Data Integration Project

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Engaging Contexts Data Integration Project

Abstract

This paper is designed to explore the use of data in the classroom. Now more than ever

educators are asked to participate in cross curriculum learning and multidisciplinary subjects. A

classroom is no longer seen as an island, but the school in itself as a community. This paper will

discuss integrating data into the classroom, engaging students with multiple sources, and the

benefits of showcasing data in a lesson. A data source from the United States Geological Survey

will be used as an example. The source provides information on Earthquakes in real time

(USGA, 2018).

Data Source

USGS (United States Geological Survey) is a member of the National Earthquake Hazards Reduction Program. The purpose of the program is to monitor earthquakes both before and after impact. The survey will also report and alert governments if an earthquake is detected. The team conducts research into the causes and effects of earthquakes around the world. Congress established the program in 1977. I used this data source in my classroom for students to look at earthquakes occuring in real time. The web link is provided below.

Web link:https://earthquake.usgs.gov/earthquakes/map/

Lesson Enhancement

I taught a 5th grade class a couple years ago which focused on Earth science. The topics we were covering at the time involved tectonic plates and the way that the shift; this of course brought up earthquakes. Students are generally fascinated by earthquakes. It is a natural disaster that can happen anywhere with no warning by sight on the surface. I designed a lesson in which I would lecture, students would discuss, the class would do research using a data source, and we would conduct an activity. The lesson in itself lasted for 3 days. I had designed the lesson to be 2 days, but it turned out the data source was too good!

The first day of the lesson I had guided notes for students as I went through powerpoint slides with information on earthquakes. We discussed vocabulary words, such as, magnitude, epicenter, focus point, seismic waves, and so on. Students took notes while I talked. Within a given lesson I don't like to lecture the whole time or even half the time. I believe in the

constructivist strategy in which the classroom is student centered. After 20 minutes I had

students get with a partner and grab a laptop. I had the 5th graders go to the data source site

presented. This site was a survey site where earthquakes from around the world were being

recorded in real time. Students could go on and look on the world map for the earthquakes

happening right now. The user can pick the time or date to look at earthquakes at that specific

time, or even click on the location and look at the magnitudes recorded. I had planned the set up,

explanation of the website, and students looking around on the site to take the other 20 minutes

of class. By the time all students were looking they had 10 minutes. That was not enough time!

The students loved the site and asked to keep looking at it. Maybe it was the real time concept,

the realism of the quakes, the drive to find that highest magnitude happening in certain location,

or a mixture of all the above that got students so interested.

Other than for science class the students at this school were stationary all day with the

same teacher. At the end of the day the 5th grade teacher told me that the kids were begging her

to look at the map again on the big screen together when they were given free time. The next

day, I decided to change up the lesson and give students more time to look at the data source.

Students were given 15 minutes at the beginning of class to get the laptops. After the 15 minutes

we finished up the lecture and had a quick review game. On the final day of the lesson, students

had to design a structure using toothpicks and marshmallows that could withstand an earthquake.

We then tested it out using trays of jello that student pairs would shake for 1 minute. The

structure still standing got a bonus point on the upcoming quiz. For the next 2 weeks class started

every day with the data source on the smartboard for students to look at and move around.

Students were still asking to check it months later! The rationale behind the data source was for

students to experience the amount of earthquakes that occur in a given moment. To show the tectonic plates and their instability. This data sources provided objectives that were not in the lesson without it, such as, examining a map of the Earth and locating tectonic plates using earthquakes, discussing earthquake locations using geography, and comparing the magnitudes of a given area.

I believe this data source enhanced the lesson by having students interested in the content. Students could see the science of the Earth happening in real time. Students not only discussed a topic, got vocabulary words, and learned how it worked, but they also could comprehend the real world application for the information. Data sources can be used to enhance the learning of a topic being covered by allowing students to explore the subject on their own or in a group. The data gives students numbers and figures that can help them understand a topic in more detail. The age that we live in is a technological one. Students enjoy learning using technology and, in my experience, grasp concepts faster with a keyboard at hand. I think data sources can be used in every content area to enhance a lesson. I do not think it should be in every lesson to just have technology. A data source should be used to make the lesson more beneficial for the students, not to waste class time. I personally use data sources in my classroom and feel as though all educators should at some point.

Interdisciplinary context:

The data source I used about earthquakes involved students looking at a map of the world (geography), examining magnitudes on a scale (math), and understanding the occurrence of

earthquakes on the fault lines of tectonic plates (science). This lesson and source on its own

incorporates multiple content areas. The entire assignment involves students using laptops or the

smartboard, so there is technology too! During the lesson I would tell students to find a certain

location to see the earthquake (example.) egypt). Students would have to know what country or

continent that was on to find it. I would ask students to find certain magnitudes or compare

magnitudes using the scale and data. Then finally, students would have to explain why some

location have a lot of earthquakes recorded. The lesson as a whole benefited from having this

data source, therefore, the students benefited as well. I could see this data being used across

multiple disciplines. This source in particular could be used in history class to discuss the major

earthquakes in history that have left their permanent mark on our culture. It could be used in

geography class as a way to practice continents and learn something about science. The USGS

source could even be used on an english assignment about earthquakes or natural disasters. The

source I found for this assignment could be an easy way to integrate STEM across different

contents without even realizing it. A classroom is not an island. A school is a community

working together to help students succeed, therefore, content areas need to intersect and overlap.

I believe data sources can be a great way to include multiple subjects into a lesson.

Resources:

United States Geological Survey (2018, June 9). *Latest Earthquakes.* Retrieved from

https://earthquake.usgs.gov/earthquakes/map/