

Earnings Outcomes Analysis: Insights from College Scorecard Data (1998-2024)

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Executive Summary

Project Overview

- Analysis of College Scorecard Dataset (1998-2024) examining mean 5 year earnings outcomes across institutions
- Focus on graduate earnings, field of study impacts, and gender distribution patterns
- Data-driven insights to inform educational stakeholders and prospective students

Key Research Areas

- Graduate earnings patterns across institutions
- Field of study correlation with career outcomes
- Gender distribution in high-performing programs
- Public versus private institution performance

Methodology

- Python-based analysis using Pandas and Matplotlib
- Statistical analysis of 25+ years of educational data
- Visualization-driven insights and pattern recognition

Research Questions

Institution Performance

Which institutions produce graduates with highest/lowest mean earnings after 5 years?

How do the top 20 and bottom 20 institutions compare?

Fields of Study Impact

Which fields of study lead to highest/lowest earnings?

What patterns emerge between popular fields and earnings?

Gender Distribution

How does gender representation vary between high and low-earning institutions?

What gender patterns exist across different fields of study?

Public/Private

How do graduate earnings compare between public and private institutions?

Data Overview

Key Dataset Statistics:

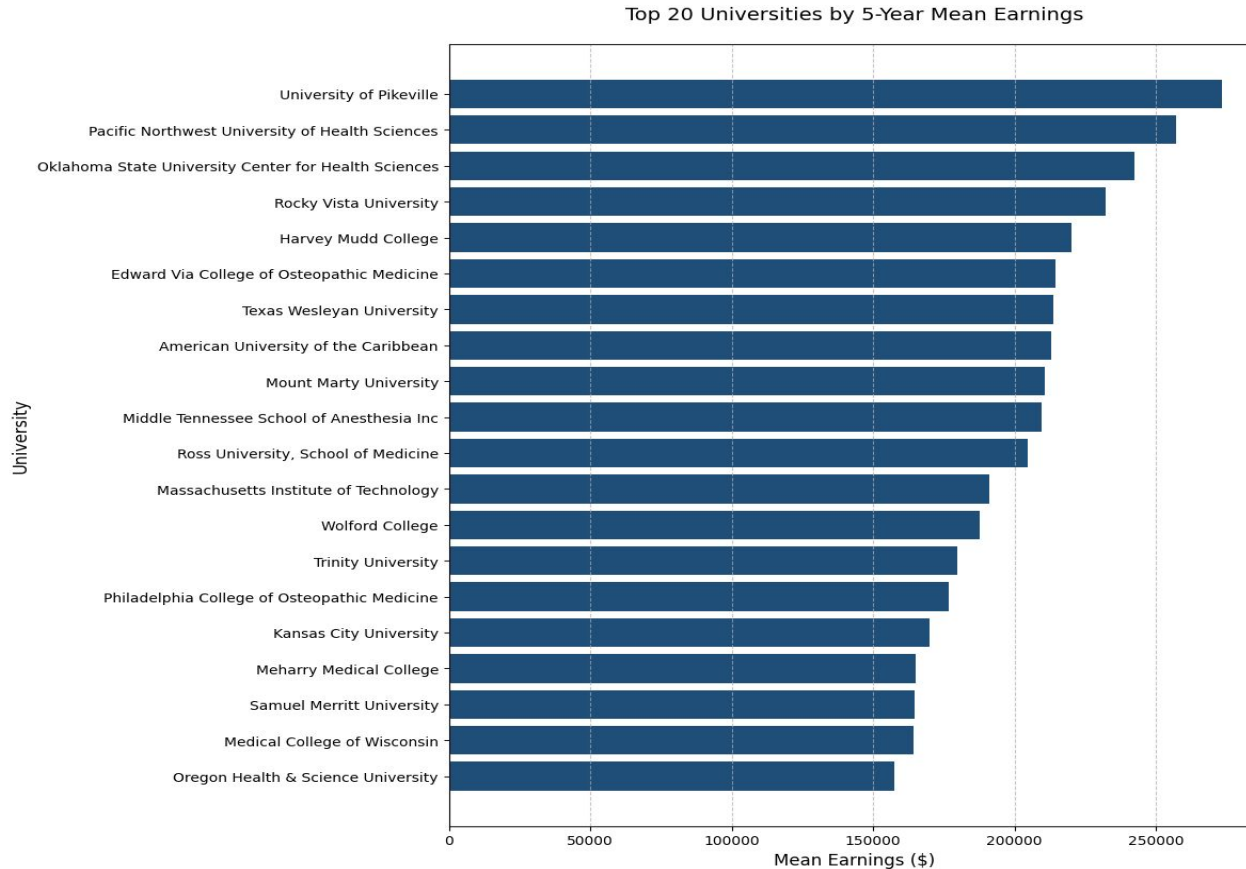
- Years covered: 1998-2024
- Number of institutions: 6,000+
- Number of fields of study 194,000 +

<https://collegescorecard.ed.gov/data/>

Methodology

- Data cleanup:
 - Renamed columns and filtered to extract the relevant columns for our analysis
 - Filtered out cells with “PS” values
- Preparation for analysis:
 - Created pivot tables to establish mean 5 year earnings and gender data, and converted to data frames for visualizations
 - Used value_counts to display popularity of fields of study
- Visualizations
 - Used matplotlib to create charts and graphs

What are the Top 20 Institutions by 5 Year (Mean) Earnings?

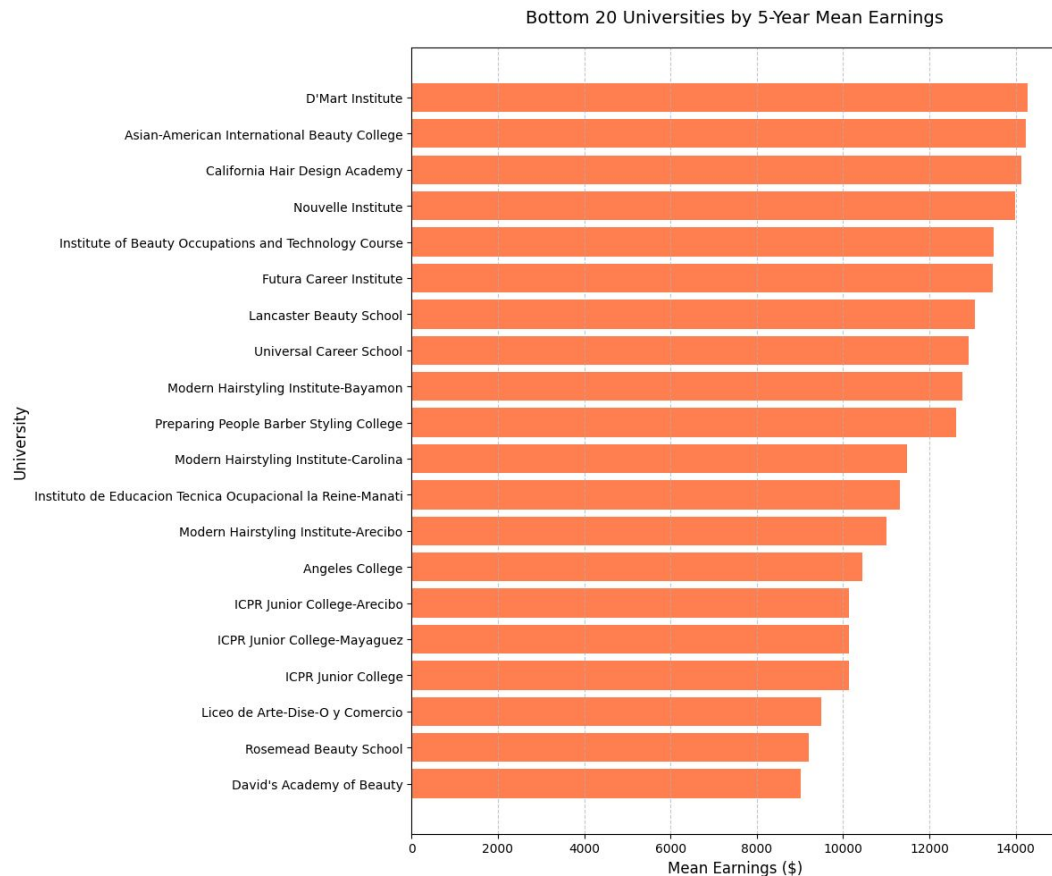


Primary Focus: Schools with strong Health Sciences and Medical Education programs

Goal: Training healthcare professionals in various medical fields (e.g., medicine, dentistry, nursing) and advancing medical research through STEM disciplines.

Mean earnings >\$150K 5 years from graduation (adjusted)

What are the Bottom 20 Universities by (Mean) Earnings?

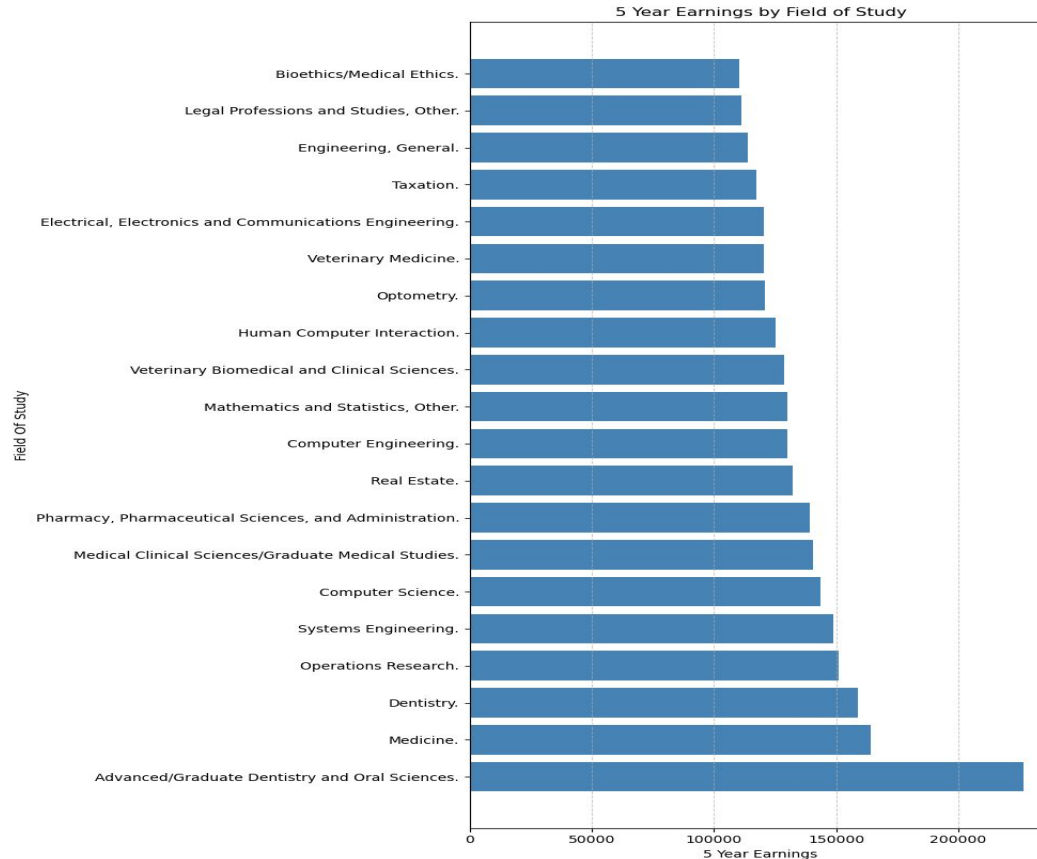


Primary Focus: Vocational training in cosmetology, barbering, and beauty.

Goal: Equipping students with practical skills for the beauty industry, often reflecting regional and cultural influences.

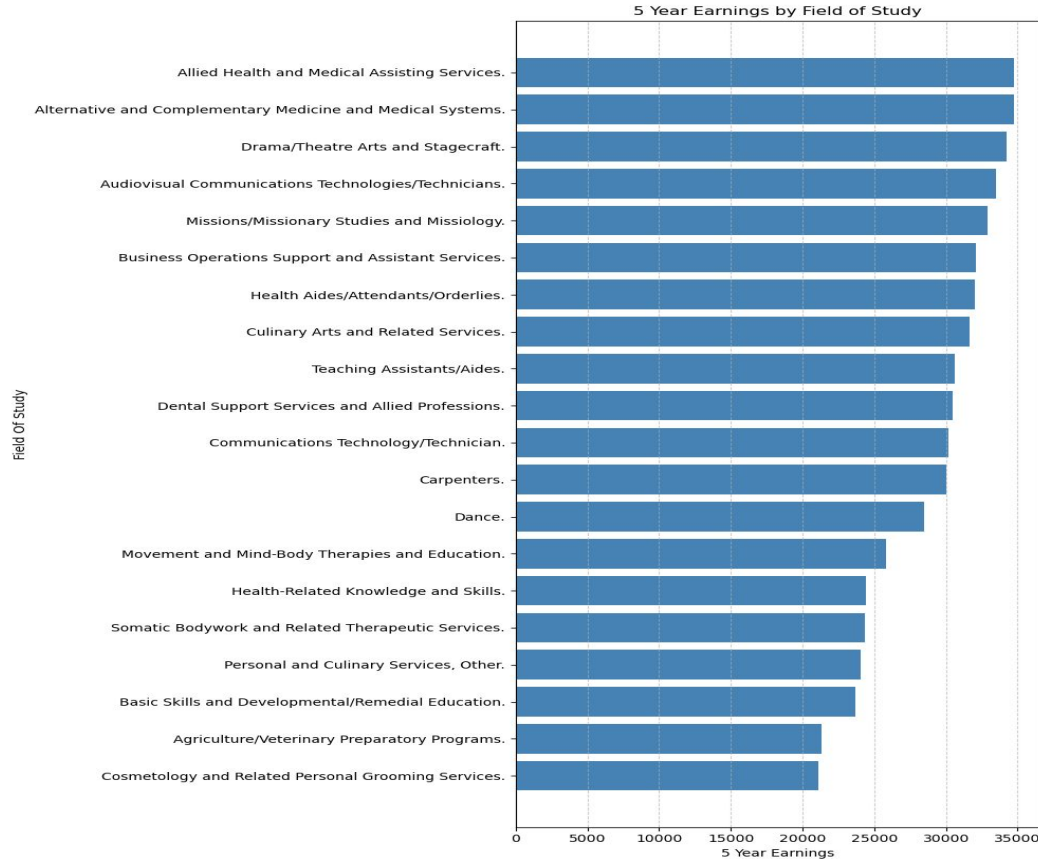
Mean earnings <\$15K
5 years from graduation
(adjusted)

Which Fields of Study have the Top (Mean) Earnings?



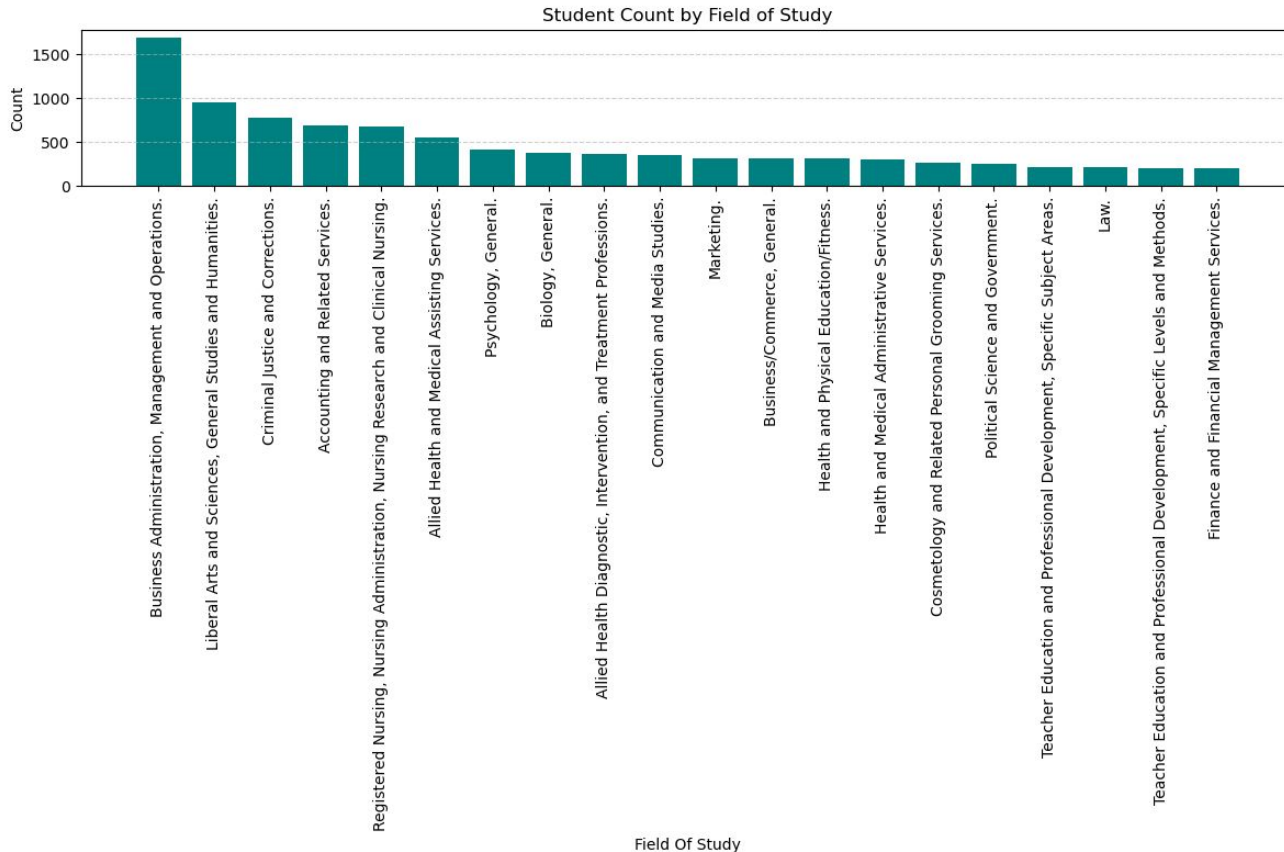
- **Advanced Dentistry/Oral Sciences** graduates earn the most of any field of study
- **High Earnings Fields of Study** analysis suggests that advanced degrees combined with specialized professional expertise can lead to better career outcomes

Which Fields of Study of the Lowest (Mean) Earnings?



- **Cosmetology and Related Grooming** graduates earn the least of any field of study
- **Lowest Earning Fields** involve hands-on, vocational training or associate degrees in areas like cosmetology, culinary arts, and healthcare support

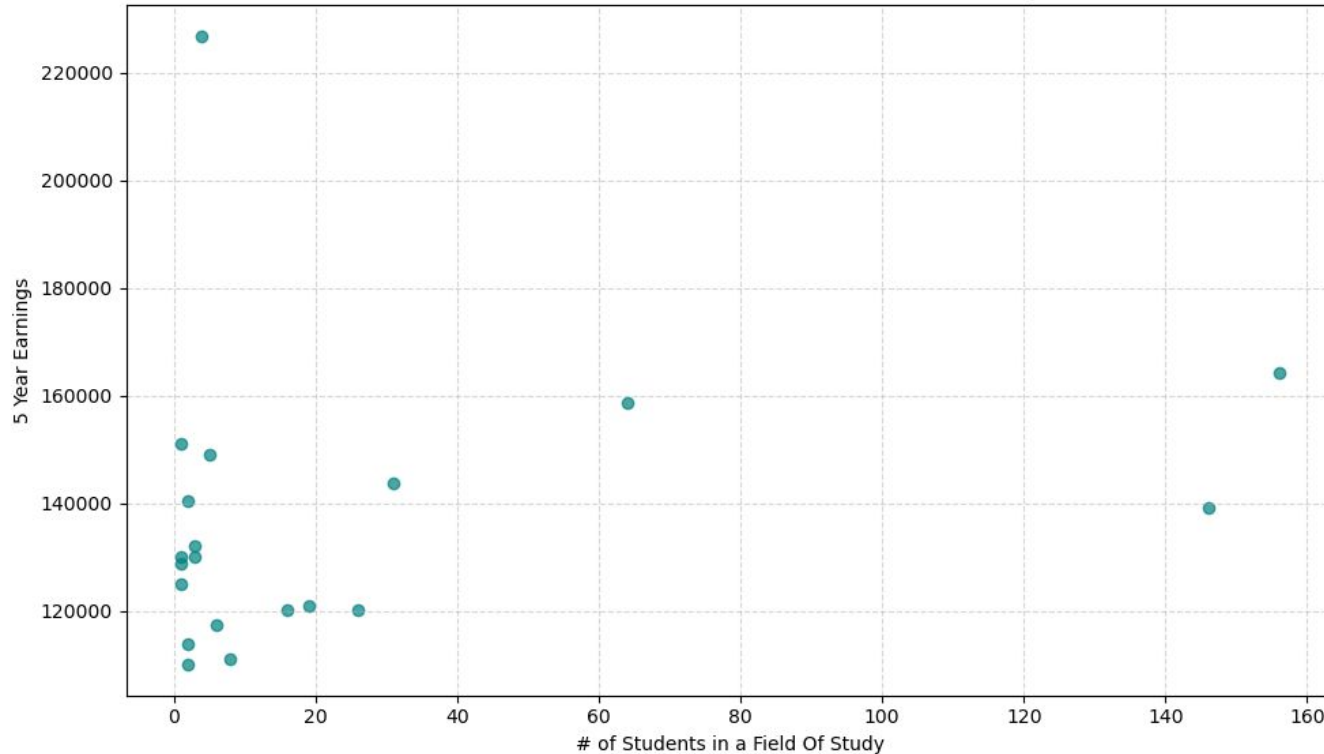
What are the Most Popular Fields of Study in the Dataset?



- **Most Popular Fields of study (by count)** include social sciences and humanities; practical vocations such as criminal justice, accounting, and healthcare clinicians are also popular
- **Least popular fields** included a large list with N=1 (therefore excluded)

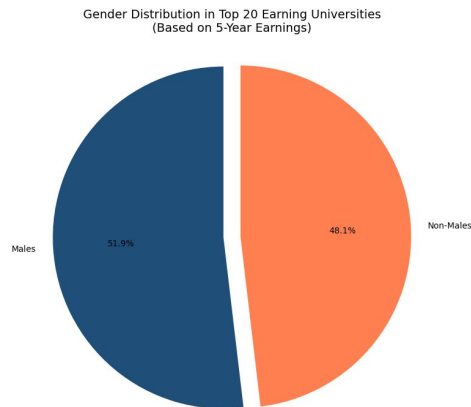
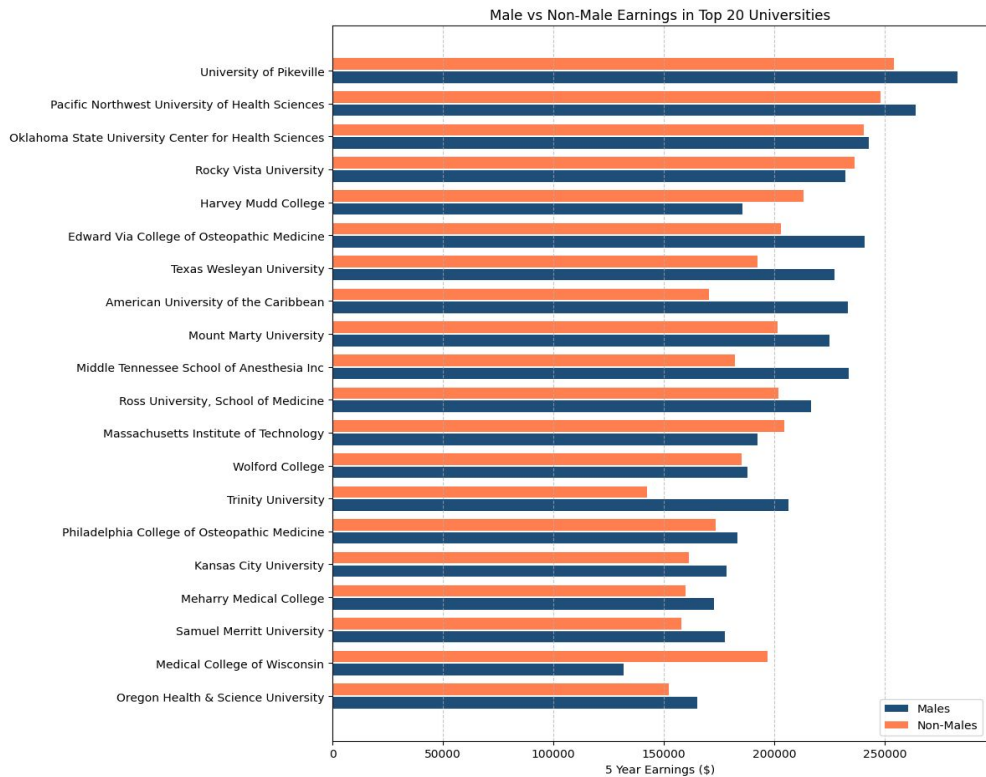
What is the Popularity of Highest Earning Fields of Study?

Correlation between Student Count and 5 Year Earnings



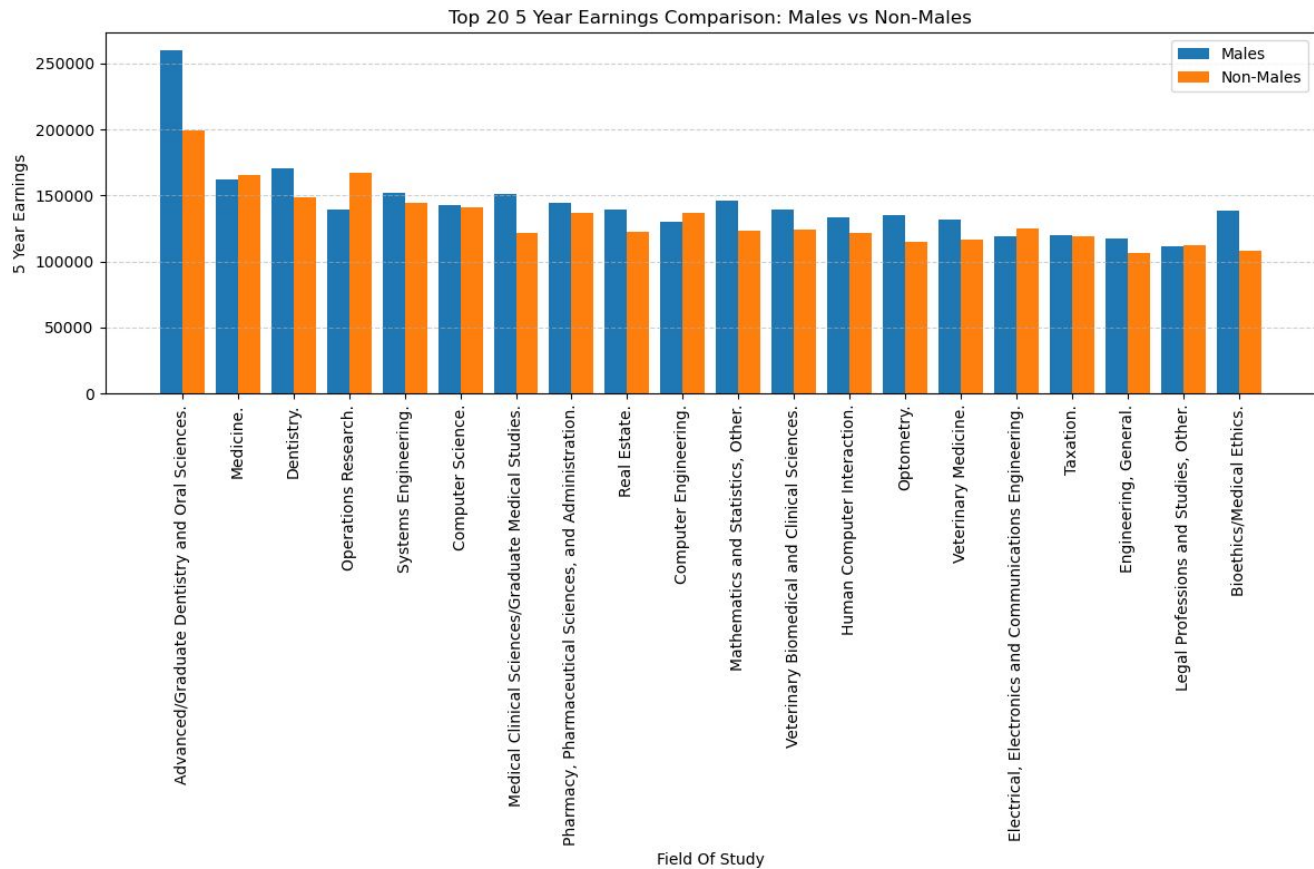
- **Highest Earning Fields** in the dataset have relatively low numbers of student graduates (<30) with 3 notable exceptions - Medicine (156), Pharmacy (146) and Dentistry(64)

What is the Gender Distribution of Earnings at Top 20 Institutions?



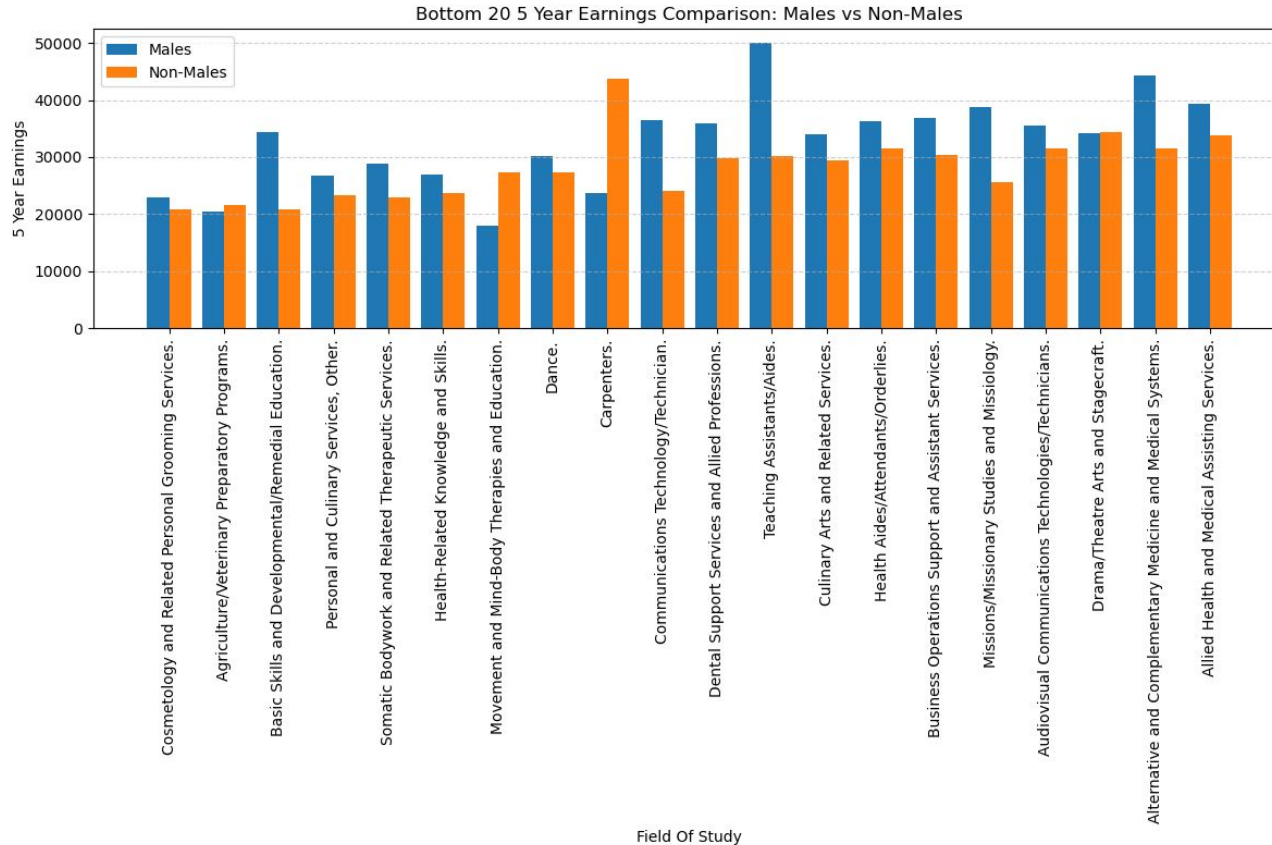
- Despite nearly 50/50 gender distribution, there is a significant earnings gap between male and female graduates
- The gap is pronounced in some, such as the U of Pikeville, where the difference exceeds \$100K

What is the Earnings Difference by Gender in Top Earning Fields of Study?



- **A Significant Gender Gap Persists in the top earnings Fields...** only 3 of the top earnings fields (Medicine, Operations Research and Computer Science) have closed the gender gap.

What is the Earnings Difference by Gender in Lowest Earning Fields of Study?



- Male graduates earn more than Female graduates in the Bottom earning fields - with 3 exceptions: Mind Body Therapies, Carpentry, and Drama

How do financial outcomes compare between public and private institutions?

Funding Status	count
Public	9072
Private, nonprofit	3819
Private, for-profit	3290
Foreign	11

Funding Status	Mean 5 Year Earnings
Foreign	138419.0
Private, for-profit	47416.0
Private, nonprofit	78586.0
Public	65207.0

In the College Scorecard Dataset:

- **Public universities** have the highest number of students, but they have the lowest mean 5-year earnings compared to private and foreign institutions.
- **Foreign institutions** have the highest mean 5-year earnings, but they have the lowest number of students.
- **Private, non-profit institutions** have a moderate number of students and a moderate mean 5-year earnings.
- **Private, for-profit institutions** have a significant number of students, but their mean 5-year earnings are lower than private, non-profit institutions and foreign institutions.

Summary of Findings

1. Gender Pay Gap:

- A significant gender pay gap persists across various fields of study and institutions.
- Male graduates consistently earn more than female graduates, even in high-earning fields.

2. Field of Study:

- STEM fields, particularly advanced degrees in medicine, dentistry, and engineering, offer higher earning potential
- Fields in the humanities and social sciences, while popular, often have lower earning potential.
- Given the increasing demand for healthcare professionals, students may want to consider careers in dentistry, pharmacy, medicine, nursing, and other health-related fields.

3. Institutional Differences:

- Public universities enroll the most students but have lower average earnings compared to private and foreign institutions.
- Foreign institutions have the highest average earnings but the lowest student enrollment.

Opportunities for Future Analysis

1. Longitudinal Analysis

- Track changes in earnings patterns over the dataset's time span
- Analyze the impact of economic events on graduate outcomes

2. Geographic Analysis

- Regional variations in earnings and gender distribution
- State-by-state comparison of public vs. private institutions

3. Additional Factors

- Student debt correlation with field of study and earnings
- Impact of institutional resources on graduate outcomes

4. Methodology Extensions

- Implementation of machine learning models for outcome prediction
- Development of interactive dashboards for data exploration