Engaging Context with Data Integration:

Engaging Students with 1946 April Fool's Hawaii Tsunami

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Connecting students to real world contexts is what makes teaching incredible. My students and I are fortunate to live in on a beautiful island, but the realities of natural disasters are always looming and are ever too present. Throughout modern history, our island has faced tragedy and near-misses with each passing tsunami. As the years have passed, our understanding of this phenomenon has improved as well as the response systems in place. This paper will illustrate the usage of engaging data integration, with real life experiences as a springboard for students to construct an engineering solution in the hands on activity: Survive That Tsunami! Testing Model Villages in Big Wavesr (Hill, Schaefer Zarske, & Carlson, 2006).

Data Source

The data source that has been selected is the Tsunami Forecast Model Animation: Aleutian Islands 1946 from the Pacific Tsunami Warning Center (PacificTWC, 2016). There is both a webpage with factual information of the specifics of the tsunami as well as a youtube video that animates how the waves traveled from the Aleutian Islands to Hawai'i.

Lesson Enhancement

For this lesson, students will first watch a firsthand account of a man named Mr. Nishimoto, a local resident, surviving the deadly April 1, 1946 Hawai'i Tsunami (Tucker, 2014). This will help to provide some context of the power behind these series of tidal waves. To further dive deeper, students will explore the webpage given as well as review the interactive model to get a better understanding of this type of natural disaster.   Providing the data of the wave heights and time frame helps to illustrate the seriousness and power behind a tsunami and

that it is not just a "big wave." First, the data shows a cause and effect relationship between a earthquake and a tsunami. Then it begins to showcase the magnitude behind this type of destructive event and how the wave height (55 feet high in Hilo, HI) traveled inland and killed 158 people on that fateful day. This then probes the natural questions like why did this kill so many people and how could this be prevented in the future. These natural questions begin to flow and curiosities arise after the initial shock of this event.

Using Data

After sharing this lesson with students, I was reminded at how important and powerful it is to utilize data in the classroom. Obviously as teacher, data is continually being collected throughout the day to measure student success, but to use it as part of the phenomenon of a lesson takes data usage to another level. By sharing real facts of a real event helps to grab the student's attention and encourages the type of questioning and discourse that we want to elicit from students. Using data in the classroom also allows for real world application and connections to be made. Naturally, we all care and are invested about the world around us and by quantifying what is happening into numbers and models, we are better able to understand what is happening where we live.

Visual Presentation

The rationale of this data source is to bring awareness and understanding to an event that happened on our island as well as information for future events. This data will be integrated across STEM content areas as students will not only have a better understanding of the science behind a tsunami, but they will use this to engineer a solution for coastal towns. Students are also able to use their math skills to graph that wave heights for the different parts of the Pacific

Ocean. The visual model is presented in a way that is user friendly and easily understood at the elementary level.

Interdisciplinary STEM

The engaging data that was presented in the tsunami forecast model really supports lots of integration across content areas and context. First, it is applicable to students as it is relative to their lives. They live on an island where we are constantly reminded of tsunami events in the past. There is the Pacific Tsunami Museum that can be visited, and we have monthly civil defense siren drills to test that our systems are ready to respond in the event of a tsunami. We often talk about ways to prepare and stay safe in the event of a tsunami and after every large earthquake on our islands (as well as other parts of the pacific), we are all alerted with civil defense messages stating whether or not a tsunami has been generated. That shows the relevance to our own lives. The model also encourages students to learn about the geography and land masses on the pacific plate and the interconnectedness that is shared amongst all islands and surrounding countries. Bringing in the firsthand video account of Mr. Nishimoto also shows how destructive and powerful a tsunami can be. This will ultimately lead us to the end goal of this unit where students will design engineering solutions and plans for a coastal town in the event a tsunami should be generated of that magnitude.

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