Mississippi Valley Technology Teacher Education Conference

The 2021 Conference is the 107th Conference

Nashville, TN

Community Resilience Engaging Advanced Training and Education programs

with Technology that Saves Lives

Session 3: Innovation Programs

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Abstract

The vision of this project is to equip underserved communities with contemporary skills for better preparedness for natural disasters and man-made disasters occurring after natural disasters (e.g., auto accidents, looting, etc.) to minimize loss of life and property; thus, building resilient communities. By taking a multi-disciplinary approach to emergency preparedness with technology being at the vanguard, this vision can come to fruition. The purpose of the **Community Resilience Engaging Advanced Training and Education (C.R.E.A.T.E)** will be to enhance the fields of Emergency Management (Technology concentration), Computer Science, Meteorology and Atmospheric Science, and Psychology so that underrepresented undergraduate minority students are highly qualified and prepared to successfully enter graduate programs and/or careers in Emergency Management with the S.T.E.M. emphasis, specifically, Emergency Management and/or Disaster Preparedness. As well as, informing and transforming the larger academic community about issues that are relevant to Emergency Management and/or Disaster Preparedness.

Keywords: Emergency Management, Emergency/Disaster Preparedness, Underserved Communities

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Introduction

Natural disasters across the nation continue to intensify at alarming rates. Life and property destroying tornados, catastrophic hurricanes, torrential flooding, blazing wildfires, and other atmospheric events poses constant threats to communities. Such natural disasters cause significant hardships, from mental and emotional trauma to financial distress. Smith (2021) from NOAA's National Centers for Environmental Information (NCEI) reported that 22 separate billion-dollar weather and climate disasters across the United States. Smith further asserted that events of 2020 included a record 7 disasters linked to tropical cyclones, 13 to severe storms, 1 to drought, and 1 to wildfires. The 22 events cost the nation a combined $95 billion in damages. In considering such impacts, some communities may struggle with their ability to bounce back from such devastation. In some southern states such as Mississippi, with a large area of rural communities, it is vital to assist in the next generation of Emergency Management specialists with diverse academic training to promote resiliency in the underserved areas.

To provide an example, research and experience have demonstrated that underserved populations suffer disproportionality during disasters. A study of 1,089 people affected by Hurricane Katrina in Louisiana, **Mississippi,** and Alabama found that 28% of those who didn't evacuate couldn't leave because of limited means, according to the nonprofit Fritz Institute (2006). Of those who couldn't evacuate, for this reason, 71% said they had nowhere else to go, 37% didn't have a car, and 36 %couldn't leave their homes without assistance. What's more, 84% of those with limited means had household incomes of less than $50,000; 58% were African American; 66% were women; 57% said their highest level of education was a high school diploma or less, and 32 percent had a physical disability. When preparing residents for disasters, officials must think not only about the different cultures within their community but also about the underserved populations. Emergency Managers and other officials have wrestled with developing relationships with these groups for decades, and it's still a challenge for many (Pittman, 2011). This directs concern on what would be ideal strategies to help such underserved communities overcome natural disasters.

Table 1: Examples of Mississippi Underserved Populations (571,000 MS below poverty)
(from U.S. News and World Report, 2018 and 2019 citations from John Mutter, author of "The Disaster Profiteers: How Natural Disasters Make the Rich Richer and the Poor Even Poorer.")

Disaster Type	Impact
Natural Disasters (various)	May not have cellphones, broadband, or regular use of technology that will keep them abreast of looming danger
Natural Disasters (various)	Cheaper houses are less safe, without the strong foundations or reinforcements that can make the difference between a blown-away home and one with some window damage.
Flood	Flood insurance must be bought separately from homeowners' insurance, not likely or able to purchase

The Ideal: Communities should be well prepared before a disaster occurs and have diverse Emergency Management professionals with multi-disciplinary academic backgrounds and skills. The Federal Emergency Management Agency's mission is to those before, during, and after disasters (www.fema.gov). According to the Mississippi Emergency Management Agency (MEMA), its mission is to safeguard Mississippi and its citizens by fostering a culture of preparedness, executing timely responses during disasters, and quickly restoring quality of life post-event (www.msema.org). As these and other emergency response organizations have been successfully fulfilling their mission, higher education academic programs and workforce development training for students would further expand the ability to build more resilient communities as they mitigate, prepare for, respond to, and recover from natural and/or man-made disasters. Therefore, the next generation of Emergency Management professionals will possess the diverse skills needed to attend to looming disasters and reflect on the various communities in which they are assisting.

The Reality: Emergency Management is a growing workforce as natural (e.g., flooding, tornados, hurricanes, and other weather and atmospheric events) and man-made (e.g., active shooters, school violence, workplace violence, terrorism, pandemics, etc.) continue to increase. Researchers Quarentelli (as cited in Philips, Neal, & Webb, 2012) suggested that with the increase of disasters and the emergence of new and more impactful disasters, there would be an increase of deaths and injuries with greater economic impacts. Disasters are found to be more impactful due to economic disparities in minority communities, therefore, it is important to promote Emergency Management Careers to people of color.

According to the Bureau of Labor Statistics (2020), employment of emergency management directors is projected to grow 6 percent from 2020 to 2030. Meanwhile, gender diversity remains an issue. There are very few women of color in emergency management positions. Furthermore, the Bureau of Labor Statistics stated that Emergency Management directors' median salary was $76,250 in May 2020. With career projections being favorable in this area, there is a demand for communities to have qualified professionals in place to help better prepare and respond to current and forth-coming disasters and further mitigate the loss of life and property. What academic and workforce development initiatives can be developed and implemented to produce the next generation of Emergency Management professionals of diverse races and ethnicity who can better assist underserved communities.

The Solution: Considering such, it is vital to a) to develop the next generation of highly proficient Emergency Management professionals through the offering of multi-disciplinary courses and training for students, and b) providing education and training service initiatives for the local Jackson Metro Community and throughout Mississippi to build community resilience. Overall, academic programs, hands-on training, extensive research to add to the Emergency and Disaster Preparedness body of knowledge, and professional development opportunities will cultivate these needed Emergency Management professionals to assist the community and our nation.

The Community Resilience (the umbrella project) Community Resilience Engaging Advanced Training and Education (C.R.E.A.T.E) project at Jackson State University (JSU) will provide an excellent opportunity to expand the pipeline of talented underrepresented minority students who pursue undergraduate degrees and careers in Emergency Management/STEM-related fields. Furthermore, JSU is uniquely situated to leverage this opportunity because of its standing as one of the leading producers of African Americans receiving baccalaureate and graduate degrees. As social and behavioral science becomes a more important factor in translating STEM-related concepts, Jackson State University (JSU) has the faculty and programs in place to serve as the foundation for an infrastructure designed to increase interest in the Emergency Management, Technology, Behavioral, and Social Sciences, Computer Science, and Meteorology and Atmospheric Science; therefore, this helps to increase the number of minorities in the Emergency Management profession. The next generation of professionals will then, by their progress, increase the capacity of the Emergency Management level of proficiency with all of whom will help meet the future demand for Emergency Management professionals in their respective fields of study.

Purpose of Community Resilience

With this concept being at the vanguard, a multi-disciplinary research team and JSU developed the Community Resilience Engaging Advanced Training and Education (C.R.E.A.T.E) project. The purpose of the **(C.R.E.A.T.E)** will be to enhance the fields of Emergency Management (Technology concentration), Computer Science, Meteorology & Atmospheric Science and Psychology so that underrepresented undergraduate minority students are highly qualified and prepared to successfully enter graduate programs and/or careers in Emergency Management with the STEM emphasis, specifically, Emergency Management and/or Disaster Preparedness. As well as, informing and transforming the larger academic community about issues that are relevant to Emergency Management and/or Disaster Preparedness. The objectives of the C.R.E.A.T.E. are:

1.) To improve the retention and persistence of Undergraduate Minority Students and promote a multi-disciplinary approach in the fields of Emergency Management (Technology emphasis), Computer Science, Psychology and Meteorology and Atmospheric Science course offering and course activities (Emergency and Disaster Preparedness focused), student service initiatives through service learning, training, and professional development and research initiatives to product peer-refereed journal publications, poster presentations, conference papers, and presentation, etc.

2.) To increase students' knowledge base, research skills, and awareness of Emergency Management and Disaster Preparedness by implementing a set of Interprofessional Education (IPE), Service Learning (SL), and Community Based Participatory Research (CBPR) activities culminating into the implementation of a Spring Research Symposium.

3.) To enhance the STEM curriculum by creating a Disaster Preparedness & Resilience course to increase the knowledge base and the awareness of all students in the fields of Emergency Management (Technology emphasis), Computer Science, Psychology and Meteorology and Atmospheric Science with an emphasis on Emergency Management and Disaster Preparedness and Community Resilience.

4.)   To establish a state-of-the-art Disaster Preparedness & Resilience teaching and research laboratory. This aspect of the project will assist in modernizing the infrastructure of JSU and provide undergraduate students and faculty with more opportunities to conduct research. The students will create an emergency preparedness APP for the campus community.

5)   To promote the concept of the Internet of Things (IoT) with Data Analytics for professional and students training, course development, and research. IoT allows professionals to quickly identify threats. It also allows professionals to use new tools in reaching individuals during an emergency, from weather-related threats to active shooters. Data and analytics strategies are vital in emergency management situations, such as preparation, mitigation, and response and recovery, to ensure business leaders have the evidence-based data to make informed decisions and position their business to withstand the unforeseen.

The C.R.E.A.T.E project has brought together a diverse group of disciplines, such as Technology, Computer Science, Psychology, Meteorology, and Journalism and Media Studies. The collaboration of these disciplines encourages the development and implementation of modern technology for fast and effective weather forecasting and notifications; disaster preparedness and mitigation; effective communication; in addition to the behavioral and social science aspects to assess the mental and emotional impacts before, during, and after a disaster. The greatest outcomes of this project will be more educated and prepared communities; a new generation of young minority students inspired to pursue careers in Emergency Management fields. Having Emergency Management specialists with high proficiency in technology is essential to further promote the mission of saving lives and property.

The Need for Technology

Modern technology helps to ensure that the four functions of Emergency Management (i.e., mitigation, preparedness, response, and recovery) are properly executed. Conferring to Mendonca et al. (as cited in Buck, 2011), Emergency Management information systems can reach their full potential, they must be designed to allow flexibility in their use, thus leaving room for creativity. It was further asserted that communication and information technology may be classified according to the combination of process structuring, communication and information processing support it best provides and the emergency response system required. Technology must be ever evolving to meet address communities' needs leading to proper emergency planning and time reduction of emergency response.

Authors Ozceylan and Coskun (as cited in Buck, 2011), the use of the internet increases awareness through informational websites that inform communities of emergency preparedness initiatives. The website, "Ready.Gov", is a model example of detailed community emergency preparedness information. Ready is a National public service campaign designed to educate and empower the American people to prepare for, respond to, and mitigate emergencies, including natural and man-made disasters (http://www.ready.gov). To further contend, internet utilization allows the opportunity for community discussion groups; makes disaster plans available online; provides educational disaster management material to schools, libraries, other community-related places; and provides support for training or drills that can be used to support cultural factors.

Buck further referred to Ozceylan and Coskun as they endorsed the development of a specific type of information system that would better assist in minimizing or alleviating some emergencies. In considering an academic program that will provide sufficient technological and decision-making ability, Technology Education is an ideal program to incorporate Emergency Management.

Technology Education and Emergency Management

According to Murphy and Barner (2020), Technology Education's philosophical foundations are many; however, Progressivism and Pragmatism are cornerstones in Technology Education's evolving scope. Progressivism embraces students' interests and the "learning by doing" approach to learning. Progressivism further promotes growth through the assertion of science, technology, economic development, and social organization advancements. Moreover, Pragmatism addresses the practical approach to problem-solving. This philosophy employs "hands-on" problem solving through interdisciplinary team collaboration. In identifying these distinguished characteristics in Technology Education's foundation, Emergency Management can be a notable and viable concentration.

Murphy and Barner further contended that nature rapidly intensifying in today's society due to climate change. It is essential to have highly proficient and problem-solving professionals from hazardous weather events. They can effectively and efficiently manage such horrific situations. Emergency Management is a paramount concern for both the general public and the academic community. According to Murphy, McLin & Thomas (as cited in Murphy and Barner (2020), the problem is the potential loss of life, property, and disruption of regular daily routines. Emergency Management is that auspice in which emergencies/disasters are resolved. As a Technology Education, Emergency Management curricula will train, equip, and endow current and next generations of Emergency Management specialists through contemporary technologically driving academic programs. Such curricula will help current and forthcoming Emergency Management professionals to develop and improve competencies as they prepare for, protect against, respond to, recover from, and mitigate the probable effects of all forms of disasters and emergencies for all communities.

Emergency Management academic programs and curricula are ranging from baccalaureate to doctoral (i.e., PhD. and Doctorate for Working Professionals). As a multi-disciplinary subject, Emergency Management can be incorporated with such academic disciplines as Public Service, Public Policy, Computer/Information Systems, Technology, etc. Nevertheless, Emergency Management in a Technology program provides a solid education foundation and training of the latest technology. The Emergency Management in Technology Education major focuses on disaster prevention, planning, preparedness, response, mitigation, and recovery. The curriculum covers needs and issues, operations management, planning and response, and terrorism. It is intended to equip students with a global outlook, interpersonal skills, and emergency management knowledge and skills. Jackson State University's C.R.E.A.T.E. project is providing proof of the success and the impact on the Mississippi community through the multi-disciplinary Emergency Management education, with the Technology program being the forerunner.

Results from C.R.E.A.T.E.

Since its March 2021 inception, the C.R.E.A.T.E. project has made major inroads in such a short time. To improve the retention and persistence of undergraduate minority students and promote a multi-disciplinary approach in the fields of Emergency Management (Technology emphasis), Computer Science, Psychology, Journalism and Media Studies, and Meteorology and Atmospheric Science develop the following courses offerings and semester activities.

    a. The majors mentioned above collaborated in a seminar course (PSY 418-Psychology of Disaster), under the Psychology program, for the multi-disciplinary approach to emergency preparedness, response, and recovery. The goal of this course is to introduce students to the psychological and physiological human response to disasters. Other Technology related courses included Introduction to Incident Command Systems (Fall 2021) and Disaster Management (Spring 2022).

    b. Services-learning activities where CREATE students participated in were participation in the video (acting) regarding emergency weather preparedness for the JSU Campus Community. Students also provided service in the CREATE projects vertical town hall meeting in which they assisted as timekeepers and monitors for the question-and-answer portion of the town halls. For the 2022 Spring academic term, CREATE Students will work with Mississippi Emergency Management Agency for the MEMA for Kids (K-6 Weather Emergency Preparedness) initiative by working with local grades K-6 schools by visiting or virtually meeting with students to explain weather preparedness through animation and cartoon characterizations.

    c. For Fall 2021 training activities, the CREATE Project Team instructors invited guest speakers for classes to discuss various topics in Emergency Management and Preparedness: Ms. Latrice Maxie with the National Weather Service (natural disasters-weather), Mrs. Selika Funchess with Hinds County Law Enforcement, and Catholic Charities (man-made disasters and human trafficking), and Mr. Ken Washington with Infra Gard (man-made disasters-cyber security).

    d. CREATE students are required to complete the FEMA Independent Study courses and earn certificates of completion including ICS 100 (Introduction to Incident Command Systems), ICS 200 (Basic Incident Command Systems for Initial Response), NIMS 700 (Introduction to the National Incident Management System), and NRS 800 (National Response Framework: An Introduction). In addition, CREATE Team and Students have completed IRB training for any research initiatives.

    e. Presentations and publications from the Community Resilience and C.R.E.A.T.E. include the following: Presentation for JSU President's Research Symposium (online) on An Exploration of Emergency Preparedness in Mississippi During Covid, October 13, 2021 (Drs. McLin, Murphy, and Ms. CeNe Harris (graduate student)). Presentation for Infra Gard Community Preparedness Event, October 19 and 20, 2021 (online) on Community Resilience and Preparedness (Drs. Murphy and McLin). Presentation for MS Valley Technology Education Technology Teacher

Conference, November 2021 on Community Resilience Engaging Advanced Training and Education Program with Technology that Saves Lives (Dr. Murphy). Presentation for the International Technology Education and Engineering Education Association, March 9-12, 2022 (Drs. Murphy and McLin, Professor Don Spann, and Ms. CeNe Harris).

To increase students' knowledge base, research skills, and awareness of Emergency Management and Disaster Preparedness Community Based Participatory Research (C.B.P.R.) activities yielding to the implementation of a Spring 2022 research symposium include the following:

a. Data collection from the Mississippi Community regarding emergency preparedness through survey from community members. See link to survey **https://forms.gle/eAJNtzWbBqm5m62j9**. There were approximately 100 participants from summer 2020 to the present (across the state of Mississippi) who completed the survey.

b. From the data collected, Ms. CeNe Harris (doctoral candidate in Psychology) led a poster presentation (including Drs. McLin and Murphy) to initially assess Emergency Preparedness for weather events in Mississippi. Ms. CeNe Harris presented (poster) at the 7th Annual Mississippi Psychology Association Conference (presentation: Community Resilience Project: An Exploration of Emergency Weather Preparedness in Mississippi.

c. Dr. McLin and Dr. Murphy have completed a proposal for a Certificate in Disaster Preparedness Post-Baccalaureate program available to JSU students and Alumni and current and aspiring Emergency Management professionals.

Communication and Outreach:

Since the Community Resilience project started in 2020 and the fund supported by the National Science Foundation and the U.S. Department of Homeland Security, we have conducted 6 virtual town hall meetings with a distinguished panel serving as our subject matter experts. Panelists have included representatives from the National Weather Service, FEMA, Infra Gard (DHS Partner), MS Emergency Management Agency (MEMA), MS Insurance Commission, and JSU Psychology graduate student (Ms. CeNe Harris). Attendance for each town hall was estimated at 30 participants. See the picture below of the September 20, 2021, virtual town hall.

Figure 1: September 20, 2021, Community Resilience Virtual Town Hall

This program was announced on JSU TV with promotional videos produced by Professor Don Spann (Journalism and Media Studies). JSU TV is viewed throughout the Jackson/Metro, MS, and central MS. The town halls were also announced on JSU Radios and the JSU Website through daily campus announcements. Furthermore, we have established a CREATE website that highlights CREATE programs and market the CREATE Scholarship, town hall, and other events and activities.

Conclusion:

As mankind continues to greatly depend on technology, there remains a need to encourage persistent advancement of post-secondary academic programs promoting the understanding of essential technological perceptions, proficiency, progression, and problem-solving to acclimatize into the workplace. With technology being a societal and economic necessity, the job market continues to direct itself to the technological trends and projected career outlooks. Technology Education and other academic disciplines have deemed themselves relevant to the **career preparation** of the 21st Century learner and workforce practitioner. Regarding the 21Century learner and workforce, new pathways such as Emergency Management and Disaster Preparedness will help Technology Education maintain significance and promote constant advancement. Furthermore, collaborations with such disciplines as Computer Science, Psychology, Journalism and Media Studies, and Meteorology will develop a dynamic multi-disciplinary approach that yields innovation, scholarship, and monumental academic programs and community outreach such as the Community Resilience project at Jackson State University.

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