

WHO'S WINNING THE GLOBAL EDUCATION RACE?


An integrated analysis of GDP investment, inequality, and student mobility to benchmark global education systems and spotlight high-impact opportunities

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Presented by Alice, Shawn, Shilpa, Pratik & Aiswarya



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Objective



Analyze the relationship between education spending and student retention rates globally



Identify countries where inequality leads to higher outbound student mobility



Benchmark national education performance using investment, mobility, and equity indicators



Support data-driven decisions for policy reform and international education strategy



Our Questions



Which countries show the greatest mismatch between education investment and actual student retention ?

01

02



Do countries with high education inequality experience higher outbound student mobility ?



Which countries successfully attract international students and retain their own talent ?

03



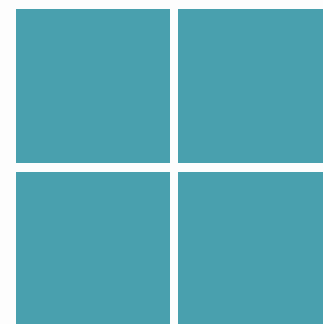
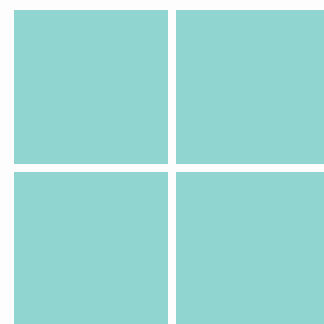
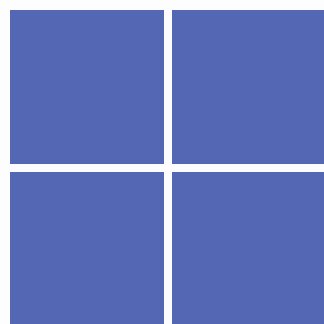
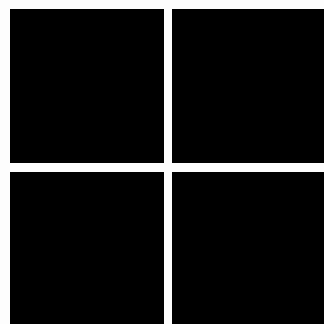
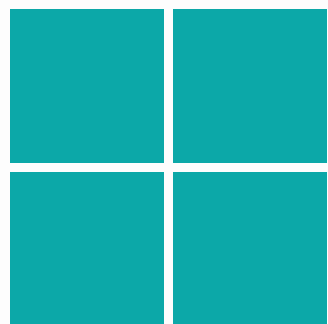
Data Sources

These five datasets together provide a comprehensive overview of global education and economic conditions, combining data on GDP, student mobility, education inequality, enrollment, and government spending to assess national performance and student retention in 2020.

kaggle



kaggle



World GDP
2020

International
Student
Mobility

Share of Students
Studying Abroad

Inequality in
Education

World
Development
Indicators

GDP and population indicators across 184 countries, used to measure national economic strength in 2020.

Share of international tertiary students in each host country (2020)

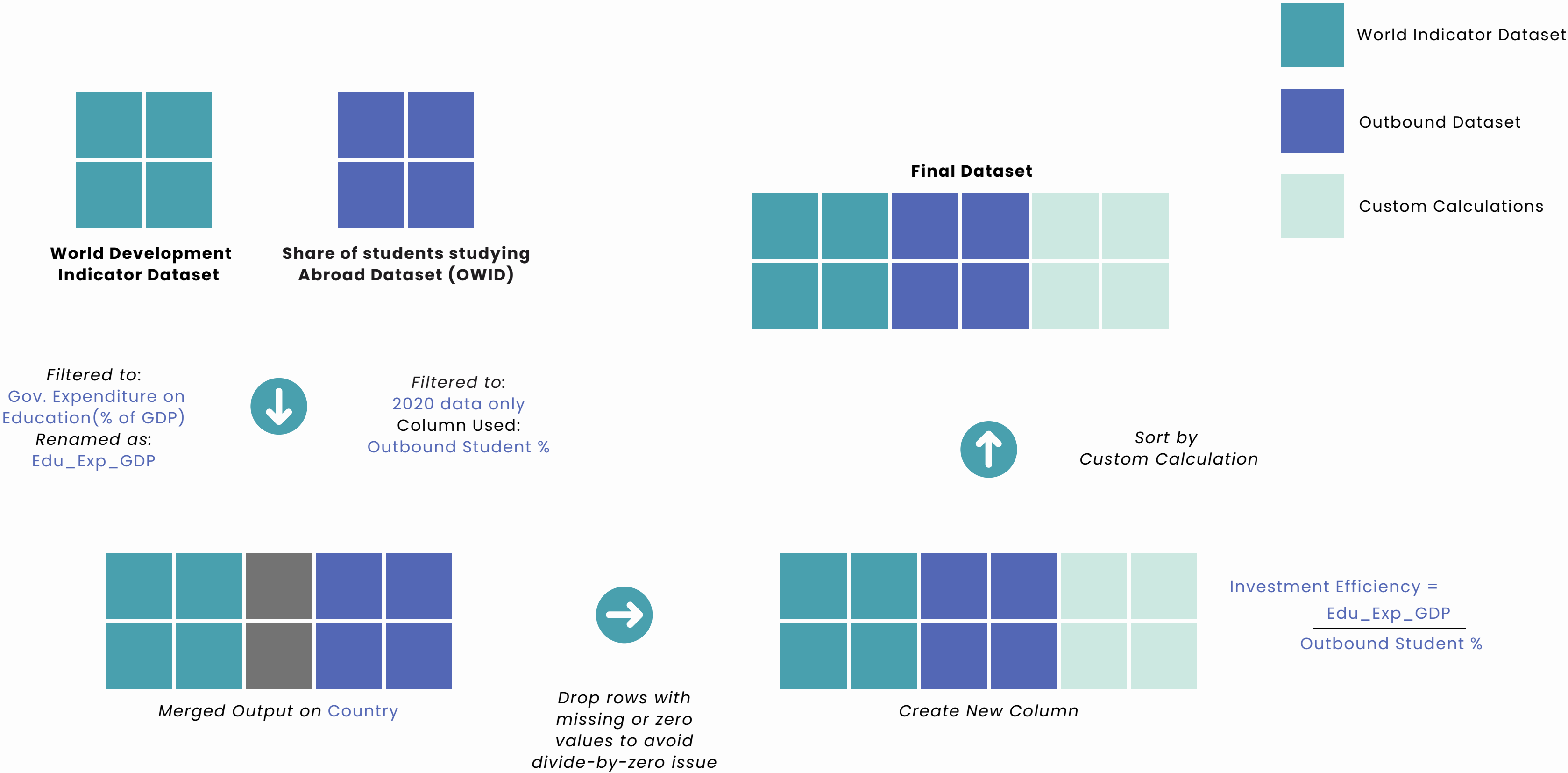
Share of students studying outside their home country (filtered for 2020)

Education inequality scores & HDI ranks for 195 countries (2020)

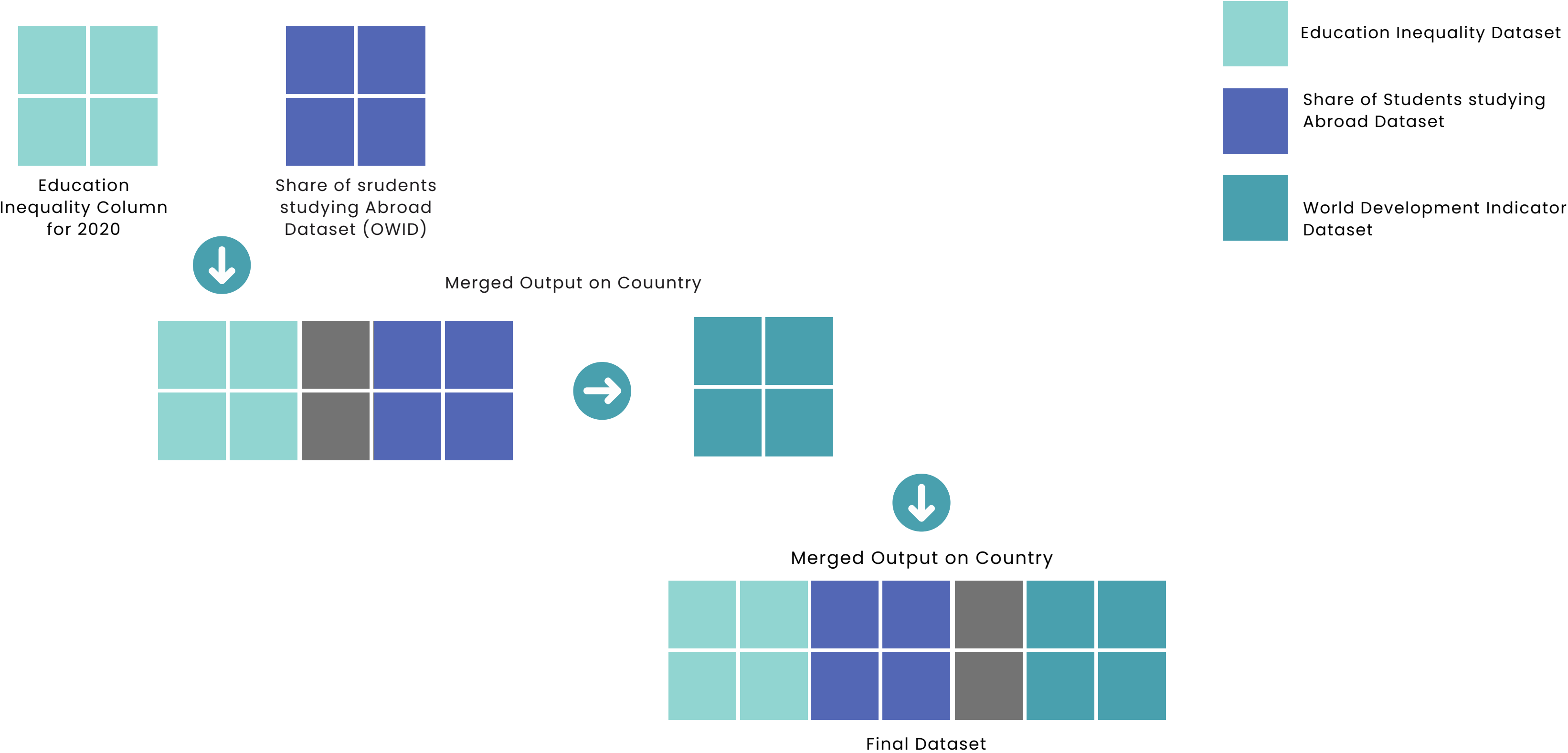
Contains global education stats: enrollment, government spending, etc. for 2020.



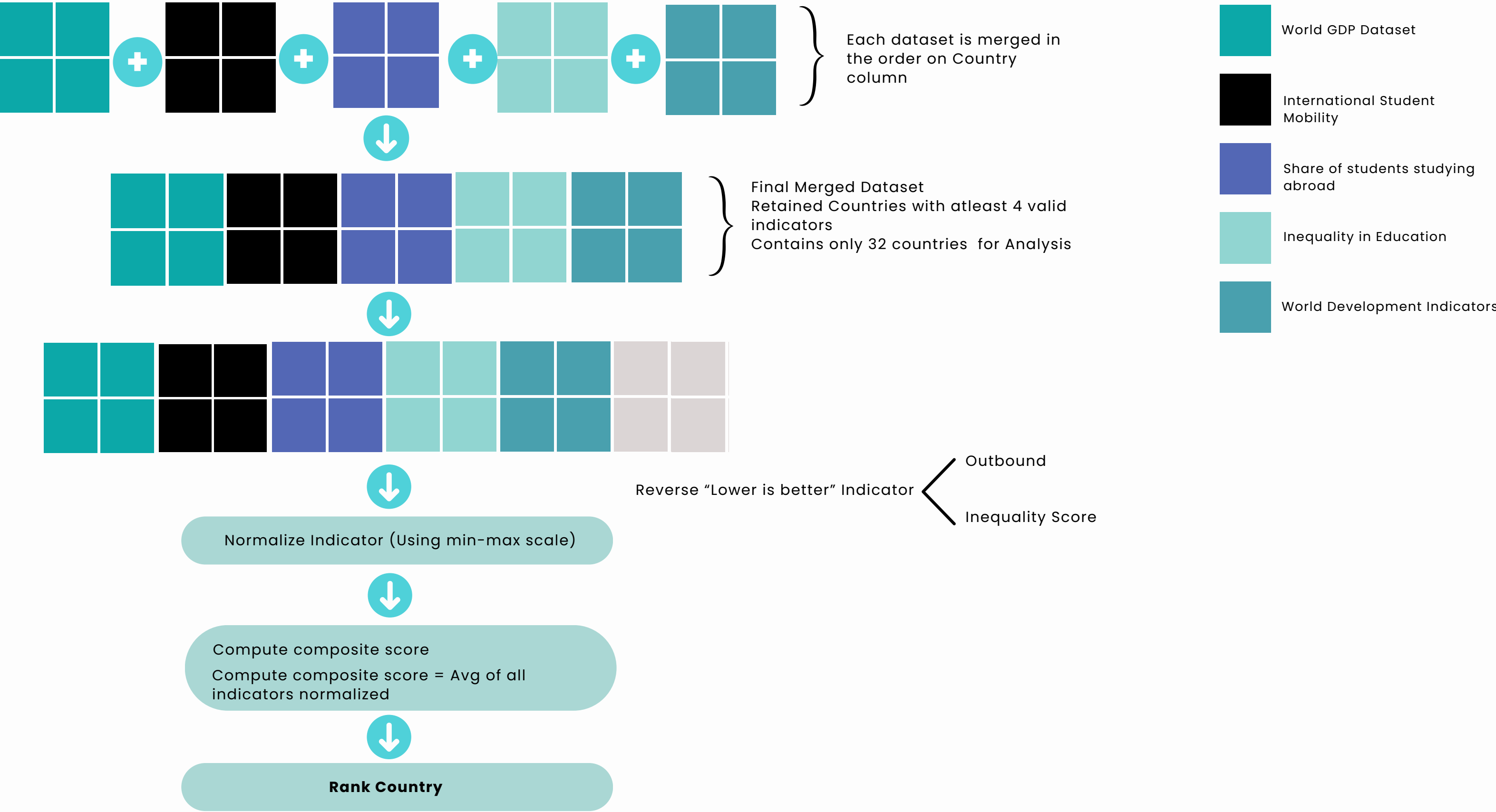
Data Wrangling : Question 1



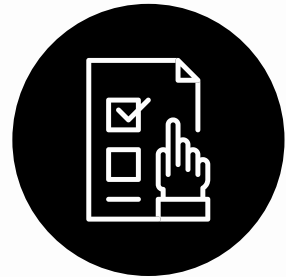
Data Wrangling : Question 2



Data Wrangling : Question 3

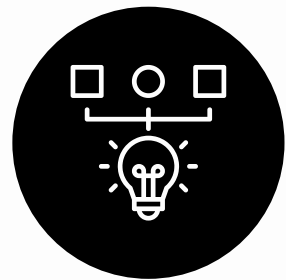


Limitation



2020 as an Anomaly (Pandemic Bias)

Most of our data is from 2020 — a year when education systems and international mobility were heavily disrupted. This means observed trends may reflect short-term shocks rather than long-term realities.



Unequal Country Representation

Key datasets like OECD and CWUR focus on developed nations, leaving out many developing countries. This skews the global picture and may hide different education challenges or strengths.



No Student Voice or Decision Factors

The analysis is based on national statistics, not on what students value — like employability, safety, or cultural preferences — which play a huge role in mobility decisions.

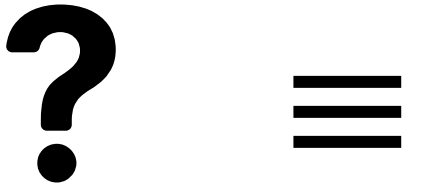


Which countries show the greatest mismatch between education investment and actual student retention?

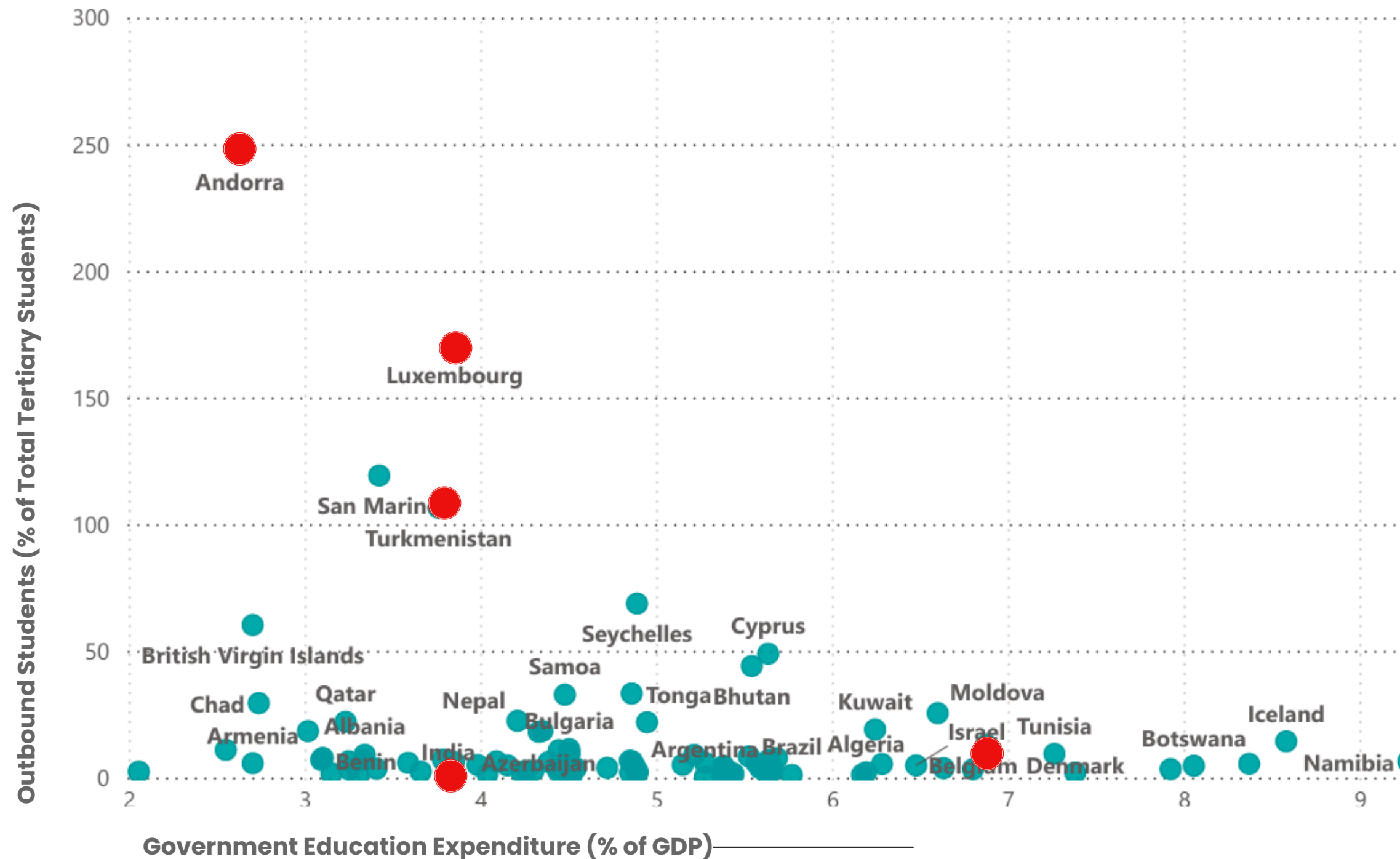
INVESTMENT VS RETENTION



Investment vs Retention – Global Patterns



How Education Spending Impacts International Student Mobility



No Clear Linear Relationship

- Countries with high education spending don't always retain students.
- Outbound rates remain high in several well-funded systems.

Notable Mismatches

- Luxembourg, Turkmenistan, Andorra show high outbound mobility despite high investment.
- These outliers signal inefficiencies or deeper systemic issues.

Moderate Zones Indicate Better Balance

- India and Israel demonstrate a more balanced pattern – moderate investment with relatively lower outbound rates.
- Suggests retention may depend more on perceived quality and access than just funding volume.



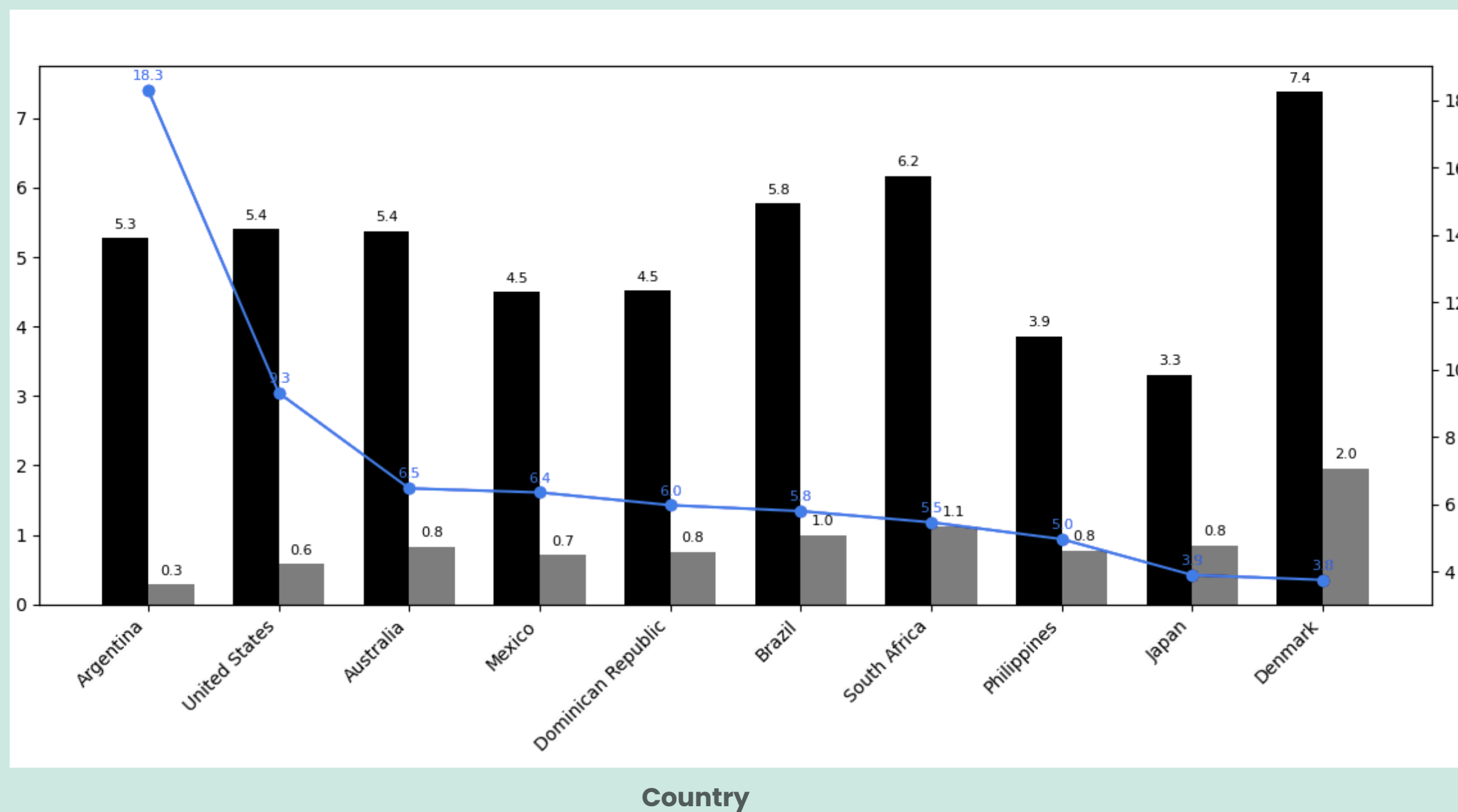
Observations



How Education Spending Impacts International Student Mobility

● Efficiency score ● Education Spend (% of GDP) ● Outbound Student %

Education Spend (% of GDP) and Outbound Student %



Argentina has the highest efficiency score (18.3%) with strong retention despite average spending



U.S. spends equally but retains fewer students — lowering efficiency to 9.3%.



Spending ≠ Success

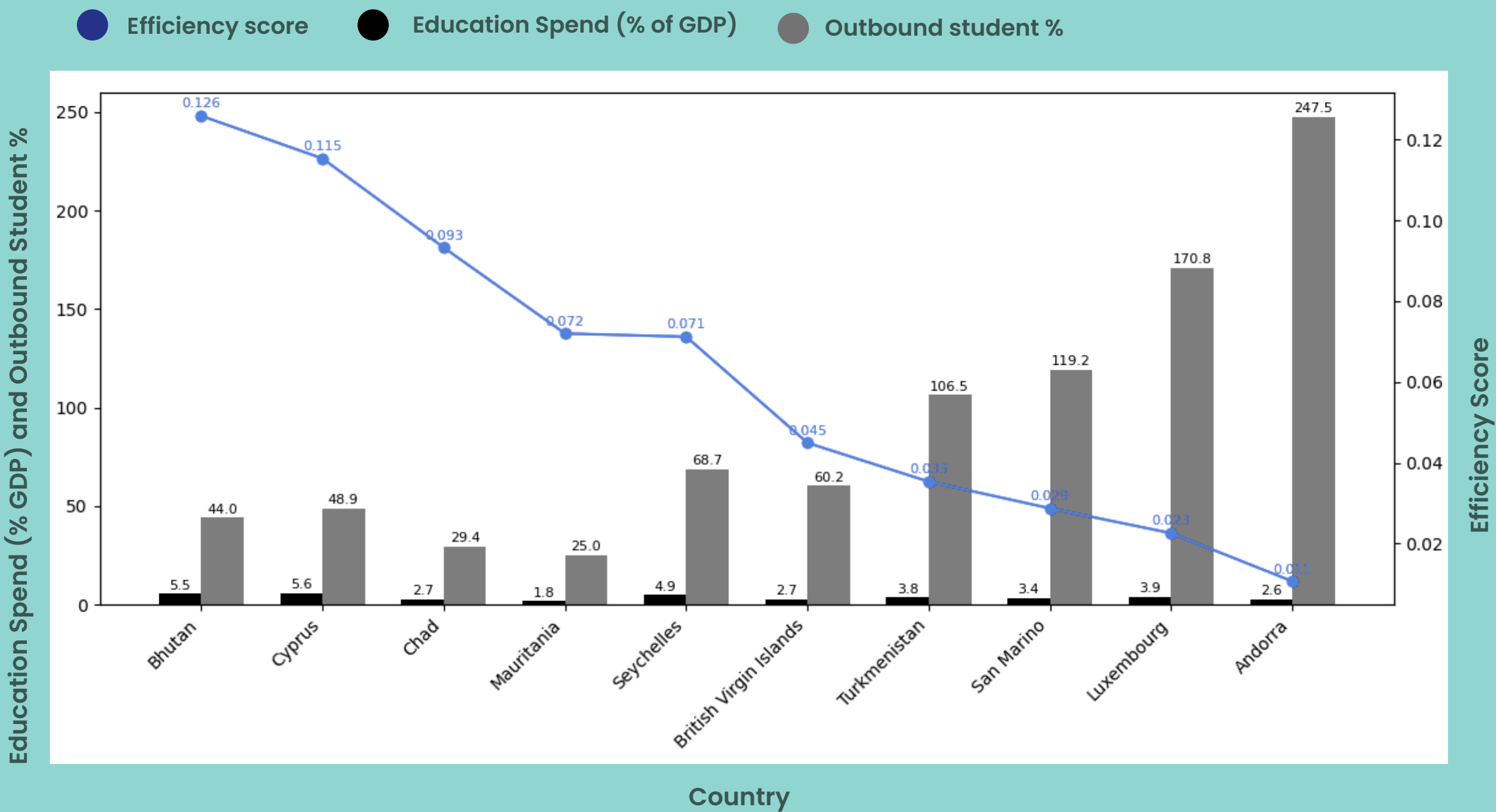
Countries spending the same can have very different results — what matters is how well they keep students, not how much they spend.



Observations



Least Efficient Countries by Education Investment Efficiency



High spend, Low return

- Andorra and Luxembourg spend a lot but still lose many students abroad.



Poor efficiency

- Countries like Cyprus and Chad show low student retention despite decent investment.



Key takeaway

- More spending isn't enough — quality and trust in local education matter more.

How Efficient Is New Zealand’s Education Investment?

Rank	Rank	Efficiency	Outbound	Edu_Exp_GDP *
New Zealand	15	2.8 %	2.01 %	5.7 %
Australia	3	6.5 %	0.83 %	5.4 %

*Education Expenditure as a Percentage of GDP

New Zealand shows moderate efficiency despite high spending, while our neighbouring country Australia achieves top tier retention with slightly less investment.





Do countries with high education inequality experience higher outbound student mobility?

INEQUALITY & OUTBOUND MOBILITY



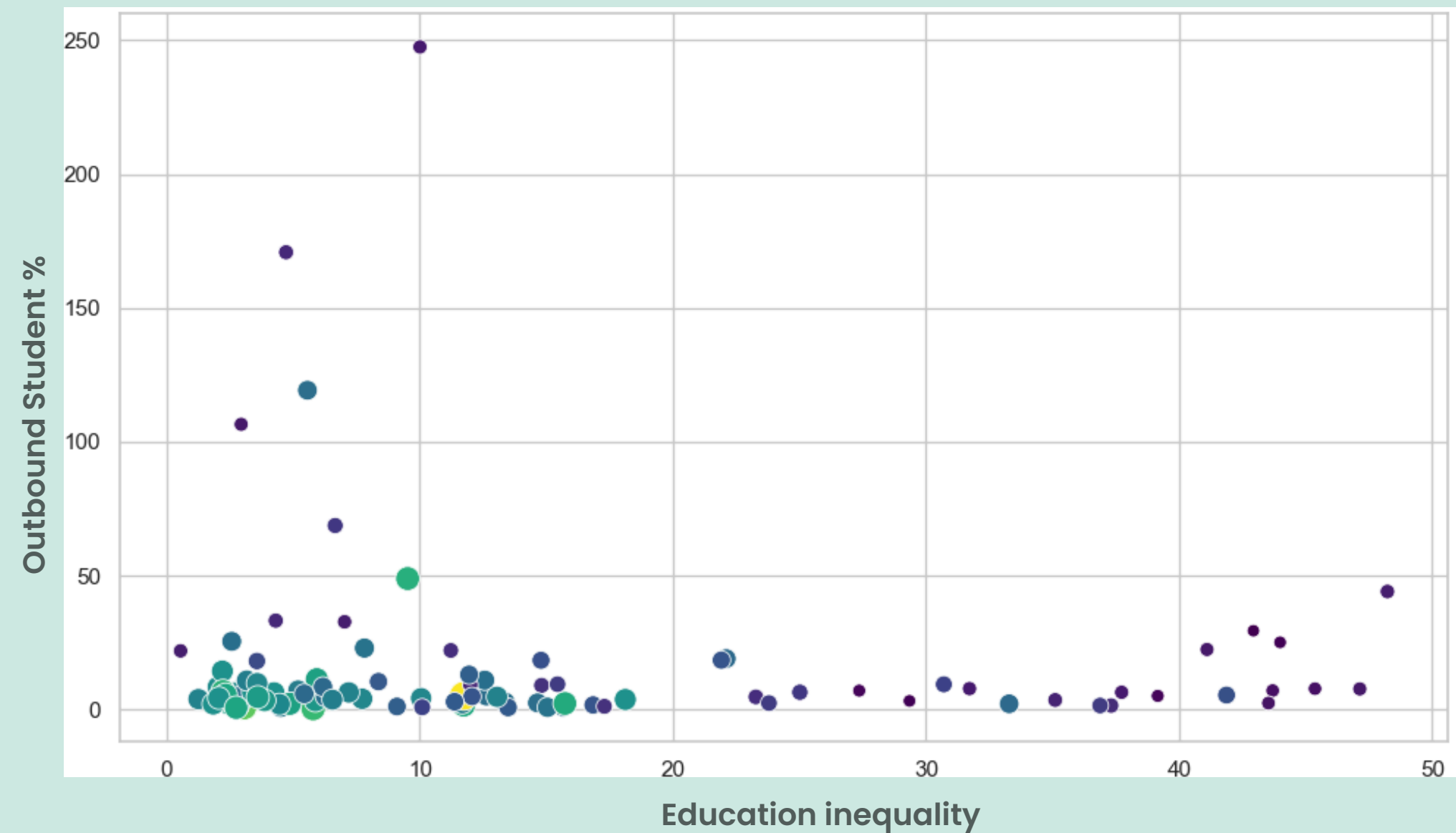
Observation

Most countries cluster in the **bottom left**:
low inequality + low outbound rates.

Correlation Insight

- Pearson correlation = **-0.067**
- P-value > 0.5

Education Inequality vs Outbound Student Mobility



Each dot represents a country, with size and color indicating Tertiary Enrollment



Observation



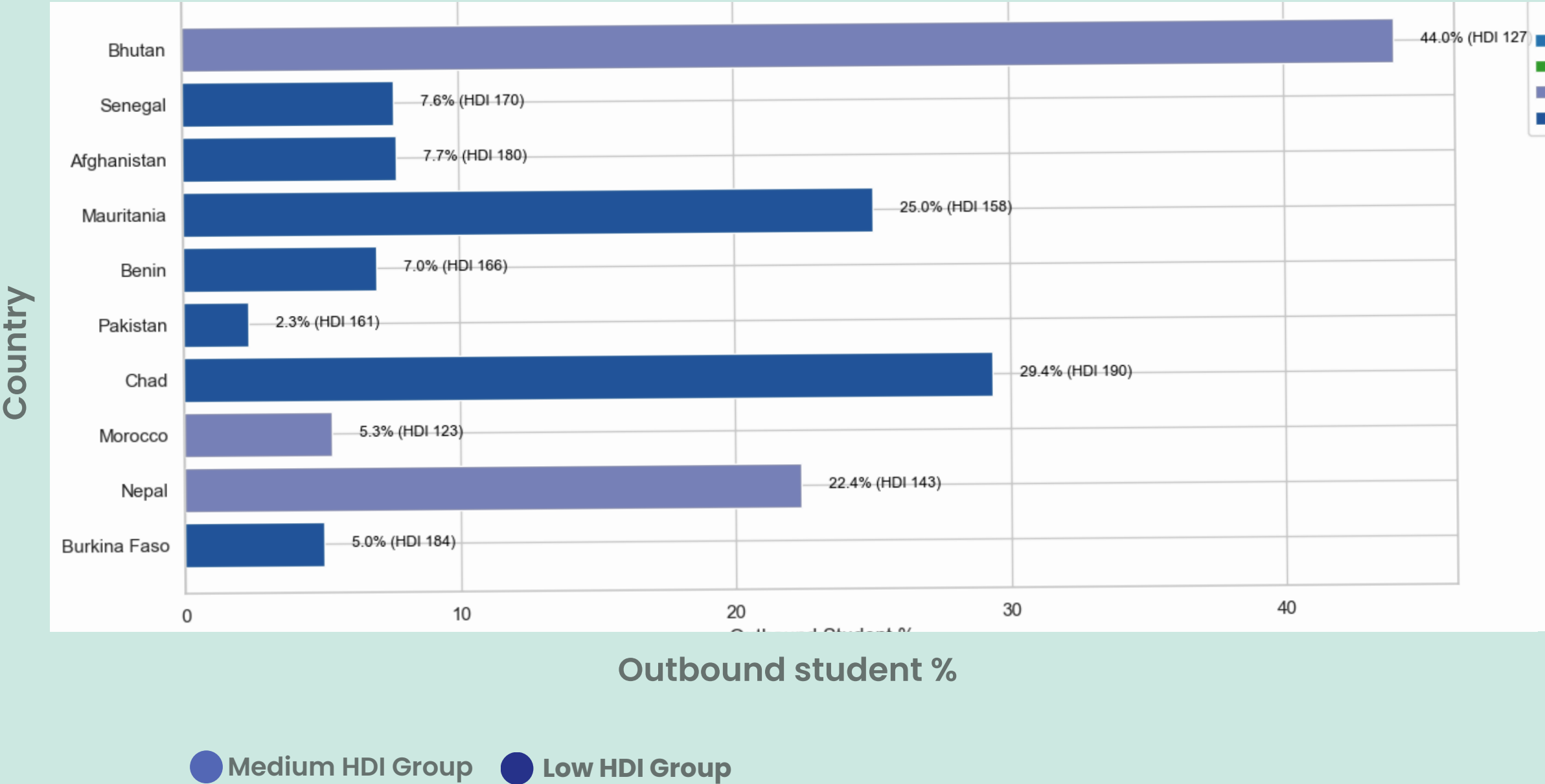
Bhutan has the highest outbound rate (44%) despite a moderate HDI rank (127).

Chad and Mauritania combine low HDI with high outbound rates, showing deep education gaps.

Nepal and Morocco reveal that even mid-HDI countries face inequality-driven student outflow.

Outbound student rates vary widely from 2.3% in Pakistan to 44% in Bhutan among similarly unequal countries, showing that factors like access, policy, and opportunities abroad also shape mobility.

Top 10 Countries with Highest Education Inequality and Student Outbound Rates





Which countries successfully attract international students and retain their own talent?

EDUCATION WINNERS



Observation



Australia (Score: 0.72)

Australia tops the global education index by attracting the most international students while maintaining strong domestic retention.



Switzerland (Score: 0.68)

With strong GDP, low inequality, and excellent education access, Switzerland is a top performer in global talent strategy.



New Zealand (Score: 0.63)

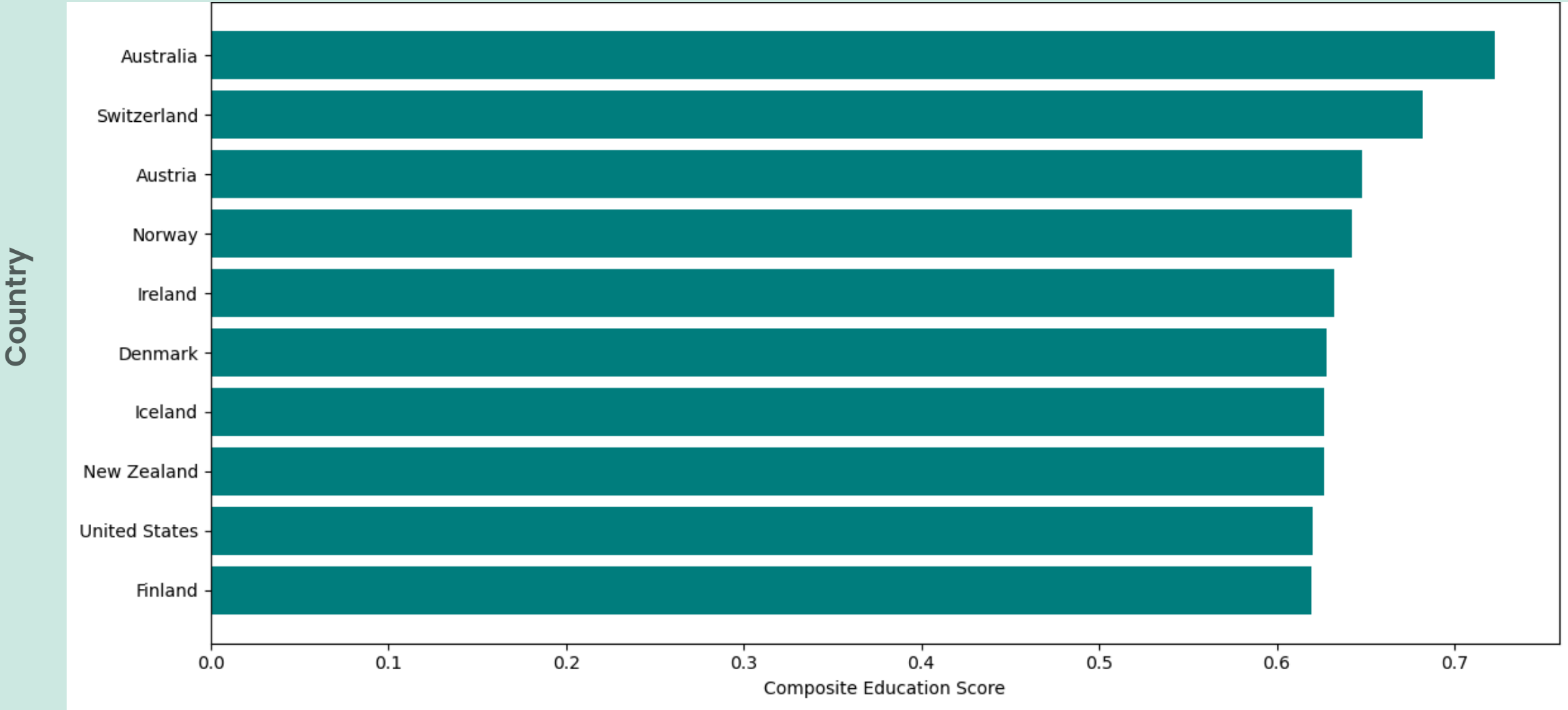
Ranked 8th, New Zealand stands out for its high student retention and strong appeal to global learners.



United States (Score: 0.62)

The U.S. remains a leading education hub with high inbound mobility and well-balanced investment indicators.

Top 10 Countries Winning the Global Education Race?



Composite Education Score



Observation



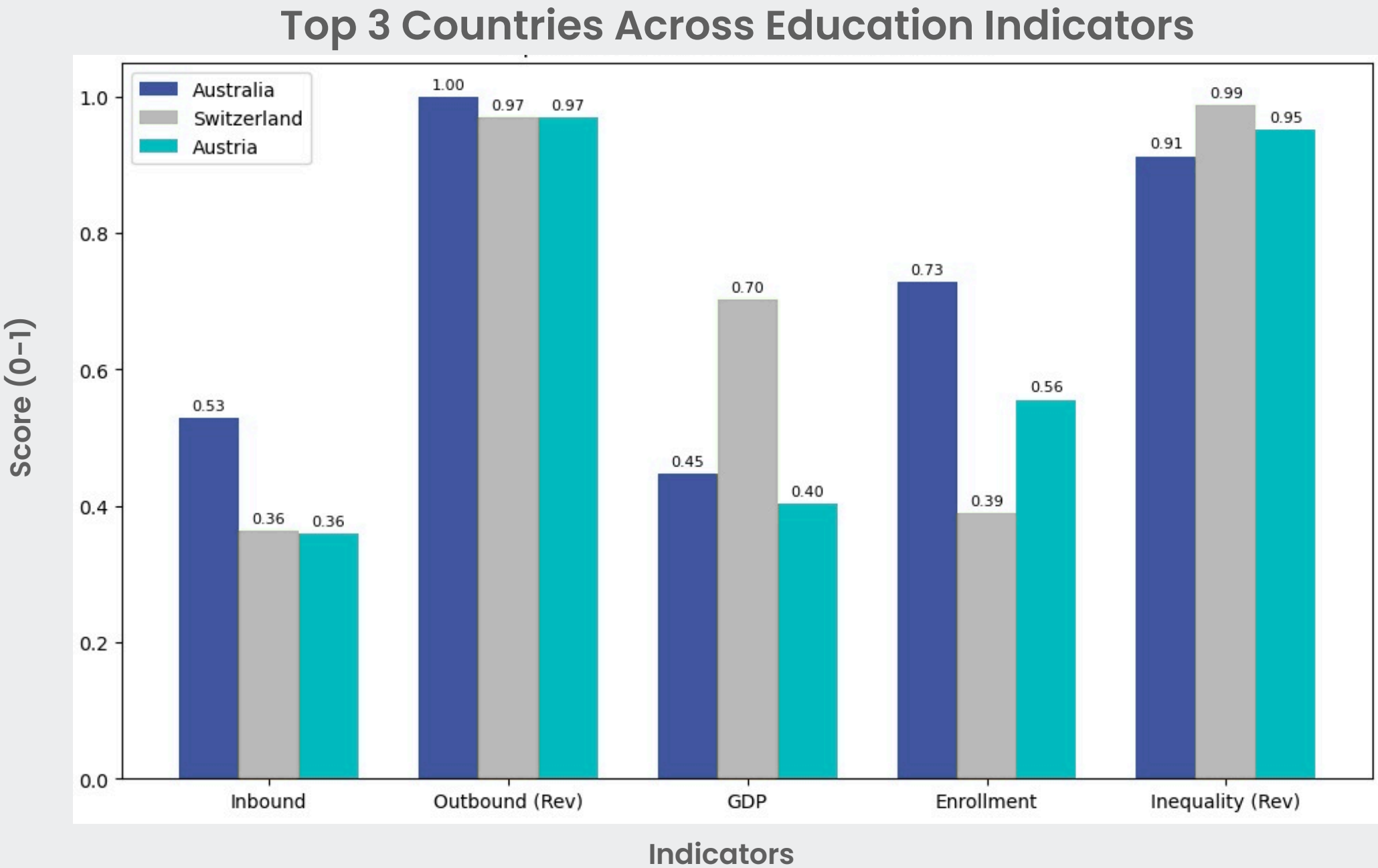
Switzerland stands out with strong economic power (GDP Score: 0.71), top equity (Inequality Score: 1.00), and very low student outflow (Outbound Score: 0.97), making it a global education benchmark.



Australia leads in student retention (Outbound Score: 1.00), has high tertiary access (Enrollment Score: 0.73), and maintains strong fairness (Inequality Score: 0.92), showing a well-rounded education system.



Austria combines equitable education (Inequality Score: 0.96) and solid enrollment (Score: 0.59) despite a modest economy (GDP Score: 0.41), proving that access can overcome economic limits.





Recommendations

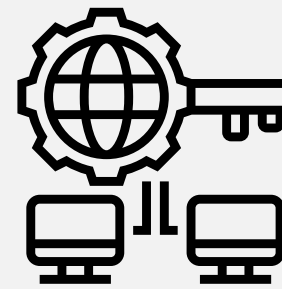


Recommendation



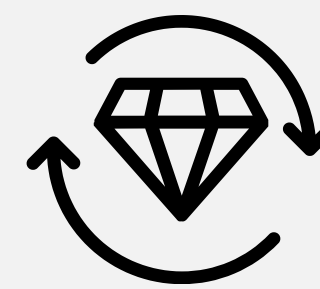
Realign Education Investment with Retention Outcomes

- Align spending with performance metrics e.g., graduate employability, access equity, and quality perception.



Equitable Access to Reduce Brain Drain

- Prioritize tertiary education access in underserved regions and support policies targeting educational equity.



Boost Systemic Integration

- Encourage system-wide innovation: support quality research, dual-degree partnerships, and post-study incentives.

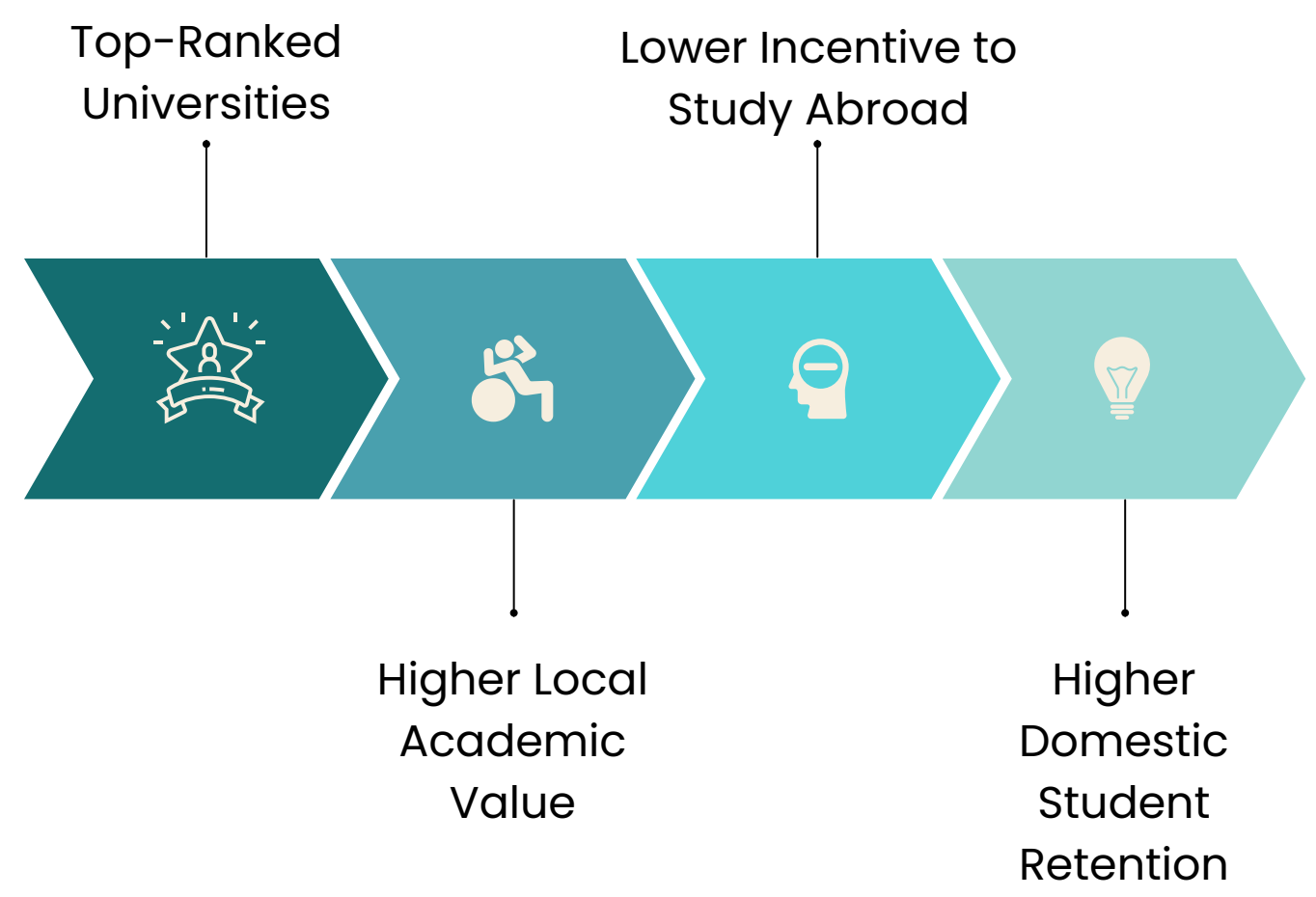





**Do Countries with top
ranked universities
also retain more
students
domestically?**



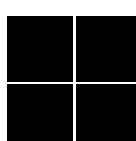
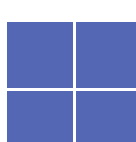


Why is this question important?




 **Limitation** - No university rankings in existing data

Current datasets

-  World GDP 2020
-  World Development Indicators
-  International Student Mobility
-  Share of students studying abroad

New dataset

 **World University Ranking CWUR**



How do we get this data?

CWUR

[About](#) [World University Rankings](#) [Methodology](#) [CWUR Rating System](#) [Media](#)

GLOBAL 2000 LIST BY THE CENTER FOR WORLD UNIVERSITY RANKINGS

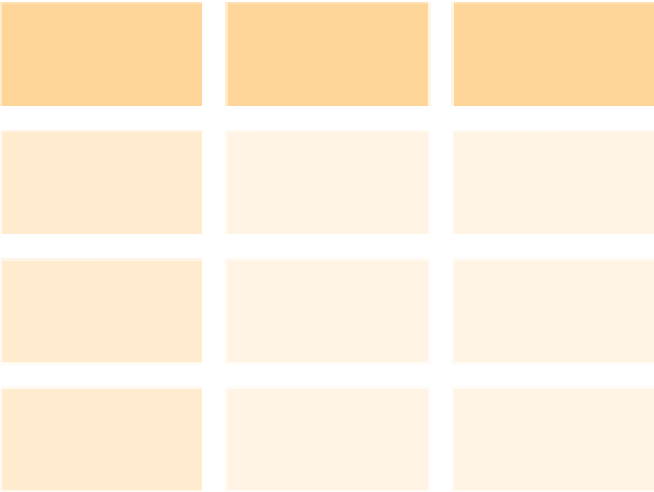
2024 Edition

20,966 institutions were ranked, and those that placed at the top made the Global 2000 list.

Search by Location

World Rank	Institution	Location	National Rank	Education Rank	Employability Rank	Faculty Rank	Research Rank	Score
1 Top 0.1%	Harvard University	USA	1	1	1	1	1	100
2 Top 0.1%	Massachusetts Institute of Technology	USA	2	4	12	2	12	96.8
3 Top 0.1%	Stanford University	USA	3	10	4	3	2	95.2
4 Top 0.1%	University of Cambridge	United Kingdom	1	3	26	4	14	94.1
5 Top 0.1%	University of Oxford	United Kingdom	2	7	28	9	6	93.3
6 Top 0.1%	Princeton University	USA	4	5	15	7	83	92.6

<https://cwur.org/2024.php>

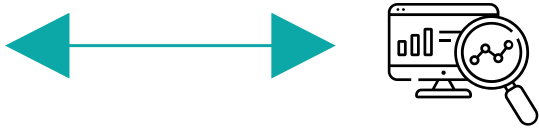


Merged dataset

Use of Scraped Data
Compare # of top universities
with outbound mobility rates



Beautiful Soup : Webscraping Tool



World Rank	Top%	Institution	Location	National Rank	Education Rank	Employability Rank	Faculty Rank	Research Rank	Score
1	0.1	Harvard University	USA	1	1	1	1	1	100
2	0.1	Massachusetts Institute of Technology	USA	2	4	12	2	12	96.8
3	0.1	Stanford University	USA	3	10	4	3	2	95.2
4	0.1	University of Cambridge	United Kingdom	1	3	26	4	14	94.1
5	0.1	University of Oxford	United Kingdom	2	7	28	9	6	93.3
6	0.1	Princeton University	USA	4	5	15	7	83	92.6
7	0.1	Columbia University	USA	5	12	14	10	15	92.1
8	0.1	University of Pennsylvania	USA	6	14	8	43	13	91.6
9	0.1	Yale University	USA	7	6	33	13	21	91.2
10	0.1	California Institute of Technology	USA	8	2	100	6	89	90.8
11	0.1	University of Chicago	USA	9	8	16	22	44	90.5
12	0.1	University of California, Berkeley	USA	10	9	61	5	20	90.1
13	0.1	University of Tokyo	Japan	1	39	6	116	32	89.8
14	0.1	Cornell University	USA	11	16	29	18	24	89.6
15	0.1	Northwestern University	USA	12	106	17	30	30	89.3
16	0.1	University of Michigan, Ann Arbor	USA	13	35	42	63	9	89.1
17	0.1	University of California, Los Angeles	USA	14	34	67	17	16	88.9

Sample Data Collected



Thank you

