



Mock Accidents Challenge Skills of Safety Students

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ABSTRACT

This paper explores the benefits of a full-scale mock accident exercise as a learning tool for safety undergraduate students. Each semester students are presented with a real world scenario designed to test the knowledge and skills learned throughout their coursework. Students are placed into teams and are responsible for investigating the accident to determine conditions and behaviors that contributed to the accident. They interview witnesses and emergency personnel, analyze the scene, identify relevant regulations and standards, and recommend control measures to prevent similar incidents in the future.

Author Bio-sketch

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Introduction

It's a sunny day in April when the 911 call goes out. Within three minutes, the first police officers and an ambulance arrive. A worker has been crushed under a portable chemical tank that is spraying its contents on the victim and the surrounding area. A large crowd gathers as the Haz-mat team secures the area, extracts the victim, and begins the decontamination process. Forty-five minutes later the victim is life-flighted to the hospital. What could be a tragic day is actually the fifth in an ongoing series of full-scale mock accident exercises for students in the Safety Sciences Department at Central Missouri State University.

The mock accident is the final project in the senior level capstone course for undergraduate Safety Management and Occupational Safety and Health majors. Each semester students are presented with a real world scenario designed to test the knowledge and skills learned throughout their coursework. Students are placed into teams and are responsible for investigating the accident to determine conditions and behaviors that contributed to the accident. They interview witnesses and emergency personnel, analyze the scene, identify relevant regulations and standards, and recommend control measures to prevent similar incidents in the future.

From Lecture to Life

In a recent article, Blair (2005) indicated that safety educators need to move beyond traditional lecture methods and incorporate activities that are more focused on students rather than the instructor. While lectures are necessary in many classes, there is much to be said for actively engaging students in learning activities that bridge the distance between textbook theories and on-the-job performance. Historically, this function has been successfully accomplished through internship experiences that immerse students in the daily activities of a safety professional under the guidance of a mentor. Blair emphasized the importance of internships as an avenue of applying course learning in "real time and with real consequences." However, the mock scenario provides another valuable opportunity for students to apply information acquired throughout their program of study in real time, but without the traumatic consequences associated with the serious injury or fatality of a worker. Mistakes here are not the foundation of guilt and stress, but truly become learning opportunities.

A recent article by Ramsay and Sorrell (2006) promoted the use of problem-based learning as an effective and innovative tool for teaching safety students. This type of learning "provides students with opportunities to solve



problems by exposing them to ill-structured situations encountered by practicing professionals. This process produces students who can define problems, work out alternative hypotheses and develop reasonable solutions to the issues at hand” (p. 3). The mock accident is an excellent example of problem-based learning that promotes student involvement and learning by effectively moving beyond traditional lecture methodologies.

The mock accident scenario provides a valuable opportunity for students to apply classroom skills in a world where they are accountable to the victim, the victim’s family and co-workers, the media, and their employer. Students must also focus on the effects of the accident on the community and carefully consider what they say, how they say it, and who they say it to. Communications must be honest, concise, and without conjecture. This is perhaps one of the more difficult tasks for students, who often say too much at inopportune moments. Consider the following comments made during one group’s formal presentation:

Q: *Mayor of town (faculty in persona)*: I saw all of those chemicals pouring into the public sewer system and I am really concerned about the town. You always read about chemicals causing cancer and other problems – so, should I be concerned? Are we all going to die of cancer next week?

A: *Student*: No, you’re not going to die of cancer next week. Cancer takes a very long time to develop. While this comment would have had devastating ramifications in the real world, in the scenario the mistake becomes a moment of learning for the group and for future students as well. It becomes a mistake that is not likely to be repeated. Faculty are able to provide students with specific feedback regarding their strengths and shortcomings and can utilize overall student performance as an assessment tool for programmatic improvements.

Additionally, students learn to work collaboratively and to develop a shared understanding of the events leading up to the accident as well as the best course of action to take after the accident. Together they learn, understand and make meaningful connections that none of them could achieve on their own. This phenomenon is identified as the “zone of proximal development,” a term that “refer(s) to understanding that lies just beyond current knowledge and ability: what we cannot learn on our own at the moment, but can learn with a little help from our friends” (Bruffe, 37). The diversity of each team members’ experiences, knowledge, and perceptions allows the group to develop a more comprehensive assessment of the scenario at hand. Additionally, students learn the value of seeking advice and having a ready network of peers to consult in their efforts to recognize and solve problems and to develop and implement best practices.



The scenarios also provide students with the chance to reflect on their leadership style and its impact on their decision making. Bolman and Deal (1997) identified four perspectives, or “frames”, utilized for interpreting and diagnosing organizational problems in an effort to determine appropriate courses of action. The frames include the following: a) *structural*, which emphasizes authority, rules, regulations, policies and procedures; b) *human resource*, which focuses on human needs; c) *political*, with a focus on scarce resources, conflict, power, and negotiation; and d) the *symbolic* frame, which centers on organizational symbols, stories, appearances and ceremonies. Frames are described as “both windows on the world and lenses that bring the world into focus” (p. 12). Good leaders are able to frame problems from multiple perspectives, but Bolman and Deal suggested that “For different times and situations, one perspective may be more helpful than others” (p. 270) and that there are “conditions under which each frame is likely to be most effective” (p. 270). Consider the following comments made during formal presentations:

Q: *Faculty*: I am the wife of the victim in your scenario. Let’s go back in time to the event – I showed up and approached you for answers. I want to know why my husband is still underneath that piece of equipment and why no one is doing anything about it. No one will let me get near him. I don’t care about the chemicals leaking from the tank and I want you to get him out NOW. How would you deal with me?

A: *Male Student (with law enforcement background)*: I would say “Ma’am, I understand your frustration. Those chemicals are very dangerous and I cannot allow you to become another victim. We are doing all we can and will have him out as soon as possible, but we cannot put other people in danger as well.”

Not a bad response, and certainly in keeping with this student’s law enforcement background. Compare with the following response from a different group:

A. *Female Student*: I would probably be pretty sympathetic to you because I’m female and can imagine how I would respond in this kind of situation. I would assign someone knowledgeable to stay with you and provide a blow-by-blow of everything taking place and why, so that you would have a good understanding of what was happening during the rescue. I would have this person accompany you to the hospital and try to make sure you had everything you needed while you were there.



Also a good response. From the perspective of the wife, probably a much better one. Both students provided appropriate answers based on their experiences and perceptions, and both chose solutions from very different frames. The male student with the law enforcement background reverted to a structural solution based on rules, regulations, and pure logic. The female student focused on the human element based on emotions and what was best for the needs of the wife. Both students have valid answers, and both were able to resolve the situation so that their attention would not be diverted from the victim and the investigation of the accident. This opens the door for classroom discussions about the focus of the solutions and how different decisions may be necessary or desirable in varying circumstances.

Community Outreach, Collaboration and Training

The mock accident scenarios have developed into mutually beneficial opportunities for students, the department, and local emergency services. The students gain valuable insights into the roles of the first responders at an accident scene and are exposed to situations they have not previously encountered. Students learn to think quickly, act consciously, and report the events accurately.

The department has realized several benefits from conducting the exercises, including the chance to increase overall community and campus awareness of safety through the accident scenarios, public presentations and demonstrations. Additionally, the scenarios have fostered collaboration with others on campus including public safety and the departments of manufacturing and construction, psychology, and agriculture. The activities have generated positive publicity and increased recognition of the department by university administration. Perhaps the most rewarding benefit is the enthusiasm generated by the students as they look forward to participation in the exercise. One semester things were running behind schedule and we told the students we were going to conduct a table-top rather than a full scale exercise. They expressed immediate disappointment and at the next class meeting unanimously requested that we reconsider and follow through with the full scenario. Their interest and excitement had been peaked based on what they had seen as observers in previous scenarios. We acquiesced and were able to provide a successful scenario.

The scenarios have also provided local emergency services with real-time practical training, including the first-time use of confined space rescue equipment. First responders play a vital role in helping students and observers understand the roles and responsibilities of EMS during an accident, and they have been more than willing



to field questions after the scenario. They display a level of professionalism that is unparalleled and we have found that they are more than willing to help the university not only by participating in the scenarios, but by guest lecturing in courses and speaking to student organizations.

Scenario Development and Assessment

The scenarios have included a scaffolding incident, confined space rescue, hazardous materials spill with unmarked drums, a worker electrocution, and a portable chemical tank accident. Each semester a new scenario is developed so that no scenario is repeated within a five year time frame. Students are encouraged to attend the activities as they progress through the program.

The original scaffolding incident was developed by a group of four faculty and included the participation of a county coroner and an OSHA compliance officer. Each subsequent scenario was improved by ongoing efforts to adapt to the needs of a variety of stakeholders both on campus and within the community. The planning committee has evolved to include a representative of campus public safety (who is also actively involved in the LEPC) and departmental students. By the fifth scenario, participation included the local police department, fire department, ambulance services, campus public safety, the campus hazardous materials response team, and life flight. In this scenario, students participated in a variety of roles that include the victim, members of the hazardous materials team, and as safety teams responsible for investigating the accident.

The accident scenarios include several instructional phases. Prior to the event, students are given little information about the exact details of the accident, so that they cannot engage in extensive “pre-planning” for the scenario. The day of the event includes special lectures and speeches on the relevant topic. The presentations are open to the entire campus. If appropriate, the scenarios are occasionally “paused” so that the unfolding chain of events can be explained to observers, creating a unique teaching moment.

Students have until the next class session to conduct any necessary research and develop their formal presentations, which include photographs of the scene, information obtained from witnesses and first responders, likely contributing factors, an outline of violations to regulatory standards, and recommended control measures. Students present their findings as a group and answer questions from faculty who play the role of key stakeholders. Presentations have typically included the use of PowerPoint and professional dress is required.



Students are graded by a group of at least four faculty. Feedback is provided on their assessment of the accident scenario, their recommendations, and their ability to effectively communicate their findings in an unbiased and professional manner. Once concluded, the entire class is provided with an overview and the opportunity to discuss the scenario collectively. Students are encouraged to provide the faculty with comments in an anonymous evaluation about how they believe the exercise could be improved and are also asked for suggestions about future scenario topics.

Where Do We Go From Here

As the faculty in the Safety Sciences Department develop future scenarios, we will continue to explore additional collaborations with other departments on campus and with companies. There are opportunities for journalism students to practice their live reporting skills, theater students to perform their “dying” and moulage skills, and criminal justice students to hone their investigative skills for a workplace violence incident. The scenarios have helped others on campus make the connections between safety and their daily lives, a worthwhile outcome. We have also found that by providing a free barbeque of hamburgers and hotdogs, public interest among other students on campus increased and it serves as a token of our appreciation for all of the people who help organize and participate in the scenario.

The involvement of local companies and regulatory agencies is a way of adding additional value to the scenarios. They provide a level of expertise that complements and reinforces information students are learning in class. As with the local emergency services, we have found that companies are more than willing to help the university through participation in the exercises and by providing speakers for presentations. Companies who currently offer internships to our students have indicated an interest in becoming part of the planning committee for one or more scenarios.

On a larger scale, the concept of the mock accident scenario presents the possibility of a safety competition between students at schools across the country. The exercise could be sponsored by ASSE and held in conjunction with the annual conference. It would be an excellent method for spotlighting our students, providing positive interactions with practicing professionals, and promoting the benefits of ASSE membership. The dialogue is open – let’s see where we can all go from here.



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