Health, Ohio Center for Public Health Preparedness
• Charles Grayson, Burlington County Community College, Public Safety Training Facility
• Jeffrey S. Hammond, University of Medicine and Dentistry of New Jersey School of Public Health, New Jersey Center for Public Health Preparedness
• Carol Mintz, Cleveland State University, Center for Emergency Preparedness
• Adam Negley, Ohio State University School of Public Health, Ohio Center for Public Health Preparedness
• Risa Shire, University of Arizona College of Public Health, Arizona Center for Public Health Preparedness
• Sam Stebbins, University of Pittsburgh Graduate School of Public Health, Center for Public Health Preparedness
• Mike Thomas, Saint Louis University School of Public Health, Heartland Center for Public Health Preparedness
• Tanya Uden-Holman, University of Iowa College of Public Health, Upper Midwest Center for Public Health Preparedness

Practice Partners

• William C. Beavin, The Boeing Company
• Robert Olshan, The Boeing Company, Network Enabled Emergency Management and Operations (NEEMO)

ASPH Coordinator

• Beth Rada

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BACKGROUND & PURPOSE

The Centers for Public Health Preparedness (CPHP), funded by the Centers for Disease Control and Prevention (CDC), were initiated in 2000 to strengthen terrorism and emergency preparedness by linking academic expertise with state and local health agency needs. The program has grown to become an important national resource for the development, delivery, and evaluation of preparedness education. CDC supports the Association of Schools of Public Health (ASPH) as the national convener of the CPHP network so as to enhance collaboration among the CPHP and with their government and practice partners, minimize duplication in development of materials, and maximize outreach of existing resources. In 2005-2006, CPHP “collaboration groups” continued to focus on reviewing preparedness resources and to develop guides and reports responsive to the training needs of the public health workforce for all-hazards situations.

The CDC charge for the Simulation-based and Interactive Training Collaboration Group states: “The group will review CPHP methods and identify measured benefits and successes related to such methods employed for preparedness training and education. The group will develop a reference document on this area.”

To address the CDC charge, the collaboration group met in Chicago and held a number of conference calls to exchange ideas. This report provides a summary of these discussions.

This document is intended for the CPHP network, state and local health departments, and any others who might be interested in using simulations, games, or interactive media as training methods. For examples of simulations, games, and interactive media training that are being used by centers participating in this workgroup, please see Section 4 of this document. For a more extensive list, please visit the CPHP network online resource center at http://preparedness.asph.org/ResourceCenter.cfm.

INTRODUCTION

Tabletop and functional exercises and simulations are increasingly used in preparedness training. The online Homeland Security Exercise and Evaluation Program (HSEEP) is a valuable resource that provides tools and guidelines for planning and implementation of such exercise-based preparedness training. Within a broad category that includes exercises, games and simulations, one genre of training aims to capitalize on interactive technologies. In this document, the Simulation-Based and Interactive Training Collaboration Group presents preliminary findings on such technology-enhanced training currently used by CPHP members. In addition, this document provides a list of features and options that could be useful to developers of technology-enhanced training in public health preparedness. Commonly used acronyms are listed in Appendix A.

This document is not intended to serve as an exhaustive listing of all the technology-enhanced resources offered by the CPHP network. Instead, only a convenient sample of innovative uses of interactive technologies identified by the group members is presented.
1. DESCRIPTIONS, DEFINITIONS, AND SCOPE OF REVIEW

From a pedagogic standpoint, “interactivity” is one of the most attractive features of new technologies and designers of e-learning environments and educational games seek to harness this potential. Although the term is used widely, its definition has been elusive. Despite the lack of a consensus on its definition, experts recognize the core attributes of interactivity.

1.1 Interactivity

Interactivity is not a single action, but a series of actions that are contingent on previous choices. The series of interactive transactions is characterized by such attributes as immediate feedback, user control, range of choice, and two-way communication. These attributes of interactivity can be invoked to varying degrees, based upon the target audience and intended use of the interactive technology. For purposes of this review, the target audience is limited to public health professionals. Intended use of technology; however, can be varied and broad, and can be classified by the type of interaction and the role of the computer within the interaction.

1.2 Types of Interactions

Computer-Mediated Communication and Human-Computer Interaction

Two types of interactions characterize interactivity: human-human interaction and human-computer interaction. In the former, computer technology facilitates interaction among humans. Here, the technology serves as a vehicle or medium for communication. This area is called computer-mediated communication (CMC); an extensive body of literature is available on computer-mediated decision-making and collaborative work. CMC is widely used in e-learning and distance education through synchronous and asynchronous modes.

Human-computer interaction (HCI) is quite different from CMC, in that the focus is on the interaction between the human and the computer. In this domain, the interface takes on an added importance. Various aspects of the interaction, including usability and social responses to computers fall within the purview of HCI. In a Learning Management System (LMS), for example, HCI occurs when a user logs into the system and the machine prompts the user that three of the four modules have been completed. It also can be seen when the system provides a prompt that a new homework assignment has been added. In these instances, although humans programmed the computer, ultimately the interaction is between the human and the computer.

Synchronous Learning

Synchronous learning may bring to mind individuals in a classroom listening to a lecture or individuals participating in an onsite exercise. In distance learning, synchronous refers to real-time, instructor-led learning, in which participants can communicate directly with one another. This interaction can take place online, via audio or videoconferencing, two-way live broadcasts, and the like.

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1 Learning Circuits Glossary from American Society for Training and Development (ASTD); http://www.learningcircuits.org/glossary.
Asynchronous Learning
In contrast, with asynchronous (“anytime”) learning, interactions between the instructor and participants happen with a time delay. Traditionally, asynchronous learning included correspondence courses or, perhaps, reading an article in the Journal of the American Medical Association and completing a post-test for CME credit. Today, the world of asynchronous learning is much more interactive, with such features as self-paced courses taken over the Internet, materials on CD-ROM or DVD, online discussion groups, and correspondence via e-mail.¹

In synchronous learning, the instructor is typically viewed as the “driver” of the educational experience. Asynchronous learning is much more “learner-driven.” The differences between these two approaches should be taken into account when designing distance-education environments. Both synchronous and asynchronous distance-based learning are currently being used by CPHP and play a role in the training and education they provide.

1.3 Roles of Computers in Interactivity
In both CMC and HCI, the computer plays one or more roles. At least three of these roles deserve attention: computer as a medium, computer as a simulation tool, and computer as a social actor. Although these roles are distinct, they are not mutually exclusive. These roles often are used in combination to achieve various learning objectives.

Computer as Medium
With the emergence of the Internet and networked computing, the computer is used as a medium for information exchange. At the same time, the computer is also used as a medium for communication. CPHP members already use the computer in these two roles. The use of websites, webcasts, discussion forums, and email are examples of use of communication as a medium. Moreover, many learning management systems (LMSs) come bundled with such features as chat-rooms, discussion forums, and other interactive tools that maximize the use of the computer as a medium.

Although the computer may already be used extensively as a medium within the CPHP network, there is potential for new innovations by extending the reach through mobile technologies. An example is the Mobile PanFlu Prep, developed by the Illinois CPHP for distribution through mobile technology (http://www.publichealthgames.com).

Also, strong use of multimedia and interactive technologies can enhance the use of the computer as a medium. An example of the use of rich media in training is the just-in-time course offered by the Upper Midwest Center for Public Health Preparedness. One of its courses, Step-by-Step Guide: Donning and Doffing Personal Protective Equipment, is a tutorial on how to don and doff personal protective equipment. In this course, text and audio explain the procedure step by step, and video is also used to demonstrate the steps (http://www.public-health.uiowa.edu/icphp/ed_training/ttt/associates/resources.html).
**Computer as Simulation Tool**

The use of computer as medium is only one of the ways that information technologies can be used to amplify human cognition. The computer also can serve as a tool that improves learning and productivity. Programs like Microsoft's Word, Excel, and PowerPoint are examples of the computer used as a cognitive tool.

The use of the computer as a simulation device has significant potential in public health preparedness training. Computer simulations and games are specialized programs that take advantage of the multimedia capabilities of the computer technology to deliver a compelling scenario and the interactive capabilities to manipulate software objects. Through programming logic and artificial intelligence, various interactive features are provided that guide the user through a series of concrete actions that are tightly integrated with learning objectives.

An example of the use of a computer as a simulation tool is the computerized mannequin or patient simulator used to train first responders at the Simulation Center for Public Health Preparedness at Burlington County College, Pemberton, NJ. With the use of high-fidelity simulators, healthcare workers can conduct basic physical assessments and perform procedures for severe trauma. Patient simulators are completely programmable and a range of physiological responses can be modeled.

Simulations can range from simple, text-based, what-if scenarios to sophisticated games in virtual or augmented-reality environments, such as war games employed in military training. The high-end options are expensive and may require considerable investment in resources and start-up time. A good compromise may be to take advantage of animations and digital videos that can considerably enhance the realism of the simulation.

Some of the simulations can be presented as multiplayer games. Each member of the team will take on a role in the multiplayer environment and the actions of the players can be monitored. Another approach is to build interactive communication components into the simulation. For example, at critical moments during the simulation, participants could be asked to express their decisions through an interactive poll. Tallies of these votes, along with real-time feedback from experts, can be presented to participants. An example of such an interactive system is the Actual Learning Environment Response Training (ALERT) webcast platform developed by the Center for Terrorism Preparedness at University of Findlay, Findlay, Ohio, which uses instantaneous interactive polling coupled with feedback from experts at http://seem.findlay.edu/.

**Computer as Social Agent**

The computer also can serve as a surrogate social agent, such as an instructor or coach. In this function, the computer is used to motivate human action or to provide social support. When a participant makes a mistake in an online quiz, the computer could offer an explanation of the mistake and present the correct response. Providing a link to a video clip from an instructor who discusses the issue could enrich the experience.

In a proof of the concept, the Illinois CPHP has used a three-dimensional (3-D) face model of a digital tutor. In another application from the Illinois CPHP, video clips of scenarios are presented within a computer game to simulate social interactions at a vaccine-dispensing center. (One should note that computer simulation of social interactions can be more cost-effective and efficient than hiring trained actors to play social roles.)
In summary, centers within the CPHP network use interactive technologies in a variety of ways. Mainly, interactive technologies are used as a delivery medium for instruction. In some cases, interactive technologies are used as simulation tools. Only occasionally have they been employed as social agents. In keeping with the group charge from the CDC, this report focuses mainly on the use of the computer as a simulation tool.
2. GAMES AND SIMULATIONS

Although functional exercises may provide the best experience for players, they can be quite expensive. Models and simulations offer a cost-effective alternative and offer avenues for systematic data collection and analysis. HSEEP defines models and simulations as follows:

- A model is a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process. Models allow responders to visualize a specific procedure or plan without actually completing a full response.

- A simulation is a method for implementing a model over time. For example, a computer program presents responders with a scenario and examines their actions at critical moments during the event. Simulation tools can provide players with instant feedback on the outcomes of their choices and the underlying reasons for those results. As potential threats to national security emerge from an increasingly complex network of challenges, the integration of various training techniques, including the use of models and simulations, can help prepare the emergency response community to respond effectively and expeditiously to emergencies.

2.1 Games

Simulations can be easily couched within Serious Games, which are described as games designed to mimic real-world possibilities that have real-life import. Games are hypothetical situations steered by player actions. Simulations of natural disasters, terrorist events, HazMat emergencies, or infectious outbreaks can be presented within a game environment.

Games are particularly effective in helping participants realize the consequences of their actions. Immediate feedback after actions can be provided to suggest appropriate actions. Thus, games can be used for validating or reinforcing plans and procedures or evaluating resource requirements.

Decision-making within a game can be simulated to be either slow and deliberate or rapid and spontaneous, depending on exercise design and objectives. Also, various scenarios can be invoked within the simulation to make the decision-making task as true to life as possible.

Game participants may come from the same discipline or different disciplines and/or from the same jurisdiction or from multiple jurisdictions, depending on exercise objectives. Some of the characteristics of games are summarized below:

- Outcomes contingent on player decisions;
- Conducted within a competitive environment;
- Provide rapid feedback;
- Improve teamwork;
- Provide opportunities to practice group problem-solving;
- Test group message interpretation;
- Assess interagency coordination;
- Familiarize senior officials with homeland security/counterterrorism responsibilities;
- Explore potential future scenarios; and
- Demonstrate consequences of player actions.
Once the major roles have been identified, scenarios are created and events within the game are timelined. Typically, roles—such as first responders, emergency personnel, public health employees, and volunteer medical reserve corps (clinical and non-clinical personnel)—are built into the game. When the game is run as a functional exercise it can be used to test for availability of resources and efficiency of established protocols. The virtue of games is that one player can play various roles and develop critical thinking through role-playing.

2.2 Simulations

While inhabiting a simulated environment on a computer screen, participants are presented with different options at each decision point. Simple input devices, such as a key or mouse, or more sophisticated options, such as joysticks and gamepads, can be used to navigate and perform tasks inside the computer-generated world. In addition, some form of communication interface may be required to facilitate human-human interaction.

3D Immersive Technologies

In advanced applications, immersion technologies with head-mounted displays could be employed. With these technologies, the participant is engaged in various actions within an artificial environment created from 3-D visual projections. As with all simulations, the purpose of realism in these synthetic environments is to sensitize the user to potential scenarios rather than to expect uniform responses from all participants.

The technology for 3-D immersive simulations can be expensive. However, the payoffs are mainly through increased or enhanced realism. For most public health scenarios, 2-D simulations may be adequate. 3-D simulations may be necessary to model situations that have a strong spatial component or action sequences that require speed and movement, as in first-responder training. Often in high-end simulations, 2-D and 3-D computer models are used in tandem with real life exercises or mock drills. These are referred to “augmented reality” simulations.

One type of specialized 3-D simulation used in public health exercises is the simulator mannequin. Patient simulators or mannequins are examples of specialized computer models to train first responders. The mannequins can be programmed to present clinical and physiological data representing various states of trauma to train healthcare professionals.

Also, large fire academies have facilities for torching hulled-out buildings and for creating confined spaces, and, water or chemical fires. All of these are designed to place true-to-life stress on the trainee. Proficiencies in physical endeavors, such as successfully dousing a fire, administering an IV, or maintaining oxygen support, can be tested in these environments. At the same time, the physiological data presented by the mannequin can be manipulated from a remote computer.

While realistic drills and exercises are preferable when possible, cost is a limiting factor. Training fields require considerable “real estate.” Moreover, construction of simulated buildings and insurance costs can be prohibitive. Also, patient simulators are increasingly more expensive as they become more high-tech. Stand-alone, computer-based simulations, on the other hand, tend to be less expensive and are suitable for improving mental acuity in responding to emergency situations, but do not provide the platform for testing physical proficiencies.
2.3 Interactive Technologies Used in Simulations, Games, and Interactive Media Training

This section discusses the other traditional interactive technologies used in simulations, games, and interactive media training.

**AJAX**

Asynchronous JavaScript and XML (AJAX), is an “old” new technology adopted by Google, Yahoo, and others to make their web applications fast and rich. In simple terms, AJAX is a set of techniques that make it possible for a web page to communicate with a server (to send or retrieve information), and to change the content, appearance or functionality of a web page without reloading the page. This means it is possible to create rich functionality within a single web page—and to manage all the server communication in the background—without the user noticing.

The Illinois Public Health Preparedness Center developed a Mass Dispensing Center Game for the Chicago Department of Public Health that was done using AJAX. It also incorporates streaming video in Adobe Flash format. More information is available at [http://www.publichealthgames.com](http://www.publichealthgames.com).

**CD-ROMs and DVDs**

CDs and DVDs offer portable mechanisms to store interactive training material.

**Adobe Flash**

Adobe Flash (formerly, Macromedia Flash) offers interactive content rich with video, graphics and animation for truly unique, engaging Websites, presentations or mobile content. All one needs to run a Flash application is the Flash Player, which is available free for all browsers. Flash also has a means to stream videos using the Flash Media Server. The trainings developed by the Upper Midwest Center for Public Health Preparedness use Flash in their online programs ([http://www.public-health.uiowa.edu/icphp/ed_training/ttt/associates/resources.html](http://www.public-health.uiowa.edu/icphp/ed_training/ttt/associates/resources.html)).

**Video Playback**

Video or audio can be played on the web the following ways (in order of best to crudest approach):

- Streaming (plays immediately and each frame is sent based on speed of connection to the Internet);
- Progressively download and play (begin playing while being downloaded); and
- Download the media file and then play.
  - This is fine for small files, but impractical for longer ones.

**Streaming Media**

Streaming media enables real-time or on-demand access to audio, video, and multimedia content via the Internet or an intranet. That is media that plays in real time and is not downloaded prior to playing. Streaming media is transmitted by a specialized media server application, and is processed and played back by a client player application as it is received, leaving no residual copy of the content on the receiving device. Streaming media adds engaging motion and sound to the Web experience, increasing interactivity, and retention. Streaming allows timely, dynamic content to be seen by a larger—even global—audience, helping to cost-effectively disseminate information, to address new markets, and to bring corporate culture closer to far-reaching constituencies. Streaming allows a user to browse through and jump back and forth in the content—as opposed to progressive download (see below), which requires
viewing from beginning to end. Streaming supports both on-demand and live content to be transmitted over the Internet in real time, allowing audiences anywhere in the world to play back media whenever and however they wish, and to experience live events as they happen.

The University of Findlay School of Environmental and Emergency Management hosts “ALERT Webcasts,” which are incident simulations. Real-time expert commentary takes place throughout the exercise; they even debate how the situation should be handled. Audience interaction also is featured. (For more information, visit http://seem.findlay.edu/webcasts.)

**Progressive Download**

Unlike traditional download, **progressive download** (also known as pseudostreaming and, in Apple’s QuickTime, fast-start streaming) allows playback to begin before the file is completely downloaded. Progressive download allows playback of content that has been received to continue while the remainder is still being downloaded. Progressive download, therefore, allows the user to view the beginning of the file as the remainder is being downloaded and to quit the download at any point. Like streaming, progressive download allows an audience to see and hear the content immediately—as it is being downloaded—but only if the download speed can be maintained at the rate needed to keep up with playback. Unlike streaming, progressive download writes the media file to disk, leaving a copy of the content in the memory of the receiving device. Streaming media, on the other hand, is processed, played, and discarded, leaving no physical copy behind. When pre-recorded streaming media content has been archived on a server, it may be accessed on demand at any time by individual audience members. Whenever a user clicks on the link to request the program, video-on-demand starts to play from the beginning.

**Mobile Technology**

Games and interactive training can be delivered via **mobile technology**, such as a personal digital assistant or cell phone. An example was developed by the Illinois Public Health Preparedness Center called “Mobile PanFlu Prep.” (For more information, visit http://www.publichealthgames.com.)
3. STANDARDS IN SIMULATIONS, GAMES AND INTERACTIVE TECHNOLOGY

Standards are important when developing simulations, games, or interactive technology that will be shared or that have to work together. Distributed simulation first appeared in the 1960s with development of a two-player, interactive computer game. In the 1980s, the DARPA SIMNET program created the first virtual world for military training by networking combat simulators. Today, several industry standards have evolved that enable the networking of dissimilar, heterogeneous simulations. The military and the manufacturing, emergency management, and medical fields use these standards.

Homeland Security Exercise and Evaluation Program (HSEEP) provides a standardized methodology and language for designing, developing, conducting, and evaluating all exercises. (For more information, visit http://www.ojp.usdoj.gov/odp/docs/hseep.htm.)

SCORM, the Sharable Courseware Object Reference Model, was developed when the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD P&R) was tasked with leading a collaborative effort to harness the power of information technologies to modernize structured learning. Through the sponsorship of the OUSD P&R, the creation of the Advanced Distributed Learning (ADL) Initiative was formed as a developer and implementer of learning technologies across the Department of Defense (DoD). Out of this effort came the SCORM standard. SCORM is a suite of technical standards that enable web-based learning systems to find, import, share, reuse, and export learning content in a standardized way. More information is available at: http://www.adlnet.gov/scorm.

National Incident Management System (NIMS) establishes standardized incident management processes, protocols, and procedures that all responders, federal, state, tribal, and local, will use to coordinate and conduct response actions. (http://www.nimsonline.com/)

Institute of Electrical and Electronics Engineers (IEEE) (http://www.ieee.org/portal/site)
• IEEE P1516.1, “Standard for Modeling and Simulation (M&S) High-Level Architecture (HLA)—Federate Interface Specification,” defines the interface between federates (simulations, supporting utilities, or interfaces to live systems) and the underlying software services that support interfederate communication in a distributed simulation domain.
• IEEE P1516.2, “Standard for Modeling and Simulation (M&S) High Level Architecture (HLA)—Object Model Template (OMT) Specification,” defines the format and syntax for recording information in HLA object models that identify the data exchanged at runtime to achieve federation objectives.
4. RULES OF THE GAME

The rules of the game depend on game design. Three key decisions drive the design of an interactive game. First, the developer has to decide between a single-player or multiplayer game. When teamwork and group decision-making are central to the learning objective, the multiplayer game is the logical option. Further, multiplayer games can be set to operate in a single-player mode with preset characteristics loaded for dummy players.

Second, the role of the controller in the game has to be determined. While rules of the game typically are programmed in computer games, in some a controller intervenes at critical decision points. Under this system, a game controller (or an expert panel) reviews the decision and introduces injects or other scenarios to maximize learning objectives. The controller-based system, while prone to some subjectivity, can offer richer feedback to the users.

The third decision involves whether consequences of player actions are scripted or random. Depending on game design, the outcome can be pre-scripted or decided after play after each action or move. Identifying critical decision-making points is a major factor in the success of the game. Guided by the rules, the controller determines the outcomes of player actions. Therefore, the controller should be allotted sufficient time to interpret the rules of the game. Given the potential for subjectivity, controller-driven games should be tested extensively prior to launch.

At the same time, the controller-driven, unscripted game can serve as a rapid-development pilot test for developing rules for future versions of the games. In games that are driven by the controller, player decisions, subsequent actions, and outcomes rely on the controller’s subject-matter knowledge and understanding of the rules of the game. The open, decision-based format of a game can provide “what if” questions, which extend exercise benefits.

Attendance at a game is dictated by its objectives and design; that is, how many players participate depends on game objectives, design, and concepts. Due to the limited number of participants, planners are encouraged to open the exercise to observers (if feasible).

Observers are asked not to participate in discussions and strategy sessions, but can be tasked to take notes and report back to controllers with feedback. The exercise planning team begins the game. Interaction among players or teams is encouraged; however, conversations and associations should emulate what is found in the real world. Controllers must be aware of pre-established rules and procedures, and they must play an ongoing evaluator role.

The game may have only one controller or, if there are teams, there may be a controller for each team (under the guidance of a lead controller). The controller ensures that player actions take place within game rules and timeframe. The controller does not prompt or guide player actions. When players perform actions, however, the controller presents the outcome. All controllers and evaluators take notes relevant to their team’s actions.

Immediately after the game, an after-action report should be generated. This can be done automatically by the game in addition to getting direct feedback from players.
5. USABILITY AND DESIGN FACTORS

When developing simulations, games and interactive media, developers need to strive to create products that are universally accessible. (See http://www.igda.org/wiki/index.php/Game_Accessibility_SIG and http://www.igda.org/accessibility/HCI2005_GAC.pdf.)

Despite the best intentions of educators, programmers and designers, an interactive game or interactive technology solution may be rejected because it is too cumbersome to use. Users approach computer applications with a set of expectations or schema. When these expectations are violated by the technology, interactive experience places an undue burden on the user. To improve user experience, user analysis and requirements can be conducted before product development. It may be helpful to start with a list of target audiences and examine the demographic, psychographic and behavioral profiles of the user.

During the early stages of the design process, it helps to begin with flowcharts and paper mockups of the interface. Particularly, when designing public health games with what-if scenarios, the underlying logic and rationale of the different branches of a decision tree should be mapped out in advance. Review by users and experts during this stage could eliminate costly errors that may be difficult to fix after the application has been programmed.

Various usability techniques, such as cognitive walkthroughs, heuristic analysis and expert review, can be used at various stages in the development process. In these usability tests, the user is given a task or hypothetical scenario and asked to complete it using the system. A fully functional system may not be necessary for conducting such usability tests. Often these tests are conducted on mockups of the system and in partially developed, or “wire-frame,” systems. While working on the usability tasks, the user is asked to think out loud. The think-out-loud protocols are evaluated to diagnose problems with logic and flow.

Usability research is often conducted with small samples of less than 10 participants from key target groups. Studies have shown that even with very small samples, a large proportion of the usability issues can be detected. A number of valuable resources are available on usability.

Finally, assessment of web logs and other user statistics can provide valuable diagnostic information that can be used for detect patterns of usage and potential problems in design. More advanced usability techniques, such as eye tracking, could be used if the application demands more rigorous testing.

5.1 Design Factors in Interactive Media Training

Several best practices that pertain to distance learning and interactive media use can be applied to games and simulations as well. Some of these simple guidelines can minimize user frustration:

- Ascertain the level of technology expertise in the target audience.
- Provide broadband access, which is critical in multiplayer games.
- Provide clear instructions on how to begin the game.
- Use a user-friendly interface with a clear navigation bar.
- List technical requirements (e.g., programs needed).
- Provide free downloads of needed software (e.g., Adobe’s Flash Player and Acrobat Reader; see http://www.adobe.com/products/).
• Use programs, such as Adobe’s Flash Player and Apple’s QuickTime player, that allow the developer to compress video so download time is reduced.

5.2 Integrating with Learning Management Systems
Interactive games and simulations can be designed as learning objects. If learning objectives can be organized into registered SCORM (shareable content object reference model) modules, they can be easily shared among members of the CPHP network.

Shareable learning objects (e.g., SCORM) is only one of the advantages that an LMS offers. Other advantages include the tracking of user progress and tailoring to the user’s level of expertise. If a game or an interactive learning environment has multiple levels or modules, the LMS can track progress and automatically direct the user to the appropriate point in the learning arc.

By the same token, performance on interactive quizzes and other assessment instruments can be easily stored in a database within the LMS and used to assess student progress and to evaluate the quality of learning resources.
6. ROLE OF COMPETENCIES IN SIMULATION-BASED TRAINING

A number of competency sets are available for public health training. These include:

- **Council on Linkages** ([http://www.phf.org/competencies.htm](http://www.phf.org/competencies.htm));
- **National Public Health Leadership Development Network** (transformational competencies) ([http://www.iowapublichealth.org/xr/ASPX/RecordId.11340/rx/IphiRecordDetails.htm](http://www.iowapublichealth.org/xr/ASPX/RecordId.11340/rx/IphiRecordDetails.htm)); and
- **Crisis Leadership Competencies** with associated training modules.

These sets of competencies provide a starting point for defining criteria for knowledge transfer and competency assessment.

6.1 Testing

A majority of the competency-based measurement of exercise training has been tied to pre-/post-testing and evaluation of knowledge gain (ability) and heightened salience (likelihood of use in performance). A “triangular” approach involving pre-/post-testing, on-site evaluation of performance by observers, and follow-up assessments may be needed to ensure the “real world” impact of the training. Also, evaluations across organizations, regions, and jurisdictions may be necessary to assess the implementation of training.

The next level of competency-based performance measurement will include integration with HSEEP and the Universal Task List ([http://www.comcare.org/uploads/Universal task list.pdf](http://www.comcare.org/uploads/Universal task list.pdf)) and Targeted Capability List ([http://www.ojp.usdoj.gov/odp/docs/TCL1_1.pdf](http://www.ojp.usdoj.gov/odp/docs/TCL1_1.pdf)). This process would include making sure public health bioterrorism competencies are well defined and integrated within the HSEEP methodology so that both CDC- and Homeland Security-funded training can be evaluated using the same competency-based measurement approaches.
7. EVALUATION

In addition to assessing the quality of the training with a competency rubric, games and simulations also should be evaluated with an after-action report (AAR) or improvement plan (IP). HSEEP provides an eight-step approach for evaluating exercises that easily can be extended to interactive games and simulations:

- Step 1: Plan and organize the evaluation.
- Step 2: Observe the exercise and collect data.
- Step 3: Analyze data.
- Step 4: Develop a draft AAR.
- Step 5: Conduct an after-action conference.
- Step 6: Identify improvements to be implemented.
- Step 7: Finalize the AAR/IP.
- Step 8: Track implementation.

The methods and means to be used to evaluate an exercise should be determined early in the planning process. It may be necessary to develop specialized evaluation plans for large-scale exercises. These plans can be augmented with traditional post-test evaluations, peer-reviews or debriefing.
8. AFTER-ACTION REPORT

An exercise AAR and corrective action plan/improvement plan (CAP/IP) should cover the schedule, scenario, player activities, evaluations, issues, opportunities, and “best practices.”

AAR content includes:

- A brief summary with introductory and general statements noting exercise scope, purpose, objectives, players, and an overall assessment of performance;
- Assessments for each functional area observed; and
- Issues and recommendations as suggested by controller, evaluator, or player comments.

The CAP/IP will address:

- Identified problems or issues and the related causes;
- Summary of modes to improve, e.g., completing additional education and training and/or modifying plans and procedures; and
- Plans for implementing.
9. BENEFITS OF USING GAMES, SIMULATIONS, AND INTERACTIVE MEDIA

Games and simulations can stimulate learning by casting learning as problem-solving tasks. In addition, games and simulations allow for a number of features that make learning interesting. Some of these features are as follow:

- Requiring the learner to solve problems and take action;
- Using a timer so learners must “beat the clock”;
- Setting a maximum number of allowed errors;
- Using suspense;
- Dramatically demonstrating the impact of good performance; and
- Dramatically demonstrating the impact of poor performance.

In addition, knowledge transfer can be achieved through a number of processes. Providing real-time feedback is a key advantage of games and simulations. Real-time training can be achieved through:

- Using job tasks as the basis for lesson design, case studies, and examples, or as follow-up projects;
- Incorporating case studies and examples that reflect best practices;
- Using high-fidelity simulation while training procedural tasks;
- Providing skill-based training at a time when learners actually need it; and
- Embedding the physical and psychological cues of the job into the instruction.

Simulations are also helpful because they promote understanding of “big ideas” and other concepts. Further, simulations sensitize the learner to roles and problems that one could encounter during an emergency. In some cases, the simulation may be the only available method to practice for a public health emergency.

On the merits of these advantages, games and simulations should be an integral part of preparedness training in public health. Some members of the CPHP network are already using interactive games and simulations as an integral part of training. Others, who do not have games and simulations as part of their training, may find this method quite rewarding.
10. GAMES, SIMULATIONS, AND INTERACTIVE TECHNOLOGIES DEVELOPED/USED BY THE CPHP IN THE SIMULATION-BASED AND INTERACTIVE TRAINING COLLABORATION GROUP

The following CPHP provided detailed information about their technologies:

- **Upper Midwest Center for Public Health Preparedness.** Online courses, including Interactive Media Learning Objects
- **Heartland Center for Public Health Preparedness.** Network Enabled Emergency Management and Operations (NEEMO) Repeatable Exercises and Competency Tracking
- **Center for Simulation, Burlington County College.** Emergency Preparedness Patient Simulation and Computer Simulation
- **Center for Terrorism Preparedness, University of Findlay.** Video–Scenario Training; School Safety and Security CD-ROM; and ALERT Webcasts
- **Center for Public Health Preparedness, University of Illinois at Chicago.** Mass Dispensing Game and PanFlu Prep (a cell phone application)
### Centers for Public Health Preparedness (CPHP)
**Individual CPHP Activities and Program Description**

<table>
<thead>
<tr>
<th>Center Name</th>
<th>Upper Midwest Center for Public Health Preparedness</th>
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</thead>
<tbody>
<tr>
<td>Program Topic and Charge</td>
<td>Development of online courses, including interactive media learning objects</td>
</tr>
<tr>
<td>Project Faculty/Staff, School</td>
<td>Upper Midwest Center for Public Health Preparedness (UMCPHP) University of Iowa College of Public Health <a href="http://www.public-health.uiowa.edu/icphp/">http://www.public-health.uiowa.edu/icphp/</a></td>
</tr>
<tr>
<td></td>
<td>• Tanya Uden-Holman: 319-384-5489, <a href="mailto:tanya-uden-holman@uiowa.edu">tanya-uden-holman@uiowa.edu</a></td>
</tr>
<tr>
<td></td>
<td>• Laurie Walkner: 319-335-6836, <a href="mailto:laurie-walkner@uiowa.edu">laurie-walkner@uiowa.edu</a></td>
</tr>
<tr>
<td></td>
<td>• Isandra Martinez-Marrero: 319-384-4250, <a href="mailto:isandra-martinez-marrero@uiowa.edu">isandra-martinez-marrero@uiowa.edu</a></td>
</tr>
</tbody>
</table>

#### Project Description (Abstract) and Project Schedule (Timeline)

- Reflective of the needs of our learners, our online courses are composed of one or more modules, each of which is easily completed in 1 hour or less. A complete course takes no more than 2 to 3 hours to complete.
- Our courses are highly interactive and include ample opportunities for learners to apply newly acquired knowledge and skills in practice exercises. Real-life scenarios and case studies are used in these exercises to maximize retention and transfer of knowledge and skills to the job.
- Courses generally contain one or more reusable learning objects. These task-specific learning objects may be downloaded on demand, distributed on CD-ROM, or used in face-to-face trainings. This allows for both flexibility in delivery method and for the opportunity for just-in-time learning.

#### Project Background

UMCPHP’s mission is to ensure that the state and local public health workforce has the skills to prepare for, promptly identify, and respond to bioterrorism and other public health emergencies.

Since its initiation, UMCPHP has established itself as a partner in meeting the challenge of adding capacity for the development of the preparedness workforce in the Upper Midwest. It has served as a facilitator of strengthened partnerships with public health organizations, including state and local health departments, and it has led to the development of new partnerships with public safety organizations. These organizations, including state and county emergency management agencies, have been identified by state and local public health agencies as critical partners in forming an effective, collective response to current and emerging public health threats.

In response to a need, UMCPHP has developed a number of online training and education resources that are delivered via the Prepare Iowa
**LMS. Prepare Iowa** allows users to assess knowledge and guides them to competency-based courses to fulfill expanding professional development needs. Through the LMS, users can map out a training plan and track progress along the way.

**Project Partners**

In the development of training and education resources, UMCPHP has worked with practice partners in the identification of training needs, as well as subject-matter experts in the development of the training resources. Primary partners have included the Iowa Department of Public Health, Iowa Association of Local Public Health Agencies, Iowa Homeland Security and Emergency Management.

**Importance of this Project to Public Health Preparedness (Justification; Benefit)**

It is critical that public health and emergency providers have access to training and education resources anytime, anywhere. To maximize retention and transfer of knowledge, trainings must be highly interactive and provide opportunities for the individual to apply the knowledge and skills being acquired. The training resources being developed by UMCPHP meet these criteria, and, because training is available in a variety of formats, are providing flexibility in delivery methods and facilitate just-in-time learning.

**Examples of Training Resources**

**Just-in-Time**

- **Step-by-Step Guide: Donning and Doffing PPE.** A tutorial on how to don and doff personal protective equipment. Text and audio explain the procedure step by step, with video demonstrating the steps.
- **Step-by-Step Guide: Setting Up the Decontamination Shower.** A tutorial on how to set up a decontamination shower. Text and audio explain the procedure step by step, with video demonstrating the steps.
- **Step-by-Step Guide: Patient Decontamination Procedure.** A tutorial on how to decontaminate ambulatory and non-ambulatory patients. Text and audio explain the procedure step by step, with video demonstrating the steps.

**Interactive Graphics and Tutorials**

- **HAZMAT Incidents in Iowa 2000-2004.** An interactive graphic displaying table and pie charts of which types of chemicals were involved in HAZMAT incidents in Iowa for each of these years.
- **Major Types of Hazardous Substances.** An interactive tutorial on 7 major types of hazardous substances (asphyxiants, corrosives, irritants, sensitizers, carcinogens, neurotoxins and fumigants), with symptoms of exposure, protective measures for healthcare workers, common locations and examples. Includes an index of some common hazardous materials. (See sample study guide for this tutorial below, Hazardous Substances in Your Community.)
- **Hazardous Substances In Your Community: Study Guide.** A sample study guide for use with an interactive graphic on major types of hazardous substances.
- **Relative Toxicity of Chlorine.** An interactive graphic displaying the relative toxicity of chlorine from zero to 1,000 ppm.
- **The DOT Marking System Tutorial.** An interactive tutorial on recognizing
and identifying Department of Transportation placards and labels.

- **The NFPA Marking System Tutorial.** An interactive tutorial on recognizing and identifying the National Fire Protection Association placards and labels.

### Activities and Drills

- **Safely Treating Contaminated Patients.** A computer-based activity that allows trainees to practice how to appropriately and safely treat exposed and contaminated patients in the emergency department after the didactic portion of a class. The activity is based on four real-life scenarios.
- **How to Use the Emergency Response Guidebook.** A computer-based activity that allows trainees to practice how to use the Emergency Response Guidebook after the didactic portion of a class. A copy of the Emergency Response Guidebook is required.
- **The DOT Marking System Drill.** An interactive tutorial on recognizing and identifying Department of Transportation placards and labels.
- **The NFPA Marking System Drill.** An interactive tutorial on recognizing and identifying the National Fire Protection Association placards and labels.

Please note that the resources listed above are “stand-alone” applications, which means once downloaded to a computer, no Internet access is necessary.

### Primary Audience

Public health and emergency providers, including, but not limited to, the following personnel:
- emergency dispatch
- emergency management
- EMS
- fire
- healthcare
- laboratory
- law enforcement
- local elected officials
- public health
- public works
- veterinary

### Recommendations for Outreach

It is essential for course evaluation to be a critical component of the training resources developed. For example, at UMCPHP, we employ a variety of tools to evaluate both online courses and individual learner performances.

- Before being made available to the public, every online course is **pilot tested** through the Prepare Iowa LMS. Individuals who participate in this process come from different areas of public health. A pilot tester completes an **online survey** that asks for feedback on one’s perception of a course’s relevance to one’s professional duties, as well as course content and difficulty, the ease of navigation, practice opportunities and more. This feedback is implemented based on its relevance to course learning objectives.
• An **online survey** is also used to evaluate the ongoing effectiveness of courses after the pilot-testing phase. After completion of a course, a learner provides feedback based on one’s perception of a course’s relevance to one’s professional duties, content and difficulty, the ease of navigation, practice opportunities, and more. Similarly, learner feedback is implemented based on its relevance to course learning objectives.

• **Individual learner performance** is evaluated through the completion of both pre- and post-test examinations. These examinations include a pool of questions developed in collaboration with subject-matter experts and based on the learning objectives for the identified courses.

| Completion Date | The training resources listed above are completed. UMCPHP continues to develop online courses based on partner-identified needs. |
### Centers for Public Health Preparedness (CPHP)
#### Individual CPHP Activities and Program Description

<table>
<thead>
<tr>
<th>Center Name</th>
<th>Heartland Center for Public Health Preparedness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program Topic and Charge</strong></td>
<td>Boeing/Heartland Center Network-Enabled Emergency Management and Operations (NEEMO) Repeatable Exercises and Competency Tracking</td>
</tr>
</tbody>
</table>
| **Project Faculty/Staff, School** | Heartland Center for Public Health Preparedness  
St. Louis University School of Public Health  
- Mike Thomas, 314-977-4350, thomasmw@slu.edu |

**Project Description (Abstract) and Project Schedule (Timeline)**

The Heartland Center has developed a strategic partnership with Boeing using its distant learning technology that focuses on virtual simulation (live, virtual, and computer-generated) exercise and drill scenarios. This training platform optimizes interactive first-responder exercises among public health/public safety/medical agencies.

A proposed model demonstration project is underway with the St. Louis Region Medical Response System (SLMRRS)/St. Louis Area Regional Response System (STARRS) as a structure for regional response training involving all sectors of public health and first-responder agencies across Missouri and Illinois service areas.

- The Heartland Center LMS will serve as the distant learning platform for the Boeing NEEMO with Embedded Simulation and Training Capability. Educational courses will be offered on the LMS using the NEEMO platform with defined objectives and competencies for each course offering.
- Pre-/post-testing will be conducted on the LMS to measure learning attainment. The LMS offers the capability to track all enrollees as to completion of courses and issuance of certificates. This is an important benefit of our proposal to insure that all segments of the emergency response and management workforce are offered courses and are tracked.
- Boeing and the Heartland Center bring extensive expertise and experience in meeting Office of Domestic Preparedness (ODP) guidelines in evaluation and performance. They will integrate these guidelines in all work and education components.
- We also have developed a funding proposal with STARRS to start the initial phase of planning simulation exercises on local, regional and state basis for public health, law enforcement, hospitals, emergency management, and first responders.

**Project Background**

**Project Partners**

Heartland Center, Boeing, STARRS
In recent years, technology-mediated simulation training has gained popularity in overcoming barriers to learning. The power of simulated training lies in its effectiveness to change decision-making behavior by giving participants the opportunity to experiment, test operating assumptions, make collective decisions/actions, and learn from mistakes in a risk-free environment. This approach encompasses simulated experience that represents years of actual decision-making and response to real events. The result would be the identification of “best practices” that can be migrated and replicated into intra-regional, inter-regional and national educational and training models. This can lead to expanded opportunities for more cross-discipline training of emergency preparedness and first-responder agencies in “virtual real time” training environments where immediate performance feedback can be measured.

Additional benefits to our state and regional partners would be the ability to meet current and future goals and objectives in preparedness planning and education/training as follows:

- Integrate critical incident information sharing and demonstrate interoperable communication capacity across regional and state cross-jurisdictional borders.
- Develop a standardize Regional Critical Incident Management Response System as a template for replication and dissemination.
- Improve capacity to coordinate mass-casualty incidents, including response, mitigation, and recovery.
- Enhance regional response capabilities to prevent, detect, respond to, and contain bioterrorism, weapons of mass destruction, or other all-hazard events.
- Establish simulation training technology network with associated crisis leadership and decision-making competencies that can be linked to performance measurement and ODP performance guidelines.
- Expand multi-agency collaborations to integrate all sectors of emergency response and management and workforce constituencies.

**Product/Course/Deliverable Description**
Simulation training and education matched to competencies and performance tracking linked to national ODP guidelines and performance standards

**Primary Audience**

- public health personnel
- law enforcement personnel
- hospital personnel
- emergency management personnel
- first responders

**User Consultation**
Extensive assessment of capabilities and competency development for end-users

**Recommendations for Outreach**
Identify best practices from pilot project and disseminate

**Completion Date**
Project still in progress; awaiting funding decisions
<table>
<thead>
<tr>
<th>Center Name</th>
<th>Burlington County College, Center for Simulation</th>
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| **Program Topic and Charge** | **Emergency Preparedness** to raise the level of preparedness for first responders in the state of New Jersey and surrounding regions through the use of simulation (patient mannequins and gaming software):  
• Scenario development;  
• Drills and exercises;  
• Public health initiatives (i.e., developing local pandemic flu plan, dissemination of hand-washing information); and  
• Providing classroom facilities for visiting organizations.  

**Patient simulation** typically is geared toward the more clinical resources. With the use of high-fidelity simulators, healthcare workers can conduct basic physical assessments as well as perform procedures for severe trauma. Patient Simulators are completely programmable and physiologically modeled.  

The **computer simulation** facility targets mostly non-clinical personnel. Using navigable computer environments, players/trainees can assume a role and respond to an unfolding situation such as a fire, accident, explosion, or hostage situation. |
| **Project Faculty/Staff, School** | Center for Simulation (CS) and Center for Public Health Preparedness (CPHP)  
Burlington County College (BCC)  
• Charles Grayson, CS Manager, 856-222-9311, x 202  
• Joy Spellman, CPHP Director, 856-222-9311, x 2085 |
| **Project Description (Abstract) and Project Schedule (Timeline)** | We had projected that we should reach 1,200 frontline responders within the first year of operation, but are likely to double that projection by the year's end. |
| **Project Background** | Designated a CPHP in August 2004, BCC was given a year extension to hire a director. Already having a simulation facility in place, the CDC funding allowed us to reach a wider audience by allowing us to construct a computer simulation facility to help train those in more non-clinical public health roles. |
| **Project Partners** | We currently partner with the New Jersey Department of Health and Senior Services. |
| **Importance Of This Project To Public Health Preparedness (Justification; Benefit)** | In the first 8 months of the BCC-CPHP, we have been able to train over 2,000 healthcare employees. Through scenario-based learning, our trainees/students benefit from:  
• Identifying proficiency or lack in clinical skills;  
• Improving critical thinking and decision-making;  
• Optimizing resource allocations; and  
• Identifying deficiencies in organization structure and communication. |
| **Product/Course/Deliverable Description** | The BCC-C PHP delivers simulation resources to qualified organizations and while it is beginning to put together course curricula, its primary focus has been on the development and delivery of simulation modes of education, in particular, scenario development. High fidelity patient simulators and networked computer simulation resources are delivered on site to organizations all over the region. |
| **Primary Audience** | • first responders (fire, police, and EMS personnel)  
  • hospital personnel (ER nurses and physicians)  
  • student nurses (in conjunction with public healthcare modules of their curricula)  
  • emergency-management personnel  
  • public health providers |
| **Completion Date:** | May 24, 2006 |
### Center Name
University of Findlay, School of Environmental & Emergency Management, Center for Terrorism Preparedness

### Program topic and charge
Video scenario training

### Project Faculty/Staff, School
- University of Findlay
  - Mark Alliman, 419-434-4135, malliman@findlay.edu
  - Mike Webber, adjunct instructor, 419-434-4053, webber@findlay.edu

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The University of Findlay’s Center for Terrorism Preparedness (CTP) has partnered with Firearms Training Systems, Inc. (FATS) in using an advanced video scenario training system to provide fast-paced, decision-making training to law enforcement, corporate security (including hospitals and school campus security) and security staffs for nuclear-power facilities. CTP also has the ability to create its own scenarios, which involve scripting, filming, editing, and producing events that can be saved to CD or DVD.

At present, all scenarios that have been developed are compatible with FATS in operation worldwide. However, we hope to develop scenarios that will not require the expensive FATS to receive the training.

### Scenario Authoring

Video scenario training is most effective when learners are exposed to varied scenarios that pertain to current training issues. Budget cuts and the high cost of FATS DVDs have greatly diminished ability of many agencies to obtain new or updated scenarios.

To produce scenarios, we use experienced trainers. Many scenarios are based on actual occurrences. All scenarios are centered on current training issues and are designed to provide learners with invaluable training experiences.

DVD selections come with a scenario guide for instructors. The guide is presented in a format that is easy to read and use while training with FATS. The guide will provide trainers with needed information to get the most out of the scenarios.

Street Survival contains 7 scenarios that require learners to think on their feet and use all of their acquired skills to make quick decisions in stressful situations:
- Active Shooters in School. The DVD consists of 5 scenarios that run continuously. The scenarios are designed to develop team and tactical skills for handling incidents involving an active shooter(s) inside of a business or school.
- OPOTA Pistol/Shotgun Range. The DVD contains the 2003 Ohio Police Officers Training Association (OPOTA) qualification pistol and shotgun range courses. This filming takes the learner through the courses in real time.

Our law enforcement instructors will work closely with agencies/individuals to develop and produce high-quality scenarios that are specific to student training needs. University resources allow us to produce scenarios at a cost significantly less than competitors.

<table>
<thead>
<tr>
<th>Project Background</th>
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<tr>
<td><strong>Law enforcement and security officers will respond in real situations according to how they train. Video scenario training has been proven to be an effective tool in exposing officers to the realism of deadly encounters and teaching them the skills necessary to survive and help others survive life-threatening incidents.</strong></td>
</tr>
<tr>
<td><strong>FATS has been providing video-scenario training to the United States military and to law enforcement for many years. The system enables participants the ability to be exposed to dangerous and potentially life-threatening situations in a controlled, safe, risk-free environment. Scenarios are created to require the learner to “think on one’s feet” and react to the situation as it unfolds on a screen. The split-second decisions and actions taken by the learner will result in escalation or de-escalation of the situation.</strong></td>
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<tr>
<td>The University of Findlay can create and develop its own scenarios. We intend to expand the reach of this training tool to professions outside of the military and law enforcement by creating scenarios for general industry, public health, hospitals, and others that do not require the use of the expensive FATS to participate.</td>
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<th>Project Partners</th>
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<tbody>
<tr>
<td><strong>FATS, Inc.</strong></td>
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<tr>
<th>Importance of this Project to Public Health Preparedness (Justification; Benefit)</th>
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<tr>
<td>Training scenarios can be developed and delivered to first responders (primarily law enforcement) that will simulate the response to a public health incident. Although the FATS system has been used primarily as a training tool for military and law enforcement personnel, the video-scenario training system can be used to create training scenarios for other professions, such as public health. The University of Findlay can author CD-based scenarios, which means playback does not require an expensive FATS system; anyone with a computer can play the CD.</td>
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<thead>
<tr>
<th>Product/Course/Deliverable Description</th>
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<tbody>
<tr>
<td>The courses and training exist now.</td>
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<tr>
<th>Primary Audience</th>
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<tbody>
<tr>
<td>• law enforcement</td>
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<td>• first responders</td>
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<tr>
<td>• hospitals</td>
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<tr>
<td>• industry</td>
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<tr>
<td>• public health</td>
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<tr>
<th>User Consultation</th>
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<tbody>
<tr>
<td>Create a project team to design and produce several scenarios as pilot.</td>
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<tr>
<th>Recommendations for Outreach</th>
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<tbody>
<tr>
<td>Develop a CD that contains scenarios for a target audience (i.e., hospitals or public health) that can be played on a standard computer.</td>
</tr>
<tr>
<td>Center Name</td>
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<tr>
<td>-------------</td>
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<tr>
<td>Program Topic and Charge</td>
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</tbody>
</table>
| Project Faculty/Staff, School | Center for Terrorism Preparedness  
The University of Findlay  
- Mark Alliman, 419-434-4135, malliman@findlay.edu  
- Harold Huffman, 419-434-5814, huffman@findlay.edu |
| Project Description (Abstract) and Project Schedule (Timeline) | The Center for Terrorism Preparedness has developed a CD-ROM titled School Safety & Security: An All-Hazards Approach. The purpose of this training program is to prepare school employees for multiple emergencies ranging from terrorist attacks to acts of student-initiated violence. The goal is to ensure that every school has the proper planning, prevention, and response in the event of a bomb threat or a chemical or biological incident. The CD educates school personnel on standard techniques that will help to ensure the safety of staff and students. |
| Importance of this Project to Public Health Preparedness (Justification; Benefit) | The role of schools has changed. It is important to include school staff and administration in community-wide planning and training. Whether an incident occurs at a school, the school is used as an alternate care site, or buses are used for transportation purposes, in nearly any incident, schools will be involved. |
| Product/Course/Deliverable Description | The CD-ROM is divided into 10 sections based on such job categories as teacher, custodian, administrator, cafeteria worker, coach, and school nurse. Scenarios are offered for each job category, showing one or more scenes involving a suspicious incident or event. The result of an improper response is then discussed, and a printable checklist of the proper procedures and preparation for such incidents is provided. A resource section presents relevant links for additional material. |
| Primary Audience | All levels of school staff, nurses, community leaders, and planners |
# Centers for Public Health Preparedness (CPHP)
## Individual CPHP Activities and Program Description

<table>
<thead>
<tr>
<th>Center Name</th>
<th>University of Findlay, School of Environmental &amp; Emergency Management, Center for Terrorism Preparedness</th>
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<tbody>
<tr>
<td>Program Topic and Charge</td>
<td>Actual Learning Environment Response Training (ALERT) webcasts</td>
</tr>
</tbody>
</table>
| Project Faculty/Staff, School | Center for Terrorism Preparedness  
- The University of Findlay  
- Mark Alliman, 419-434-4135, malliman@findlay.edu  
- Randy VanDyne, 419-434-4572, vandyne@findlay.edu |

### Project Description (Abstract) and Project Schedule (Timeline)

- The University of Findlay’s newest venture is the live interactive webcast of training scenarios. This approach is excellent for teaching public health and safety personnel in many locations during a single integrated exercise, while eliminating the need for travel to the same location.
- As ALERT webcasts are interactive, learners can answer questions or ask questions online while training events take place. In addition, learners can help decide—through instantaneous polling of all the participants—what should be done next in the scenario.
- Pre-tests, post-tests, and learner evaluations are easy to administer and control.
- ALERT webcasts can be archived for future use, extending the useful life of a training event.

### Project Background

The University of Findlay’s School of Environmental and Emergency Management (SEEM) and Exponent Event Technologies, LLC, have combined resources to develop and deliver live, interactive ALERT webcasts that address specific training needs of the first-responder, public health and emergency management communities. Webcasting is the live, interactive broadcast of training scenarios streamed over the Internet. It provides a technology solution that allows security officers to train at their own location with a standard computer.

### Project Partners

Exponent Event Technologies, LLC

### Importance of this Project to Public Health Preparedness (Justification; Benefit)

The live webcast technology provides an effective training technique that can quickly and efficiently reach across the entire country; can be utilized by all entities (large and small); can be delivered on-site; and can be conducted either in a synchronous, or an asynchronous fashion. This technique would allow public health professionals to have training tools available at their fingertips, and be able to participate in training on their own schedule, and at their own location.

Many other agencies (besides public health) benefit from this type of training.
| Product/Course/ Deliverable Description | To date, three ALERT webcasts have been completed:  
• Methamphetamine lab drug bust;  
• Simulated release of a biotoxin at a political rally; and  
• Chlorine release from a rail car. |
|----------------------------------------|----------------------------------------------------------------------------------------------------------|
| Primary Audience                       | • firefighters  
• HazMat teams  
• public health personnel  
• hospital personnel  
• EMS personnel  
• emergency management agency personnel  
• social services personnel  
• volunteer agency personnel  
• industrial personnel  
• city person nel  
• county personnel |
<p>| User Consultation                      | Scenario development, review emergency operations plans, and standard operating procedures |
| Recommendations for Outreach           | Inform CPHP network and partners of the archived webcasts and encourage involvement of CPHP subject-matter experts and partners in future events. |
| Completion Date:                       | Ongoing |</p>
<table>
<thead>
<tr>
<th><strong>Center Name</strong></th>
<th>Illinois Public Health Preparedness Center</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program topic and Charge</strong></td>
<td>Development of online games/simulations to train public health workers</td>
</tr>
</tbody>
</table>
| **Project Faculty/Staff, School** | Illinois Public Health Preparedness Center  
University of Illinois at Chicago School of Public Health  
[http://www.uic.edu/sph/prepare](http://www.uic.edu/sph/prepare)  
Colleen Monahan, Co-PI and Game Contact 312-515-1360,  
cmonahan@uic.edu  
Bernard Turnock, PI, btumock@uic.edu |
| **Project Description (Abstract) and Project Schedule (Timeline)** | The online mass dispensing game allows public health workers and volunteers to practice their roles singly or together (multiplayer). Before accessing the simulation exercise, didactic training is required and offered online within the LMS. Once this is completed, the individual can access the web-based single and multiplayer simulation game. The game is set up to train Health Department staff to deal with various scenarios in different roles they may be faced with during several select events that may require mass pharmaceutical dispensing. The game can be played repeatedly, provides feedback on performance, and records improved competency in the LMS. |
| **Project Background** | The Chicago Department of Public Health contracted with UIC-School of Public Health Center for the Advancement of Distance Education (CADE) to develop a simulation of a mass dispensing drill. The IPHPC is also under the CADE administrative umbrella. The IPHPC is defining how this game can be disseminated nationally. |
| **Project Partners** | In the development of training and education resources, the IPHPC has worked with the Chicago Department of Public Health, who provided funding for the Mass Dispensing Game. |
| **Importance of this Project to Public Health Preparedness (Justification; Benefit)** | It is critical that public health and emergency providers have access to training and education resources anytime, anywhere. To maximize retention and transfer of knowledge, trainings must be highly interactive and provide opportunities for the individual to apply the knowledge and skills being acquired. The training resources being developed by the Center meet these criteria and, because training is available in a variety of formats, are providing flexibility in delivery methods and facilitate just-in-time learning. |
| **Product/Course/Deliverable Description** | Mass Dispensing Center Game  
The game is set up to train Health Department staff to deal with scenarios they may be faced with during several select events that may require mass pharmaceutical dispensing. The game can be played repeatedly, |
<table>
<thead>
<tr>
<th><strong>Primary Audience</strong></th>
<th>Public health workers and volunteers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User Consultation</strong></td>
<td>Game and mobile phone application development</td>
</tr>
<tr>
<td><strong>Recommendations for Outreach</strong></td>
<td>Inform CPHP network and demonstrate at conferences.</td>
</tr>
<tr>
<td><strong>Completion Date:</strong></td>
<td>Piloting will begin for the Mass Dispensing Game in August 2006. PanFlu Prep has been released and is available at <a href="http://www.publichealthgames.com">http://www.publichealthgames.com</a>.</td>
</tr>
</tbody>
</table>

**Provides feedback on performance and records improved competency in the LMS.**

**PanFlu Prep**

An application that runs on a mobile phone that prepares and educates the user about Pandemic Flu.
## Appendix A

### Acronym List

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAR</td>
<td>After-Action Report</td>
</tr>
<tr>
<td>AJAX</td>
<td>Asynchronous JavaScript and XML</td>
</tr>
<tr>
<td>ALERT</td>
<td>Actual Learning Environment Response Training</td>
</tr>
<tr>
<td>ASPH</td>
<td>Association of Schools of Public Health</td>
</tr>
<tr>
<td>CAP/IP</td>
<td>Corrective Action Plan/Improvement Plan</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
</tr>
<tr>
<td>CMC</td>
<td>Computer-mediated communication</td>
</tr>
<tr>
<td>CPHP</td>
<td>Centers for Public Health Preparedness</td>
</tr>
<tr>
<td>CTP</td>
<td>[University of Findlay] Center for Terrorism Preparedness</td>
</tr>
<tr>
<td>FATS</td>
<td>Firearms Training Systems</td>
</tr>
<tr>
<td>HCI</td>
<td>Human-computer interaction</td>
</tr>
<tr>
<td>HLA</td>
<td>High Level Architecture</td>
</tr>
<tr>
<td>HSEEP</td>
<td>Homeland Security Exercise and Evaluation Program</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>IP</td>
<td>Improvement Plan</td>
</tr>
<tr>
<td>LMS</td>
<td>Learning Management System</td>
</tr>
<tr>
<td>M&amp;S</td>
<td>Modeling and Simulation</td>
</tr>
<tr>
<td>OMT</td>
<td>Object Model Template</td>
</tr>
<tr>
<td>SCORM</td>
<td>Shareable Content Object Reference Model</td>
</tr>
<tr>
<td>SEEM</td>
<td>[University of Findlay] School of Environmental and Emergency Management</td>
</tr>
<tr>
<td>UMCPHP</td>
<td>Upper Midwest Center for Public Health Preparedness</td>
</tr>
</tbody>
</table>

ABOUT THE ASSOCIATION OF SCHOOLS OF PUBLIC HEALTH

ASPH represents the 40 Council on Education for Public Health (CEPH) accredited schools of public health (SPH) in North America. ASPH promotes the efforts of schools of public health to improve the health of every person through education, research, and policy. Based upon the belief that “you’re only as healthy as the world you live in,” ASPH works with the government and other professional organizations to develop solutions to the most pressing health concerns and provides access to the ongoing initiatives of the schools of public health. www.asph.org