Crisis SimEx's & Escape Rooms

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1. *SimEx's*
2. *Escape Rooms*
3. *Comparisons*
4. *Applications*

What's the "Why?"

Creating engaging and immersive simulations for disaster response will help create the "muscle memory" needed for effective organizing and problem-solving in the midst of disasters and crisis response.

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Simulation Exercise (SimEx)

"A simulation exercise is a <u>fully simulated, interactive exercise</u> that tests the capability of an organization or other entity to respond to a <u>simulated emergency, disaster or crisis situation</u>. Simulation exercises are normally run as field exercises and <u>include a scenario</u> that is as close to reality as possible. The scenario takes place in real-time, and requires a variety of resources to operate – both human and material."
--WHO

Simulation Exercises

Have been around many years.

- In medicine, "Full-body mannequin simulators originated in the field of anesthesia in the late 1960s, based on work done by Denson and Abrahamson from the University of Southern California." –Lateef (2010)

Began with the military

- Frederick the Great, King of Prussia from 1740 to 1786, Kabinettskriege (Cabinet wars), the rehearsed army
- Prussian army game "Kriegspiel, which was invented around 1811"

Nonprofit relief groups run SimEx's annually

- UN ETC (WFP) A full-scale exercise run annually since 2012; now an intensive 8-day field exercise
- NetHope (to follow…)

As does UM

- Crisis Challenge, Sanger Leadership Center since (at least) 2018

NetHope SimEx Training

- ➢ **Since 2017: Panama, Philippines and CA, USA this summer**
- ➢ **5-day training course including a 48-hour SimEx**
- ➢ **Run by NetHope with Cisco TacOps, Ericsson response**
- ➢ **Attendees from NetHope members and tech co's. including Google, Facebook, Amazon (AWS)**
- ➢ **The Emergency Response Simulation Exercise (SimEx Lite TTX) was run by Save the Children International at the 2017 NetHope Summit in early November, 2017, in Vancouver, Canada.**

Military Simulation Exercises

Operational Realism ← | → **Increased Abstraction**

| Major Field Exercises | Minor Field Exercises | Map Exercises | War Games | Computer Simulations | Analytical Models |

Increased Cost ← | → **Convenience and Accessibility**

Taylor (1983)

US Government Training (Dept. of Homeland Security)

Two categories and seven types of exercises:

Discussion-Based Exercises

1. Seminars
2. Workshops
3. Tabletop Exercises
4. Games

Operations-Based Exercises

5. Drills (e.g., fire drill)
6. Functional Exercises (aka Simulation Exercise)
7. Full-scale Exercises

--Homeland Security Exercise and Evaluation Program, April 2013, pp. 2.4-2.6

"Simulated crisis and disaster scenarios are frequently cited as effective learning tools because they offer the only <u>ethical means</u> by which organisations can expose decision-makers to critical situations."

--van Haperen (2001)

SI-537 Crisis Informatics

Hybrid table-top and functional exercise

- A paper-based situation awareness and communications-loop exercise
- In the midst of a stressful, chaotic environment
- With the clock ticking

The Crisis Informatics Immersion Lab has been run 10 times in 2017-2019

https://interactions.acm.org/archive/view/may-june-2018/the-connectivity-lab-umsi

The Crisis Lab Scenario

And multiple events (injects) happen during the scenario (e.g., injuries)

Your nonprofit group is in a safe house at the edge of a conflict zone in a country torn by civil war. Things have been quiet for a few days until this evening, when mortar fire (shelling) began that resulted in the exit routes from the house being blocked, and the house caught in cross-fire.

Communications and power have been cut-off. There is no radio, TV or other communications device in the house other than cell phones, which are not working. … You need to account for each member of your team, check for injuries, and assess your situation. You need to find out what is going on and what the news and forecasts are. A major storm is coming that will likely suppress the immediate conflict. You need to get information quickly, get it out to your regional headquarters and get instructions for what to do next. You have 50 minutes to complete the (a 12-question situation awareness) exercise.

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Our data is sketchy, but improving

SI-537 Immersion Lab
Completion Times
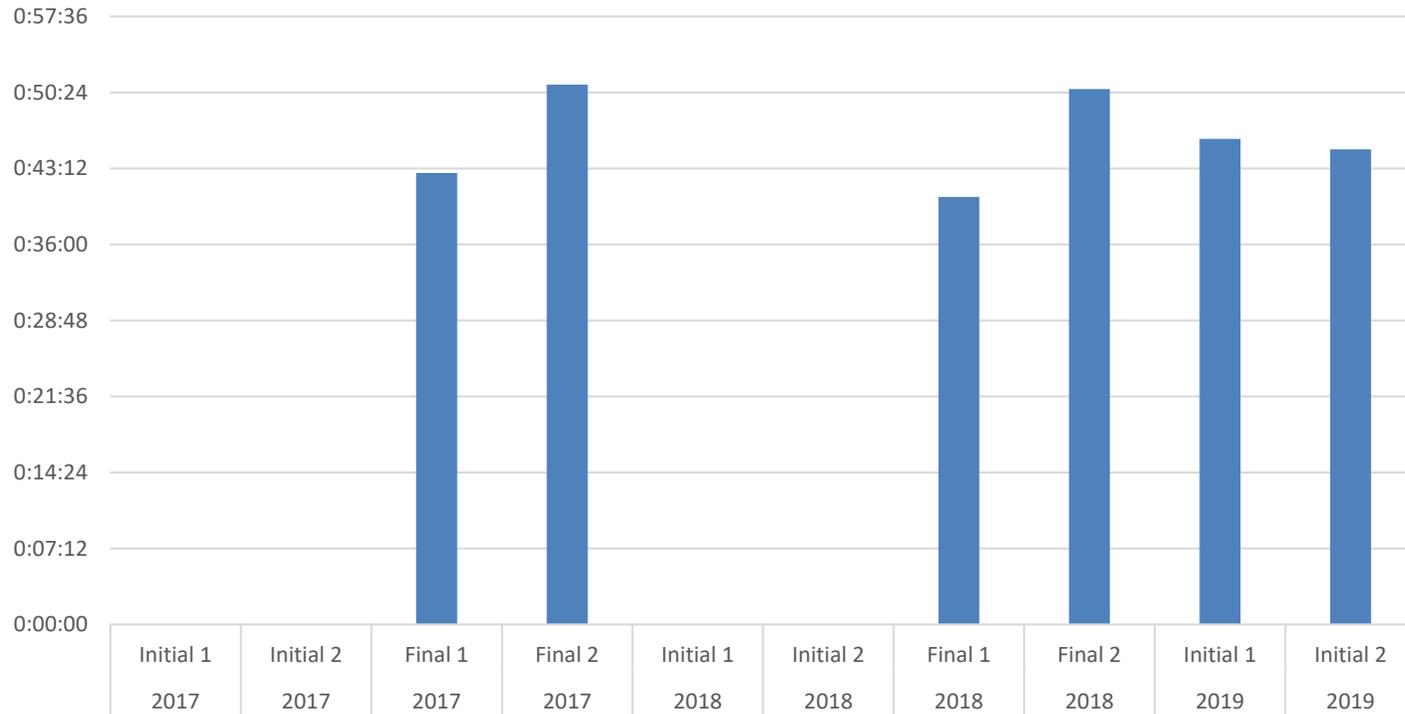
Question for the day

Was our Crisis Informatics SimEx analogous to an Escape Room game … problem-solving to complete a communications loop under a chaotic, time-constrained scenario, with an escape from danger?

Escape Rooms

Origin of Escape Rooms

"The original concept of Escape Games comes from video games called 'Escape Rooms' or 'Escape Games'. Players of those games had to solve mysteries by interacting with characters around them in order to escape from the room and move onto the next level. The first Escape Game video game, Crimson Room, was created in **2004** by Toshimitsu Takagi…

The Japanese company SCRAP first transformed the concept in **2007** into a Live Escape Rooms. Its founder, **Takao Kato, wanted players to be immersed in the game.** Player would physically play in a themed room and solve mysteries to escape within the allotted time."

–Lock Academy

There are over 1,900 escape rooms today, including 3 in the Ann Arbor area

"Unlike other forms of games where the player controls an avatar [such as Voki or Minecraft], escape rooms place the player directly into the game," said <u>Scott Nicholson</u>, a professor of game design and development at Wilfrid Laurier University in Ontario, Canada. "Because of that, the effects of experiential learning can be more effective, as there are fewer barriers between the player and the experience."
--The Atlantic (Jul 28, 2016)

Collaborative Problem Solving

"Escape games are cooperative games, so the **players work together to win or lose as a team**. Having a shared environment in which players are working together on a game designed around specific learning outcomes sets the groundwork for active learning and social constructivism. The team of players takes the prompts and artifacts and brings them to life by engaging with them and with each other to explore a narrative-driven challenge."

--Nicholson, S. (2018). "Creating engaging escape rooms for the classroom," *Childhood Education* 94(1). 44-49

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A Personal Journey
or what I did with my summer break

I attended two escape rooms this summer:

1. **Kinmen National Park on the Taiwan island of Lieh-Yu offers an escape room experience for free, but an advance reservation is required. It is located in Nanshantou District at an old military base. We reserved the 10am spot for two people on June 18, 2019. For more info, see translate in Chrome, here: https://kinmen.travel/zh-tw/travel/attraction/1665**

2. **Rec Escape in Seoul, So. Korea, provides themed based escape room experiences. Cost is $23,000 won per person (about $20 US). Each game can house 2-6 people. On July 7, 2019 we reserved for 5 people for the Sherlock: The Professor's Secret room. For info see https://www.rec-escape.com/rooms**

The Two Contexts

Kinman, Taiwan

Map card provided. Note the 8 rooms, final room (top left) and starting lobby (top center)

Seoul, So. Korea

With our hostmaster, Yong Wei Feng (on the Left) and our Korean friends

A Comparison

Looked at 24 categories like context, objectives, physical layout, team size, roles and time constraint.

A sample from the 46 row spreadsheet

N	Category	Taiwan Escape Room	Seoul Escape Room	NetHope SimEx	Crisis Immersion Lab
1a	Date	June 18, 2019	July 7, 2019	October 27, 2017	September 10, 2019
1b	Group size	2 Americans	5 (3 Korean and 2 American)	12 NGO members	2 teams of 9 students each
1c	Website	https://kinmen.travel/zh-tw/travel/attraction/1665	https://www.rec-escape.com/rooms	N/A	https://interactions.acm.org/archive/view/may-june-2018/the-connectivity-lab-umsi
1	Exercise Context	Presumed military defense stronghold; There was no overall context scenario.	Sherlock: The Professor's Secret; the professors study and secret side room. The overall context/scenario was finding out how the professor exited and returned to the study without being detected.	A major earthquake in Central Asia. Power, communications, and logistics have been impacted.	Safe house in civil war country, with remote regional headquarters; power and communications knocked out.
2	Language context	Mandarin	Korean & English	English	English
3	Objective	Solve problems to unlock the final room.	We were given 60 minutes to solve the problems and escape through the final locked door in the hidden room (see below).	Develop a procurement plan and budget to fulfill IT, energy and communications infrastructure for response.	Overcome ICT constraints and complete communication "round trip" with HQ and "escape" from safe house.
4	Physical layout/constraints	The only constraints were the rooms and tunnels; the rooms were connected by narrow underground tunnels and were clearly numbered; lighting and handrails provided.	Two rooms separated by a hidden, locked door; The first room was obviously the professor's study/library, with a desk, table, bookcase and other items.	This was a desktop exercise in a conference room with teams split among the tables in the room; For the budget exercise, a ceiling amount was not provided, but the size of an NGO and its donor base is a real constraint	Two rooms separated by halls and floors; safe house room and no lights, plus loud battle movie scenes projected on the wall.

A Comparison

Points in common

- ✓ Each had a context that required some imagination
- ✓ Each had a goal or objective
- ✓ Most used rooms
- ✓ There were no roles indicated
- ✓ Instructions were provided
- ✓ Each had problems to solve
- ✓ All were for similar timeframes
- ✓ All had initial instructions
- ✓ Each had administrator(s)
- ✓ Each had a final step (solution)
- ✓ Each had to keep careful track of time (prime source of stress)

Escape Room Differences

- ➤ Smaller sized teams
- ➤ Escape room problems were mostly cumulative numeric or physical keys
- ➤ Escape rooms provided means to get hints
- ➤ Escape rooms uncovered useful info along the way
- ➤ Escape rooms do not have injects
- ➤ Escape rooms provided for communication (hints) with Admin
- ➤ Escape rooms have far more tools useful for the exercise
- ➤ The problem solving sequence for escape rooms was more fluid
- ➤ Escape rooms are harder to complete

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Lessons for the Immersion Lab

➢ **The reentry to (or exit from) the Safe House could be analogous to a final door-lock solution and exit**

➢ **The concept of acquiring solutions as you go is an interesting aspect of problem solving: acquiring pieces of knowledge, like reconnaissance, to be assembled and can be acted on.**

➢ **Having incomplete information fails to solve the problem.**

➢ **Acquiring equipment as you go is another interesting possibility.**

➢ **Selected equipment and supplies could also be an inject.**

➢ **Providing an annotated map is an important tool.**

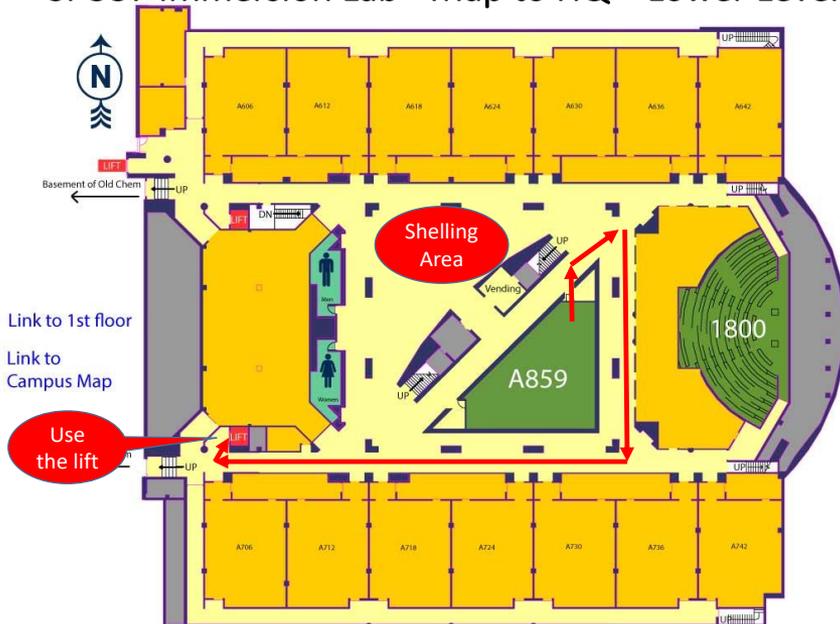➢ **Listening to team mates is important. (Teamwork)**

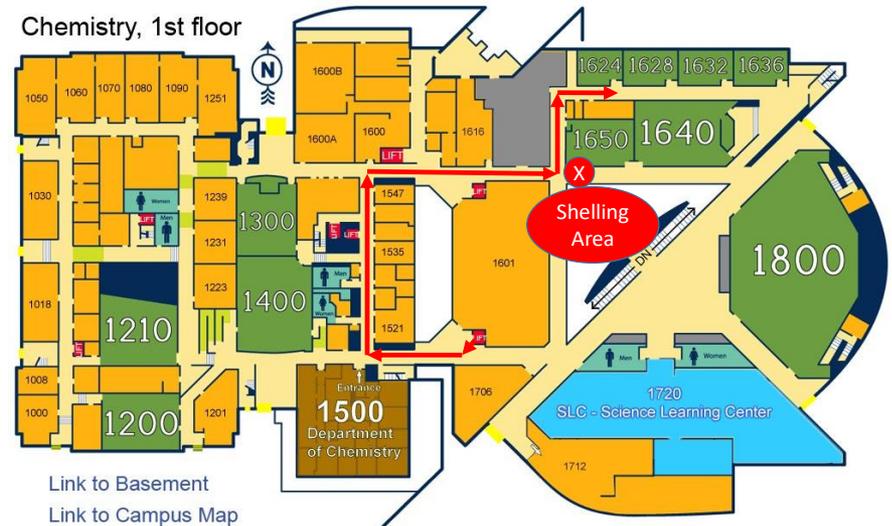# Changes made to the SI-537 SimEx

For the Sept. 10, 2019 lab:

➤ **Added annotated map for floors and rooms**

➤ **Added an "escape" from safe house final step (annotate supplies)**

The escape step proved more difficult than expected (it "could not have been that simple")

SI-537 Immersion Lab - Map to HQ – Lower Level

Immersion Lab - Map to HQ – FL1

Pros and Cons of an Escape SimEx

Pros

1. It's immersive
2. Hands-on (builds muscle memory)
3. Problem-solving under constraints (e.g., time)
4. Try alternate solutions (and scenarios) in a safe environment

Cons

1. Risk of focusing on the game (a disaster is not a game)
2. Problem solving in a crisis is not about open combination locks (but may be about escaping)

Next Steps

1. **An AR/VR simulation (M-Cubed project and CHI paper)**
2. **Contact Prof. Nicholson to compare notes**
3. **Continue to experiment with adding "escape room" elements into the SI-537 crisis lab exercise**
4. **Work with a local escape room and its designer to create a disaster scenario at their location (an extra-credit project in SI-537)**

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Questions and Comments?

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Appendix – Additional Slides

"A Simulation Exercise or SimEx is a fictional disaster event created with the purpose of testing the plans and procedures that would come into affect during a real emergency, helping to identify strengths and weaknesses… simulations are a highly effective training and educational tool that develop skills and deepen people's understanding of disaster response through practical experience."

--ReliefWeb (2014)

FEMA CERT Training

CERT = Community Emergency Response Team

"…educates volunteers about disaster preparedness for the hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations."

FEMA/CERT offers training material for:

- 4 Full-scale exercises
- 4 Functional exercises
- 6 Tabletop exercises

UN ETC OpEx Bravo

A full-scale exercise

Run annually since 2012

Now an intensive 8-day field exercise

"Opex Bravo: The goal of this operational exercise is to give solid, hands-on field experience to IT technicians and team leaders in a complex, high-pressure environment. Participants will work in teams to deploy ICT services and equipment under challenging conditions and timeframes. This exercise allows participants to gain practical experience with the technical solutions adopted by the ETC for emergency response. The scenarios cover IT and telecoms skillsets, including satellite connectivity, networking, VHF radio, and drone operations" *–ETC Cluster*

Next Steps

<u>M-Cubed Project: Augmented Reality Crisis Simulation & Triage</u>

The goal of this project is to design and evaluate augmented reality interfaces for crisis simulation and triage applications. …The current immersion lab is representative of the kinds of augmented reality interfaces this project seeks to investigate… The project …seeks to develop and assess a variety of augmented reality interfaces, ranging from simulations of personal crises such as a major accident, to recent international crisis-disaster response, such as the …Nepal earthquake. The project will create an augmented reality interface platform to support not only courses in need on campus, but also research experiments and user studies around augmented and mixed reality interfaces based on the concept of serious games. The platform will implement a set of interaction tracking techniques and metrics to measure user experience and produce analytics and visualizations to assess both system and user performance.

Hopes & Fears for an AR/VR SimEx

My hopes for AR/VR include

1. Gaining mobility for the immersion lab to take to a greater variety of organizations rather than have them come to us
2. Gain a platform that allows an administrator to design or choose a scenario, choose a context, injects, and timeframe.
3. For a single administrator to run the lab rather than 2-3 people
4. To allow a single ("player") to participate with a virtual group
5. To be able to model communications contexts of disaster

My fears include

1. That the technology increases participant frustrations; i.e., the tech gets in the way
2. That improvisation results in abandoning the headsets
3. That simulating or allowing group dynamics (e.g. self-organizing behavior) becomes difficult if not impossible

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