

Implementing ShakeAlert® in Schools: A Mixed Methods Earthquake Early Warning Study

Rachel Adams, Jennifer Tobin, Jolie Breeden, and Lori Peek

Natural Hazards Center, University of Colorado Boulder



hazards.colorado.edu/research-projects/nhc-usgs-earthquake-early-warning-and-schools-study

Background

The ShakeAlert® earthquake early warning (EEW) system, managed by the U.S. Geological Survey (USGS), is the first public alert system in the nation to provide rapid mass notification when an earthquake is detected.

Although widespread mobile phone alerts began in California in 2019 followed by Oregon and Washington in 2021, little was known about **what drives successful implementation of EEW** in institutional settings such as **schools**.

Methods

To address this gap, we conducted a mixed methods study on how K-12 schools in earthquake-prone areas can best adopt and implement EEW.

Phase 1

Interviews with 118 K-12 school administrators, teachers, parents, students, emergency managers, building officials, and engineers in **Anchorage, Alaska (Jan. 2020)** and **Ridgecrest, California (Feb. 2020)**.

Phase 2

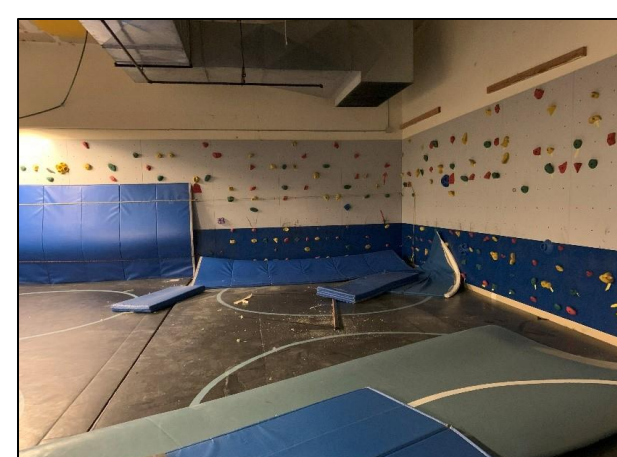
Online survey of school district superintendents in **Alaska, California, Oregon, and Washington** in **Spring 2022**.

Results

Phase 1 Qualitative Findings

Respondents were enthusiastic about the possible adoption of EEW in schools but had questions and concerns, such as:

- Awareness and Knowledge:** Respondents reported limited or no experience with EEW, but they saw its potential after learning more about how it could be used in schools.
- Funding:** Questions regarding how much it would cost to adopt and maintain ShakeAlert.
- Alert Channels:** Concerns about not receiving alerts given “no cell phone” policies and confusion with non-centralized alerting.
- Alert Threshold and Message Frequency:** Concerns about over-warning and classroom disruption.
- Message Content and Drills:** Importance of messaging that conveys correct protective actions and a need to integrate EEW into existing drill schedules.
- School Infrastructure:** Questions about what to do when receiving alerts outside of the classroom.
- Generational Differences:** Adults sometimes acted on the outdated earthquake education they received as children, which led to conflicting messages and behavioral cues for children.

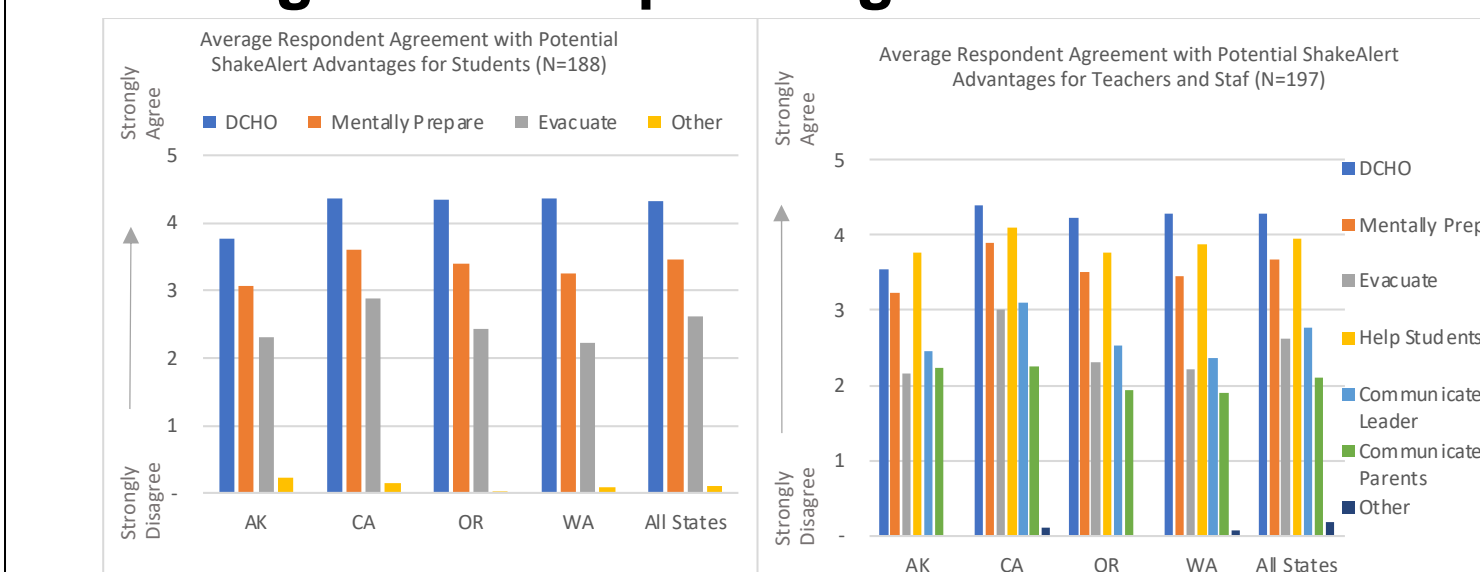


Phase 2 Survey Findings

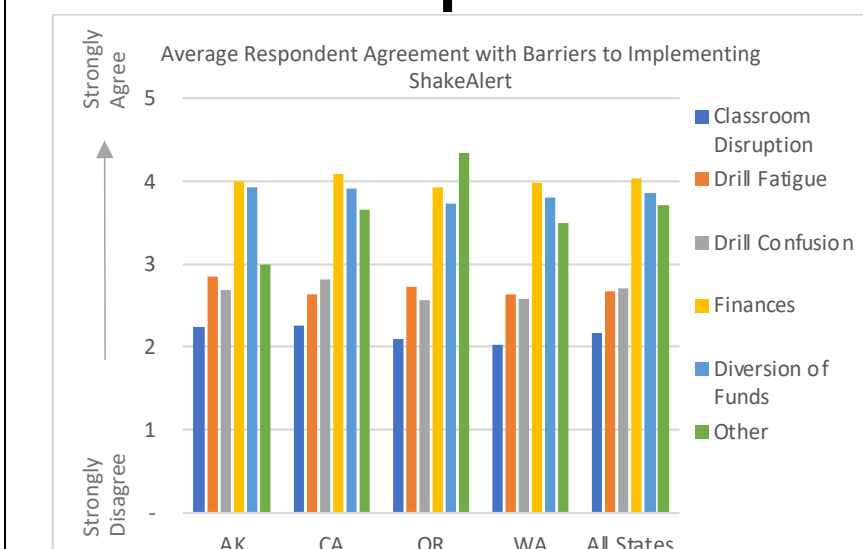
Adoption and Funding of ShakeAlert:

- Only 38% of school leaders had previously heard of ShakeAlert. Awareness was highest in Oregon (56%).
- Most respondents thought the state government should pay for the system.

Advantages of Incorporating ShakeAlert:



Barriers to Implementation:



Tolerance for False Alerts:

- Participants thought false alerts could have a major impact on teacher and parent confidence in ShakeAlert.
- Superintendents in Alaska were more likely to say that false alerts would have a major impact on classroom disruption than the other states.

Alert Delivery and Messaging:

- SMS/text was the preferred delivery method.
- Respondents favored alerts that contain actionable guidance.
- Respondents indicated they would like post-shaking messages about next steps, including information about additional hazards, a reassuring note, and detailed information about the earthquake.

Conclusions

- Although ShakeAlert awareness is very low, those familiar recognize the system's potential to facilitate life-saving protective actions.
- Funding is the biggest barrier to adoption.
- EEW implementation needs to be coupled with regular drills.
- There are significant state differences in survey responses, as well as variation in drill mandates, state funding, and hazard risk.

Implications

- Better communication is needed to educate school district leadership about EEW availability, system cost, and funding support.
- ShakeAlert info tailored to schools could help address each region's concerns.

Acknowledgements

The Natural Hazards Center acknowledges the **USGS** for funding this study and thanks the **USGS Social Science Working Group** for reviewing research instruments.

Sign up here:

