

DataPBL:

Contextualizing Data Education via Project-Based Learning

OVERVIEW

How can we ensure that learners gain sufficient “data acumen” to be equipped for life and work in a world steeped in data, and how can we help them build positive identities toward work with data? Learners need opportunities to develop agency and acumen in using data as a means of understanding and addressing relevant societal issues. The DataPBL project seeks to provide these opportunities through partnership with middle school teachers who embed data practices into their existing PBL-based disciplinary content.

YEAR 1 STORY

Implementation at two schools (NYC and Columbus) in three modules co-designed with teachers (8th grade social studies: **Immigration and who gets to be an American?**; 8th grade ELA and social studies: **Incarceration and racial identity**; 7th grade science: **Epidemics, vaccination, and public health**)

- The two schools had different structures of support and the three teachers had different comfort levels and approaches to data integration.
- Just-in-time on-the-ground support for teachers was vital to development of comfort and efficacy, and more is needed to grow that.
- The social studies teachers struggled with how to teach the “math.”
- Student engagement with CODAP (Common Online Data Analysis Platform) was high and resulted in development of data skills.
- Students and teachers expanded their view of what counts as data and how and when data can be used.

“I learned that data could actually be helpful. Before I thought data was like percentages or something, but now I see it more as diverse information.” — 8th Grade Social Studies Student

“It influenced students’ ideas about what it means to grow up in certain countries. Most kids are first or second generation, so I think it helps them get a better understanding of the why. When you look at the data, it’s like, oh, yeah, it’s a big difference, like that’s 15 years of life expectancy.” — 7th Grade Science Teacher

“At first it was just a tech thing. But then, once I felt a lot more confident with that, it is also knowing how to teach the graphing skills. I do not know the pedagogical content knowledge to teach students some of those math skills.” — 8th Grade Social Studies Teacher

Who Gets to Be an AMERICAN?
So many people want to be American, but government policies have changed who can enter this country over time.

19th and 20th Century
Immigration levels from countries like Mexico began to increase when US immigration laws began to favor white Europeans less.

IMMIGRATION TODAY
Today, Asian and Central American countries generally have higher immigration levels than European countries. This has to do with what conflicts occur in those countries, but it also reflects how government policy changed to allow a more diverse selection of people into our country.

HOW TO BECOME A CITIZEN
One path to becoming a citizen:
1. Enter with a visa
2. Apply for a green card
3. Meet requirements for citizenship and pass a citizenship test.
Unfortunately, the government does not give out enough green cards and visas for all applicants, so many choose to come without documents.

KEY TERMS
Green Card - Proves an immigrant is a lawful permanent resident
Visa - Gives someone permission to be in a country for some time (travel or residency)
Undocumented Immigrants - Immigrants who don't have legal permission to be here
Detention Centers - Prisons where people who are found to be undocumented are held

UNDOCUMENTED IMMIGRANTS
Injustice is prevalent in the systematic deportation of undocumented people. They live in constant fear of being sent to a detention center if they are caught. Families are torn apart and undocumented children have less access to opportunities like attending college.

MAP
Map of the US showing immigration patterns.

Source: IRAC Immigration, US Census Data

Text
Farewell to MANZANAR
Jeanne Wakatsuki, who was interned at Manzanar when she was only 7 years old, wrote a book about her and her family's experiences at camp during the war called *Farewell to Manzanar*. Her family's data will be explored in many of these graphs.

cases
Dot plot showing Birthplace/Father data for cases. Birthplace: US Mainland, Other, Japan, Hawaii. Father: Hawaii, Japan, US.

Manzanar Demographics
As seen in this graph, a majority of the internees at Manzanar were *Nissei*, meaning they were born in the United States to Japanese parents. Over half of these people were U.S. citizens that had lived in America their entire lives, yet they were still being treated like prisoners in their home country. Highlighted are the Wakatsuki family. Just like the rest of the camp, most of the family was born in the U.S. to a Japanese immigrant father. These are Jeanne and her siblings, along with some of their spouses. Jeanne's father was born in Japan, and her mother was born in Hawaii to Japanese immigrants. The third variable on this graph, gender, reveals that there were more men than women at Manzanar, and that men were more likely to be born in Japan than women. This may be because in Japanese culture and just general gender norms at the time, more men worked than women, so men were more likely to leave home for job opportunities, a major pull factor for Japanese immigrants.

Gender
F M

RESEARCH QUESTIONS

1. How can teachers integrate data practices into interdisciplinary project-based learning curriculum modules?
2. In implementations of the DataPBL curriculum, what interdisciplinary data practices do students participate in, and under what conditions?
3. Under what conditions do students manifest agency in the course of their data-infused PBL?
4. How do aspects of the experienced projects contribute to developing positive identities for students related to data?

DATA SOURCES

Student exit tickets and final products, student post-intervention surveys and focus group interviews, teacher reflections, planning and implementation materials, and post-implementation interviews.

CHALLENGES & REFLECTIONS

How do we balance...

- PBL, interdisciplinary, and data science within the existing curriculum needs?
- Existing teacher knowledge and data fluency skills within a co-design framework?
- Data practices, agency, and identity within student experiences?

How do we support teachers to become leaders and masters of CODAP and data fluency in their community?

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