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Methods in STEM Education - Elementary  
Engaging Contexts Data Integration

This spring someone offered our school several Milkweed plants. There is a movement in New Jersey to cultivate more Milkweed plants due to a documented decline in population which effects the migration of the Monarch butterfly. Our school's secretary generously started a plot of Milkweed for us. In STREAM class last week the classes went out to observe the plants and the Monarchs. That was very engaging, so I thought that I'd take it one step further by presenting data to the kids. Our second grade class is currently studying life science.

My goal was to present data for the children to discover the problem of Milkweed decline. Then, to engage the children in working to solve the problem within our own Milkweed plot. What can we do to increase the number of Milkweed plants growing at our school? In order to gage their success, the students need to collect their own data by counting the number of Milkweed plants present in our school's plot.

*The World Journal of Agricultural Research* provided an article which included data that would be very approachable for my second grade class to understand (Gopal, 2015). Here is the link: <http://pubs.sciepub.com/wjar/3/4/1/wjar-3-4-1.pdf>. I decided to present table 1 from the article to my students (Gopal, 2015). Here is the slide deck that I created to present the data and pose the questions to my class: [https://docs.google.com/presentation/d/18sCUYEM8w6\\_eBgTSPG0wbebNiTRqeJtl8SdNyQ90te0/edit?usp=sharing](https://docs.google.com/presentation/d/18sCUYEM8w6_eBgTSPG0wbebNiTRqeJtl8SdNyQ90te0/edit?usp=sharing)

This data enhances our study of life science in that it demonstrates a problem in our state. Our school has already taken efforts to join the movement working to reverse this problem. My second grade students can interpret/analyze the provided data, collect their own data, and apply what they know about life science to personally contribute to improving the Milkweed population at our school. Our class can use the presented data to engage and inform personal contribution to solving a real-world problem. That certainly changes both teaching and learning. The three learning objectives mentioned above (interpreting/analyzing data, collecting data, and solving a real-world problem) are three new objectives that I wouldn't have thought to address if it weren't for this assignment.

My personal feelings regarding the use of data has certainly developed through this assignment. I am very fond of presenting students with maps in order to understand location and distance. So in that sense, I have often used data to enhance instruction. However, I can't think of a time when I sought out data from scientific studies in order to enhance instruction. It honestly never occurred to me to do so. I was pleasantly surprised to find data that not only connected perfectly with my class's current investigation, but also the data was very clear and approachable for second

graders. It was easy for me to guide the children in learning how to read the table presenting the data. The kids were excited to use simple addition and subtraction to analyze the data in order to discover an alarming pattern. What's more is that my students are working towards collecting their own data similar to that which was presented to them by the scientists (Gopal, 2015). Admittedly, having the students collect and record data is proving to be much more difficult than I had anticipated. Nevertheless, I have some new ideas to scaffold this for the students. I'm going to stick with it because I believe that providing my students with the opportunity and skills to collect their own data will be very meaningful for them. The increased student engagement and the ease of finding relevant, grade-level appropriate data for this assignment certainly make me want to continue to enhance instruction using data. (I will also be recommending this practice to my co-workers.)

According to Merriam-Webster data is defined as "factual information (such as measurements or statistics) used as a basis for reasoning, discussion, or calculation" (Merriam-Webster, 2019). The very definition of data suggests that it is interdisciplinary. When presented in science class, students must apply reading skills for informational text and math skills to understand and interpret data. Using data to enhance instruction blurs the lines between subjects. For example, the data that I presented to my students required them to build skills for reading a data table. Additionally, they applied addition and subtraction skills (studied during our current math unit) to analyze the data. They were at the same time using information from scientists in the field and working as scientists to discover the trend shown by the data. This work is definitely interdisciplinary.

Resources:

Gopal, N. , & Witsen, J. (2015). Decline in Milkweed (*Asclepias syriaca*) Populations in Central New Jersey over a One Year Period. *World Journal of Agricultural Research*, 3(4), 119-122. Retrieved from: <http://pubs.sciepub.com/wjar/3/4/1/wjar-3-4-1.pdf>

Merriam-Webster (2019). Data. Retrieved from: <https://www.merriam-webster.com/dictionary/data>