WHAT IS THE DEADLIEST NATURAL HAZARD IN HAWAIʻI?

A. Floods
B. Volcanoes
C. Tsunamis
D. Hurricanes
From Paper To Pixels

A Usability Study of a Tsunami Safety E-Booklet

Leon Geschwind
Education Technology Specialist
WHERE ARE YOU?
NEED

- Tsunami education for primary students

Content
- Hazards
- Preparedness
- Evacuation
- Warning
- Risk
WHICH DEVICE ARE YOU MOST LIKELY TO USE WHEN ACCESSING ONLINE CONTENT?

A. Desktop
B. Laptop
C. iPad
D. Other Tablet
E. Other
PARTICIPANTS

- 6 Females
- 5 classroom teachers
- 1 science specialist
- Grades K – 6, SPED
- Age 25-64
TECH READINESS SURVEY

Computer Lab: 100%
Computers in Classroom: 96%
Tablet Devices in Classroom: 81%
PURPOSE

To evaluate the *efficiency*, *effectiveness*, and *user satisfaction* of a *tsunami safety e-booklet* for *grades 3-5 students in Hawaiʻi* through *iterative usability testing*.
DEVELOPMENT

INTERACTIVE

ACCESSIBLE

articulate® STORYLINE

HTML
WHY USABILITY?

- Find problems early
- Lower costs
- Short timeline
  - Oct 2013: Recruitment
  - Nov 2013: Prototype 1 (Pre-Alpha)
  - Dec 2013: Usability R1
  - Jan 2014: Prototype 2 (Alpha)
  - Feb 2014: Usability R2
  - Mar 2014: Prototype 3 (Beta)
METHODS

STEP 1

Pre-Study Survey - From Paper to Pixels: A Usability Study of a Tsunami Safety E-Booklet

* Required

Name (optional)

Email (optional)

What is your primary job? *
- Classroom teacher
- Informal educator
- Instructional designer
- Other: 

What is your sex? *
- Male
- Female

Which grade(s) do you teach / work with?
- K
- 1st
- 2nd
- 3rd
- 4th
- 5th
- 6th
- 7th

Which device are your students most likely to use when accessing online?
- Desktop (PC)
- Desktop (Mac)
- Laptop (PC)
- Laptop (Mac)
- iPad
- iPad mini
- Android tablet
- Windows tablet
- N/A
- Other: 

METHODS

STEP 2

Hangouts On Air
METHODS

STEP 2

Think Aloud!

Hangouts On Air
STEPS

Metaphysical

To design

Design

Post-Survey- From Paper to Pixels: A Usability Study of a Tsunami Safety E-Booklet

* Required

Name (optional)

What was your overall impression of the tsunami safety e-booklet?

What did you like? What was interesting or engaging? *

What did you dislike? What was boring? *

Are there any additional improvements that you would suggest?

Which device did you use to access the e-book? *

- Desktop (PC)
- Desktop (Mac)
- Laptop (PC)
- Laptop (Mac)
- iPad
- iPad mini
- Android tablet
- Windows tablet
- Other: 

The e-booklet was clear and easy to understand. *

The length of the e-booklet was appropriate. *

Which browser did you use? * The videos in the e-booklet were helpful.

1 2 3 4 5

Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree
METHODS: TRANSCRIBE

STEP 4

180 comments total

Be a Tsunami Superhero
Tsunamis in Hawaii
Learn About Tsunamis
Tsunami Science
Tsunami Travels
Be a Tsunami Scientist
Tsunami Warning System
Get Out of the Zone!
Our Evacuation Zone
Use Your Senses!
Tsunamis Hit the Coast
Tsunami vs. Surf
Make an Emergency Kit
Our Tsunami Action Plan

18

22

13
METHODS: CODING

STEP 5

- Clearer directions
- Needs edits
- Auditory feedback
- Praise
- Control over media
- Visual feedback
- Gamification
- Personalization
- Level of difficulty
INTRO PRINT

1. Why Learn About Tsunamis?
2. Tsunami Scientist
3. Tsunami Warning System
4. Get Out of the Zone!
5. Our 'Ohana Evacuation Route
6. Local Tsunami Evacuations
7. Use Your Senses!
8. Tsunami vs. Coastline
9. Emergency Kit
10. Our Tsunami Action Plan

Tsunamis in Hawai‘i

Hawaiian myths and legends speak of great sea floods and the ‘rising of the sea to the hills’. These stories suggest that tsunamis have impacted Hawaiian coastal communities in the past, just as they do today. It is important to learn about what has happened in the past so that we can be prepared for the future.

‘Iluki ke kai i ka opepe la, lilo; ili no he hawa. The sea snatches the bundle. It is gone; it goes when one is not watchful.

Interpretation
A person who falls to watch out often loses. Never turn your back on the sea.

Look for the No Ka ‘Ohana activities throughout the booklet. No Ka ‘Ohana means ‘for the ‘ohana’ so these challenges should be done at home.

BE A Tsunami SUPERHERO!

Tsunami Superheroes are kids just like you who know all about tsunami safety and have pledged to help others prepare for the next tsunami event.

Build your Superhero powers by completing the Tsunami Superhero Challenge after the activities throughout this booklet. When you have finished them all, you will be a Tsunami Superhero!
Tsunami Superheroes are kids just like you who know all about tsunami safety and have pledged to help others prepare for the next tsunami event.

Build your Superhero powers by completing the Tsunami Superhero Challenge. Click on the Honu Hero for your instructions! When you have finished them all, you will be a Tsunami Superhero!

Tsunamis in Hawai‘i

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‘Iliki ke kai i ka ‘ope’ope la, lilo; i lilo no he hawaiwā.
The sea snatches the bundle, it is gone; it goes when one is not watchful.

Interpretation:
A person who fails to watch out often loses. Never turn your back on the sea.

No-Ka‘Ohana

Look for the No-Ka‘Ohana activities throughout the booklet. No-Ka‘Ohana means ‘for the ‘ohana’ so these challenges should be done at home.
Tsunami Superheroes are kids just like you who know all about tsunami safety and have pledged to help others prepare for the next tsunami event.

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ʻIliki ke kai i ka ʻopeʻope la, lilo; i lilo no he hawaii.
The sea snatches the bundle, it is gone; it goes when one is not watchful.

Interpretation
A person who fails to watch out often loses. Never turn your back on the sea.

No Kaʻōhana

Look for the No Kaʻōhana activities throughout the booklet. No Kaʻōhana means ‘for the ‘ōhana’ so these challenges should be done at home.
Be a Tsunami Superhero

Hi I'm Sue Nami, the Tsunami Superhero Turtle. What's your name? Type your first name.

Tsunami Superheroes are kids who know all about tsunami safety.

Click on the Superhero Challenge to learn more!

No Ka ‘Ohana activities throughout the booklet. Click here!
Too many things to click on this page… not sure what to do first.

Hi I'm Sue Nami, the Tsunami Superhero Turtle. What's your name?

Type your first name

Tsunami Superheroes are kids who know all about tsunami safety.

Click on the Superhero Challenge to learn more!

Look for the No Ka ‘Ohana activities throughout the booklet. Click here!
Be a Tsunami Superhero

Hi, I'm a Tsunami Superhero Turtle. What's your name?

Leon

INTRO e-PROTOTYPE 3
Nice to meet you Leon!
Are you ready to be a Tsunami Superhero too? Let's learn all about tsunami safety!

Click on the blue words to see and hear the definition. Try it out by clicking on the word tsunami!
Nice to meet you Leon! Are you ready to be a Tsunami Superhero too? Let's learn all about tsunami safety!

Click on the blue words to see and hear the definition. Try it out by clicking on the word tsunami!

tsunami: a series of waves that can travel across an ocean.
Nice job Leon!

Now click on Superhero Challenge to learn how you can become a Tsunami Superhero.
Nice job Leon!

Now click on Superhero Challenge to learn how you can become a Tsunami Superhero.

Complete the activities and challenges to become a Tsunami Superhero! Play the games and solve the puzzles to get superhero points!
Now click on No Ka ʻOhana to learn about activities you can do with your family.
Now click on No Ka ‘Ohana to learn about activities you can do with your family.

No Ka ‘Ohana means for the family so these activities can be done with your ‘ohana or your class. Then you can share your ‘ike or knowledge with everyone!
Great work Leon!
Click on NEXT on the bottom right to go to the following page.

OR

Click on the Table of Contents on the top left to jump to a specific page.
Mean Score (1 = strongly disagree, 5 = strongly agree)

<table>
<thead>
<tr>
<th>General Categories</th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understandability</td>
<td>3.33</td>
<td>4.20</td>
</tr>
<tr>
<td>Length</td>
<td>3.60</td>
<td>3.67</td>
</tr>
<tr>
<td>Difficulty</td>
<td>3.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Content</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Logical</td>
<td>4.00</td>
<td>4.40</td>
</tr>
<tr>
<td>Visual Appeal</td>
<td>3.67</td>
<td>4.40</td>
</tr>
</tbody>
</table>

General Categories

- Understandability: 26% increase from Round 1 to Round 2
- Length: 33% increase from Round 1 to Round 2
- Difficulty: No change
- Content: No change
- Logical: 20% increase from Round 1 to Round 2
- Visual Appeal: No change
A tsunami is one of nature’s most dangerous natural hazards. Tsunamis have killed many people in Hawai‘i and caused millions of dollars in damage. Tsunamis have also caused death and destruction in other parts of the world. On average a dangerous tsunami occurs somewhere on Earth nearly every year.

There is no “tsunami season” and a tsunami can strike at any time of day or night, in good weather or bad. When a tsunami reaches shore, a series of waves can flood inland over a period of several hours.

1. http://www.pdc.org/iweb/tsunami_history.jsp

Hawai‘i is vulnerable to tsunamis generated far away along the Pacific Ocean rim and also to tsunamis generated right here in Hawai‘i. A tsunami from far away (distant tsunami) will take many hours to reach our shores, but a tsunami generated here in Hawaiʻi (locally generated tsunami) can reach our shores in minutes!

Studying our history of past tsunamis helps us to know which areas are safe from tsunami waves and which areas are dangerous and should be evacuated. Tsunamis can be deadly, but if you understand them and learn what to do when the next tsunami strikes, you will have a better chance of keeping yourself and your ‘ohana safe.

The words have been scrambled by the tsunami waves. Use the words in bold from above to help you unscramble.

radahsz
fesa
ldof
mistanu
ldof
ersho
vecatudaev

Superhero Challenge!

Talk with your ‘ohana and kupuna about the impact of past tsunamis on communities in your area and how they were experienced by the people who lived through them.

evacuate: to remove persons from an area
Learn About Tsunamis

Tsunamis are dangerous hazards that can happen day or night! When a tsunami reaches the shore, a series of waves can flood the coast for hours.

Hawai‘i is vulnerable to both distant and locally generated tsunamis. Distant tsunamis can take hours to reach our shores while locally generated tsunamis can arrive in minutes.

If there is a tsunami, people should be evacuated to higher ground. In Hawai‘i, tsunamis have killed people and damaged property, but if you know what to do when a tsunami strikes, you will have a better chance of keeping safe.
Learn About Tsunamis

Tsunamis are dangerous hazards that can happen day or night! When a tsunami reaches the shore, a series of waves can flood the coast for hours.

Hawaii is vulnerable to distant and local tsunamis. Distant tsunamis can take hours to reach while locally generated tsunamis can arrive in minutes.

If there is a tsunami, people should be evacuated to higher ground. Tsunamis have killed people and damaged property, but if you know a tsunami strikes, you will have a better chance of keeping safe.

Correct
That's right! You selected the correct response.

Continue
Learn About Tsunamis

Tsunamis are dangerous hazards that can happen day or night! When a tsunami reaches the shore, a series of waves can flood the coast for hours.

Hawai‘i is vulnerable to both distant and locally generated tsunamis. Distant tsunamis can take hours to reach our shores while locally generated tsunamis can arrive in minutes.

If there is a tsunami, people should be evacuated to higher ground. In Hawai‘i, tsunamis have killed people and damaged property, but if you know what to do when a tsunami strikes, you will have a better chance of keeping safe.

This is a tough one. Remember to look at the blue vocabulary words for clues.
Tsunamis are hazards that can strike suddenly. When an earthquake hits off the coast or near the shoreline, a series of tidal waves, or tsunamis, can arrive. If there is a tsunami, people should be evacuated to higher ground. In Hawai’i, tsunamis have killed people and damaged property, but if you know what to do when a tsunami strikes, you will have better chances of keeping safe.

Correct
That’s right! You selected the correct response.
Honorary Tsunami Safety Ambassador

Certificate of Achievement

In recognition of outstanding tsunami safety skills
the title of
Tsunami Safety Super Sleuth
to

Sue Nami

The awardee pledges to continue to practice tsunami safety
and spread the word to future generations

NOAA
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
DO YOU LIVE, WORK, OR PLAY IN A TSUNAMI EVACUATION ZONE?

A. Yes
B. No
C. Don’t know *

*If you live in Hawai‘i, go to the yellow pages or [http://tsunami.csc.noaa.gov](http://tsunami.csc.noaa.gov) to find out
We cannot prevent a tsunami

BUT WE CAN PREPARE FOR ONE
NEXT STEPS

- Test with students
- Compare print to e-booklet
- Less words
- Bigger buttons for iPad
- Analytics on individual pages
LESSONS LEARNED

- Usability = time well spent
- Listen to users

- Interactive ≠ Programming
- Media speaks louder than words
- Balance Glitz vs. Performance

- Print → Digital format
MAHALO

- ETEC Faculty and Staff
  - Dr. Mike
- ETEC Cohort
  - Dana
  - Nick
- Family and Friends
  - Kayee
  - Anna
- TCC
Interested in providing feedback?

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http://gplus.to/lgeschwind

Tsunami Booklet Draft