

Planning for resilience: the Hazard Education and Resilience Awareness Task (HEART) Force empowers youth to lead the resilience conversation in rural Colorado

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Abstract

The impacts of climate change are being felt across the country, with wildfire seasons getting longer and more severe and flooding occurring more frequently. Colorado has experienced significant extreme weather events in the last ten years and, consequently, has begun a statewide effort to incorporate resilience into short- and long-term planning across state and local governments. As cities and counties undergo resilience planning processes, today's students (tomorrow's leaders) are often unaware of these efforts and are left out of the planning process. The HEART Force curriculum empowers students with the knowledge needed to participate (and lead) the resilience conversation in their own community, with place-based hazard education that includes a scenario-based role-play game and design thinking to create resilience strategies in their community. The curricular unit culminates with a resilience expo, where students engage with community members as resilience experts and share their ideas. HEART is a novel approach in that it uses several current instructional strategies (place-based learning, project-based learning, gamification, and design thinking) to empower students to engage with their community. If students want to implement their resilience projects that arise from the curriculum, mini-grants are available to fund projects. The HEART program is currently in its second year of piloting in rural and urban Colorado schools. We will present preliminary evaluation findings and share curriculum and program design strategies.



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Program Description

HEART Force engages Colorado secondary students, teachers, and communities to take proactive steps in preparing for hazards that are becoming more frequent due to climate change.

- NGSS Aligned Middle and High School Curriculum (MS-ESS3-2 and HS-ESS3-1)
- Flexible formatting - teachers can teach a 1-6 week unit using stand alone lessons or the entire lesson progression.
- Active, engaging pedagogy based in local context
- Partners include NOAA, the Colorado Resilience Office, and various rural schools and local government officials

Research & Evaluation

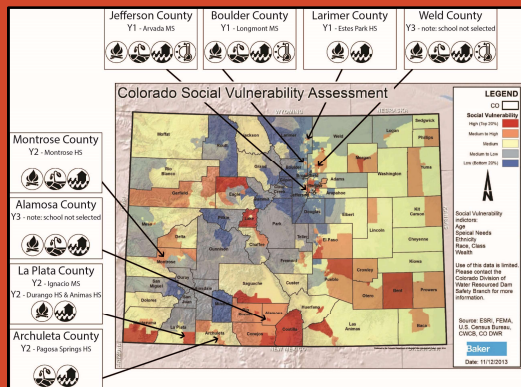
The following goals are being evaluated by CIRES evaluators through front-end, formative and summative evaluation:

- Increase Colorado secondary teachers' knowledge and confidence to teach about local hazards and to facilitate discussion about community resilience.*
- Increase Colorado youth's understanding of natural hazards, their community's vulnerability, and their involvement in resilience planning efforts
- Enhance the capacity and empowerment of young people in Colorado to engage in dialogue with their peers, families, and community stakeholders about community resilience issues and identify, develop, and implement resilience actions.

*A needs-assessment of Colorado teachers to identify current teaching practices around natural hazards and community resilience, and their needs for training, resources, data sources was conducted in spring of 2019.

Pilot Programs

CIRES Education and Outreach is partnering with several school districts across Colorado to pilot the curriculum.



Curriculum Overview

Natural Hazards
Teachers begin by selecting a natural hazard to focus on throughout the unit.



Introduction Lessons

Teachers can choose to begin the unit with vocabulary and/or a visioning exercise.

Vocabulary of Hazards Lesson
Students decide whether actions are considered to be for emergency preparedness, mitigation, or to build resilience.



Resilient Future Lesson
Students participate in a visioning exercise, and then reflect on why resilience is important to create the future they hope for.

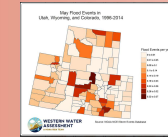


Hazard Lessons

Students analyze quantitative, spatial, and observational data about the causes and impacts of natural hazards to create a local news story to educate their community. They also learn how to respond if a hazard occurs.



Expert Scientist Videos



Authentic Data



Case Studies

Scenario-Based Role-Play Games

Students assume the role of community members responding to a natural hazard as it occurs in their hometown.



Wildfire Game Materials



Students Play the Game in Gunnison, CO

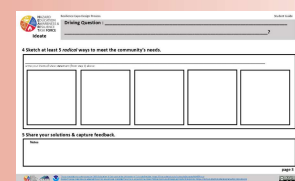
Resilience Expo
Students either research existing resilience strategies, or develop their own strategy to present at a community expo. Students also have the opportunity to apply for a mini grant to complete a project if they choose.



Interview Local Experts



Explore the Colorado Resiliency Framework and County Hazard Mitigation Plans



Resilience Design Challenge

Project Timeline

Year 1(2018-19)
Develop curriculum, design research and evaluation surveys, initial pilot in 4 classrooms.

Year 2(2019-20)
Pilot curriculum in 8+ classrooms, revise curriculum, collect research and evaluation data.

Year 3(2020-21)
Final curriculum revision, disseminate curriculum and assist teachers with resilience expos.

and beyond...
Curriculum will be freely available for use.

Instructional Strategies

Project Based Learning

If teachers choose, they can teach a project based learning unit with the driving question "How can we help make our community be stronger if we experience a wildfire (or flood, drought)?" "Gold Standards" Project Based Learning means having a challenging problem or question, sustained inquiry, authenticity, student voice & choice, reflection, critique & revision and a public product (pblworks.org)

Place Based Learning

The HEART Force curriculum provides several opportunities for students to interact with data and information that is specific to their own hometown. In order to do this we used ESRI GIS Educational Products, including a Story Map and a lesson modeled after ESRI GeoInquiries. We also encourage teachers to reach out to local experts as much as possible to bring authentic, local topics into the classroom.

Gamification

Science-based role-play simulation is an effective tool to increase awareness for natural hazards, enhance readiness to adapt, and envision a future that is different from the current reality. Role play simulations involving face-to-face mock decision-making increases concern about community vulnerability and awareness of adaptation (Rumore et al., 2016).

Design Thinking

The final component of the HEART Force unit asks students to create a strategy to build resilience in their own community. Human-centered design thinking equips teachers and students with a process that allows for innovation, creativity, and several feedback cycles. The curriculum adapts resources from Stanford's d.school (dschool.stanford.edu), using the stages of Empathize, Define, Ideate, Iterate, Prototype & Test, and Launch.

Reference

Rumore, D., Schenk, T., & Suskind, L. (2016b). Role-play simulations for climate change adaptation education and engagement. *Nature Climate Change*, 6(8), 745–750.

Learn more about HEART Force at: cires.colorado.edu/outreach/programs/heart-force