WORKSHOP SESSION SUMMARY

POST-CONFERENCE PROCEEDINGS

2018 National Trainers' Exchange

1. **Session Title and Presenter's Contact Information:**

   Workshop #10 title: Augmented Reality in HAZMAT Training

   Speakers:

   - Cesar Bandera, Founding Partner, Cell Podium cesar.bandera@cellpodium.com
   - Mitchel Rosen, Director, Rutgers School of Public Health mrosen@sph.rutgers.edu
   - Peter Schmitt, Founding Partner, Cell Podium peter.schmitt@cellpodium.com

2. **Workshop Summary:**

   A goal of HAZMAT training exercises is presenting learners with realistic experiences involving PPE, tools, air monitoring instruments/sensors, and mock hazards. All are readily available to trainers, except sensors that operate with mock hazards, often requiring the instructor to provide verbal descriptions of hazard exposure to the learner, breaking the realism of the exercise. Because HAZMAT workers' real-time decisions are often dictated by sensors, making and interpreting sensor readings under realistic conditions are important skills to learn. Participants of this hands-on workshop will learn how to incorporate augmented reality in experiential HAZMAT training that cost-effectively supports the development and evaluation of these important skills. Specifically, participants will operate firsthand augmented reality for HAZMAT training exercises that integrate real PPE and tools with mock hazards and hand-held sensor simulators that behave as if they were actual air monitoring instruments and the hazards were real. The behavior is realistic both in terms of the exposure values displayed, themselves a function of the type of hazards in the exercise and their distance from the learner, and the response time to changes in the environment (e.g., if the instructor invokes a sudden chemical release, or if the learner quickly approaches or retreats from a hazard). At the workshop, we will discuss how this technology is used in field exercises by NIEHS WTP grantees, how augmented reality differs from virtual technology and other computer-based training paradigms, and the settings for which each is recommended in HAZMAT worker training.

3. **Methods:**

   Participants downloaded the handheld sensor simulator on their own phones, and used their phones to detect and classify mock hazards distributed across the room. This approach demonstrated the ease with which augmented reality can be incorporated into existing field exercises, but only attendees with Android phones were able to participate (iPhone support will be available later in 2018). Phones were able to download the app through their wireless carrier instead of relying on hotel internet, and the Bluetooth beacons that served as chemical and radiological hazards worked with all the phones in the room simultaneously.

4. **Points Raised by Participants:**
   Participants provided valuable feedback on their desired configuration of the app screen, and the types of sensors and hazards they would like the system to simulate. The following points were raised by the presenters:
   1. The differences between augmented reality and other training technologies.
   2. How to apply augmented reality into existing HAZMAT training exercises.
   3. Learn to configure and operate augmented reality gas sensor simulators.

   All attendees were invited to participate in a two-year pilot program, in which they receive three mock hazards, the app, and support for integrating augmented reality into their training exercises.

5. **References:**
   https://www.datamakespossible.com/hazmat-goes-augmented/
   http://cellpodium.com/project-hazmat.html

6. **Workshop Handouts/ Resources:**
   Slides describing the evolution and adoption of training technology from the early days of e-learning to augmented reality, the benefits of augmented reality technology to HAZMAT training, installation instructions, and the invitation to participate in the pilot program.