

# Vietnamese Graduation Exam Analytics

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Proof of Work:  
[https://github.com/sydneycally-inclane-2812/data\\_vis\\_uni2024](https://github.com/sydneycally-inclane-2812/data_vis_uni2024)



S P Jain  
School of Global  
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# Importance of Data

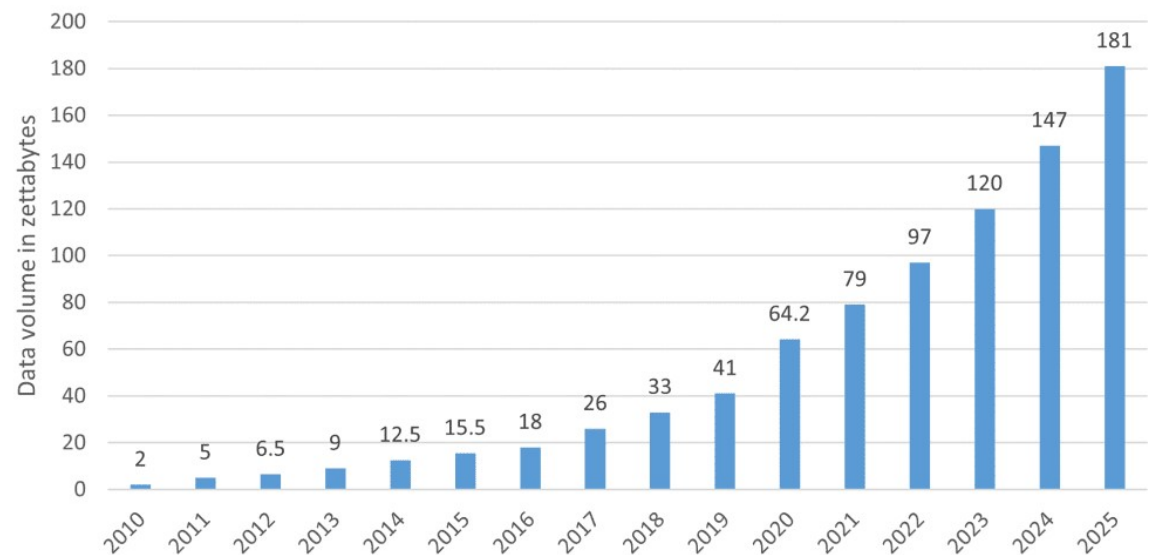
The amount of data produced worldwide is **increasing exponentially** every year.

- **40%** of companies use **Big Data Analytics**
- **44%** use **data-driven** decisions making
- **90%** believe data is **important** to business

We offer a **great course** for a **promising field**, in a **rapidly growing economy**; how do we make the most of our efforts?

Optimize the curriculum, find inspiring educators and **empowering the right student**.

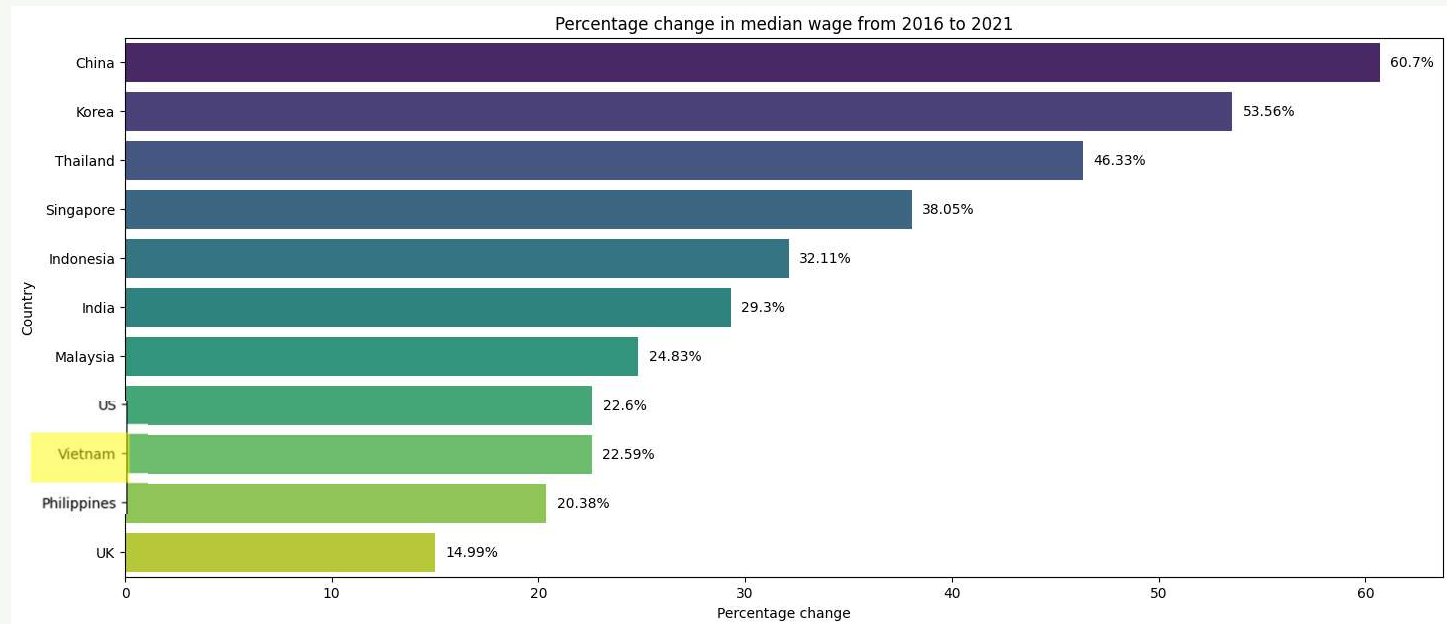
Volume of data created and replicated worldwide (source: IDC)



Source: QuantHub

Vietnamese migrants are becoming **larger and larger contributors** to the Australian economy.

Vietnam has a comprehensive, SAT-like national examination which result is used by all domestic universities.



**Can that be a good indicator of promising talents for our program?**

# Context

Overview of Vietnamese HS Graduation Test:

- Usually occurs over **2 days** in July
- Taken by **12<sup>th</sup> graders** or anyone who wishes to be enrolled into a **tertiary education** institute
- 3 compulsory subjects: **Math, Vietnamese Literature** and **2<sup>nd</sup> language** (typically English)

Choose 1 in 2 groups:

- Natural Sciences (**Biology, Physics, Chemistry**)
- Social Sciences (**History, Geography, Civics**)
- All tests are **Multiple Choice**, except for Vietnamese Literature
- To graduate, all subjects must be taken, none has scores  $\leq 1$  and the average must be  $\geq 5$

In 2024, after nine years of implementation, the test was administered in this format **for the final time.**

People who wants to go to university and have been studying for this format has **one last attempt**, so the number of test takers saw a **substantial increase.**



# Business Questions

We are looking to verify:

- The quality of Vietnamese students are gradually increasing to meet our standards, especially STEM subjects
- The test is **standardized** and **stable over multiple years**, so student's results are representative of their ability.

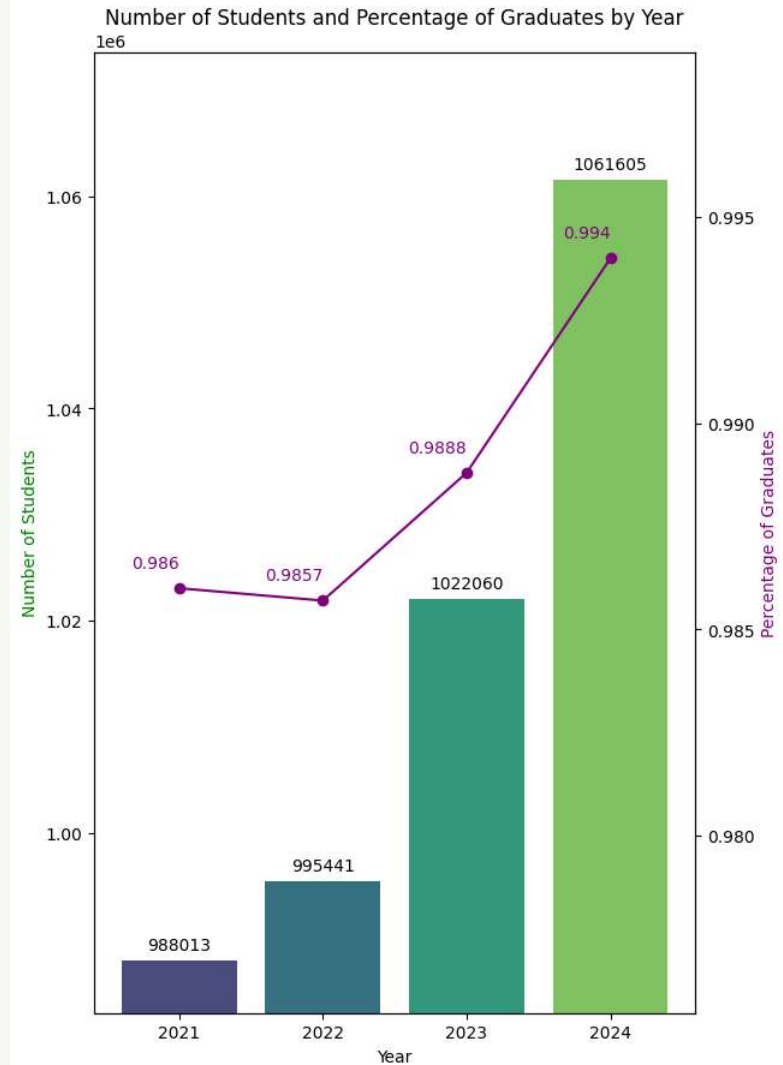
We will use data visualizations to find out:

- How much the **distribution** changes?
- Which subjects significantly **improved/declined**?
- How many students don't meet the **graduation criteria**? **Where** are they?
- How do scores vary by **region**?
- Is there **correlation** between **STEM subject scores**?
- How does **COVID-19** affect 2021?
- How different is **2024** is from the previous years, considering the change in test format?
- How can we further our **admission campaigns** in Vietnam with this findings?



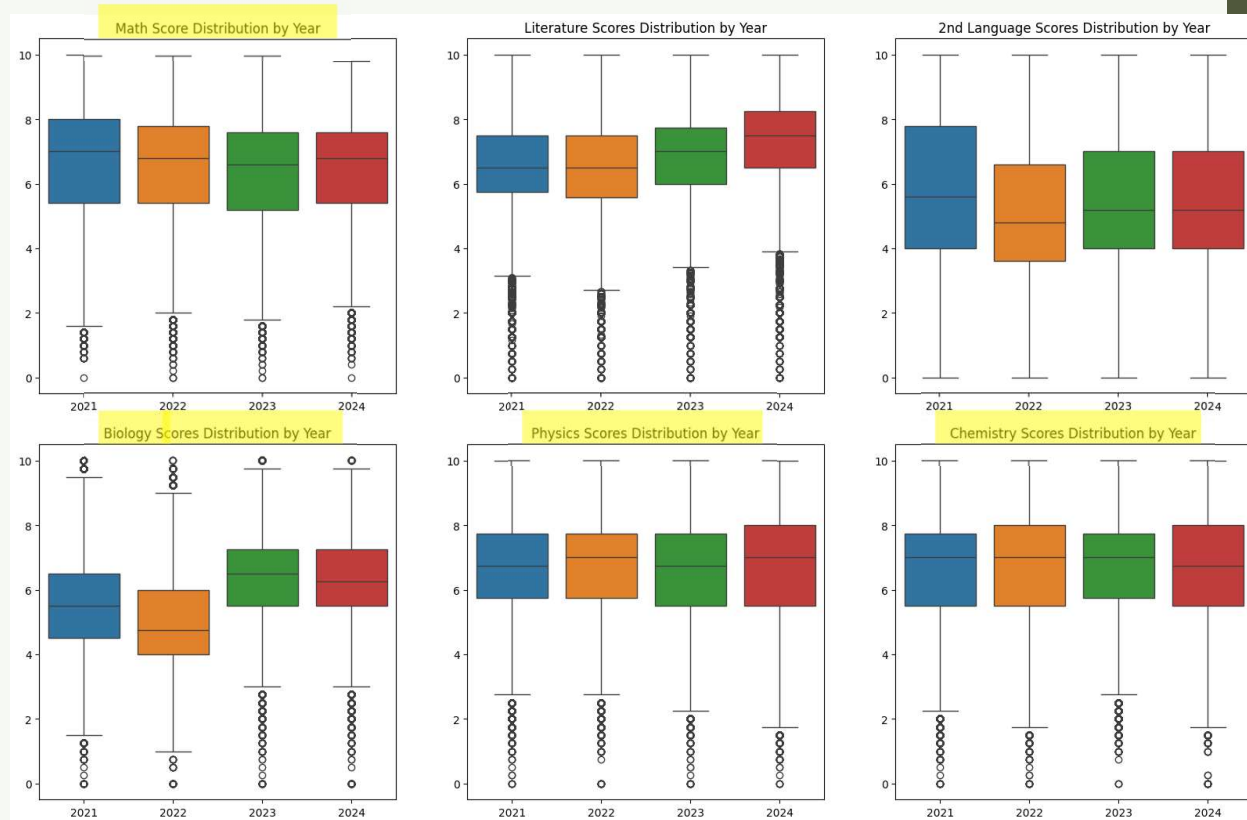
## Number of Students and Percentage of Graduates by Year

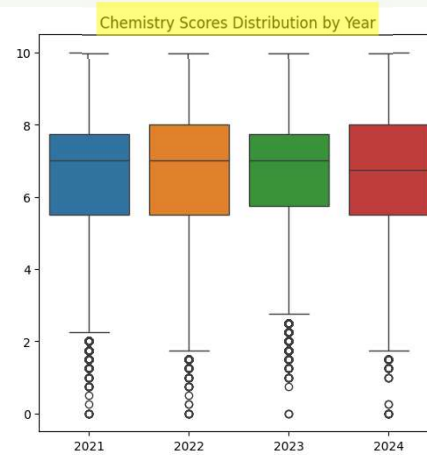
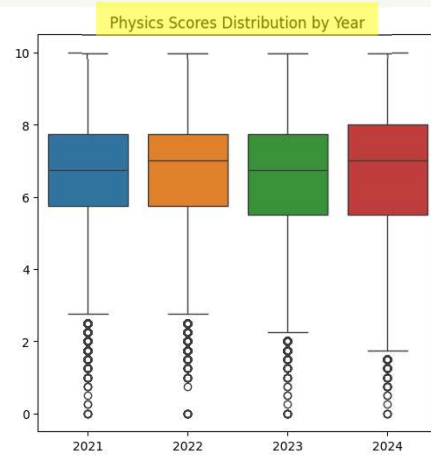
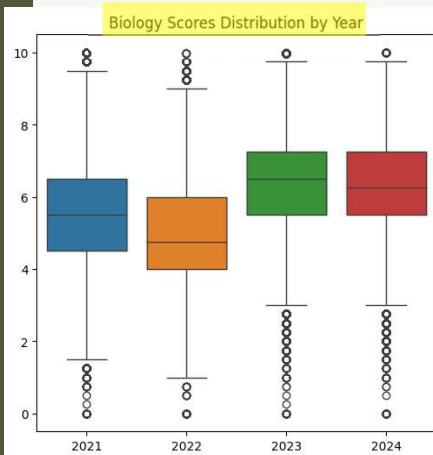
- The number of test takers **increases** year by year, but 2024 saw an increase by as much as **the previous two combined**.
- The graduation rate also inclined rapidly, indicating an increase in **learner's quality**.



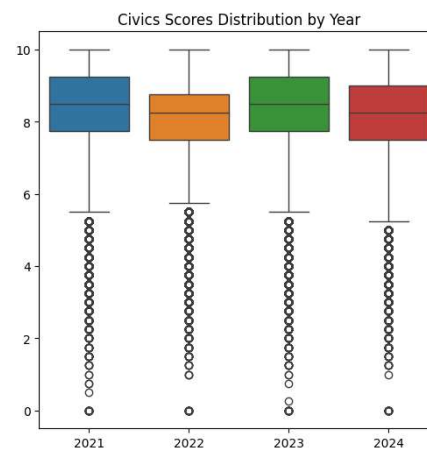
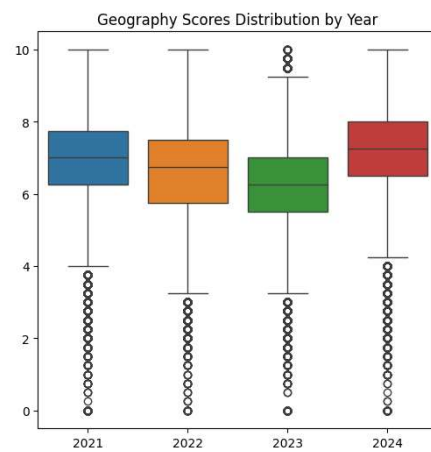
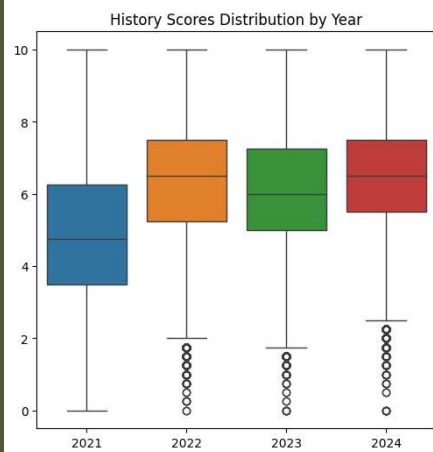
## Score Distribution: STEM vs Social Science

- The distribution of 9 subjects, over 4 years, are shown in the adjacent graphic.
- Results mostly follow **normal distribution** centered at the middle of the scale, showing **effective classification**.
- Despite being the last year, results of 2024 (in red) does not deviate much from previous year, except for a **small bump** for Literature and Geography





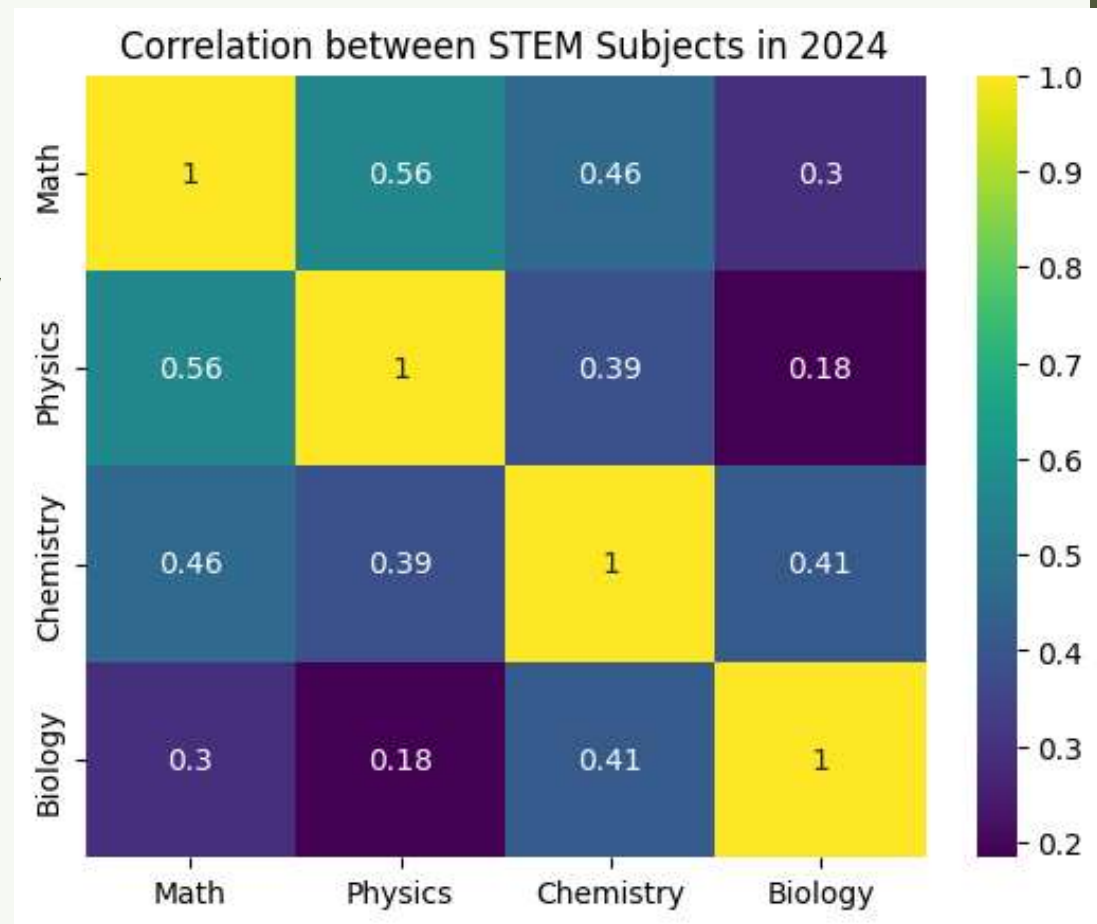
Performance of the STEM subject tests (1<sup>st</sup> row) is also **more consistent** than social science (2<sup>nd</sup> row), indicating more **reliable** testing and results.





## STEM Score Correlation

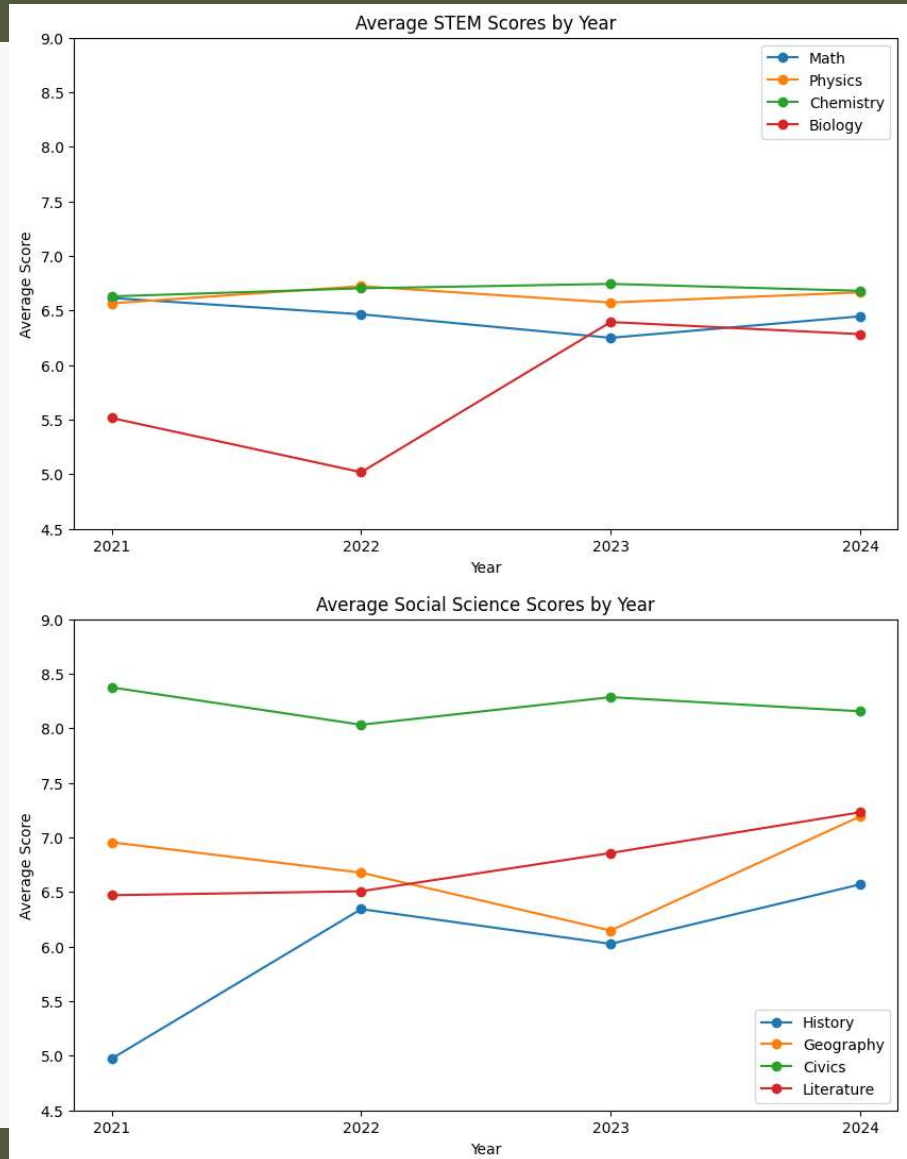
- Throughout the four years, the correlation between STEM subject scores stay **relatively unchanged**.
- **Math, Physics and Chemistry** all show significance correlation.
- **Chemistry and Biology** are also correlated
- This can be explained by:
  - STEM students would usually be interested in all four.
  - Universities often use Math, Physics and Chemistry scores for admission.
  - Chemistry and Biology is another combination for medicine schools.



## Average Score by Year

- The **mean score** of each STEM subjects maintained **relatively stable**, except for 2022 after COVID-19 (overly ambitious test makers)
- The last two years has **mostly stabilized**
- Social science scores, in contrast, has larger range and more fluctuation.

Vietnamese education put more effort into **education** and **evaluation** for STEM subjects.



## Under-performing provinces

This is the number of students that failed the exam, grouped by region in 2021.

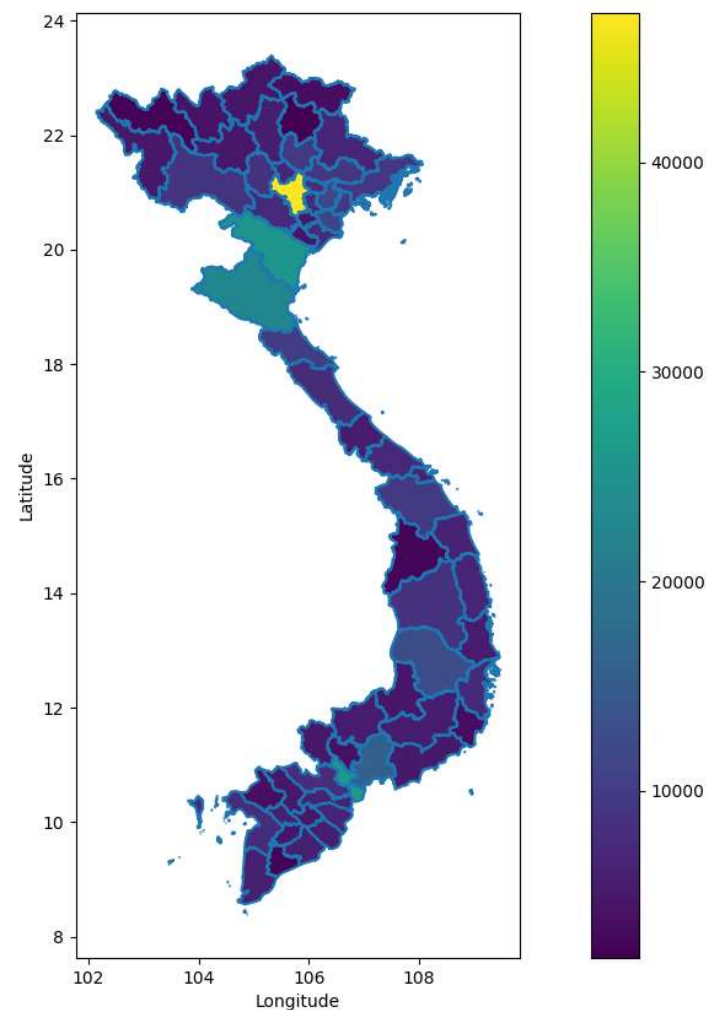
All subsequent years are **almost identical**.

Most regions are similar, but 1 and 2 are the two major metropolitans of Vietnam, Ho Chi Minh City and Hanoi, so the number of drop-outs also scale up.

Provinces with the highest # of failing student:

	Count	Proper_loc_name
0	47136	Hà Nội
1	26582	Hồ Chí Minh
2	25808	Thanh Hóa
3	22678	Nghệ An
4	15696	Đồng Nai
5	12517	Đắk Lắk
6	11385	Hải Dương
7	11291	Thái Bình
8	9971	Hà Tĩnh
9	9728	Hải Phòng

Number of Students who failed the exam in 2021 by Province



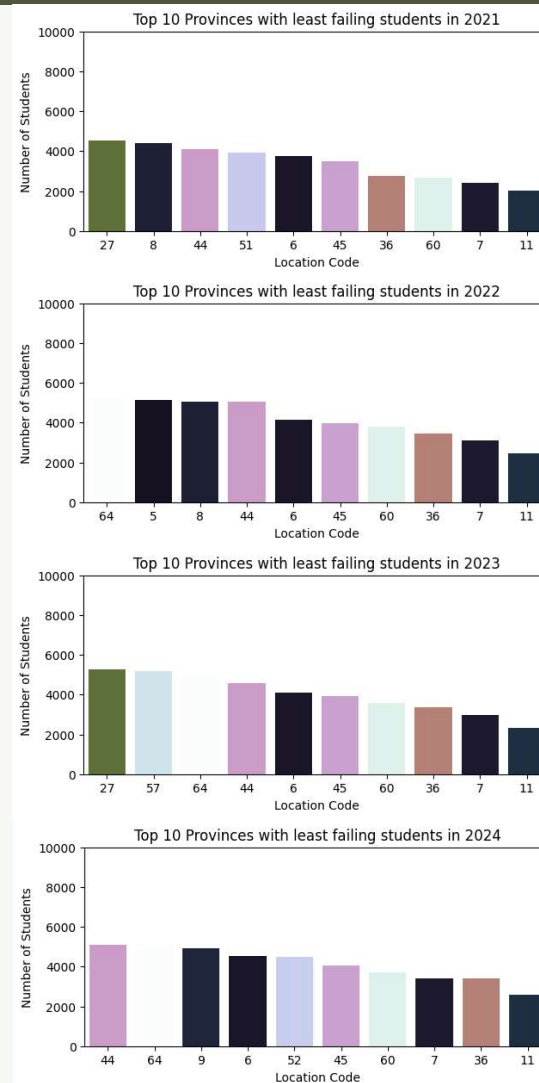
## Provinces with least failing students

Looking at the other end of the spectrum, the provinces **consistently** having the **lowest** number of failing students are:

- 6: Cao Bang
- 7: Lai Chau
- 11: Bac Kan
- 27: Ninh Binh
- 36: Kon Tum
- 44: Binh Duong
- 45: Ninh Thuan
- 60: Bac Lieu
- 64: Hau Giang

Except for 44, 45, 27, most are the poorer regions of Vietnam.

**The ones going through hardships are the hardest working ones. Maybe we can help empower them?**

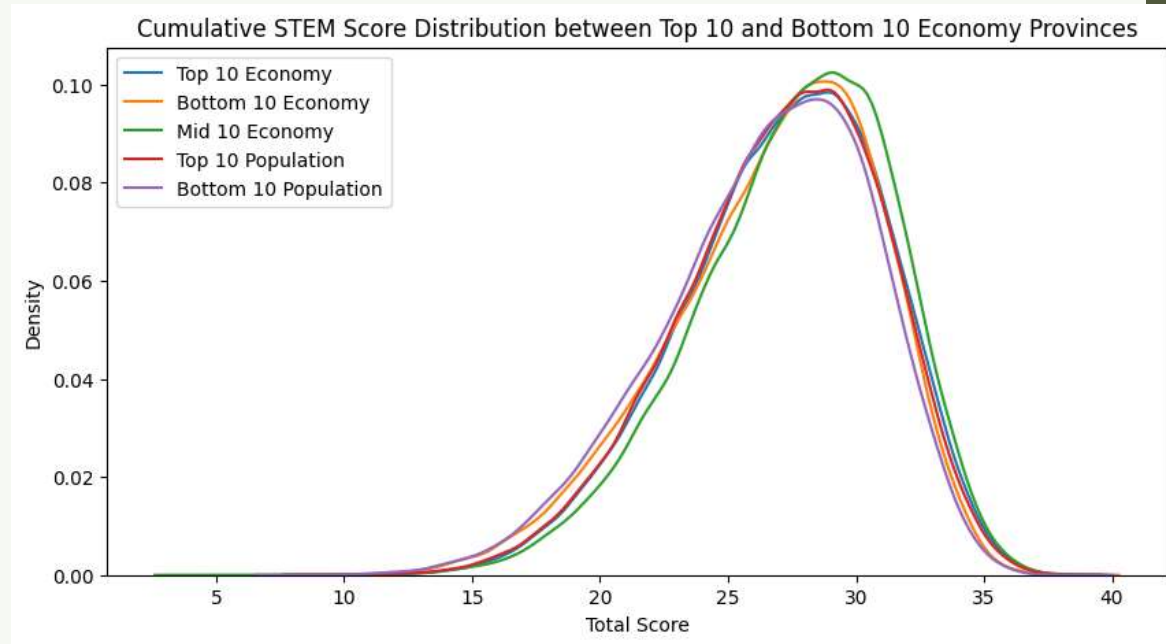


Same color, same province.



## STEM Score Distribution Across Regions

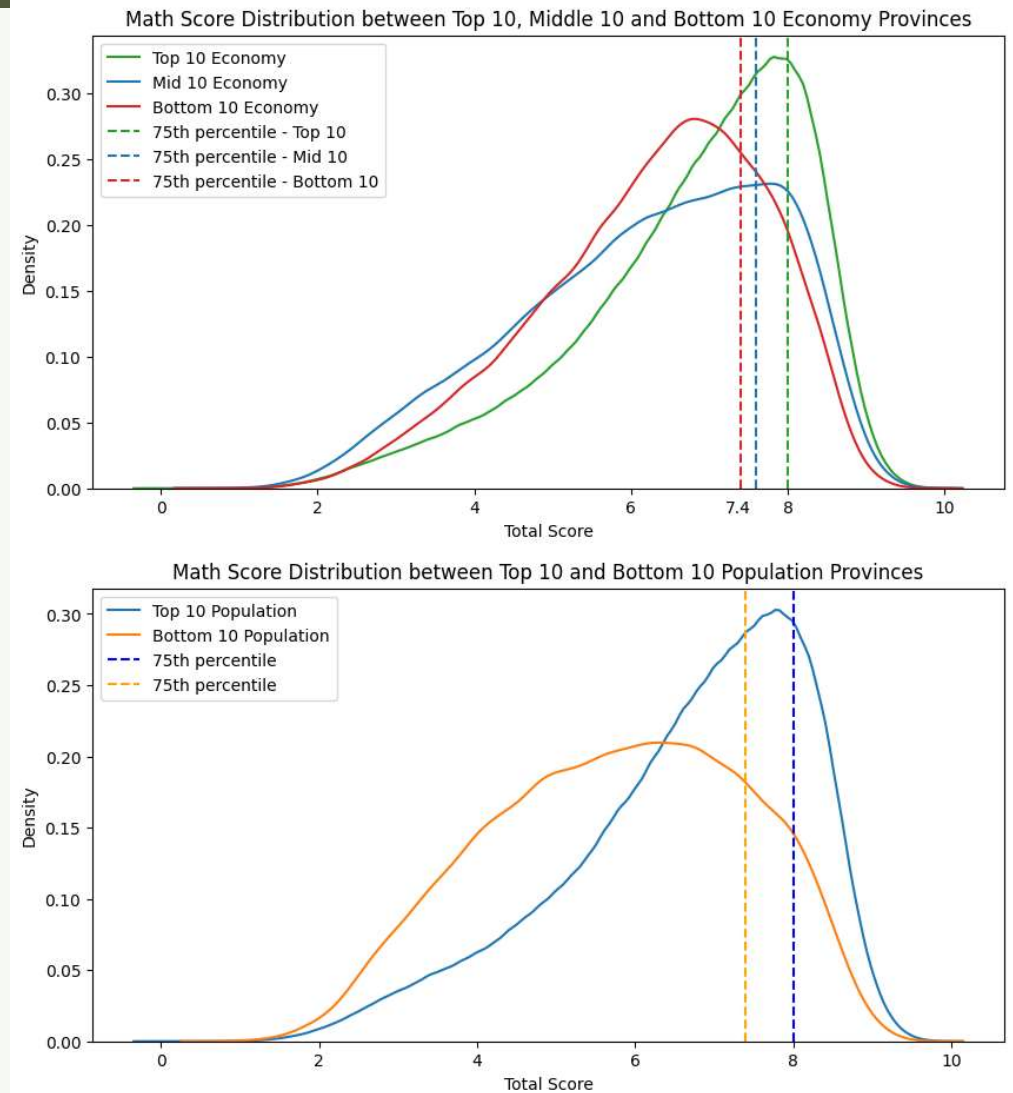
- The cumulative STEM subjects' score between regions, surprisingly, are **similarly distributed**.
- This might be because different regions prioritize different subjects (due to cultural influences), but the accumulated differences **cancel out**.
- However, a different story is told with the Math score.



## STEM Score Distribution Across Regions

- The math scores reflect **in order** the **top, middle and bottom** economically provinces of Vietnam.
- Note that the top has the **sharpest point**, indicating that a **larger portion** of students from **top earning** cities got good scores.
- From a **population** point of view, the 10 largest cities have many more high scorers, and the bottom 10 is more spread out and peaking almost 2 points lower.
- We want to aim to appeal to the **top 75<sup>th</sup> percentile** for our institute, which is around 7.5 – 8 depending on the region.

Scores **vary significantly** between economic and population regions of Vietnam





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# Conclusion

From the perspective of this presentation,  
you are the **admission officer** for the BDS course of SP Jain.

# Conclusion

The Vietnamese graduation test is **fully comprehensive, stable** and provide a **reasonable baseline** to assess a student's performance.

Vietnamese people place heavy emphasis on **STEM education**.

Students are usually **all rounders** for these subjects but **focuses** on ones that gets them into University.

Math score is the **main differentiator** across all regions, with the top 25% getting 7.5 - 8

Vietnamese students' performance **vary wildly** between **economic** and **population** regions, but **cumulative performance** is **similar** throughout Vietnam.

Regions with **lower economies** have **less** people failing the exam. **Major cities**, where education is more accessible, saw **more** failing people.

Scores should be interpreted **in context**.





# Recommendations

Based on the insights,  
here are my recommendations for the  
institute:

- The Vietnamese Graduation Exam results should be available as an **additional metric** for admission. **Collaboration** with Vietnamese **top high school** in major economic hubs can also bring a stream of successful applicant, but **do not overlook** applicants from **other areas**
- When using exam results, the **region** in which the applicant resides is also important for a **holistic evaluation**.
- It is also important to continuously improve **academic standards, curriculum** and **resources** to attract talented individuals.

