

## **Evaluating Online Disaster Preparedness Training for Family Caregivers of Senior Citizens**

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**Abstract:** According to the American Association of Retired Persons (AARP), more than half of the casualties from Hurricanes Katrina and Sandy were senior citizens, and many died from avoidable injuries. As climate change is predicted to increase the frequency and intensity of natural hazards such as hurricanes, tornadoes, and floods, communities must plan for an increasing senior population with many now opting to live with their adult children. Seniors are more vulnerable to hazards due to economic, medical, social, cognitive, and physical issues. Precautions taken in advance of disasters can greatly reduce senior citizen casualties. Having an understanding of disaster preparedness is key to building resilience and mitigating impacts. Family members who take on caregiving responsibilities may not have access to or time for formal training in disaster preparedness. Thus, the purpose of this study was to evaluate the effectiveness of an online module, created with Articulate and Canvas, to train participants on the special preparedness needs of elderly family members. Participants completed the module, including pre- and post-surveys and an assessment. The project used Baldwin and Ford's transfer of training theory (Baldwin, Ford, & Blume, 2009). Participants can use the knowledge gained from the module to enhance their ability to support senior citizens. The presentation will show parts of the module and discuss the findings from the evaluation.

### **Introduction**

Climate change is predicted to increase the frequency and intensity of extreme natural hazard events such as hurricanes, tornadoes, floods, and drought (Mendelsohn, Emanuel, Chonabayashi, & Bakkensen, 2012). Hawaii is not immune to these events. Communities must begin to plan for this new reality while considering their vulnerable populations. Senior citizens are disproportionately vulnerable to natural hazards. Senior citizens are more likely to have economic, medical, social, cognitive, or mobility issues, which affect their ability to be resilient, a measure of one's ability to bounce back from a hazard (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011; Plough et al., 2013; Wang & Yarnal, 2012). Recent natural hazard events across the nation and in Hawaii have brought this resilience issue back into focus and into conversations on preparedness. How can we better prepare our families to withstand weather and other natural events? The purpose of this instructional design project was to design, develop, and evaluate the effectiveness of a Web-based module for adult learners who live in Hawaii to increase

their awareness of the special disaster preparedness needs of elderly family members with whom they reside or provide care. The Federal Emergency Management Agency (FEMA) currently offers training on disaster preparedness for senior citizens through its training partners; however, the course on senior citizen disaster preparedness is only offered in face-to-face format. The FEMA course also targets formal caregivers such as care home attendants and nurses but not informal caregivers—the family members and friends of seniors. Modeled after the FEMA-certified content, this research project was focused on providing content for informal caregivers in an online format. The online format was ideal because family members who take on caregiving responsibilities may not have access to or time for formal training in disaster preparedness.

Offering training to adults who provide care for or reside with elderly family members can increase the resilience of senior citizens to prepare for, respond to, and recover from natural hazards. The need for training is great. Many rural and isolated communities do not have access to training. These communities are considered to be vulnerable to hazards because of their remoteness and inaccessibility (Terry & Goff, 2012). The availability of an online instructional module could improve the dissemination of and access to this vital information. This research project and module was intended to fill in the service gap by providing access to information for those individuals who have taken up caregiver responsibilities.

### **Literature Review**

Having an awareness and understanding of disaster preparedness is a key component to building resilience and mitigating the impact of hazards (Department of Homeland Security, 2014). The 2014 Quadrennial Homeland Security Review suggested individuals can improve their resilience by enrolling in training, completing preparedness activities, and acting on the lessons learned from past natural hazard events.

The necessity to inform senior citizens when to evacuate and how to properly shelter in place is clear. Dosa et al. (2012) discussed the implications of deciding whether to evacuate from or shelter in place during a natural hazard event. Caregivers and family members, researchers found, need to make informed decisions based on the risks posed for either option: evacuating a potential storm or weathering it out.

The foundation of this project was imparting the younger family members of senior citizens with knowledge of disaster preparedness rather than the senior citizens themselves due to concerns of cognitive capacity. Gutman & Yon (2014) noted that senior citizens are vulnerable to issues of fraud, neglect, and abuse during and after natural hazard events. With limits to their cognitive, physical and social capacities, seniors may be unable to deal with increasingly difficult situations revolving around disasters. It is imperative that family members step up to help with caregiver issues. Additionally, cognitive load theory is a concern for seniors who have limited working memory and are at a disadvantage at learning new tasks (de Jong, 2009).

To help improve learning for all learners, this project utilized instructional design techniques, such as case-based learning and John Keller's ARCS motivational design

model to help participants to learn and apply the new strategies for caring for senior citizens (Deslauriers, Schelew, & Wieman, 2011; Keller, 2010; Mounsey & Reid, 2012). The learning content was designed to utilize Baldwin and Ford's theory of transfer of training, the transfer of knowledge gained from training to regular performance, which aimed to enhance the ability of family members to aid senior citizens (Baldwin, Ford, & Blume, 2009).

Furthermore, Grossman and Salas (2011) wrote that the acquisition of knowledge is increased when motivation and perceived utility are considered. When online instruction is perceived to be useful, relevant, and necessary, users will be motivated to learn and their experience will be reinforced (Castle & McGuire, 2010; Pawlyn, 2012). The lessons from Hurricanes Katrina and Sandy proved to be great motivators for training. Josh Keller (2012) reported that nearly half of those who died from Hurricane Sandy were senior citizens. Hurricane Sandy was the deadliest storm of 2012 with many senior citizen fatalities caused by drowning, falling debris, and electrocution concentrated in urban areas. Many of the estimated 1,300 people that lost their lives in 2005 during Hurricane Katrina were senior citizens (Gibson & Hayunga, 2005). Keeping these natural hazard events in mind is important in promoting disaster preparedness (Johnson, Ronan, Johnston, & Peace, 2014).

Life expectancy is anticipated to improve as science achieves new feats. An increase in the population of senior citizens will lead to a rise in the old-age dependency ratio, a measure demographers have used to calculate dependent elderly individuals to working individuals. This is projected to double by 2050 (Lee, 2011). The nation's demographics have shifted with more families living together (Taylor et al., 2010). Fry and Passel (2014) also reported that the rate of multigenerational homes increased from 14.3 percent in 1990 to 18.1 percent in 2012.

This trend of senior citizens moving in and residing with younger relatives is caused by economic hardships, foreclosures, increased longevity, and rising health care costs. With more families living together, seniors are beginning to rely more heavily on their families to take up the role of caregiver (Taylor et al., 2010; Fry & Passel, 2014). The definition of a senior citizen caregiver is changing as multi-generational family households are increasing in numbers. More and more families are taking on caregiving responsibilities for their elderly family members. For family caregivers that live separately, care may involve restocking food and cleaning the residence. Family members and caregivers must understand the specific vulnerability factors that affect senior citizens whether or not they live with the seniors.

### **Project Design**

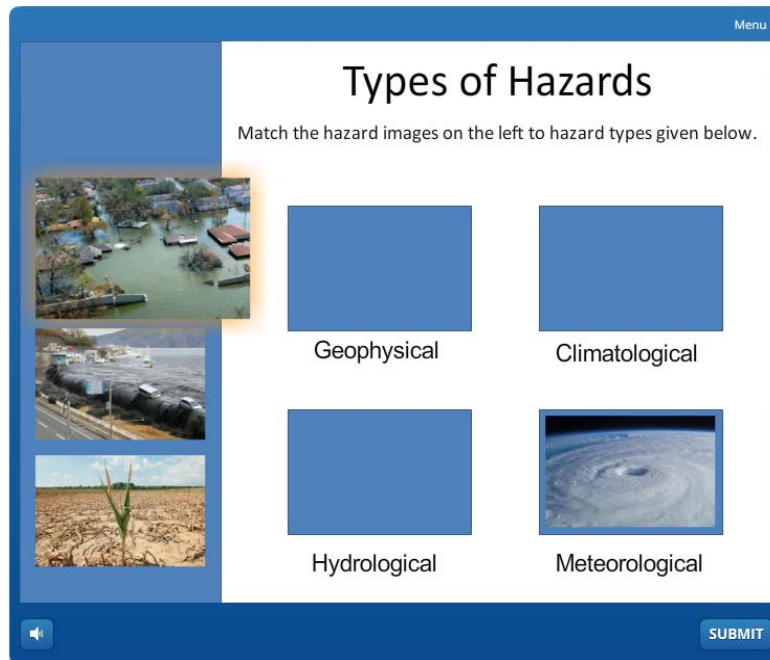
Canvas, a Web-based learning management system, was chosen to host the training module. Canvas allowed participants to access the content asynchronously over the Internet without the presence of the researcher and at their own convenience. Using this learning management system allowed the study to prescribe a defined pathway for participant engagement, starting with a pre-survey and ending with a post-survey. Participants were required to complete specific portions before moving on to the next

portion. For example, participants were required to complete and submit the pre-survey before accessing the instructional content. See Appendix A for a screenshot of the module pathway on Canvas.

Although the module was hosted on Canvas, a landing page with a tutorial video was created on Weebly, a free website hosting service, to help facilitate the login process. The tutorial video provided step-by-step instructions to prospective participants on how to create their Canvas account. Canvas was favored over other alternatives such as Google Forms because it allowed participants to leave and return at their convenience. The Canvas system also managed survey and assessment submissions, matching the instruments together for analysis. By relying on Canvas to help automate data collection, participants were not required to follow any ad hoc methods to link or match research instruments (e.g., having participants create, input, and recall a unique identifier for each research instrument that was submitted). Automating the data collection process helped mitigate any user error on part of the participant or researcher. This was all accomplished while maintaining user confidentiality; Canvas did not reveal participant e-mail information to the researcher. See Appendix B for screenshots of the landing page.

In addition to using a learning management system, this project used Articulate Storyline 2, an e-learning authoring program, to design the module content. Unlike the FEMA course, which is targeted to formal caregivers, this version was designed with informal caregivers in mind. John Keller's ARCS model (2010) was used to guide the development and design of the module's structure. The project consisted of four modules: 1) Introduction—attention was gained and the participant was introduced to the concept of preparedness, resilience, and the need for training on senior citizens concepts because of their vulnerable status, 2) Natural Hazards—relevance was conveyed to the participant through a brief overview of the types of natural hazards that may affect their elderly family members, 3) Needs and Capabilities—the participant's confidence was strengthened as they were instructed on the special needs senior citizens have and how to understand what they are physically and cognitively capable of, and 4) Risk and Vulnerability—mini quizzes aided in reinforcing content mastery on how Risk is considered when evaluating a potential hazard and how vulnerability is used as a function to determine one's exposure, sensitivity and adaptive capacity.

Figure 1, for instance, shows a knowledge check used in the online content, which was designed using the ARCS model. The knowledge check used color images to draw the user's attention, topics were referenced in the section to reinforce relevance, multiple answer options were available to build confidence, and immediate feedback was given to improve satisfaction.



**Figure 1.** Screenshot of a knowledge check used in the online training.

The instructional content presented short videos, scenarios, and tutorials. Articulate Storyline 2 design functions allowed for interactive knowledge checks at the end of each section. Research instruments included a pre-survey, an assessment, and a post-survey. The modules were designed to take approximately one hour to complete and no pre-test was administered. This study was concerned with understanding how participants viewed the design of the instructional module as an alternative to formal training. A second concern was increasing participant confidence as well as measuring the instructional effectiveness of the module by the level of knowledge with which a participant concluded the training.

## Methods

Adult learners with no formal training in senior caregiving who live in Hawaii were targeted for this research study. The initial call for participants was focused on recruiting participants who either resided with elderly family members or were responsible for the care of elderly family members. The study was expanded to include adults who did not currently live with seniors but had extended elderly family members. The potential for these participants to eventually take on caregiving responsibilities and to benefit from the information was great enough to warrant their inclusion in the study. Participants completed the instructional module asynchronously and without assistance from the researcher. A total of 36 participants were recruited and thirty-five completed the assessment and post-survey. Data from the lone participant who did not complete all the research instruments was omitted. See Appendix C to review the recruitment materials.

Demographic data was collected using the pre-survey. Participants were asked to report their age, employment status, level of education, and if they currently lived with or provided care for seniors. The pre-survey questions asked participants to report whether

they agreed to statements that they are confident in their knowledge in general disaster preparedness and their knowledge in disaster preparedness for senior citizens. A 5-point Likert scale was used for the survey questions with options covering “Strongly Disagree” (1), “Disagree” (2), “Unsure” (3), “Agree” (4), “Strongly Agree” (5). “Unsure” was used instead of “Neutral” to allow participants to opt out of a particular question without having to opt out from the entire set of questions. See Appendix D to view the research instruments.

Table 1, below, details the demographic information for the sample population. Participants were sorted into age groups; more than half of the participants (69%) reported that they were less than 40 years of age. An overwhelming majority of participants (91%) reported they possessed a college degree (Two-year degree through graduate degree). All participants reported they were employed with 80 percent holding full-time positions. Participants were also asked if they lived with or provided care for senior citizens. More than half (54%) responded that they did not live with or provide care for senior citizens while just under half (46%) reported that they had caregiver responsibilities for at least one senior citizen.

**Table 1.** Participant Demographics. (n=35)

Variables	Participants	Percentage
Age		
18-29	8	22.9%
30-39	16	45.7%
40-49	6	17.1%
50-59	3	8.6%
60+	2	5.7%
Education		
Less than high school	0	0.0%
High school	0	0.0%
Some college but no degree	3	8.6%
Associate (2-year) degree	1	2.9%
Bachelor (4-year) degree	17	48.6%
Some graduate coursework or advanced degree	14	40.0%
Employment Status		
Retired	0	0.0%
Unemployed	0	0.0%
Part-time	7	20.0%
Full-time	28	80.0%
Other	0	0.0%
Number of Seniors Live With or Provide Care		
None	19	54.3%
1	7	20.0%
2	7	20.0%
3	2	5.7%
4 or more	0	0.0%

From these initial demographic findings, the typical participant that consented to take part in the study was an employed adult under the age of 40 with a college degree.

However, the target population for this research study was adults that lived in Hawaii and who provided care or had caregiver responsibilities for elderly family members. The module was designed for participants who are self-motivated, have basic computer and Internet literacy skills, will benefit from learning about senior citizen caregiver issues, and have little to no advanced disaster preparedness knowledge. General learner characteristics for the target audience are analyzed through four domains of learning: cognitive, affective, social, and physiological (Figure 2).

Cognitive	Affective
<ul style="list-style-type: none"> <li>• Able to read and comprehend information</li> <li>• Able to apply logical reasoning</li> <li>• No problem with memory</li> </ul>	<ul style="list-style-type: none"> <li>• Interested in learning about disaster preparedness</li> <li>• Motivated to help seniors</li> <li>• Open to online learning</li> </ul>
Social	Physiological
<ul style="list-style-type: none"> <li>• Have family members who are seniors</li> <li>• Understand caregiver role</li> <li>• Unable to afford formal caregiving</li> <li>• Have access to computer with Internet connection</li> </ul>	<ul style="list-style-type: none"> <li>• Able to use a computer</li> <li>• Able to read text and view graphics</li> <li>• Over 18 years of age</li> <li>• No problem with seeing or hearing</li> </ul>

**Figure 2.** Target Audience Learner Characteristics.

The assessment instrument was administered immediately after participants completed reviewing the instructional content and prior to beginning the post-survey; the assessment focused on measuring participant mastery of the four module sections by having participants answer 12 questions. Table 2, below, lists the content areas and the various types of questions asked in the assessment.

**Table 2.** Types of Assessment Questions.

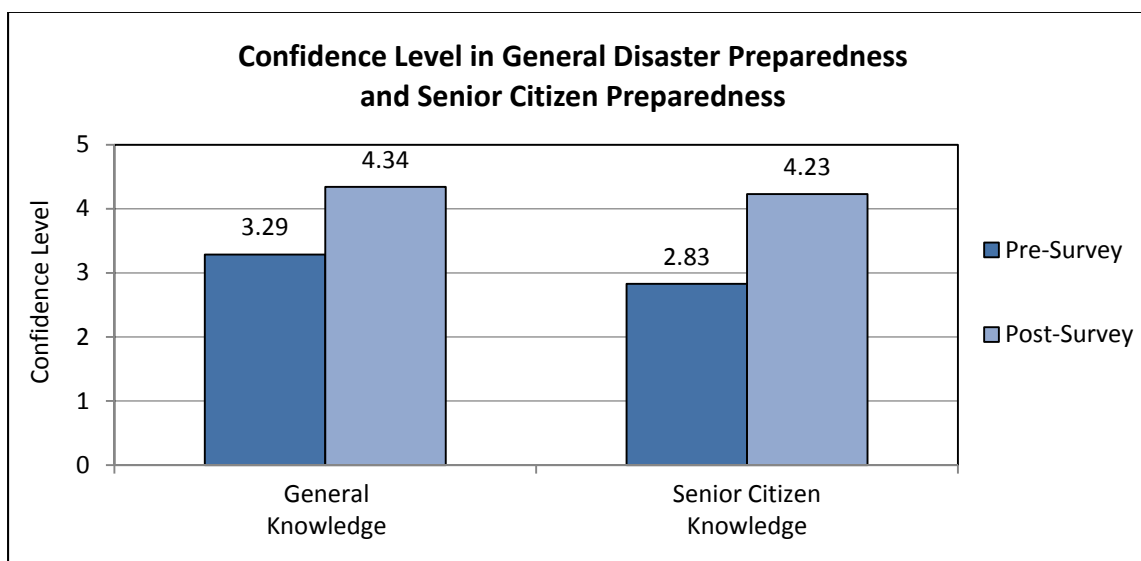
Question Number	Content Area/Question Type
1	Hazard Identification/Matching
2	Map/Evacuation
3 and 4	Capabilities (Physical and Cognitive)
6, 7, and 8	Needs (Social, Economic, and Medical)
5 and 9	Needs and Capabilities Scenario
10	Risk
11	Vulnerability
12	Risk and Vulnerability Scenario

The post-survey, like portions of the pre-survey, asked participants to again rate their confidence using a 5-point Likert scale for both general disaster preparedness and senior citizen disaster preparedness. Aligning both surveys allowed the study to examine participant confidence levels before and after completing the training. The post-survey also asked a series of questions that were grouped into thematic constructs pertaining to 1) ease of use of the module, 2) engagement of the content, 3) quality of the material, and 4) participant satisfaction. A 5-point Likert scale similar to the pre-survey questions were used with options ranging from “Strongly Disagree” (1) to “Strongly Agree” (5).

Participants were also allowed to provide general feedback on the modules. Questions asked participants to report which sections were confusing, which sections were useful, what information should be included in future versions of the training, would they recommend others to also take the training, and were they able to complete the training within an hour. Data from the research instruments were analyzed using Canvas and Microsoft Excel. Descriptive statistics were used to examine instrument responses, which will be discussed in the next section.

## Results

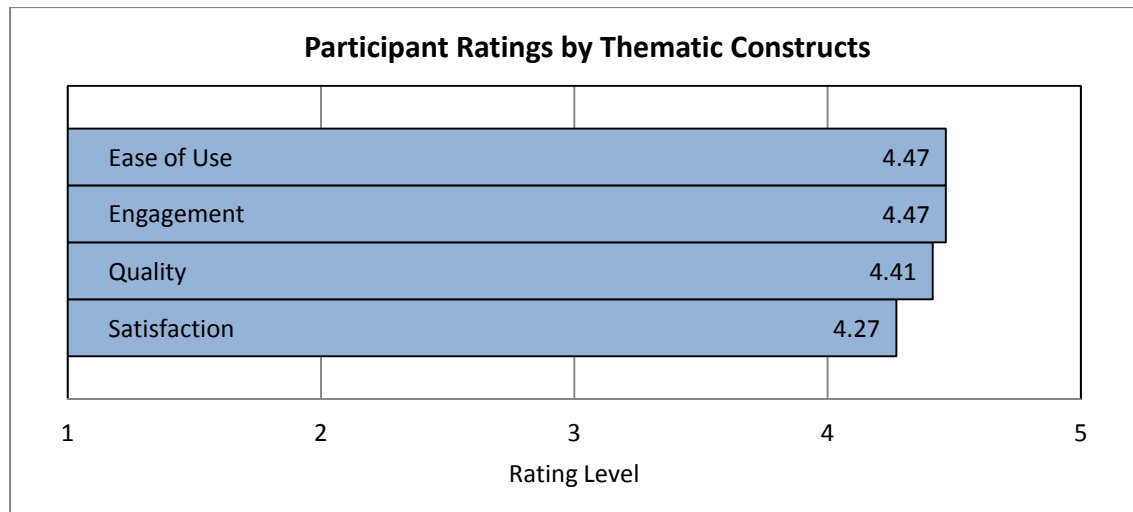
Pre-survey participant confidence in general disaster preparedness knowledge was rated 3.29 out of 5 and confidence in senior citizen disaster preparedness knowledge was rated 2.83 out of 5. Post-survey confidence levels showed a marked increase after completing the module; confidence in general knowledge rose to 4.34 out of 5 and senior citizen knowledge rose to 4.23 out of 5. All responses were gauged using the 5-point Likert scale with “Strongly Disagree” (1) and “Strongly Agree” (5) as anchors. Figure 3, below, depicts the increase in confidence levels. Participants, in general, completed the training, confident in their knowledge of disaster preparedness and senior citizens disaster preparedness.



**Figure 3.** Participant Confidence Levels.

Along with measuring participant confidence in preparedness knowledge, the post-survey asked questions centered on the four attitudinal constructs (Ease of use of the module, Engagement of the content, Quality of the material, and participant Satisfaction). Participant responses were averaged into grand means for each construct (Figure 4). The instructional module received overall positive reviews. Each construct exceeded 4 points on the 5-point Likert scale with Ease of Use and Engagement both receiving 4.47. Participant Satisfaction received the lowest score with 4.27.





**Figure 4.** Participant Rating of Thematic Constructs

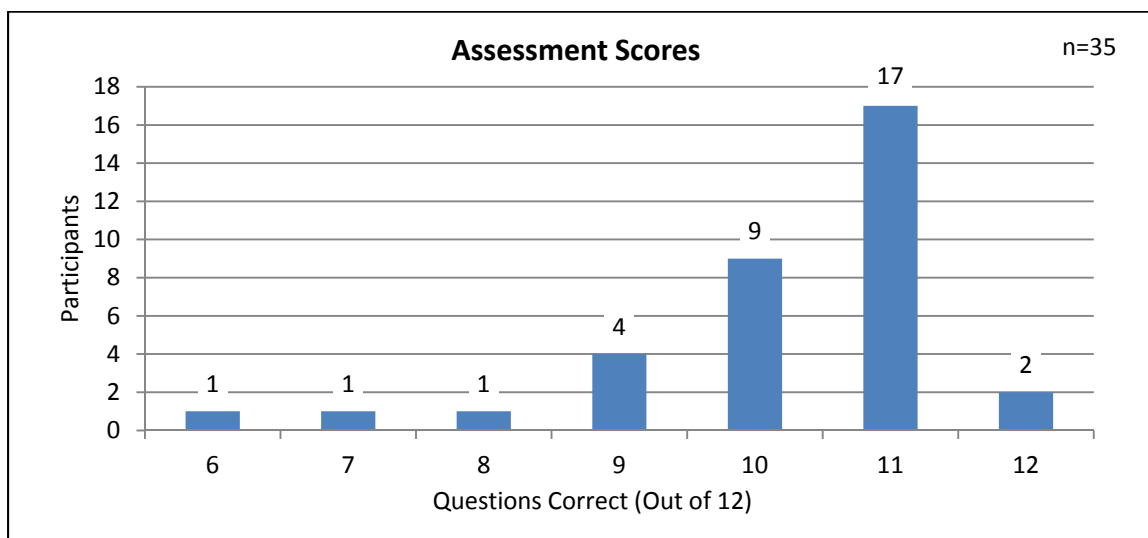
Each thematic construct can be broken down further into subsections. Highly rated items (over 4.5) reflected participant views that the module was easy to use and that directions were easy to understand. Additionally, participants responded with highly positive ratings that the videos and images were engaging and that the information presented was appropriate. Participants responded with moderate ratings (4.25 to 4.49), noting that the questions were easy to complete, the module length was manageable, using a website made the content engaging, the information was generally useful, and that participants would consider using online training again in the future. Table 3, below, outlines the 11 survey questions, which spanned the four constructs.

**Table 3.** Participant Construct Ratings.

Thematic Construct	Rating
Ease of Use	<b>4.47</b>
Module was easy to use	4.51
Directions are easy to understand	4.54
Questions are easy to complete	4.34
Engagement	<b>4.47</b>
Length of module is manageable	4.46
Use of website makes module more engaging	4.40
Videos and images used are engaging	4.54
Quality	<b>4.41</b>
Information presented is useful for me	4.29
Information presented is useful for others	4.40
Information presented is appropriate	4.56
Satisfaction	<b>4.27</b>
Consider using online training again in the future	4.31
Would recommend others use online training	4.23

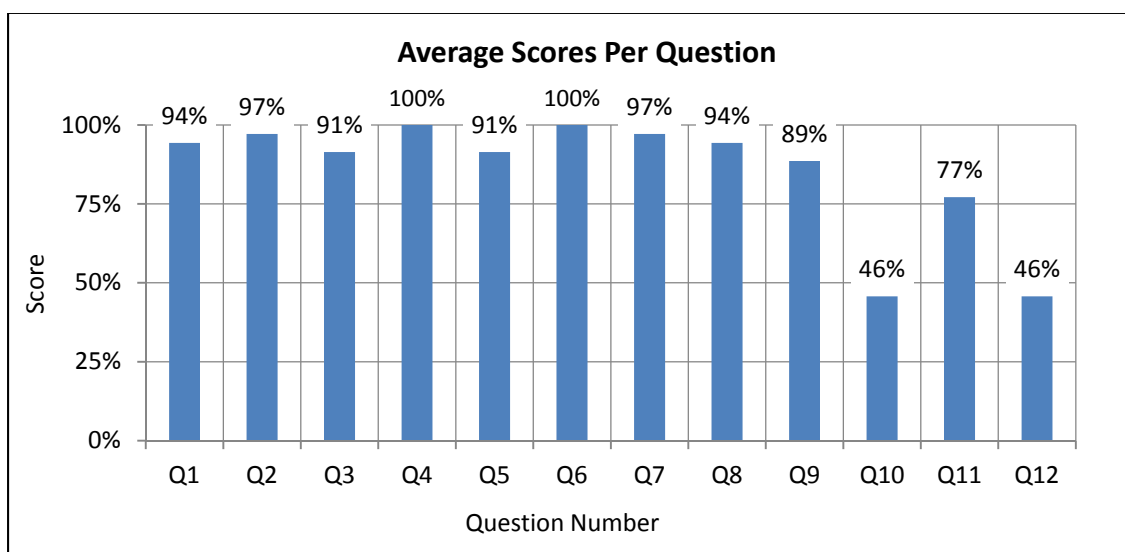
Note: Grand mean for each construct shown in boldface.

Nineteen (19) out of 35 participants correctly answered at least 11 out of 12 assessment questions, scoring at least 92 percent (Figure 5). Of the 19 participants, two scored 100 percent. Participants achieved fairly high marks on the assessment. Three participants, however, did not do as well; one participant answered six questions correctly (50% score), another participant answered seven questions correctly (58% score), and the third participant answered eight questions correctly (67% score).



**Figure 5.** Assessment Score Distribution.

Participants by and large scored well on the assessment with scores between 89 percent and 100 percent for Questions 1-9 (Figure 6). While participants did fairly well, average scores per question showed that participants had trouble with Questions 10-12. Questions 10 and 12 scored as low as 46 percent. These last three questions were focused on risk and vulnerability.



**Figure 6.** Average Scores Per Assessment Question.

Participants provided feedback on modules as part of the post-survey instrument. More than half of the participants (more than 18) found the sections covering capabilities, needs, and risk and vulnerability was useful (Table 4). Participants were allowed to respond that sections were both confusing and useful. The risk and vulnerability section was considered both the most confusing (9) and most useful (29). Each section is separated out and categorized into those living or providing care (caregiver) and those not living with or providing care (non-caregiver). See Appendix E for additional data results.

**Table 4.** Participant Feedback. (n=35)

Section (By Instructional Topic)	Confusing	Useful
Natural Hazards		
Caregiver	1	8
Non-caregiver	1	7
Assessing Capabilities		
Caregiver	0	9
Non-caregiver	3	11
Assessing Needs		
Caregiver	1	10
Non-caregiver	2	14
Assessing Risk and Vulnerability		
Caregiver	6	16
Non-caregiver	3	13

### Discussion and Conclusions

Although participants scored fairly well on the assessment portion, the last three questions on risk and vulnerability (Questions 10-12) showed a noticeable drop in performance. Questions 10 and 12 received only 46 percent correct responses. There are a few possible reasons to understand the low performance for this section. Participants may have been fatigued since this section was the last of four sections before the assessment portion. Participant feedback also noted that the risk and vulnerability section was confusing. Feedback questions did not survey participants to determine if the amount of instruction was inadequate or if the questions were unclear.

More participant data is needed to better understand why the risk and vulnerability section had low performance. Moreover, additional data and participation is needed to understand why three participants scored between 50 percent and 67 percent. This research project did not use any methods to track and monitor participant progress. Also, Canvas did not record how long each participant took to complete the instructional content or how long they took to answer each question. This is something to consider for future iterations of the module since tracking participant progress will be able to provide insight into participant performance.

As one of the goals of this research project was to understand how participants received the online training as an alternative to formal face-to-face training, results showed 32

participants responded that they would recommend others take this online training. In regards to informal caregivers lacking time for training, 29 participants reported that they took less than one hour to complete the training, four (4) participants reported that they took about an hour to complete the training, and two (2) were unsure how much time they needed to complete the training. Future versions of the training will need to track time spent within each module and if videos are viewed.

Several participants requested additional scenario questions, specialized content (e.g., how to evacuate for a specific need; information on vog, hail, and acid rain; etc.), and resources to connect with subject matter experts. Participants noted that the course was useful and these requests could be a result of the increased interest and perceived utility. Likewise, this project would benefit from partnering with established departments at the university. Experts and practitioners with in-depth knowledge and experience on preparedness will help improve the overall quality of the material presented.

Given the limited resources available for design and development of the project, this project would also benefit from funds to purchase authoring software. The project development phase was hampered when trial periods for Articulate Storyline 2 expired. Purchasing Articulate Storyline was not an option due to its high cost (\$1,500) and the limited scope of the project (one year). Additional funds would also help with increasing the effectiveness of the learning management system. Participants requested feedback on their individual results. Presently, this would involve the researcher attempting to match and identify the de-identified data. Because the data was cleared of personally identifiable data, this would prove difficult but would nevertheless be beneficial to participants in order to aid in learning and provide meaningful feedback. Additional funds would also help to build a process to provide instant feedback on individual assessment results.

Additional time and money would also help in recruiting a more diverse sample population. The sample population was primarily young adults that either attended or worked in higher education. The target population is quite different. A report that profiled Hawaii's seniors and their caregivers noted 55 percent of informal caregivers were greater than 45 years of age (Executive Office on Aging, 2006). Participants of this study reported that approximately 68 percent of them were less than 40 years of age. Future iterations of this study should consider attending service provider resource fairs and partnering with the state and county government agencies.

A second concern of this research study was evaluating the effectiveness of the training; participants were expected to have a high level of knowledge and increased confidence after they finished. By focusing on designing content to help participants increase their knowledge of issues pertaining to disaster preparedness, participants have generally reported an increase in their confidence to support senior citizens. Twenty-eight (28) out of 35 participants completed the course with scores greater than 80 percent. This is a positive outcome for the course. One limitation, however, is that this project is unable to measure if and how senior citizen resilience is increased. This study did not use any

methods to measure if participants are using information learned from the course to improve outcomes for senior citizens.

In conclusion, this research project set out to help improve the resilience of senior citizens to prepare for, respond to, and recover from natural hazards by providing training for informal caregivers. This project will serve as a good foundation for improving the overall resilience of our senior citizens. Information and data collected in this study will help training providers like FEMA to better understand how to improve their course offerings by considering aspects of instructional design aspects and time and access constraints.

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## APPENDIX A

### Screenshots of Canvas

The screenshot displays the Canvas LMS interface for a course named "Disaster Preparedness". The top navigation bar includes "Courses", "Grades", and "Calendar". The breadcrumb trail shows the user is in the "Modules" section of the "Disaster Preparedness" course. Two buttons, "View Progress" and "Create a Module", are visible in the top right.

The main content area is organized into four collapsible module sections, each with a green checkmark, a plus icon, and a settings gear icon:

- Pre-Survey**: Contains one item, "Pre-Survey", with the requirement "must submit the assignment".
- Instructional Content**: Contains four items, "Part 1", "Part 2", "Part 3", and "Part 4", each with the requirement "must view the page".
- Assessment**: Contains one item, "Assessment", with a weight of "12 pts" and the requirement "must submit the assignment".
- Post-Survey**: Contains one item, "Post-survey", with the requirement "must submit the assignment".

Prerequisite relationships are shown below each section:


- Under "Pre-Survey", the prerequisite is "Pre-Survey".
- Under "Assessment", the prerequisite is "Instructional Content".
- Under "Post-Survey", the prerequisite is "Assessment".




Question 1

1 pts


Match the image of the natural hazard with the answer options below.




A




B



C



D



E

Tsunami

[ Choose ]

Flood

[ Choose ]

Volcano/Lava

[ Choose ]

Wildfire

[ Choose ]

Severe Storm/Hurricane

[ Choose ]

Next

## APPENDIX B

### Recruitment Materials

**Grant Chartrand**

---

**From:** Grant Chartrand  
**Sent:** Monday, January 05, 2015 2:05 PM  
**To:** Grant Chartrand  
**Subject:** Research Project

Dear Friends and Colleagues,

I'm working on my final project for my degree in Learning Design and Technology at the College of Education. Your help would be appreciated.

Please consider joining my research study as a participant and complete the surveys and assessments for my online course on senior citizen disaster preparedness. I designed the course to introduce and familiarize family members on disaster preparedness for senior citizens. You do not need to live a senior citizen to be eligible. Those that have senior citizen relatives or who will eventually take on caregiver responsibilities are able to participate. Seniors are more vulnerable to hazards due to economic, medical, social, cognitive, and physical issues.

This course is intended to help participants to support their seniors to prepare for, respond to, and recover from natural hazards.

This project should take an hour to complete and you will need a Flash-enabled browser. The project is found at: <https://canvas.instructure.com/enroll/866TM9>. Please be sure to do submit all surveys and assessments. A consent form to participate is also located at the link provided. Please let me know if you have any questions.

Thank you,  
Grant Chartrand

The University of Hawai'i is conducting a study:

***An Instructional Module to Increase the Awareness of the  
Special Needs of Senior Citizens for Disaster Preparedness***



**Do you live with or help provide care for  
someone who is over 65 years old?**

If the answer is **YES...**

Mr. Grant Chartrand would like to invite you to participate in a research study.

**The purpose** of this study is to design, develop, and evaluate the effectiveness of an online module for adult learners who live in Hawaii to increase their awareness of the special disaster preparedness needs of elderly family members with whom they reside or provide care. This study is part of the course requirements for the Department of Learning Design & Technology at the University of Hawai'i at Manoa.

- Participants will be asked to voluntarily participate online.
- All information will be kept confidential.
- A report of the study will be available to study volunteers.

**To learn more about the study, please email Grant Chartrand at [gchartra@hawaii.edu](mailto:gchartra@hawaii.edu) or visit [hazardtraining.weebly.com](http://hazardtraining.weebly.com).**

### CONSENT TO PARTICIPATE IN RESEARCH PROJECT

#### *An Instructional Module to Increase the Awareness of the Special Needs of Senior Citizens for Disaster Preparedness: Increasing Senior Citizen Resilience*

My name is Grant Chartrand and I'm a student in the Learning Design & Technology department at the University of Hawaii at Manoa. I am conducting a research project to help improve the resilience of our senior citizens. Senior citizens are disproportionately vulnerable to hazards due to the likelihood that they have economic, medical, social, cognitive, or physical issues. The purpose of this study is to design, develop, and evaluate the effectiveness of a Web-based tutorial for adult learners who live in Hawaii to increase their awareness of the special disaster preparedness needs of elderly family members with whom they reside or provide care.

**What activities will you do in the study and how long will the activities last?** If you participate, I will ask that you complete my online instructional module, which is compiled using Canvas, a learning management system. You will be asked to create an account in Canvas using an email address and a name, which will only be used for evaluation and assessments for this project. The module will last up to one hour and it will consist of a pre-survey, the instructional content, a post-assessment, and a post-survey. Your responses to the tests and surveys will be recorded and the information will be evaluated. If you decide to participate, you will be one of a total of approximately twenty adult participants that reside in Hawaii.

**Benefits and Risks:** You may benefit from participating in my research project by learning more about the disaster preparedness needs of the elderly. The results of this project might help me and other researchers learn more about providing online training and instruction on disaster preparedness. I believe there is little or no risk to you in participating in this project. There is a possibility you may become uncomfortable or stressed by participating in an instructional module. If that happens, you may take a break or stop the module. You may also withdraw from the project altogether by disenrolling from Canvas. Your information will be kept confidential and no names will be reported. Only aggregate data will be reported. The information will be deleted at the completion of the final project report.

**Confidentiality and Privacy:** I will store all information collected in a safe place. Only I and my instructor will have access to the information. The University of Hawaii Human Studies Program has the right to review research records for this study.

When I report the results of my research project in my typed papers, I will not use your name or any other personal information that would identify you. If you would like a copy of my final report, please contact me at the e-mail listed near the end of this consent form.

**Voluntary Participation:** Participation in this research project is voluntary. You are free to choose to participate or not to participate in this project. At any point during this project, you can withdraw your permission without any penalties or loss of benefits.

**Questions:** If you have any questions about this project, please contact me at via e-mail at [gchartra@hawaii.edu](mailto:gchartra@hawaii.edu).

If you have any questions about your rights in this project, you can contact the University of Hawaii, Human Studies Program, by phone at (808) 956-5007 or by e-mail at [uhirb@hawaii.edu](mailto:uhirb@hawaii.edu).

**To Access the Module:** Please go to [hazardtraining.weebly.com](http://hazardtraining.weebly.com) to access the module website. You should find a copy of this consent form and background information on natural hazards on the website. Clicking on the link "START" at the bottom of the page will be considered as your consent to participate in this study.

## APPENDIX C

### Landing Page

#### Disaster Preparedness for Senior Citizens

Home

Background

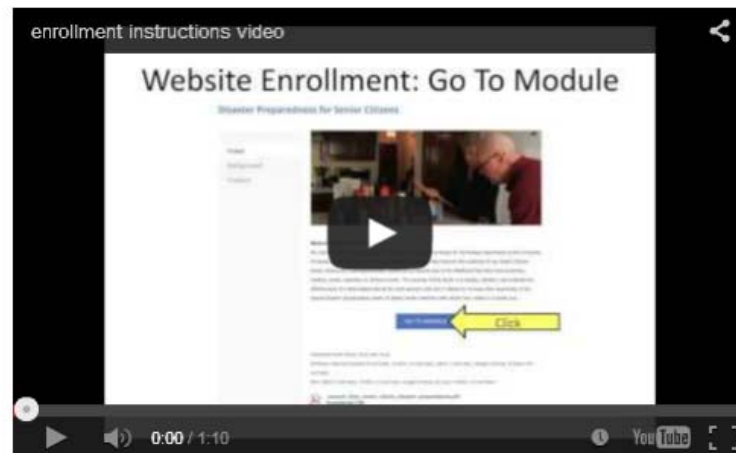
Contact



#### Welcome Research Participant!

My name is Grant Chartrand and I'm a student in the Learning Design & Technology department at the University of Hawaii at Manoa. I am conducting a research project to help improve the resilience of our senior citizens. Senior citizens are disproportionately vulnerable to hazards due to the likelihood that they have economic, medical, social, cognitive, or physical issues. The purpose of this study is to design, develop, and evaluate the effectiveness of a Web-based tutorial for adult learners who live in Hawaii to increase their awareness of the special disaster preparedness needs of elderly family members with whom they reside or provide care.

GO TO MODULE



Download Flash Player 10 or later [here](#).

Windows: Internet Explorer 6 and later, Firefox 1.X and later, Safari 3 and later, Google Chrome, & Opera 9.5 and later

Mac: Safari 3 and later, Firefox 1.X and later, Google Chrome, & Linux: Firefox 1.X and later



consent\_form\_senior\_citizen\_disaster\_preparedness.pdf  
[Download File](#)

## Disaster Preparedness for Senior Citizens

Home

Background

Contact

### Preparing Makes Sense for Older Americans



### 3 Be Informed

Know What Emergency Plans and Disasters Mean for You

To prepare for the emergency, you need to understand the emergency, what it means for you, and what you can do to protect yourself. It's important to know where you are, what you are doing, and what you can do to protect yourself. It's important to know where you are, what you are doing, and what you can do to protect yourself.

**Programs for Emergencies: Know the Information for Older Americans.**

[www.ready.gov](http://www.ready.gov)

Ready

FEMA

### 1 Get a Kit

What to Get in Your Kit

The first step is to know what you need. You need to know what you need, and you need to know what you need. You need to know what you need, and you need to know what you need. You need to know what you need, and you need to know what you need.

**How to Prepare:** First, find out what you need. You need to know what you need, and you need to know what you need. You need to know what you need, and you need to know what you need. You need to know what you need, and you need to know what you need.

**Get Ready Now.**

Ready



ready\_seniors\_2014.pdf  
[Download File](#)

## Disaster Preparedness for Senior Citizens

[Home](#)[Background](#)[Contact](#)

Use the form below to send me a message about this website. Your comments and feedback are appreciated. Please note that by entering your email address, your comments will not be anonymous. Thank you for participating in my learning module.

**Name \***

First

Last

**Email \*****Comment \***



## **APPENDIX D**

### **Research Instruments**

#### **Pre-Survey Questions**

1. What is your age?
  - a. 18-29
  - b. 30-39
  - c. 40-49
  - d. 50-59
  - e. 60+
  
2. How many senior citizens do you live with or provide care?
  - a. 1
  - b. 2
  - c. 3
  - d. 4 or more
  - e. none
  
3. What is your current employment status?
  - a. Full-time
  - b. Part-time
  - c. Unemployed
  - d. Retired
  - e. Other:
  
4. What is your level of education?
  - a. Less than high school
  - b. High school
  - c. Some college but no degree
  - d. Associate (2 year) degree
  - e. Bachelor (4 year) degree
  - f. Some graduate coursework or an advanced degree

#### **How much do you agree with the following statements?**

5. I am confident in my knowledge of general disaster preparedness.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure

6. I am confident in my knowledge of disaster preparedness for the senior citizens with whom I reside or provide care.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - a. Unsure

### **Post-Survey Questions**

#### **How much do you agree with the following statements?**

##### **Confidence**

2. I am confident in my knowledge of general disaster preparedness.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure
3. I am confident in my knowledge of disaster preparedness for the senior citizens with whom I reside or provide care.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure

##### **Ease of Use**

4. The module is easy to use.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure
5. The directions are easy to understand.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure

6. The questions in the surveys are easy to complete.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure

**Engagement**

7. The length of the module is manageable (not too long or too short).
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure
8. The use of a website makes the module more engaging.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure
9. The videos and images used are engaging
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure

**Quality**

10. The information presented is useful for me as someone that resides with or cares for senior citizens.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure
11. The information presented is useful for others that reside with or care for senior citizens.
  - a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure

12. The information presented is appropriate for family members and caregivers.
- a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure

**Satisfaction**

13. I would consider using online training again for learning in the future.
- a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure
14. I would recommend others use online training for learning.
- a. Strongly agree
  - b. Agree
  - c. Disagree
  - d. Strongly disagree
  - e. Unsure

**Content**

15. What section was useful for you? (Check all that apply)
- ☐ Assessing capabilities (physical and cognitive)
  - ☐ Assessing needs (social, economic, and medical)
  - ☐ Assessing risk and vulnerability
  - ☐ Natural hazards
  - ☐ Other: \_\_\_\_\_
16. What section was confusing for you? (Check all that apply)
- ☐ Assessing capabilities (physical and cognitive)
  - ☐ Assessing needs (social, economic, and medical)
  - ☐ Assessing risk and vulnerability
  - ☐ Natural hazards
  - ☐ Other: \_\_\_\_\_
17. What information should be included in future versions of this module? \_\_\_\_\_

**General**

18. Would you recommend others take this module?
- a. Yes
  - b. No
  - c. Unsure

19. How long did it take you to complete the module?






- a. Less than an hour
- b. About an hour
- c. More than an hour
- d. Unsure

### Assessment Questions

Objective EL 1: Given a series of images, the participant will identify the natural hazard shown.

Behavior EL 1: Identify natural hazards

Question EL 1: Match the natural hazard on the left with the appropriate image on the right.

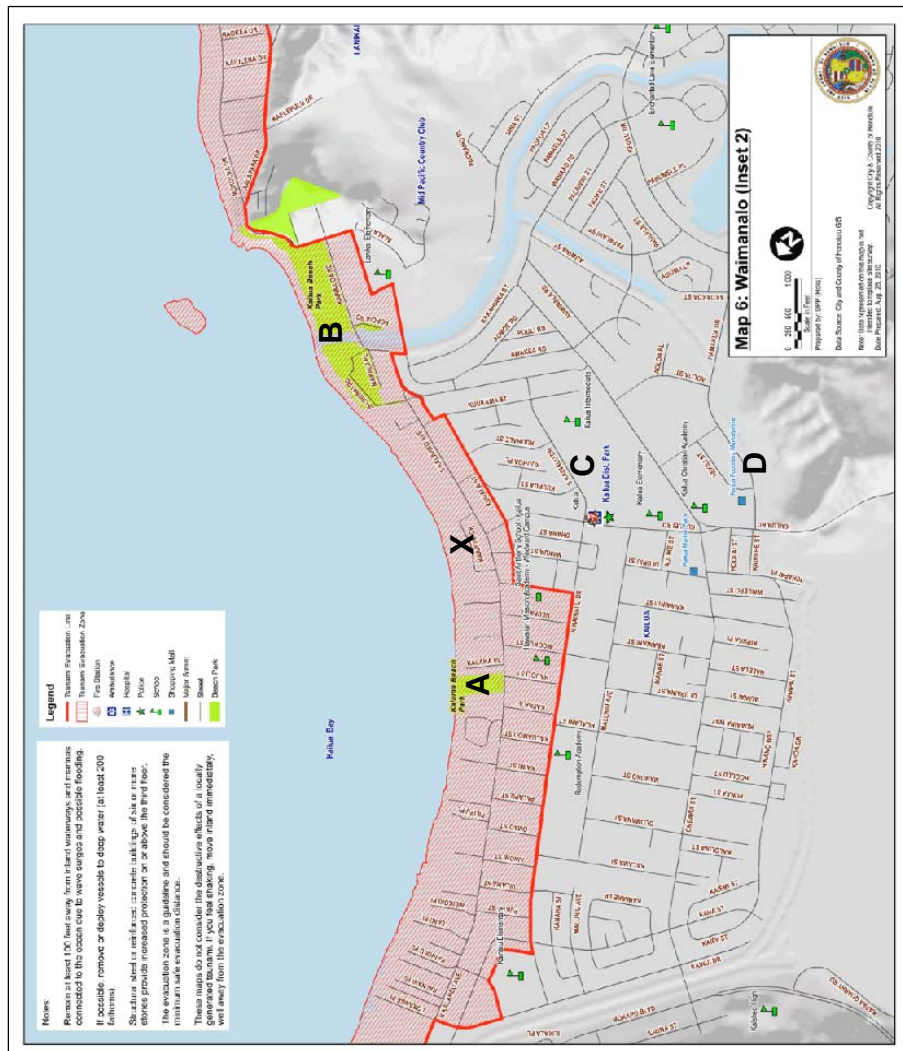
Tsunami	
Flood	
Volcano/Lava	
Wildfire	
Severe Storm/ Hurricane	

Objective EL 3: Given a map and the location of a residence, the participant will select the nearest evacuation point.

Behavior EL 3: Identify an evacuation point

Question EL 3: What is the nearest evacuation point or shelter for Mr. H. Kojima if a tsunami warning was given?

(Image of map showing Mr. Kojima's residence marked "X", Kalama Beach Park marked "A", Kailua Beach Park marked "B", Kailua District Park marked "C", and Kailua Foodland marked "D")



- A. Kalama Beach Park
- B. Kailua Beach Park
- C. Kailua District Park\*
- D. Kailua Foodland

Objective 1: Given a cognitive condition, the participant will select the correct action(s) to augment a senior citizen's cognitive capability.

Behavior 1: Define cognitive capabilities

Question 1: What preparedness action could be done to accommodate trouble with memory?

- A. Keep up-to-date on the current weather conditions.
- B. Store five days worth of water.
- C. Know where the nearest evacuation point or shelter is.
- D. Have a map to the nearest evacuation point or shelter.\*

Question 1: A wildfire is approaching Sally Smith's house. Sally has trouble with memory. What preparedness action should be done to accommodate her memory?

- E. Label the containers in the pantry.
- F. Organize the food in the refrigerator.
- G. Prepare a Christmas shopping list.
- H. Create a map to the nearest evacuation point or shelter.\*

Objective 2: Given a physical condition, the participant will select the correct action(s) to augment a senior citizen's physical capability.

Behavior 2: Define physical capabilities

Question 2: What preparedness action could be done to accommodate trouble with mobility?

- A. Have a spare disaster kit.
- B. Keep up-to-date on the current weather conditions.
- C. Store five days worth of water.
- D. Have a wheelchair ready.\*

Objective 3: Given a scenario, the participant will assess a senior citizen's capabilities and the possible actions that can be done during an evacuation.

Behavior 3: Assess senior citizen's capabilities

Question 3: A tsunami warning was just announced while Tom was at home in Waikiki. Evacuation needs to occur immediately. Tom is wheelchair-bound and is forgetful. Most of the dwellings in Tom's part of Waikiki are one- or two-story structures. Tom lives on the bottom floor of a two-story structure and is friendly with his neighbors that live on the second floor. What preparedness action could be done to accommodate Tom's capabilities?

- A. Tom can make sure his appliances are easily switched off in the event of an emergency.
- B. Tom can schedule paratransit services (Handi-Van) to request a pick-up to evacuate.
- C. Tom can have a stockpile of disaster supplies for himself, his wife and his neighbors.
- D. Tom can have an agreement with his neighbors to have them check on him and to evacuate with them in the event of an emergency.\*

Objective 4: Given a medical condition, the participant will select the correct item needed during an evacuation.

Behavior 4: Define medical needs

Question 4: What preparedness action could be done to accommodate someone with a medical condition such as diabetes?

- A. Store five days worth of water.
- B. Have an insulin travel kit and non-perishable food items packed and ready.\*
- C. Have a spare mobile phone.
- D. Have a vehicle ready with at least half a tank of gas.

Objective 5: Given a social condition, the participant will select the correct action(s) needed during an evacuation.

Behavior 5: Define social needs

Question 5: What preparedness action could be done to accommodate someone with a social condition such as distrust of strangers?

- A. Work to ensure the individual is familiar with their neighbors.\*
- B. Have a vehicle ready with at least half a tank of gas.
- C. Have a spare disaster kit.
- D. Create a phone list of government agencies to call for help.

Question 5: What preparedness action could be done to accommodate someone with a social condition such as isolation?

- A. Keep a guard dog.
- B. Stockpile emergency rations to enable sheltering-in-place.
- C. Continue going on with daily routine to avoid people and to keep from worrying.
- D. Have a mobile device that can provide them with alert information.\*

Objective 6: Given an economic condition, the participant will select the correct action(s) needed during an evacuation.

Behavior 6: Define economic needs

Question 6: What preparedness action could be done to accommodate someone with an economic condition such as living on a fixed income?

- A. Purchase an extra mobile phone.
- B. Have a vehicle ready with at least half a tank of gas.
- C. Keep up-to-date on the current weather conditions.
- D. Coordinate with a local food bank to prepare a disaster kit.\*



Objective 7: Given a scenario, the participant will assess a senior citizen's needs and the requirements that need to be satisfied during an evacuation.

Behavior 7: Assess senior citizen's needs

Question 7: Dorothy lives alone in an apartment. She prefers to remain isolated and does not interact with strangers. Dorothy does not work and relies on Social Security and food deliveries from a local church. Lately, Dorothy has been having trouble breathing and now relies on an oxygen tank. What preparedness action could be done to accommodate Dorothy's needs?

- A. Dorothy can make sure that her vehicle has a full tank of gas.
- B. Dorothy can stockpile supplies so she doesn't have to evacuate.
- C. Dorothy can make sure her apartment is secured and locked up to prevent theft.
- D. Dorothy can have the number of a trusted friend who checks in on her and can help her evacuate.\*

Objective 8: Given a natural hazard and a location of a residence, the participant will determine the risk.

Behavior 8: Define risk

Question 8: The risk of a tsunami for someone living in an oceanfront high-rise apartment.

- A. Low\*
- B. Medium
- C. High

Question 8: The risk of a flood for someone living near a river known to flood after heavy rains during the rainy season.

- A. Low
- B. Medium
- C. High\*

Objective 9: Given a natural hazard and a location of a residence, the participant will determine the vulnerability.

Behavior 9: Define vulnerability

Question 9: The vulnerability to a severe storm for a new home that meets safety standards.

- A. Low\*
- B. Medium
- C. High

Question 9: The vulnerability to a tsunami for a wooden structure.

- A. Low
- B. Medium
- C. High\*

Objective 10: Given a scenario, the participant will assess the risk and vulnerability of a location.

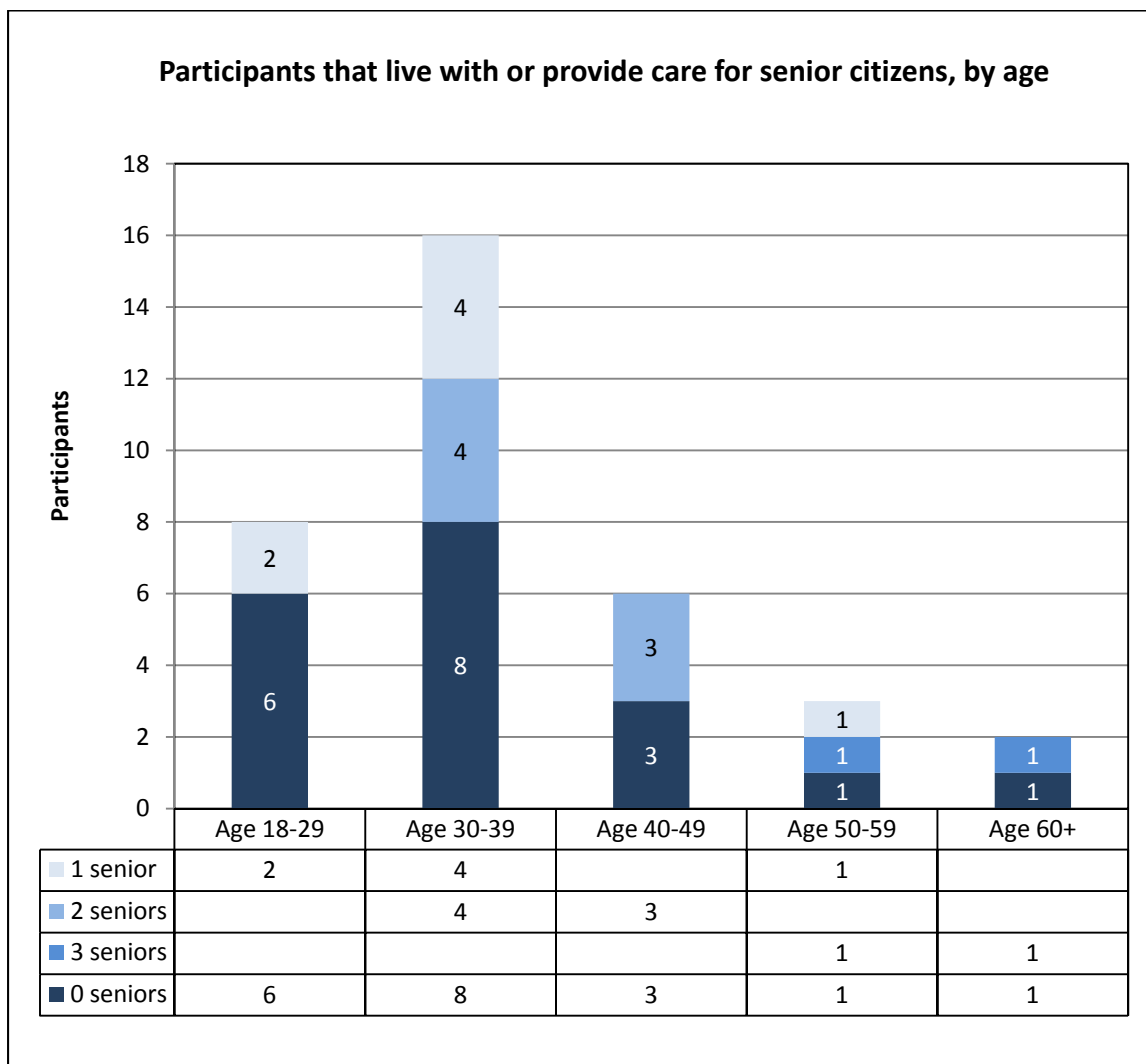
Behavior 10: Assess a location's risk and vulnerability to natural hazards

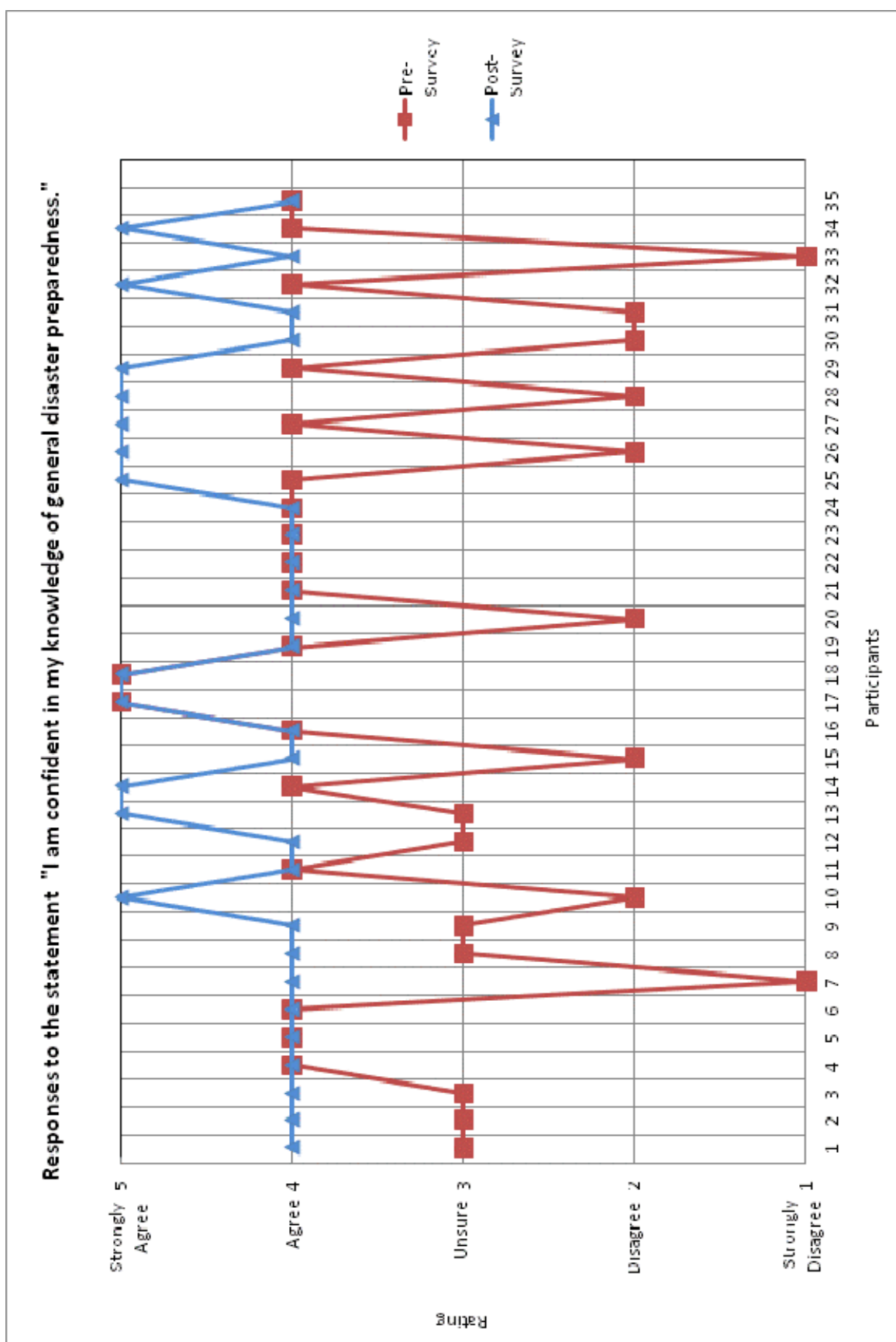
Question 10: John recently retired to an old, wooden cottage on a beachfront property in Puna. The area in Puna that John moved to is isolated, surrounded by forests, and situated on a hill away from any rivers or low areas. There is increased activity in the volcano in the region as of late. What is the risk and vulnerability for John in his home?

- A. John's home is not a risk or vulnerable to any natural hazards in the area.
- B. John's home is at risk to tsunamis, wildfires, volcanoes and severe storms but not for floods. His home is vulnerable to tsunamis, wildfires, volcanoes and severe storms but is not vulnerable to floods.\*
- C. John's home is at risk to volcanoes only. His home is vulnerable to tsunamis, wildfires, volcanoes and severe storms but is not vulnerable to floods.
- D. John's home is at risk and vulnerable to all the hazards in the area.

## APPENDIX E

### Additional Data Results





Responses to the statement "I am confident in my knowledge of disaster preparedness for the senior citizens with whom I reside or provide care."

