Using the Google Public Data Explorer as a Learning Tool in the University Geography Classroom

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Charting the Course
A Road Map for 21st Century Geography Education

Executive Overview | www.natgeoed.org/roadmap
National Assessment of Educational Progress
Geography Test (2010)

Grade 12

100%

80%

Below basic

Basic

Proficient

Advanced

1994*

2001*

2001

2010

Imagine a classroom where...

- learning activities are engaging, student-centered, hands-on, and focused on student thinking and experiences with real-world issues
- students investigate problems and solutions through fieldwork and geospatial technologies, such as web-based GIS and remotely sensed images
- students analyze maps, photographs, graphs, and charts to better understand patterns and distributions of geographic phenomena
GIS in the Classroom: Tools for Learning

• ESRI for Education
  • Curriculum Support
  • ArcGIS Online
  • But both teacher and student training are problematic

• Google Earth
  • Excellent public buy-in
  • Browser integration
  • Strong research community
  • Great for representing places, but what about spatial patterns?

Al-Masjid Al-Haram in Mecca
The Google Public Data Explorer

http://www.google.com/publicdata/directory

Public Data

Datasets
Metrics

Any data provider (132)
Eurostat (10)
Destatis (7)
Statistics Iceland (6)
U.S. Bureau of Labor Statistics (5)
Central Statistics Office, Ireland (5)

My Datasets

Living longer with fewer children
This chart correlates life expectancy and number of children per woman for each country in the world. The bubbles are sized by population and colored by region. Over time, most countries have moved towards the bottom right corner of the chart, corresponding to long lives and low fertility. Note the progression of the bubble for China- in the late 60's and 70's life expectancy rose quickly, then the implementation of the one-child policy caused a drop in the number of children per woman.

Explore the data

Dataset: World Development Indicators
Source: World Bank
And now, for a live tour of the system.
Classroom Use Case: World Regional Geography

1. Show both graphs and maps in class; **students need to see examples**
2. Teach basic data gathering, data entry, and **simple graph production** with Microsoft Office (Excel and PowerPoint) and Google Drive
3. Identify significant **quantitative variables**
4. Find **relationships** between variables and describe geographic **distributions**
5. Conduct research to **explain** patterns
Standard of Living depicted by GDP PPP and Infant Mortality

The graph above shows a relatively strong correlation between Infant Mortality Rate and GDP (PPP) per capita. Even though this graph looks like it is decreasing, this graph actually shows a positive connection. The reason for this “reversal” is that a low Infant Mortality Rate is what countries are striving for. I have selected a few countries just for a visual reference and a couple that I thought had some interesting data, these countries are the Democratic Republic of the Congo, Equatorial Guinea, Iceland, and The United States of America. In general the trend shows that the more money within a country, the better the healthcare and thus lowering the infant mortality rate. The map illustrates the same variables GDP, PPP shown in color and the Infant Mortality Rate shown by circle size. It is clear to see on the map that typically the larger circles are lighter colored, meaning that these countries have a high infant mortality rate and a low GDP, PPP; meaning that these countries are a little less developed than those that have small dark circles.

The Democratic Republic of the Congo does not have the greatest social surroundings to promote the standard of living for its population. “The Secretary-General’s Special Representative for Children and Armed Conflict, Leila Zerrougui, has cautioned that thousands of children continue to be abducted, recruited, killed, maimed, or raped, [UN.org].” They have the lowest GDP (PPP) per capita and one of the highest infant mortality rates of any country in the world, it’s not the best place to have kids.

I thought the location of Equatorial Guinea on the graph was worth looking into. According to the CIA World Fact Book, in the recent years, Equatorial Guinea’s GDP had a rapid growth because there was large off shore oil deposits found. But even with the rapid economic growth there has still been hardly any improvement to the standard of living.

Data Source:
- World Bank
- World Development Indicators
- Dataset (2013)

References:
CIA World Fact Book [2013] [https://www.cia.gov/library/publications/the-world-factbook/]}
Custom data can be uploaded, and existing datasets can be connected via the **Dataset Publishing Language**

NSF data on female participation rates in STEM disciplines custom loaded into the GPDE.
Concluding thoughts

1. **Graphical literacy** is a key component in helping students become **active knowledge builders**
   - Students need to be able to "play" with data

2. **Tools need to be easy to use** for both students and teachers
   - Reduce data gathering demands
   - Responsive and well-constructed interface

3. Geography is ideally suited to approach graphical literacy with **more than maps alone**
   - Integrate spatial and non-spatial perspectives
One alternative to GIS software and Google Earth is the United Nations Environmental Data Explorer.