

# Moving Disaster Management Education Beyond the Classroom through Local Collaboration

Qingyu Meng

University of Georgia Institute of Disaster Management

## ABSTRACT

Qingyu (Jason) Meng is a senior at the University of Georgia studying Risk Management and Insurance and serves as a firefighter and Emergency Services Captain in Oglethorpe County, Georgia. Recognizing the need for collaboration between academia and local government in disaster management, Jason initiated a partnership between a researcher at UGA's Institute of Disaster Management, Dr. Michelle Ritchie, and Oglethorpe County. This collaboration led to several novel initiatives, including the development and conduction of (1) a training on active shooter prevention and response tailored for a nursing home, (2) interactive emergency and disaster management field days for student learning, and (3) a county-led search and rescue exercise featuring the use of drones. All three case studies garnered positive feedback and stakeholder interest. Ultimately, we emphasize the importance of collaboration in disaster management, including through experiential learning in higher education. Indeed, undergraduate students can be powerful actors by participating in disaster risk reduction activities like disaster preparedness education and training. Looking ahead, we see the potential for further collaboration to enhance emergency and disaster management in higher education and professional practice.

## 1. Introduction and Background

This paper highlights the importance of collaboration between higher education and professional practice in emergency and disaster management. We begin by reviewing the state of disaster management and higher education. Then, we present three case studies developed and implemented by the authors that leverage collaboration with local government actors.

### 1.1 Disaster management and higher education

Disaster management aims to save lives and property through risk reduction efforts, including mitigation, planning, preparedness, response, recovery, and adaptation. National frameworks exist for many risk reduction efforts, e.g., the National Mitigation Framework (FEMA, 2016). Alongside these frameworks, the National Incident Management System (NIMS) is a leading approach to emergency and disaster management in the United States (Federal Emergency Management Agency, 2017). The primary management structure within NIMS is the incident command system (ICS) (Perry, 2003). ICS is an on-scene, scalable, standardized approach “for marshaling pre-identified and pre-assembled resources to respond to an emergency or disaster” (Perry, 2003, pp. 405; Schulz, 2021). Together, these and other frameworks guide emergency and disaster management in the United States, particularly within professional practice.

Similar frameworks for guiding disaster education remain lacking. Despite this, the need for disaster education is a focus within the literature on emergency and disaster management. Within higher education, disaster management stands alone as a modest discipline (Andharia, 2020; Staupe-Delgado, Abdel-Fattah, & Pursiainen, 2022; Urby & McEntire, 2015). It has been incorporated into studies in health and medicine (Math, et al., 2015; Ruzek, et al., 2004), built and urban environments (Malalgoda, et al., 2015; Rai, Singh, & Mishra, 2021), veterinary studies

(Heath, 2003; Shreve, Davis, & Fordham, 2016), and other related disciplines, highlighting the interdisciplinary nature of disaster management. Despite this interdisciplinarity, to our knowledge, a comprehensive review of how actors in higher education can collaborate with local governments, businesses, and non-profits in the United States remains to be seen.

The Hyogo Framework for Action 2005-2015 formally acknowledged the need for disaster education, identifying "education, training, and capacity building" as one of their critical pillars (United Nations Specialized Conferences, 2005). The Sendai Framework for Disaster Risk Reduction 2015-2030 (United Nations, 2015) reiterated this need, calling for educational measures to, for example, prevent exposure to hazards and enhance preparedness for response and recovery. Peer-reviewed studies have also called for more disaster education (Johnson, 2011; Phillips, 2005), particularly those designed with active and critical reflection (i.e., reflexivity) in mind (Phillips, 2005). Indeed, "disaster education is a functional, operational, and cost-effective tool for risk management" (Torani, et al., 2019).

Globally, there are dozens of higher education programs in emergency and disaster management and related fields (e.g., crisis management and homeland security studies). Within IHEs, EDM programs are found across diverse colleges, including continuing education and professional studies, public health and services, and public and international affairs, among others, further highlighting disaster management's interdisciplinary nature.

To our knowledge, only one study has attempted to review these programs within the context of the United States (Phillips, 2005). This knowledge gap again leaves questions about how higher education actors can support local emergency and disaster management efforts, such as through disaster education and preparedness training. Specifically, we argue that more research, applied projects, and collaborations are needed that pair actors in higher education (e.g., researchers, students) with actors at local institutions (e.g., governments, non-profits).

## 1.2 Author positionalities and project motivation

As of this writing, Jason Meng is a University of Georgia (UGA) senior studying risk management and insurance at the Terry College of Business and disaster management at the Institute of Disaster Management. While at UGA, Jason has served as a firefighter and Emergency Services Captain in the Emergency Management Agency (EMA) of Oglethorpe County, Georgia. Due to these engagements, Jason sought to couple disaster management studies and theory with practice and application during his time at UGA and beyond.

Also at the time of this writing, Michelle Ritchie is an assistant professor at the UGA IDM. She first met Jason in 2022 when he was a student in her undergraduate class, "How to Survive the Apocalypse." Jason then enrolled in her second undergraduate class, "Disasters and Society," and took a series of directed study courses, "Faculty-Mentored Undergraduate Research I" and "Faculty-Mentored Undergraduate Research II."

Jason and Michelle established a rapport through these courses, and a collaboration was born between the IDM and Oglethorpe County. To further this collaboration, in September 2022, Oglethorpe County EMA and Emergency Medical Services (EMS) leaders visited the UGA IDM for a tour with Dr. Ritchie, affirming mutual trust and a commitment to initiating impactful applied projects using shared expertise and resources.

## 2. Case Study Applications

We implemented three unique case studies based on the need for more disaster education and collaboration between academia and local institutions. Each case study highlights a novel approach to experiential education for upper-level undergraduates that advances local emergency and disaster management. Namely, case study one focuses on a training session about active shooter event mitigation, preparedness, and response at a long-term care facility. Case study two focuses on a series of hands-on undergraduate field days in emergency and disaster management. Case study three focuses on using drones to inform county search and rescue efforts. We hope these case studies inspire other disaster

management educators to implement similar initiatives at their institutions of higher education to make positive local impacts and inform local collaborations that reach beyond academia.

## 2.1 Case study one: mitigation, preparedness, and response for active shooter events in long-term care facilities

In October 2022, we hosted an approximately one-hour training session with staff members at a long-term care facility for the aging in the Crawford, Georgia, area to enhance emergency preparedness. This training session was led by then-graduate student James Dean (J.D.) Bryan, who now serves at UGA Police, and Jason Meng. Although it is typically a duty of law enforcement to conduct this training, this particular facility was uncomfortable with police presence. Therefore, the Oglethorpe County EMA took responsibility for the exercise in collaboration with UGA IDM. Considering these hesitations, before developing any plans or materials for the training session, the team had multiple extensive discussions about cultural competence in disaster management, thus hopefully improving the experience for participants while increasing empathy and following best practices in ethical conduct (Knox & Haupt, 2015; Wu, et al., 2022).

On the day of the training session, first, a forty-minute lecture covered what to do during an active shooter event. J.D. presented the concept of Run, Hide, Fight, and discussed the ethical issues of using this framework in a long-term care facility (McKenzie, et al., 2020). He also presented site-specific solutions identified on the day of the training session. For example, J.D. reviewed how to barricade doors and lock door spring mechanisms. Following the lecture, a twenty-minute conversation was had among the participants and the presenters to digest and discuss the material presented. Based on informal feedback from facility participants, the event was a success, and they would like to continue collaborations.

## 2.2 Case study two: undergraduate field day in emergency and disaster management

In March 2023 and February 2024, we hosted an interactive field day for approximately three hours in the spring semesters. The event was required for students in the undergraduate “Disaster Policy” course offered by the IDM, and it was open for anyone associated with the IDM to attend. During the field day, attendees (n=25) watched a presentation. Accompanied by a slideshow, the one-hour presentation reviewed the roles of the Oglethorpe County Emergency EMA and EMS, the UGA IDM, and the UGA Police, as well as the presenter’s paths to their current positions at these institutions. Following this, they engaged in a forty-minute question-and-answer with two Command Staff members of Oglethorpe County, one UGA IDM faculty, and one UGA Police officer.

Then, after a twenty-minute break, students engaged in a one-hour, outdoor, guided demonstration with Oglethorpe County EMS’s fire truck, ambulance, and emergency equipment. Students spent 20 minutes at three stations, respectively. They rotated through the three stations in small groups of fewer than ten students to encourage more meaningful small-group discussions. At the first station, while gathered inside a fully-equipped ambulance, the Oglethorpe County EMS Director spoke to students about continuity of care from a prehospital setting to the emergency room of a receiving hospital. At the second station, the Oglethorpe County EMA Director spoke to students about various emergency tools, including apparatuses for extrication and breathing, as well as the other capabilities of their fire trucks. At the third station, Jason Meng spoke to students about various emergency equipment, including helmets and firefighting suits, which the students then tried on (see Figure 1). He also spoke about the role of an incident commander in stabilizing an incident.



**Figure 1.** A photograph featuring Cooper Furman (left), a student in the undergraduate course Disaster Policy offered by the IDM, trying on a firefighting suit and helmet (Photo Credit: Erin Mumper, 2024).

Attendees ( $n=25$ ) found the event successful based on feedback gathered informally in person and through an anonymous survey ( $n=5$ ). For example, one student wrote, “I loved it, I had a lot of fun and it was informative” (student 1). Other students agreed, stating it was “very informative” (student 2) and “super fun and informational” (student 3). Based on the success of the field days, we aim to make this an annual event. The field days ultimately introduced emergency and disaster management careers, taking student learning beyond the classroom through hands-on instruction and demonstration. This is important because the literature shows that active learning, such as field days, can improve student success outcomes (Weimer, 2017). Indeed, the hands-on disaster management field day emphasized concepts learned through in-class readings and discussions, reinforcing course learning objectives and disaster management core competencies (Subbarao, 2008).

### 2.3 Case study three: using drones to inform search and rescue efforts

Studies show that drones (i.e., unmanned aerial vehicles or UAVs) are valuable tools for disaster management practices, including search and rescue operations (Ajith & Jolly, 2021; Yeong, King, & Dol, 2015), because they can enhance “mission success rates, augmenting situational awareness, and facilitating efficient and effective SAR activities” (Lyu, et al., 2023, pp. 1). For example, UAVs can reach areas of challenging terrain (Silvagni, et al., 2017), and artificial intelligence and deep machine learning can aid in image analysis (Claesson, et al., 2020; Dong, Ota, & Dong, 2021). Still, relatively little data exists on using drones for survivor and victim identification (Albanese, Sciancalepore, & Costa-Pérez, 2021; Daud, et al., 2022; Yamazaki, 2019).



To contribute to the literature, in May 2024, we conducted a search and rescue training exercise with the help of drone technology. This exercise mimicked a missing person scenario in which an elderly man goes for a walk and fails to return home. The missing person’s family calls 911, initiating a search and rescue operation. As part of the response, the incident command requests a drone to cover rugged terrain and conserve personnel. The exercise scenario was led by the Oglethorpe County EMA. Members of the Oglethorpe County Community Emergency Response Team, Emergency Management Services, and other community stakeholders were also in attendance.

The day before the exercise, the planning team met at the field site in Crawford, Georgia, to practice flying the drone and to gain familiarity with the physical area. On the day of the exercise, Dr. Michelle Ritchie first orally presented an overview of the use of drone technology in emergency and disaster management. This included basics about drone use for conducting efficient and effective search and rescue operations, enhancing situational awareness, and identifying victims, as well as an overview of how to read a navigational Sectional Aeronautical Chart (U.S. Coast And Geodetic Survey, 2023) and how to become certified to remotely operate a drone under the Federal Aviation Administration’s Part 107 (Small Unmanned Aircraft Systems, 2015). During the exercise, she introduced two drones to the participants, a DJI Mini 3 Pro and a DJI Phantom. However, due to poor visibility and rainy weather conditions, flight time was limited.

Pre- and post-exercise surveys were given to the participants before and after the exercise, respectively, to determine differences in their understanding of drone technologies and how they can inform disaster management (n=5). Survey responses were cleaned and analyzed in the statistical software R (2021) using descriptive statistics and a repeated measures *t*-test, which compares the mean of responses from a group of people tested at two different times (Ross, et al., 2017).

The repeated measures *t*-test null hypothesis was that pre-exercise survey responses would equal post-exercise survey responses. However, results revealed statistically significant differences in the pre- and post-exercise survey responses, indicating that participants learned much from the exercise (see Tables 1 and 2). In particular, results show that participants learned the most about the limitations and barriers to drone technology in disaster management practices. Participants also learned about the overall value of using drones in disaster management practices, including for survivor or victim identification.

**Table 1.** A table showing the results of descriptive statistics based on survey responses.

Survey Question	Pre-	Post-	Difference
1. I mostly understand the <b>value</b> of using drone technology in disaster management practices.	0.8	1.0	+0.2
2. I mostly understand the <b>limitations and barriers</b> to using drone technology in disaster management practices.	0.6	1.0	+0.4
3. I <b>have used</b> drone technologies in the past.	0.2	0.4	+0.2
4. I <b>presently use</b> drone technologies.	0.0	0.4	+0.4
5. I <b>would like to use</b> drone technologies in the future.	1.0	1.0	0.0
6. Drones can be helpful for <b>efficient and effective</b> search and rescue operations.	1.0	1.0	0.0
7. Drones can be helpful for <b>situational awareness</b> in search and rescue operations.	1.0	1.0	0.0
8. Drones can be helpful for <b>victim identification</b> in search and rescue operations.	0.8	1.0	+0.2

**Table 2.** A table showing the results (within the 95% confidence interval) of the repeated measures *t*-test based on survey responses.

<i>Pre- Mean</i>	<i>Post- Mean</i>	<i>Pre- SD</i>	<i>Post- SD</i>	<i>t</i>	<i>p</i>
0.7	0.8	0.4	0.3	3	0.021

These outcomes are important because they show that even short, guided demonstrations can significantly improve an individual’s understanding of disaster management technologies. Further, we demonstrated the potential efficacy of drones for future local search and rescue operations.

### 2.4 Limitations and Challenges

Finding time within everyone’s schedules was challenging, resulting in the events featured in the case studies occurring on weeknights and weekends. Further, each case study took substantial time and support to plan and execute, as did the writing of this manuscript. Not every student, course, or professor will have the time and capacity to implement these efforts. Further, future statistical tests should be conducted on large samples for more powerful results. There were also uncontrollable situational factors that impacted Case Study Three, namely poor weather conditions. Despite these limitations, we hope we have sufficiently highlighted the importance of collaboration for risk reduction to enhance emergency and disaster management in higher education and professional practice, such as through hands-on disaster education and training.

### 3. Conclusions

In conclusion, this project exemplifies the potential for impactful collaboration between academia and local government in emergency and disaster management. This collaboration led to several novel case studies, including conducting active shooter preparedness training for a nursing home, interactive emergency and disaster management field days, and a county-led search and rescue exercise using drones. These efforts received positive feedback and demonstrated the value of such collaborations. This project underscores the importance of integrating experiential learning in higher education and highlights how undergraduate students can significantly contribute to disaster risk reduction activities. There is vast potential for enhancing emergency and disaster management through continued collaboration between academic institutions and professional practice.

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