



Civic Data Project

CIVIC DATA PROJECT: Lessons Learned from the Co-Design Process

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The Civic Data Project

The **Civic Data Project** works collaboratively with middle school social studies teachers to develop dynamic, data-rich activities for the social studies classroom that:

- empower students to use data to explore their own questions,
- engage students with meaningful multivariate data that are relevant to real world issues they care about,
- build data literacy and foster critical thinking.

To meet these goals, we have been exploring the feasibility of integrating **data inquiry** into social studies curricula in a way that highlights the epistemic value of data and engages critical thinking while deepening social studies learning.

Data inquiry for the social studies classroom actively engages students in action-goals grounding the statistical problem-solving process (Bargagliotti, et al, 2020):

- considering and/or collecting civic data,
- formulating statistical investigative questions that can be explored with the data at hand or to be collected,
- conducting analysis using tools of visualization and making sense of data visualizations; and
- contextualizing findings, extracting actionable insights, and communicating what has been learned.

The Model

The project uses an interdisciplinary and collaborative co-design approach to develop resources to support teachers in creating openings in their curriculum for data inquiry.

- Our team of teachers:** 5 middle school social studies teachers (grades 5, 6, 7, and 8)
- Content areas:** each teacher works with a different curriculum and subject matter (global studies, ethnic studies, civics)
- Location:** communities in MA and RI

The collaboration between teachers and researchers keeps the work responsive to the learning context and the students' communities, and forges connections so that we can learn from each other. The interdisciplinary lens of social studies brings interrogation, contextualization, and empowerment to act on data into focus.

The resources development process is supported by design-based research iterated through two cycles over two academic years. After completing the second cycle, resources based on the lesson sequences will be developed for wider distribution and made freely accessible through our project website hosted at TERC.

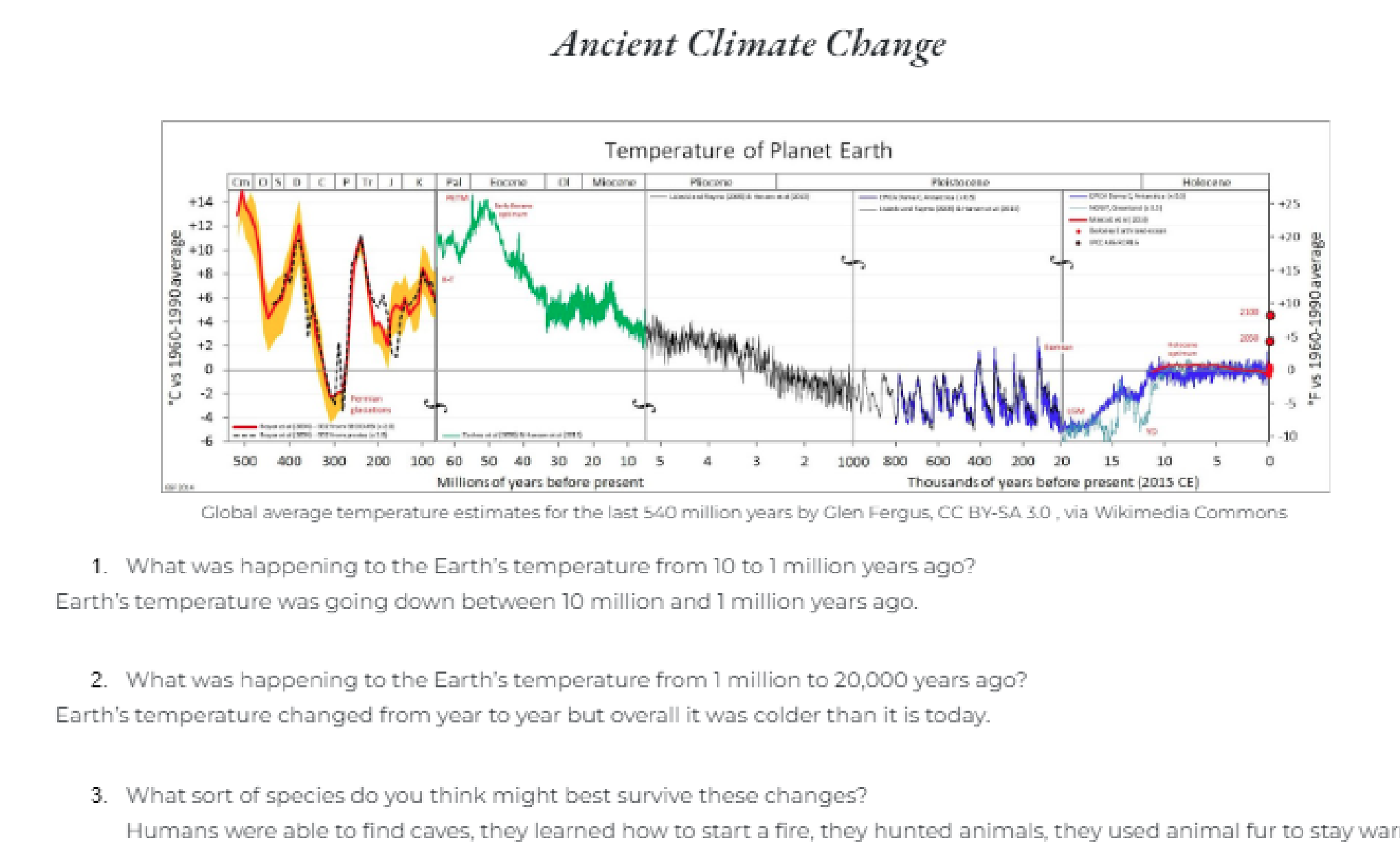
Research Question & Methods

Research Question. What synergies and tensions arise in the process of co-designing data investigations with social studies teachers for the middle school social studies classroom?

Method. The co-design process is studied using qualitative methods (Saldana, 2016). Data includes artifacts and notes from the co-design and lesson development process, lesson plans and student-facing materials, classroom observation notes, de-identified student work, interviews with students, and interviews with teachers. Analysis is inductively driven and focused on uncovering themes that emerge as we negotiate the development process and plan classroom implementations.

What We are Learning

1. Social studies teachers engage students with complex data visualizations found in commercial curricular materials and sourced online as free resources connected to content they teach. Example of a data visualization in a 6th grade textbook:



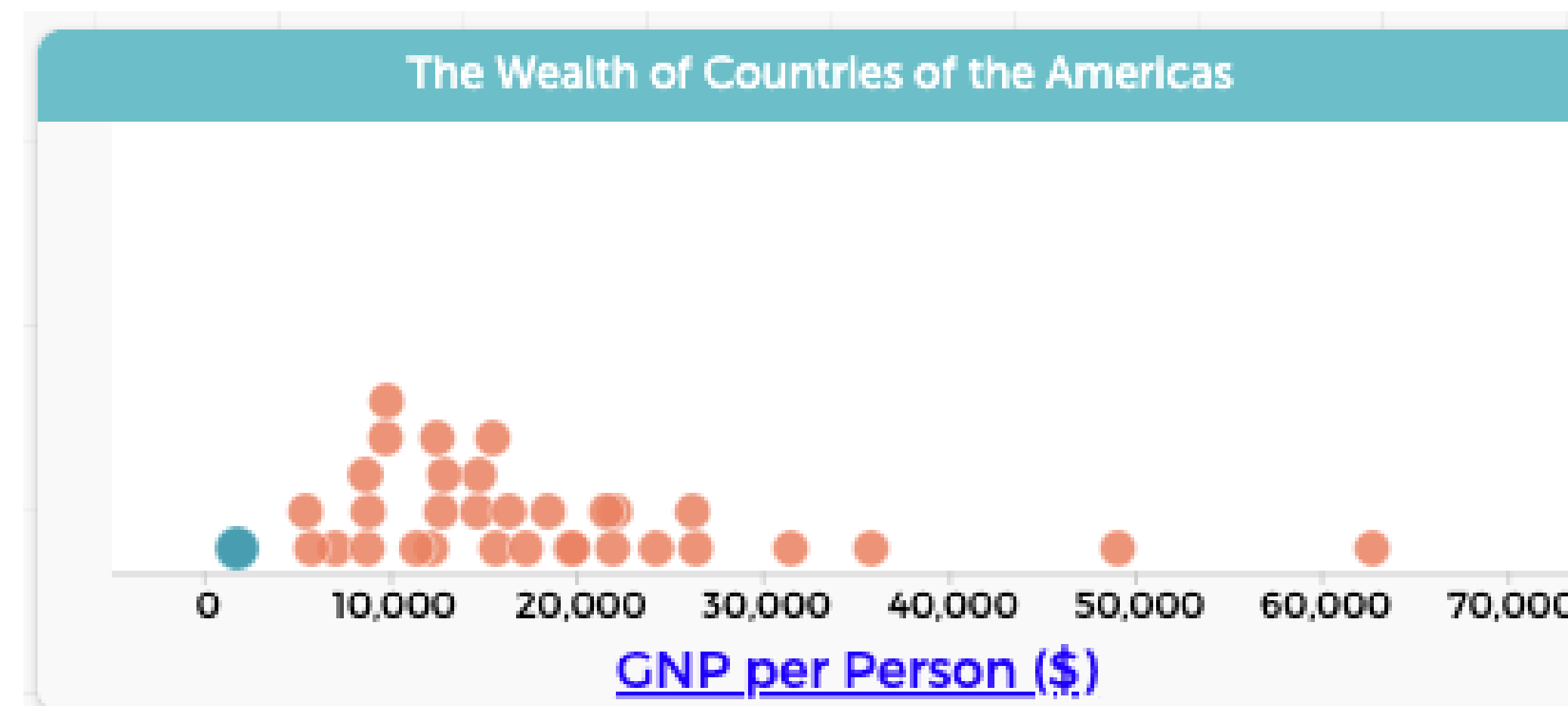
Note the changing scale and lack of reference point for the period relevant to human life. Each of the teachers we have been working with have shown us data visualizations that they have sourced to address a question that it doesn't directly address. In response, we developed a one-page "Thinking Critically about Data Visualizations" resource that will be piloted with teachers this summer.

2. There is a strong disciplinary focus in social studies on examining cases in depth while also considering dominant narratives of the society as a whole. In developing classroom materials, we worked to foreground characteristics of the aggregate while still engaging the case value view (Konold, et al, 2015). See the example in the next column.

The below prompts and example of a student-generated graph is taken from a 7th/8th grade investigation of sustainable development indicators for the countries of the Americas using CODAP (<https://codap.concord.org>).

Use the following question to explore the similarity and differences between countries

- What are the most common values? Are there clusters of countries with similar data?
- How spread out is the data? How big is the range of values?
- Are there cases (countries) that really stand out compared to others?
- How do the patterns in the data connect to what you have been learning about the history of the Americas?



3. Efforts to integrate data literacy across the curriculum benefits from social studies teachers' strength in humanizing, contextualizing, and connecting data to relevant domain knowledge.

T: What did you notice?

S: Haiti has a really low GNP per person compared to all the other countries.

T: Why do you think that is?

S: Because of the exploitation that they face. All the work they had to do... The history of slavery.

T: They have a history of slavery, keep adding on.

S2: The attribute we chose was average years of schooling and we also saw that Haiti had the lowest, only about 10 years! That could tie into the GNP.

T: Interesting. When we did our presentations during the last unit, who looked at Haiti versus the Dominican Republic? Remember how they are both part of one larger island? Tell us something about why Haiti is exploited or why it doesn't have advantages that the Dominican Republic has. Who colonized Haiti?

S3: Spain.

T: Also, England. Who else?

S4: French.

T: They basically took Haiti and said you are going to grow stuff your land is not meant to grow. It ruined the land. They exploited slaves on that land. This is why we look at data. Because now we see the effects of things that happened generations ago.

Discussion

The interdisciplinary co-design process has helped us embrace teachers' disciplinary need to adapt rather than outright adopt approaches to teaching data literacy that are grounded in data science education (Gills, 2014). This tension has been both challenging and rewarding. There are many openings for data inquiry in the social studies curriculum and teachers are engaging their students with data (Shreiner, 2024). More opportunities for interdisciplinary collaboration, especially focused on data inquiry and work with data visualizations, will strengthen both social studies and data science education.

References

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