

'I Survived the Crisis!' - Using Real World Scenarios to Teach Crisis Leadership Skills to Undergraduate Engineering Students

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Abstract

This paper will present the “Crisis Simulation,” an extracurricular activity developed by the Leadership Education and Development Program (LEAD) at a small undergraduate engineering college. The goal of the activity is to expose engineering students to the types of leadership roles that they might have to assume, or might be exposed to, in an unplanned crisis event. Exposed to an unfamiliar crisis situation in an environment which is meant to simulate realistic conditions, student teams are led by volunteer faculty and staff through an intense two hour experience in which they assume roles of leadership in a community, business or an organization. There are several major learning objectives of this simulation: i) students are introduced to different leadership styles and forced to discover that many of the leadership assumptions that hold true in business-as-usual situations are violated in a crisis; ii) students learn how to utilize and allocate limited resources and make necessary trade-offs; iii) students are exposed to situations in which they have to question the ethical implications of their decisions and determine what risks are acceptable and tolerable. Through a post-simulation reflection activity led by volunteer faculty and staff, as well as the local Emergency Services personnel, students are asked to relate their simulation leadership experiences to more domain-specific problems that they might encounter in their future careers. This paper will present three simulation scenarios that the group has tested and will share the experiences encountered by participating students as well as the faculty and staff organizers.

Introduction

Traditional undergraduate engineering programs offer students little in the way of leadership training. They also offer students little exposure to complex real-world problems. Yet, the general expectation is that one day our students will be able to lead the way in solving complex problems.

At Rose-Hulman Institute of Technology, we seek out ways to provide our students with exposure to real world problems that might require some engineering interventions. These problems also require a great deal of collaborative work and leadership skills. To meet these two objectives, we have developed the Crisis Simulation, a brief yet intense extracurricular experience open to all engineering and science students at our college. The simulation has been designed to provide students with a risk-free experience in which they can test their leadership

and decision-making skills, practice making difficult trade-offs, and assess the range of potential outcomes of their decisions, without suffering lasting negative repercussions.

We take students out of their comfort zone and provide them with limited resources to succeed. The problems that we have developed have no optimal solution that our engineering students are used to. At best they have solutions that are good enough, acceptable under the circumstances. This causes discomfort among some engineering students. The intentionally stressful simulated environment allows some students to rise above and assume roles of leadership, and it teaches all that they cannot solve complex problems alone.

This simulation teaches students that while necessary, engineering skills alone are not sufficient for solving complex problems; these problems require continuous cooperation and a constant reevaluation of leadership roles in a group. The simulation also enables them to explore their leadership potential in a stressful, conflict-ridden environment. An important additional benefit of this simulation is that it enables students to more deeply experience real-world problems with dire consequences that they traditionally know very little about, and to experience some empathy for those affected by such problems.

This paper describes three different crises simulations that we have developed over the last three years, outlines the major learning goals, and presents an analysis of the student and volunteer reflections.

Literature review

The history of using games and simulations for learning purposes is long, and has been discussed extensively in literature. Langton et al. ¹ suggest that games were first introduced as training tools by and for the military in the 18th century, and it was a century and a half later when games and simulations became useful tools for teaching mostly business management and business strategy. Today, simulations continue to be used extensively in the training of military personnel ², medical personnel ³, and engineers, as they provide opportunities in which future decision-makers can practice making decisions in a risk-free environment.

Shaw ⁴ reviews literature on the benefits of using simulations in the classroom and suggests that simulations: (i) provide “students with a much deeper understanding of differing perspectives”, and (ii) that they can lead to students engaging in “*affective learning*.” Affective learning refers to students being able to change their perspectives and attitudes on issues at hand, experiencing empathy for others, and more deeply experiencing issues of the outside world.

The focus of our simulation is building leadership skills. Kumar and Hsiao ⁵ discuss the need for engineering students to learn about leadership while in school, rather than having to learn it on the job. Galloway ⁶ suggests that engineers cannot fulfill their jobs of serving the public without completing some training in “public policy, ethics, leadership, communication, and management” (p. 47).

While much has been written about the many styles of leadership, our simulation is mostly grounded in what Lichtenstein et al.⁷ call “adaptive leadership.” According to Lichtenstein et al., adaptive leadership is “a dynamic that transcends the capabilities of individuals alone; it is the product of interaction, tension, and exchange rules governing changes in perceptions and understanding” (p. 2). From this perspective, leadership is an emergent outcome that is produced from the reality of interactions of decision-makers with each other and with their environment (Bradbury & Lichtenstein, 2000).” According to this theory a single individual might act as a leader in one situation, and as a follower in another, as they “experience tension in the form of pressures on and challenges to their personal knowledge base (Carley and Hill, 2001)” (p. 5)⁷.

Learning goals

There are nine learning goals associated with our crisis simulation experience. As a result of participating in the Crisis Simulation, students will:

- Understand that many leadership assumptions that hold true in a business-as-usual situation are violated in a crisis situation.
- Understand that traditional roles and responsibilities assigned to different positions/groups may become more fluid in a crisis situation, allowing those who have more information/knowledge at a specific point in time to take the lead.
- Be able to utilize, allocate and track limited resources and make difficult but necessary trade-offs. They will see that sometimes a decision that is most sensible from an economic cost-benefit perspective may not be ethical.
- Judge that at some point in their career they might be exposed to situations in which they will have to question the ethical implications of their decisions and determine what risks are acceptable and tolerable under specific circumstances.
- Conclude that ethical standards in a business-as-usual situation may be much better defined than ethical standards in a crisis situation.
- Assess each action they take (or fail to take) to analyze resulting consequences. In other words, students should be able to think strategically and holistically.
- Collaborate with a diverse group of individuals, even when their personal perspectives and goals might be in conflict with those of their teammates.
- Identify leadership capabilities in others, and learn how to foster adaptive leadership.
- Evaluate their individual needs and be willing to set them aside for the betterment of a larger population.

Basic structure of crisis simulations at Rose-Hulman Institute of Technology

The crisis simulation at Rose-Hulman Institute of Technology is a once a year activity developed and sponsored by the Leadership Education and Development Program (LEAD). LEAD is a partnership between student affairs and academic affairs on our campus. Members of the faculty, staff, administration, as well as graduate students, design the components of the program and implement multiple activities during the academic year^{8,9,10}. All activities, including the

Crisis Simulation are open to all students and free of charge. For the Crisis Simulation, we limit the participation to the first 45-50 students who sign up to ensure that all students receive a hands-on experience.

Student participants are randomly divided into three or four groups (usually of 10-15 students), and those are separated into different rooms. There are at least two faculty/staff facilitators per room, and they are responsible for introducing students to the procedural rules and for observing their actions during the simulation. At the commencement of the simulation facilitators read simulation instructions that set the stage for the simulation, detail any specific information students need to know about their simulated environment, including their roles and rules for engagement. Once the simulation rules are explained in detail, the simulation begins, and students are left to deal with the scenarios on their own, with two facilitators present to observe their behaviors, and answer any further procedural questions.

During the actual simulation experience which lasts between 1.5 – 2 hours, participants receive prompts from simulation masters (ROTC volunteers) who follow a pre-determined script which outlines which events will happen in what order, and with what consequences (which may or may not be dependent on the actions that participants take). Simulation masters track the decisions that students make and the resulting consequences in a simulation matrix. After the simulation is finished, they share aggregated results with the participants. Those results, as well as the facilitators' observations, are used to facilitate a reflective discussion amongst all participants and all volunteers.

The following three sections will outline in more detail three crisis example scenarios that we have developed and tested at Rose-Hulman Institute of Technology. Example simulation products and supporting materials will be shown for the 2015 crisis simulation example.

2014 Crisis Simulation Exercise: Eruption of Mount Rainier

Participants in this simulation portrayed the municipal leadership of the City of Seattle, and the nearby communities of Tacoma and Olympia, WA. Those three communities were threatened by an impending eruption of Mount Rainier.

Simulation participants were divided into three groups, each representing one of the cities, and they were located in different rooms, with no means of direct communication between them. Participants within each group assumed the roles of community leaders, including the mayor, police chief, fire chief, public works director, local National Guard Armory Commander, American Red Cross leaders, as well as the local public health director. Students were allowed to select their roles, and those who were not assigned a specific role were asked to serve as support staff. Students were told that over the last three days, Mount Rainier tremors had become more frequent, sustained and severe, and that the three communities had sustained minor structural damage. A large-scale exodus was ongoing, although no official evacuation order had been issued yet. Students were also told that many services had been significantly disrupted, especially communications, and cell phones were not working. During the simulation students

were allowed to use only what was provided to them in the room. A grid map of the area indicated the location of emergency services in all three areas and allowed them to calculate the length of time to travel from one location to another in each city, and between the cities. An organizational chart, unit capability summary list summarized the available assets. They also had dry erase boards with markers and sticky notes.

During the simulation introduction phase participants received a summary of their areas of responsibility, as well as a summary of the assets that were available to them for the duration of the simulation. For example, a Public Works director was responsible to the maintenance of city utilities (potable water, sewage, and electricity) and infrastructure such as roads. He or she had at their disposal between 1-3 construction crews, 1-3 electric crews, and 1 waste water treatment unit (with different allocations for the three cities). Similarly, other leadership positions had defined roles and available assets, although students were told that ultimately their responsibilities were somewhat fluid in a crisis situation.

Each group of participants could directly communicate only with their own Central Communications Center (C3), composed of three ROTC volunteers, and they had to use Lync (a Windows messaging app) to talk to them. C3 volunteers tracked the movement of groups' assets, read out the scenario prompts to groups, and recorded consequences that resulted from each group's actions. The consequences were predetermined based on an array of responses that a group might select. C3 sent participants prompts to let them know what was going on outside of their offices.

During this simulation experience participants went through 22 different scenarios including a major car accident with injuries on an interstate, rioting with injuries, looting, building collapse, power outage at hospital, burst water main near hospital flooding area, and a fire in a nursing home. Participants had to respond to those scenarios by suggesting how to move their assets (e.g., police cars, construction crews, etc.) in the simulation space depicted on the map. When requested by the participants, C3 sent them update reports on their assets in the field (simulation space), as well as information on the consequences of their action or inaction (e.g., number of dead individuals in a nursing home as a result of late response to a fire).

The three groups of participants could not communicate directly with each other, but they could communicate through their respective C3s to seek or offer assistance to each other. In the end, the three groups were evaluated based on the number of lives they lost and the monetary losses associated with their actions (all of which were prebuilt in the simulation matrix for each single scenario).

Major observations from this simulation

Despite the fact that they could select their own role from a list of available roles, once the simulation started many students believed that the problem at hand was not a problem that they could solve, and they kept waiting for somebody else to take on a leadership role and start issuing commands. Most groups were very bad at tracking the usage of their assets (despite the

fact that they could have used sticky notes and white boards to do that easily), which resulted in overutilization of some assets, and underutilization of others. Students were under some stress and that certainly affected the way in which they processed information and managed the scenarios. Scenarios were changing quickly and students would panic whenever a new scenario came and they still hadn't responded to the previous one. They have yet to learn that with limited resources they cannot realistically address every concern, and that they need to prioritize. Most of the students failed to think outside of the box – in a scenario in which protesters were gathering outside of a police station to protest the lack of action to help local residents, instead of, say, issuing a public statement to outline major known risks, most groups automatically send police to detain peaceful protesters.

2015 Crisis Simulation Exercise: Memorial Hospital in New Orleans during Hurricane Katrina

Participants in this simulation assumed roles of various staff members and medical personnel of the Memorial Hospital in New Orleans, Louisiana over a period of five days, beginning with August 29th, 2005, when Hurricane Katrina destroyed the city's levees, and the simulation participants were left in the hospital to care for 150 remaining patients (see Appendix A for the simulation introduction).

Simulation participants were divided into four groups of approximately 12 students. Each group experienced the same simulation, and took on the same roles. Roles included: hospital's CEO, Public Relations Officer, Executive Director of Administration & Staff, two or more doctors, two or more nurses, food service staff, maintenance staff, security staff (see Appendix A for the complete list of roles and responsibilities). Participants were provided with a list of typical responsibilities associated with these roles, but were told that the responsibilities may be somewhat fluid in emergency situations, and were encouraged to think outside of the box. They were tasked with managing the wellbeing of the patients and staff, and to evacuate patients when opportunities presented themselves.

In order to simulate a more realistic environment (New Orleans in August), electric heaters and humidifiers were used in the rooms where the participants were held. Additionally, at some point during the simulation the lights were switched off to simulate the loss of electricity in the hospital, and participants could only use a flashlight which was left in their emergency pack. Throughout the simulation participants were shown six brief videos that were actual newscasts during the Hurricane Katrina crisis. These videos provided them with some necessary visual imagery that made the scenario more real, and that elicited some deeper emotional reactions. Libby and Eibach (2013)¹¹ point to evidence that “demonstrated the function of visual imagery in a wide range of social processes including attribution, impression formation, memory, emotion, persuasion, communication, and judgment and decision-making.”

During the simulation participants were allowed to use only the materials provided to them:

- maps of the region which indicated the location of Memorial Hospital and other regional hospitals
- hospital blueprints
- patient records (which indicated the name, age, gender, ethnicity, weight, location within hospital, physical condition, whether patient is on life support, whether patient is able to walk, and the patient ID number) (see Appendix B for example of patient records),
- emergency supply box which was hidden somewhere in the room and contained some water, a flashlight and batteries.

Participants used a Windows messaging app Lync to communicate with the Central Communications Center C3 (managed by ROTC cadets). Participants were able to direct their movement and activities of staff and patients by contacting the C3. If they wanted to do something with the patient (evacuate, move to different area of hospital, provide treatment, etc.), participants had to study their patient records, and then read off the patient ID number and provide C3 with specific instructions on what they wanted to do with the patient. Given that the hospital lost power during the simulation, participants had to create a priority for care and evacuation. They could not evacuate everyone, so they had to determine who to evacuate, how and when, given specific evacuation rules (see Appendix C).

During the simulation participants were exposed to situations which forced them to determine priorities, and caused them to experience some ethical dilemmas (see Appendix D for example of simulation scenarios). They were additionally stressed by the fact that during the simulation they had to report their progress to the local media and the Memorial Hospital Board of Directors. This was not announced to them at the beginning of the simulation, but instead at selected times during the simulation representatives from different groups were called out of their room and sent to a different area where they were interviewed and filmed by actual reporters from a local TV station, and by the Memorial Hospital Board of Directors (played by the president, a vice-president, and member of the Board of Trustees of Institution who volunteered to help with the simulation). Both of these groups asked participants probing questions about how they were dealing with the situation, and participants were asked to justify their actions or inactions, and to take responsibility for the condition of the patients and the hospital. This proved to cause some level of stress among the participants.

Major observations from this simulation:

Those students who were chosen to present their actions to the media and board of directors were very stressed and unprepared to discuss the consequences of their actions. They used the questions that they received from the media and the board to inform the rest of their teammates. Subsequent reporting got significantly better.

Many students were not adequately prepared to deal with ethical dilemmas, and they struggled with scenarios in which they had to determine the fate of certain patients. Some of the consequences that the group suffered (e.g., helicopter could not land because of strong winds, so

they could not evacuate a group of patients) were not of their own doing, so students were frustrated that there were other factors that were making their plans unattainable.

At the conclusion of both the 2014 and 2015 simulations, we debriefed students using a set of reflection questions developed specifically for each scenario. These questions are provided in Appendix E.

2016 Crisis Simulation Exercise: Batumi Camp for Displaced Persons

This simulation will take place in February of 2016, so this paper will simply outline the scenario, and results and reflections from this simulation will be included in the conference presentation.

In this simulation students assume the roles of various staff members of the Batumi Camp for Displaced Persons, a fictional camp located in a fictional country of Gorgovia. The camp was established to house individuals who lost their homes and their livelihoods in a historic flood that caused extensive damage to the villages in Gorgovia and neighboring country of Ariana. The flood decimated the region's crops, causing severe famine, and some six months before the simulation starts, the last of the region's remaining villagers were forcibly removed from their decrepit homes and sent to the Batumi Camp, in light of some reported cases of water-borne communicable illnesses.

The Batumi Camp was quickly established by the Gorgovian Prime Ministry for Disaster and Emergency Management, to provide a safe shelter to those fleeing the flood, famine and diseases. Residents of the Camp had little access to clean water and adequate sanitary facilities, and were subjected to constant power outages, cold shelters, scarce food, and inadequate medical resources. Additionally, Camp residents were unable to work and earn a living, unable to exercise their religious freedom or send their children to school, and soon tensions arose among the residents.

Simulation participants assume the roles of new leadership of the Camp, and they were asked to manage the insufficient and failing infrastructure and ease the tensions to ensure the wellbeing of its residents for the unforeseeable future, until the residents are able to return to their homes.

Conclusion

We are now in the third year of development of the Crisis Simulation as a major feature of the LEAD Program. Our initial assessment of the event through surveys and focus groups (the details of which will be discussed during the conference presentation) suggests that we are providing our students with a realistic and challenging environment in which they can enhance both their problem solving and interpersonal skills. We plan to present at ASEE 2016 excerpts from the assessment survey we ask each student to complete following the event, as well as some insights obtained from follow-up focus group discussions. In this way, we hope to share our work with conference attendees and to find partners for further development of our model.

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Appendix A: Example Introduction Script for the 2015 Crisis Simulation

2015 Crisis Simulation Exercise Introductory Script [This script is read by (facilitator) to the Crisis Simulation students]

Ladies and gentlemen, welcome to the 2015 Crisis Simulation Exercise. This evening you are assuming the roles of various staff members and medical personnel of the Memorial Hospital in New Orleans, Louisiana. The day is Monday, August 29th, 2005, and Hurricane Katrina has just destroyed the levees that were meant to protect the city and its inhabitants from disastrous flood waters. You have been left in the hospital to care for 150 patients.

Roles

Everybody in the group will be randomly assigned a certain role. Once you get your role, you must stay in it for the duration of the simulation.

The available roles are as follow:

- One member of the group represents the hospital's CEO
- One member of the group represents the hospital's Public Relations Officer
- One member of the group represents the Executive Director of Administration & Staff
- Two or more members of the group represent the doctors
- Two or more members of the group represent nurses
- One member of the group represents the food service staff
- One member of the group represents the hospital maintenance staff
- One member of the group represents the hospital security staff

Typical responsibilities associated with these roles are as follow:

- The hospital's CEO is responsible for the management and continuous operation of the hospital. S/he works for the company that owns the hospital and is responsible for communicating all business activities to the owner company and the Board of Directors.
- The hospital's Public Relations Officer is responsible for communicating and promoting the activities of the hospital with the outside world. S/he reports directly to the CEO.
- The hospital's Executive Director of Administration & Staff is responsible for managing the medical, administrative and support staff. S/he reports directly to the CEO.
- The doctors are responsible for maintaining the wellbeing of their patients. They report to the Executive Director of Administration & Staff, but they have the right to make ultimate calls when it comes to the wellbeing of their patients.
- The nurses are responsible for maintain the wellbeing of their patients while they are not under the direct supervision of a doctor. They keep patients' records, perform non-critical medical tasks, and ensure that proper non-medical care is given to patients (i.e., nourishment, hygiene). Nurses report directly to doctors.

- The food service staff is responsible for maintaining adequate food supplies, and for preparing and delivering food to patients and medical and administrative staff.
- The hospital maintenance staff is responsible for maintaining a clean and safe environment inside the hospital, and for maintaining the smooth functioning of the hospital's support systems: electric, water and gas services.
- The hospital security staff is responsible for maintaining security inside and around the hospital.

Note that the actions that you take during the simulation should not be limited only to these prescribed roles, and we encourage you to think outside of the box!

Your situation

Tonight you will be portraying the staff of Memorial Hospital in New Orleans, Louisiana. Your simulation will span the five days during and after Hurricane Katrina. Hurricane Katrina was the costliest and one of the deadliest hurricanes to ever hit United States. It caused severe destruction along the Gulf coast from Florida to Texas, and had a devastating impact on New Orleans. Approximately 80% of the city flooded when the levee system failed, pushing tens of thousands from their homes forever, and killing many in the process.

Memorial Hospital was affected as well, and tonight you will get a sense for what it was like to be responsible for stranded patients during a natural disaster. While the simulation experience will introduce you to many scenarios that were experienced by the hospital staff and patients over a period of five days, these experiences have been compressed into a single simulation. Please note that if at any point in time you start feeling ill due to the changes in the simulation environment conditions, please tell one of your facilitators.

Appendix B: Example patient records for the 2015 crisis simulation

	NAME: KEVIN CHO AGE: 35 SEX: MALE ETHNICITY: ASIAN WEIGHT: 165 FLOOR: 1		NAME: STACEY PARKS AGE: 30 SEX: FEMALE ETHNICITY: BLACK WEIGHT: 135 FLOOR: 2
CONDITION: CONCUSSION		CONDITION: PREGNANT	
LIFE SUPPORT: NO		LIFE SUPPORT: NO	
MOBILITY: WALK		MOBILITY: WALK	
PATIENT ID NUMBER		PATIENT ID NUMBER	
	27		105
	NAME: COREY FERGUSON AGE: 45 SEX: MALE ETHNICITY: BLACK WEIGHT: 175 FLOOR: 1		NAME: BETSY INGRAM AGE: 40 SEX: FEMALE ETHNICITY: WHITE WEIGHT: 145 FLOOR: 1
CONDITION: BROKEN ARM		CONDITION: BROKEN LEG	
LIFE SUPPORT: NO		LIFE SUPPORT: NO	
MOBILITY: WALK		MOBILITY: CRUTCHES	
PATIENT ID NUMBER		PATIENT ID NUMBER	
	40		66
	NAME: TIM GIBSON AGE: 55 SEX: MALE ETHNICITY: BLACK WEIGHT: 180 FLOOR: 1		NAME: ALANIS HERNANDEZ AGE: 50 SEX: FEMALE ETHNICITY: HISPANIC WEIGHT: 150 FLOOR: 2
CONDITION: BACK PAIN		CONDITION: PNEUMONIA	
LIFE SUPPORT: NO		LIFE SUPPORT: NO	
MOBILITY: WHEEL CHAIR		MOBILITY: BED	
PATIENT ID NUMBER		PATIENT ID NUMBER	
	52		62

Appendix C: Evacuation rules for the 2015 crisis simulation

The following rules will apply for evacuation procedures:

Patient condition	Base time to move one patient one floor up or down (compressed simulation time, not real time)
Walking	10 seconds
Crutches or wheelchair	20 seconds
Bed-ridden	40 seconds
NICU baby	40 seconds

Additional time will be added to the base time in the following cases:

1. Additional 20 seconds per floor will be added to any patient whose medical records suggest s/he is on life support.
2. Additional 10 seconds per floor will be added to any patient who weights over 300 pounds.

Appendix D: Example of simulated scenarios for the 2015 crisis simulation

EVENT
Introduction
MESSAGE "Video 1"; lights out after video
MESSAGE "The basement floor of the hospital is flooded and at least one backup generator is dead. You have enough fuel to power that generator for 48 hours, if you use only the most critical machines continuously. The hospital is notorious for having poor cellular coverage, and land phone lines are down due to power loss. 1st floor patients have been relocated to the second floor."
MESSAGE "An emergency box is in corner of the room for you to use"
MESSAGE "Patient records are in the FedEx envelope in the emergency box"
MESSAGE " Memorial hospital currently has enough food and potable water for 2 days. Your patients are complaining about the heat and humidity. "
MESSAGE "Start thinking about evacuating patients, hospital administration will contact you on channel 4"
MESSAGE "Roads are completely impassable. Evacuations will either be by boat from the first floor or by helicopter on the roof helipad"
MESSAGE "_ and _ have died due to their condition"
MESSAGE "Evacuation has been approved, stand by for further guidance on evacuations"
MESSAGE "You are now in day 2. An unpleasant odor is starting to spread around the hospital due to the fact that the A/C is down, and bathrooms are starting to overflow. With no re Fridgeration, the bodies of the dead patients will start to decompose soon."

Appendix E: Reflection Questions for the 2014 and 2015 Crisis Simulations

2014 reflection questions:

1. What internal organizational structure, if any did you establish, or develop, over the course of the exercise? Did you find this effective, why, or why not? What about the way you organized yourselves would you sustain for any future leadership requirements, what would you change, why?
2. What was the first decision that you had to make collectively as a group? Did you have a deliberate decision making process? Should you have? Was the method you used effective? What would you do the same or differently, and why?
3. How did you organize your community service leaders to gather and track information? Was this effective? What would you do the same or differently, and why?
4. How did you keep track of the assets you had available? Was this effective? What would you do the same or differently, and why?
5. How did you prioritize your requirements? Was this effective? What were points of contention in prioritizing resources? What would you do the same or differently, and why?
6. Did you consider how your actions might affect the adjacent communities? Did you consider asking adjacent communities for assistance? Did you consider offering assistance to adjacent communities?
7. What aspect of the exercise did you find the most challenging, and why? Based on your experience in the exercise, what actions would you sustain as a leader, what would you change, how and why?
8. What skills did you employ that you have already? What skills do you wish you had to be more effective?
9. Did you function as a team? Did you leverage the skills / knowledge / motivation of the people on this ad-hoc team? Was this a one (or a few) person show?

2015 reflection questions:

1. Over the course of this simulation did you change your internal organizational structure to adapt to the changing environment and to respond to the changing needs of your patients? Did you find that your roles and defined responsibilities constrained your involvement in the simulation? Did you consider taking on additional responsibilities that were outside of your regular job description to help deal with the situation?

2. What was the first decision that you had to make collectively as a group? Did you have a deliberate decision making process? Should you have? Was the method you used effective? What would you do the same or differently, and why?
3. How did you organize yourselves to gather and track information? Was this effective? What would you do the same or differently, and why?
4. Did you have an efficient way of tracking the movement and wellbeing of your patients? Who kept track of this?
5. Did you consider what to do with the patients who passed away before you were able to evacuate them? Did you consider the possible health issues that others in the hospital would be exposed to in the presence of decomposing bodies?
6. Did you find yourself facing some challenging ethical dilemmas?
7. Did you consider how your actions might affect the patients and their families?
8. What aspect of the exercise did you find the most challenging, and why? Based on your experience in the exercise, what actions would you sustain as a leader, what would you change, how and why?
9. What skills did you employ that you have already? What skills do you wish you had to be more effective?
10. Did you function as a team? Did you leverage the skills / knowledge / motivation of the people on this ad-hoc team? Was this a one (or a few) person show?
11. Can you envision a situation in your future line of work where you might have to manage a crisis, or decide how to allocate limited resources?