

W209 Final Presentation

Explore And Visualize Educational Opportunities for Women



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Overview

Context:

Women face barriers to education caused by poverty, cultural norms, poor infrastructure, violence and political instability. Better educated women lead to broad national benefits.

Goal:

Our goal is to enable users to efficiently discover, compare and explore educational opportunities for women around the world.



Data / Users / Tasks

Data: Our project utilizes the World Bank EdStats' country-level enrollment statistics as a proxy for educational opportunities by gender at the primary, secondary and tertiary education levels.

Users: Policy analysts, government education/development officials and NGOs concerned with gender equality issues in education.

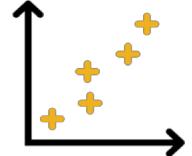
Tasks:



Present an
Overview
Dashboard



Discover **distributions** of
education indicators among
countries and regions



Explore **relationships** between
country education indicators
and key macroeconomic and
demographic measures



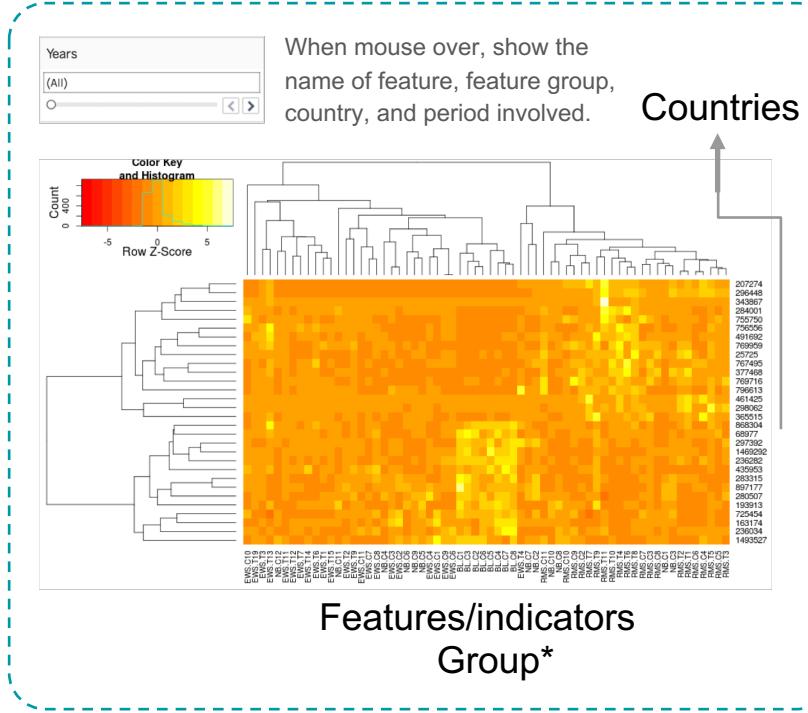
Compare **trends** of key
education indicators and
key macroeconomic and
demographic measures

Summary

Detail

Task 1 - Overview

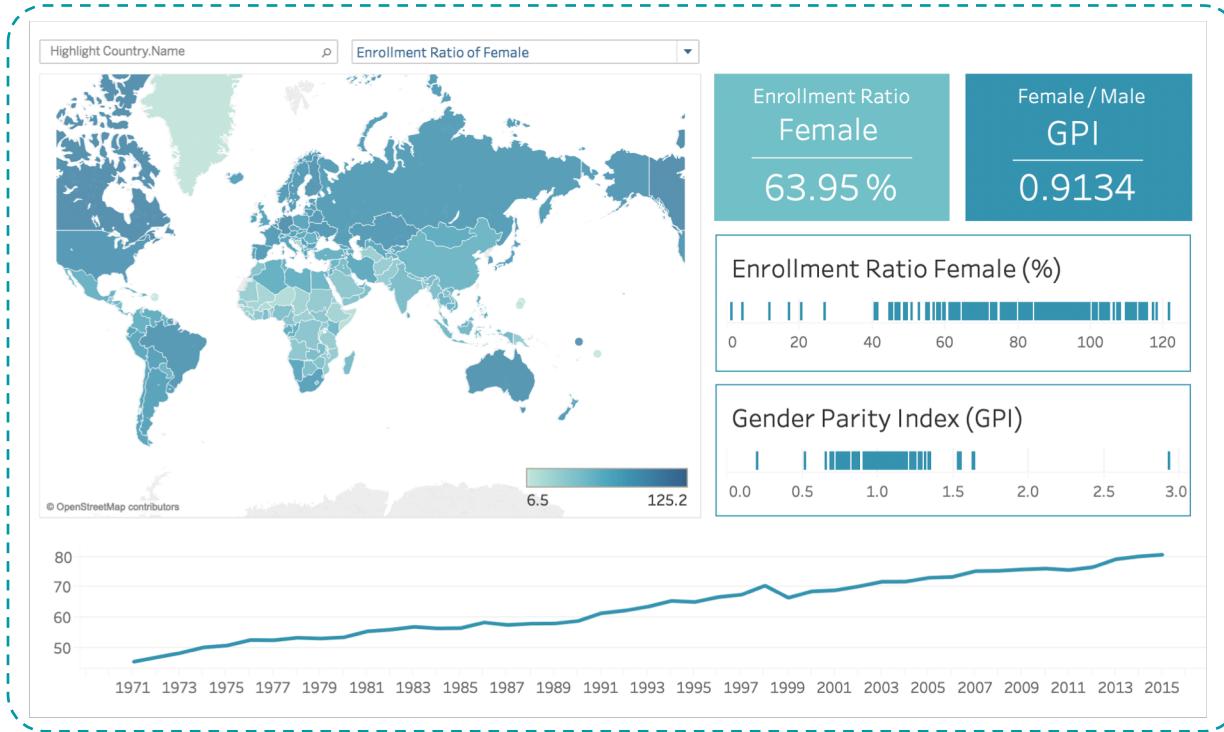
Heatmap overview



Narrow down to few metrics for gender equality issues in education

Get rid of the heatmap of midterm presentation

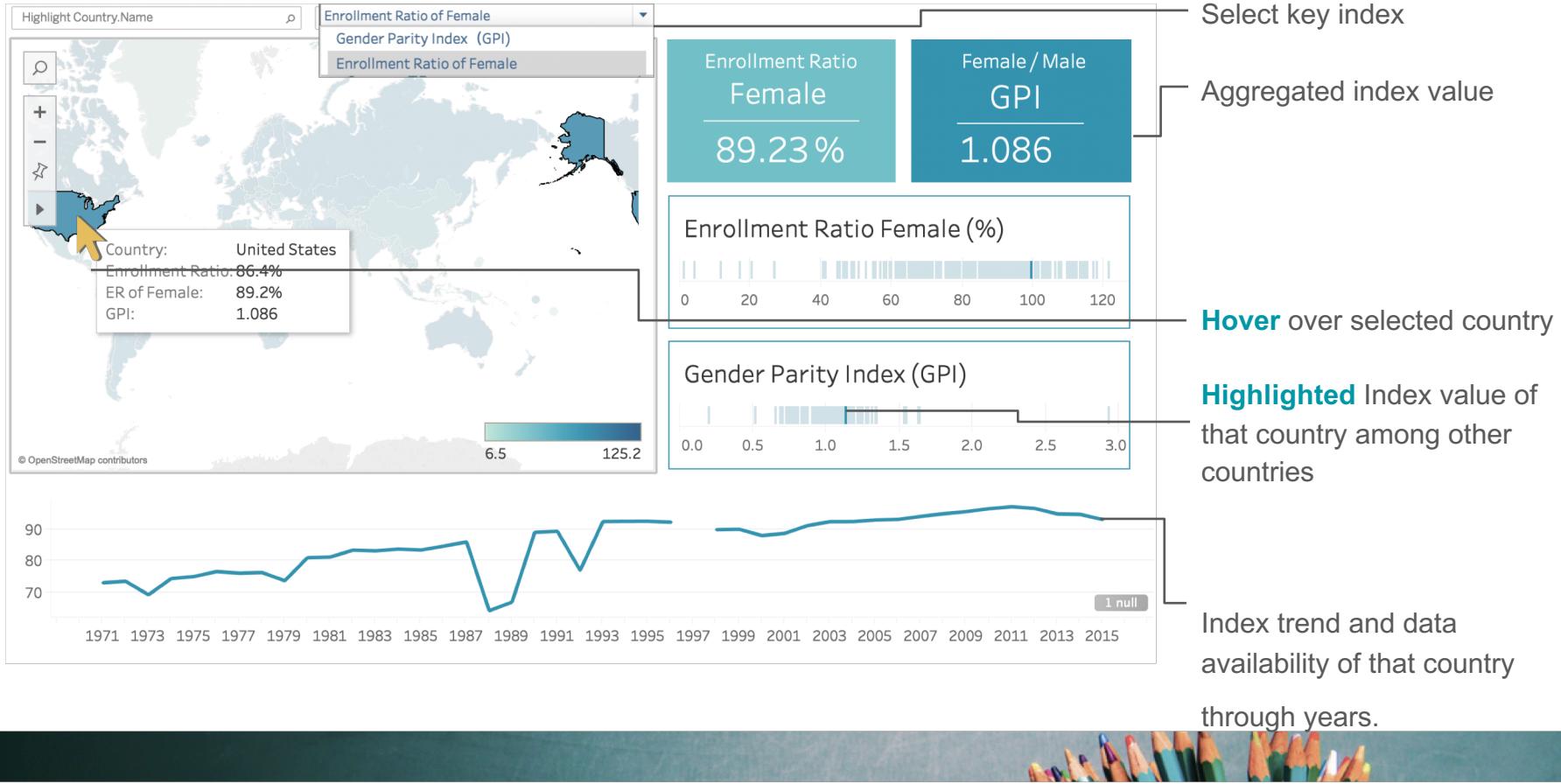
Task 1 - Dashboard Overview



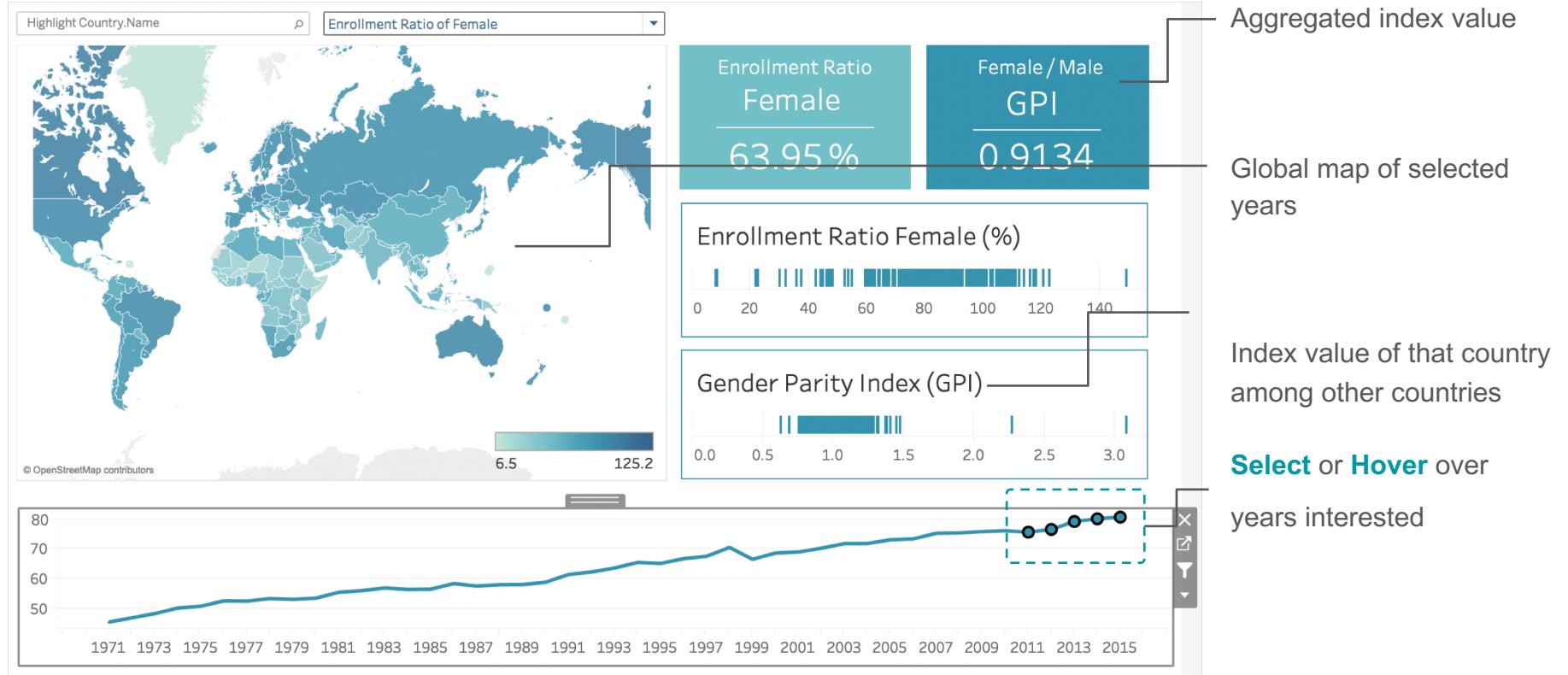
Present a dashboard overview of two key index, the **Enrollment Rate of Female** and the **Gender Parity Index (GPI)** by country and by time.

Then users are able to hover and select interesting index, countries, or years to see the subset overview.

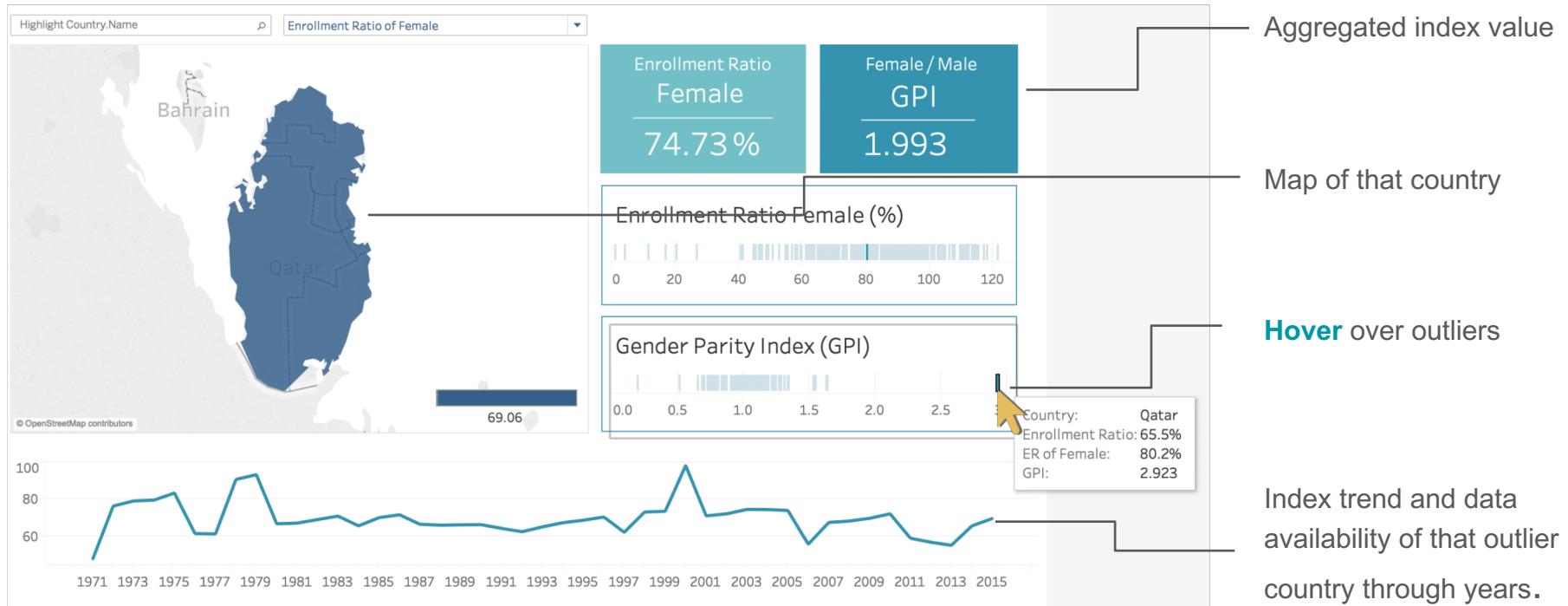
Task 1 - Overview by Selected Countries



Task 1 - Overview by Selected Years

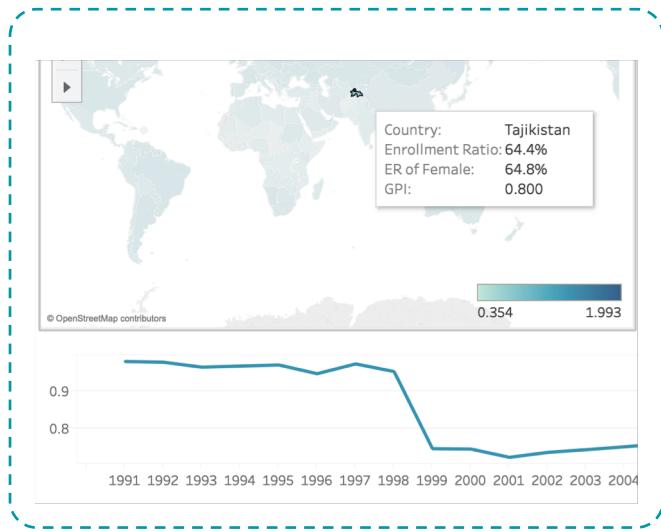


Task 1 - Overview by Outliers

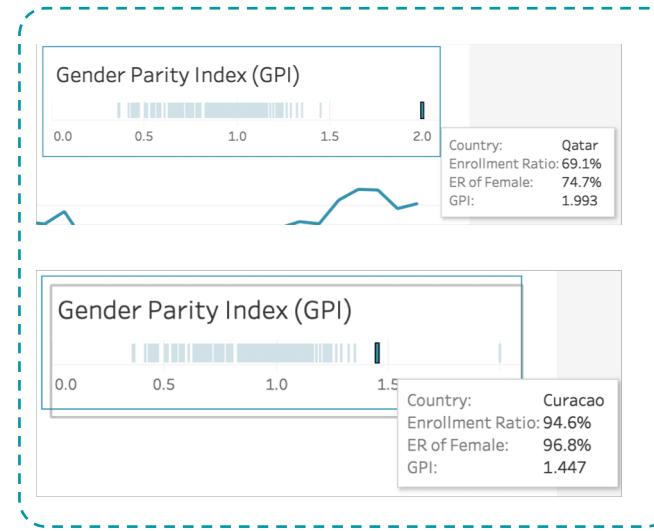


Task 1 - Example of Interesting Insights

Overall trends: GPI and enrollment ratio of female is steadily going up by time, indicating more and more women get the opportunity to receive education.

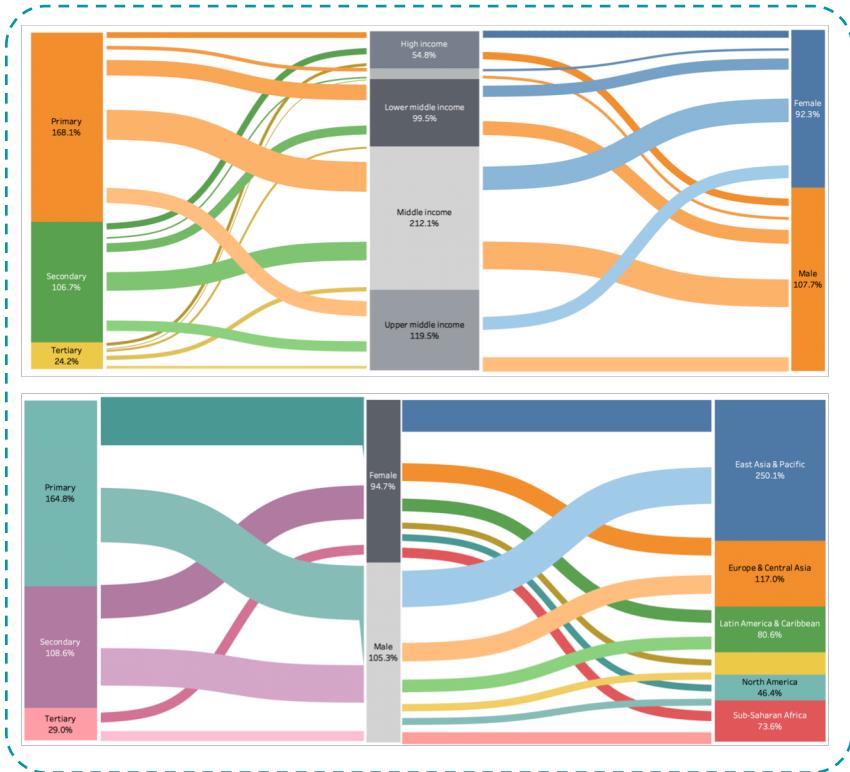


There are some outliers, for example, the GPI of Tajikistan decrease from above 0.9 to below 0.8 in the year of 1998 because of the Civil War.



Outliers: Qatar has far higher GPI (1.997) than that of the second highest country Curacao (1.447).

Task 1 - Incorporating Usability Test Feedback



**Issue Identified In Usability Testing
And give up the Sankey Diagram**

“This diagram is not straightforward, and not informative as expected.”

Task 2 - Discover Distributions

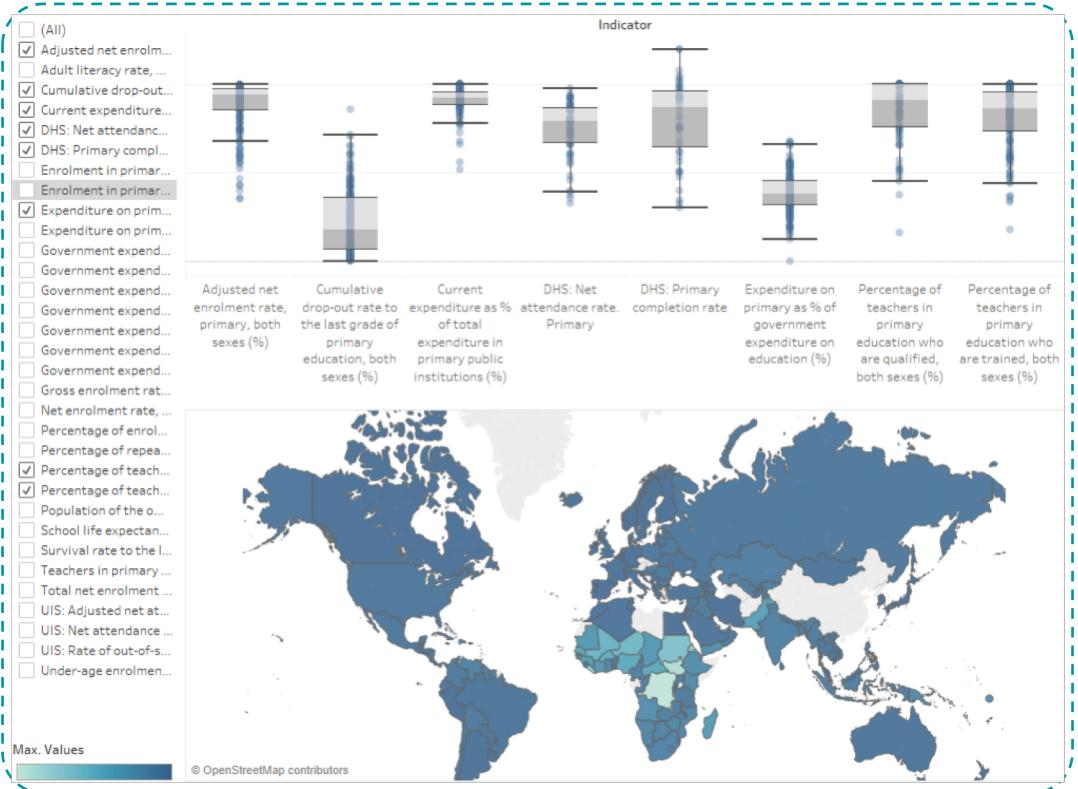
Discover geographic distributions of educational opportunities for women at different levels of schooling using key macro outcomes to filter the data.

Subtasks:

- Identify Distribution Outliers
 - ◆ Regional Outliers (In Global Scope)
 - ◆ Country Outliers (In Global Scope)
 - ◆ Country Outliers (In Regional Scope)
- Identify Regional Similarities
- Generate Hypotheses



Task 2 - Early Concept - Task Recap



Current Iteration

Future Iterations

- Unlinked dynamic visualizations
- Allows users to select desired indicators and brush over regions of interest
- Reversible linked highlighting
 - Select region on map to discover regional outliers on box plots
 - Brush box plots to see if outlying regions exist

Task 2 - Incorporating Usability Test Feedback



Prioritized List of Changes

Must:

- The charts do not appear to be linking correctly and applying identical timeline filters.
- GPI needs to be explained or spelled out and defined.
- Macro Indicator boxplot needs to be displayed.

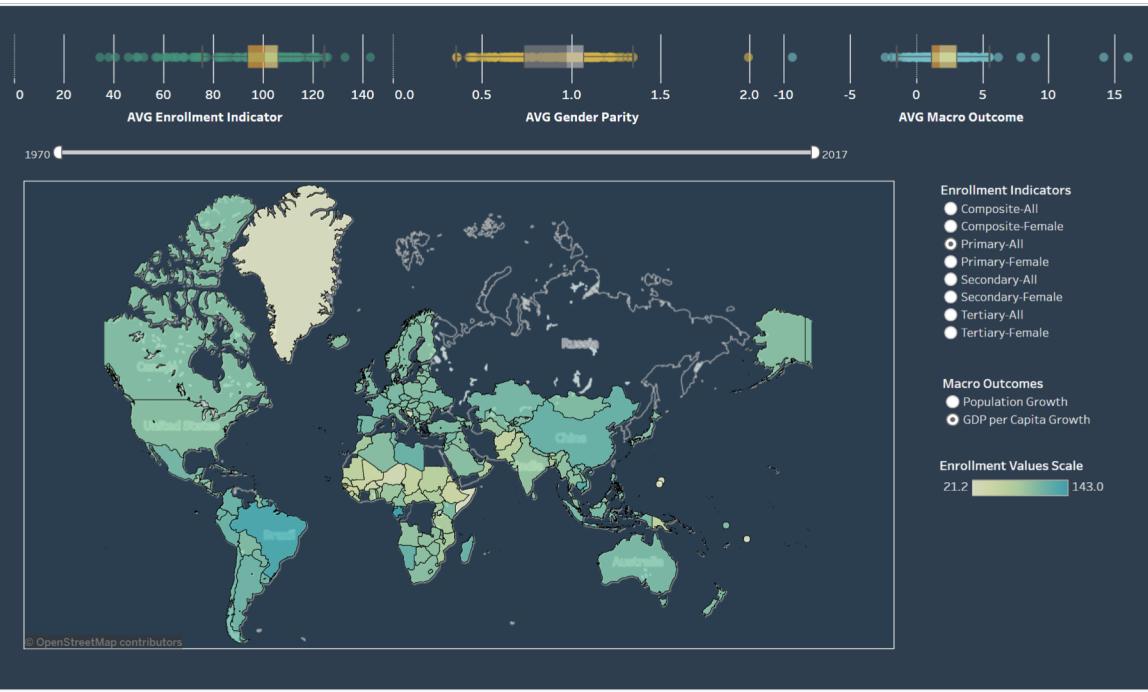
Should:

- Linked highlighting should be explained or annotated/clearly evident.
- Null data countries should be displayed the same.

Could:

- Hue range could be larger (the lightest displayed was like light blue).
- Controls and indicators are not intuitively placed or labeled.

Task 2 - Evolution to Final Product



Major Changes

- Implemented changes from “Future Iterations”
- Narrowing of scope to female education
- Simplification of UI
- Explanation of controls
- Integrated color scheme

Task 3 - Explore Relationships

Explore relationships between enrollment measures and macro outcomes

Subtasks:

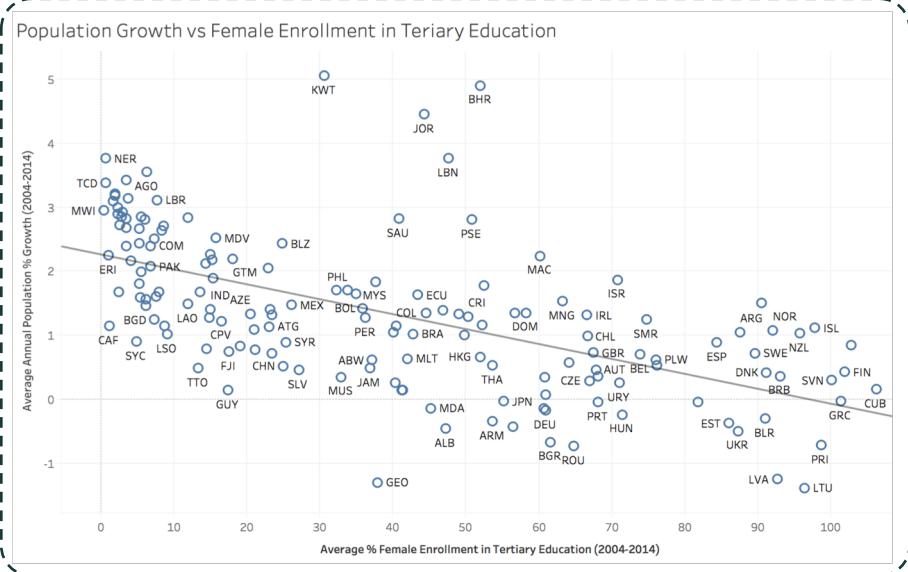
- Identify outliers/countries of interest to examine in greater detail (Task 4)
- Identify enrollment measures that have the greatest impact on specific macro outcomes
- Compare enrollment measure | macro outcome relationship
 - ◆ by geographic region | income group
- Locate specific countries of interest and retrieve details



Task 3 - Evolution to Final Product

Prior Iteration

- Static Visualization

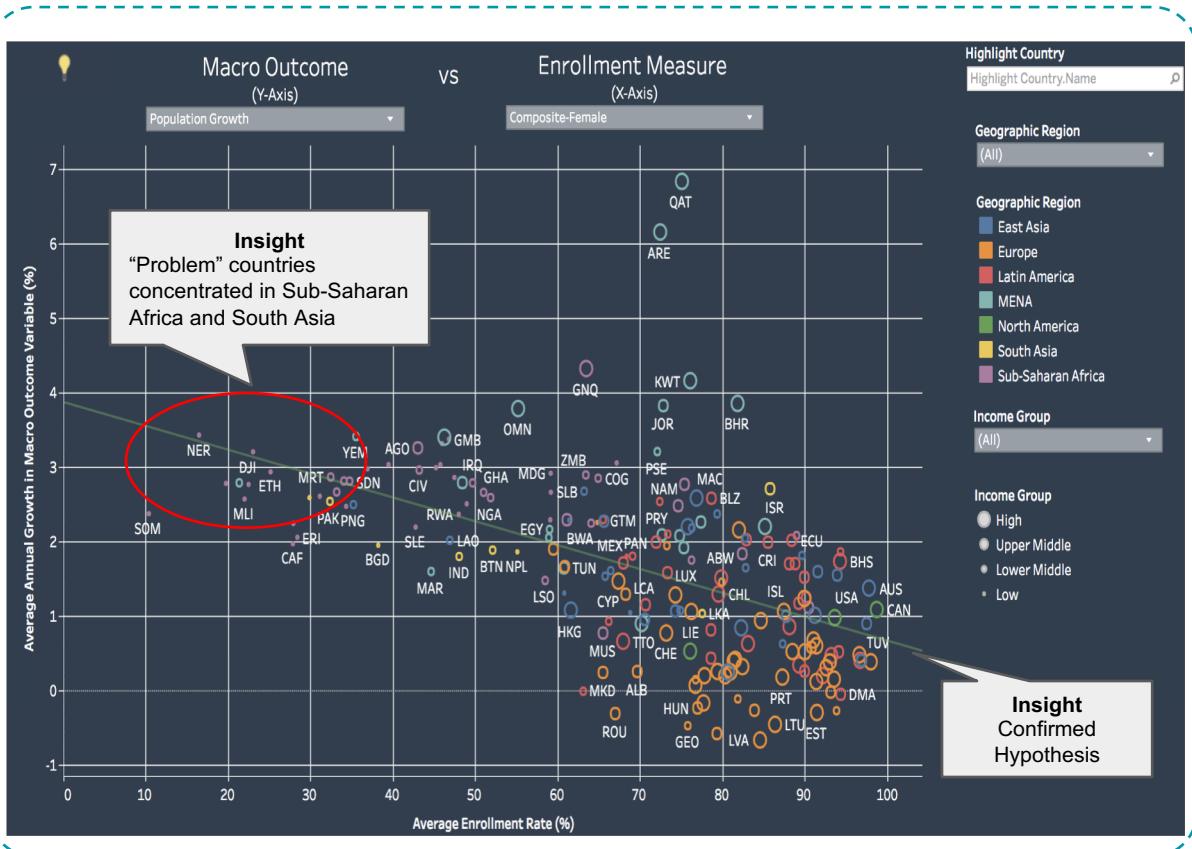


Final Product

- Allow users to dynamically select enrollment measures and macro outcome variables
- Filtering by Region and/or Income Group
- Highlight by Region or Income Group
- Details on Demand



Task 3 - Use Case: Testing Hypotheses



User Hypothesis

Higher levels of female educational attainment, as measured by enrollment rates, are associated with lower population growth

Insights Lead to New Lines of Inquiry

Do higher female enrollment rates lead to higher economic growth?

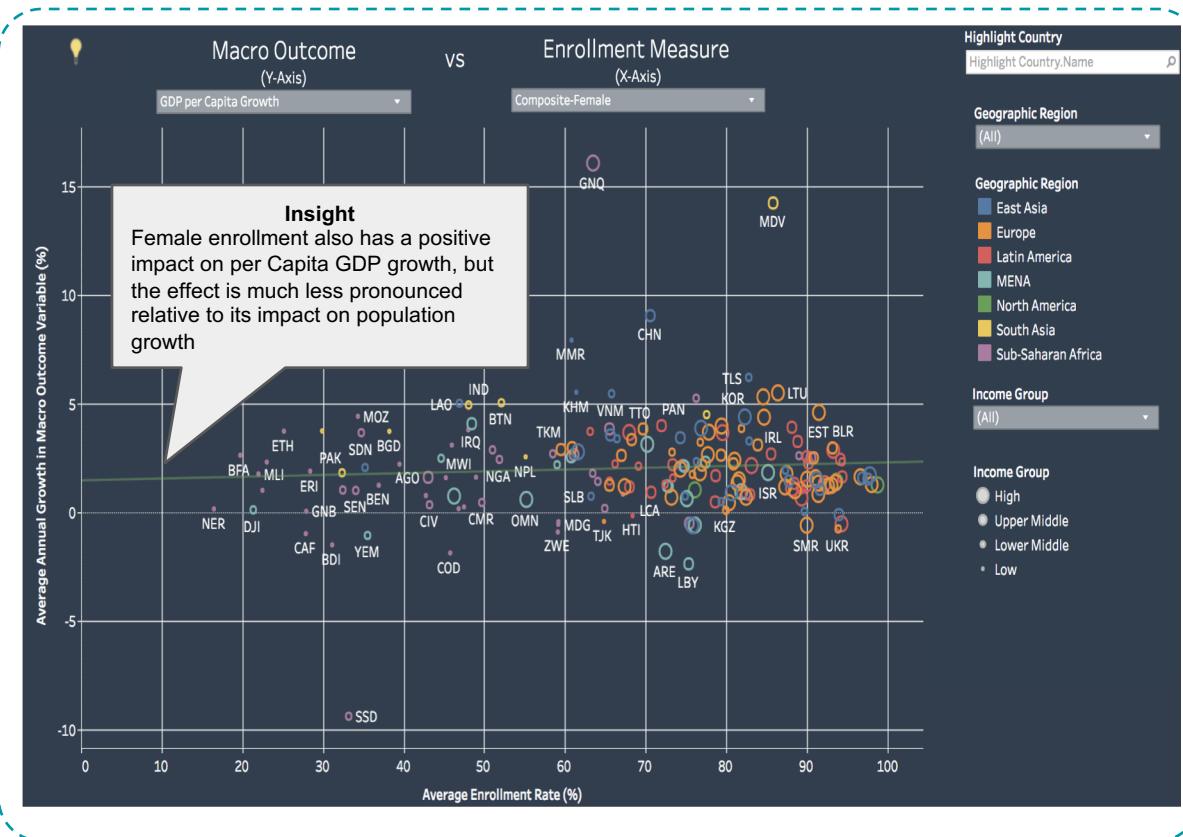
Is the effect as strong as it is for population growth?

Which enrollment measure has the strongest impact on population growth?

Task 3 - Use Case: Investigating New Lines of Inquiry

Do higher female enrollment rates lead to higher economic growth?

Is the effect as strong as it is for population growth?

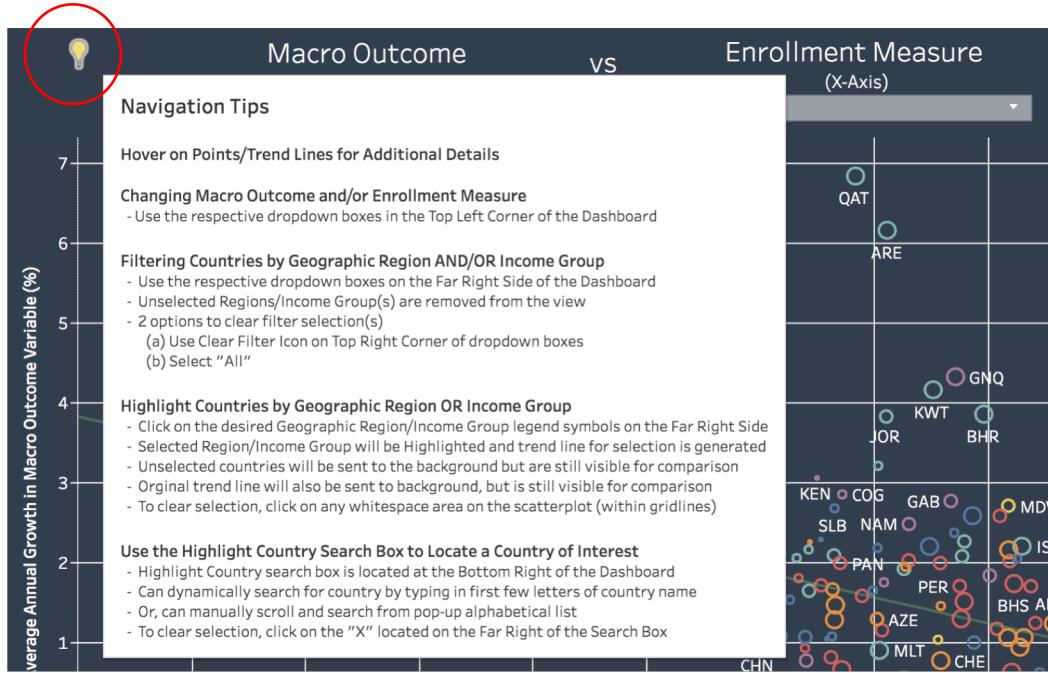


Task 3 - Incorporating Usability Test Feedback

Priority Issue Identified In Usability Testing

“Add explanatory text that provides an overview of the visualization’s interactive features and basic instructions on how best to use them.”

How Issue was Addressed



Task 4 - Explore trends

Analyze and compare trends of key education indicators and key macroeconomic and demographic measures

Subtasks:

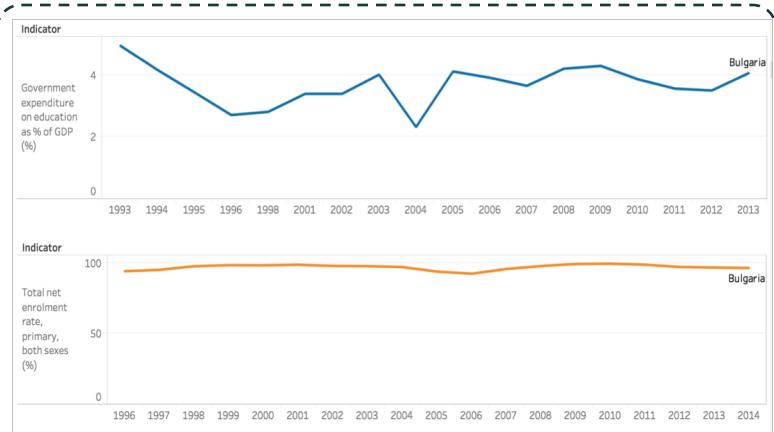
- Identify trends in education indicators vs macroeconomic/demographic measures for a specific country over time
- Compare trends for different countries



Task 4 - Evolution to Final Product

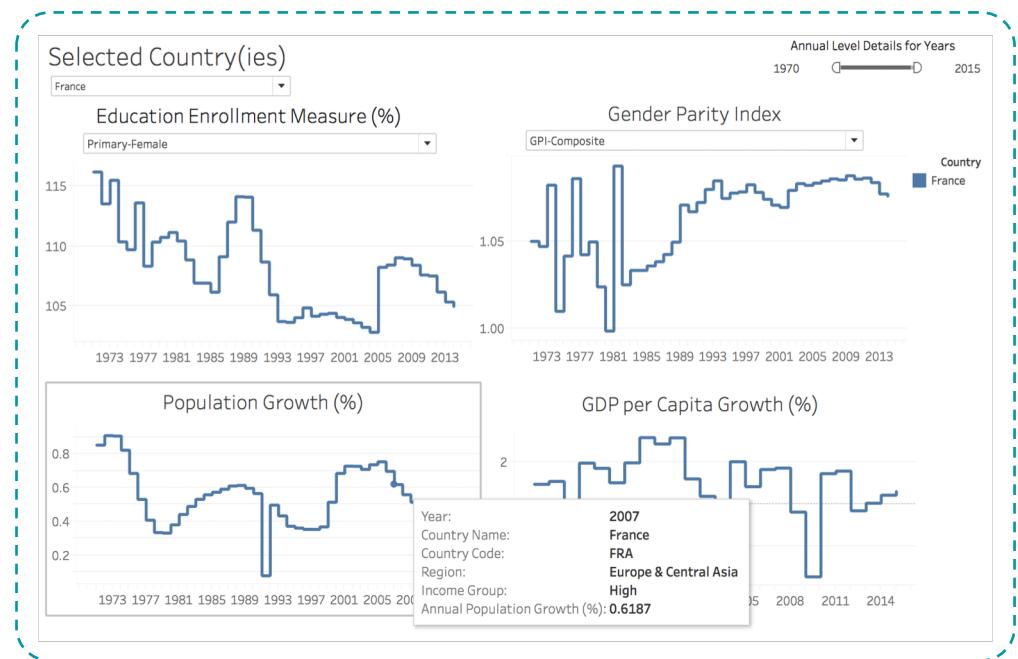
Prior Iteration

- Manual selection from vast number of Indicators



Final Product

- Select a country or countries to explore or compare trends
- Explore trends for various indicators
- Details on demand



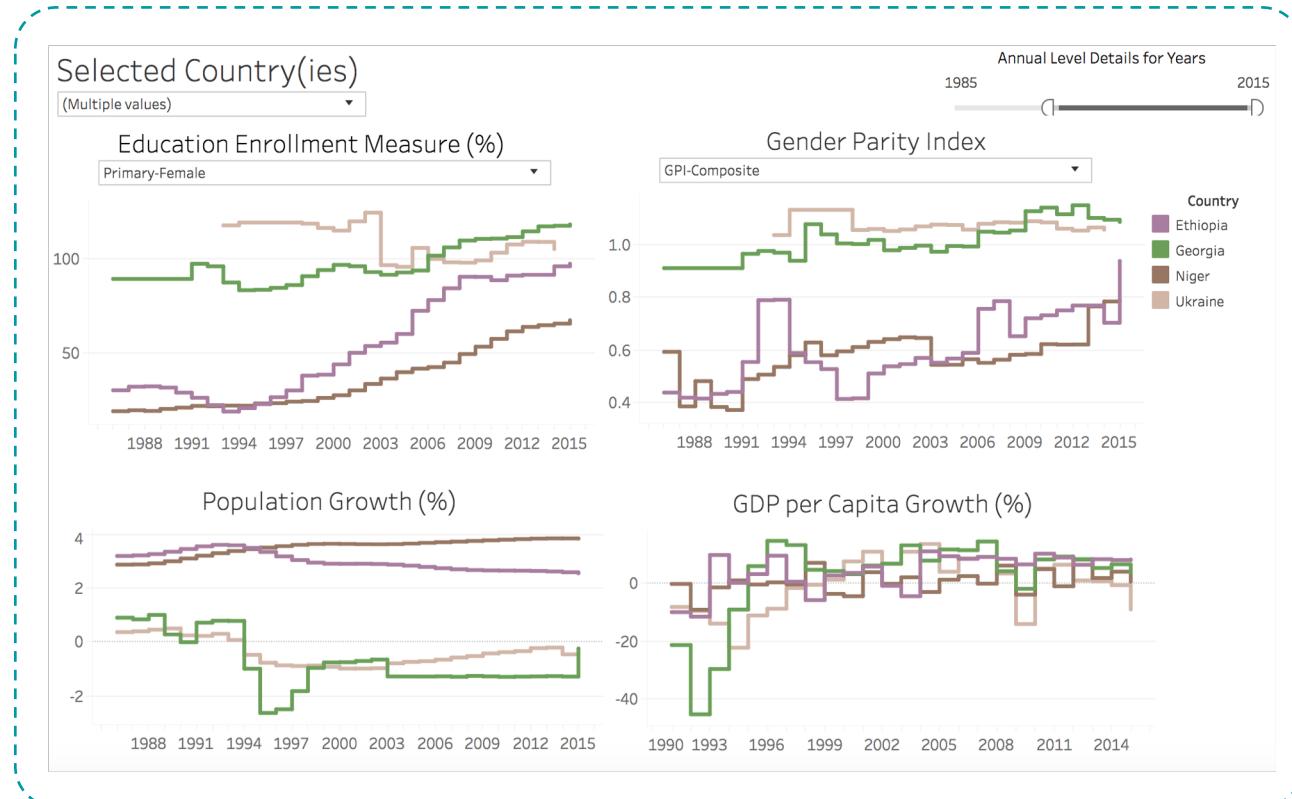
Task 4 - Insights

Insight 1

Female enrollment rate and gender parity are improving in Low and Low-Middle income countries over time

Insight 2

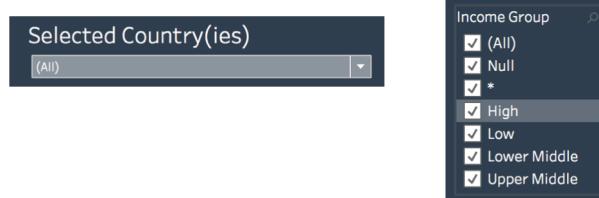
High-income countries have high enrollment rates over the years and they have been able to sustain these rates



Task 3 - Incorporating Usability Test Feedback

Must:

1. Narrowed down from 100+ indicators to female education and gender parity related metrics.
2. Income Group filter removed, to avoid resetting the Country filter.



3. Removed propagating filter from Task 3 and added Country dropdown menu.

Could:

Graphs for population growth for male and female indicators
not enough data points



Q&A

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