

# **Project Proposal for YZV211 Introduction to Data Science and Engineering**

## **Project Team**

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## **Project Title**

Analyzing the Impact of Educational Expenditures on Academic Success in Higher Education

## **Summary**

This project aims to investigate the relationship between financial investments in Higher Education Institutions (HEIs) and their academic success. Specifically, we will analyze how expenditures for HEIs and expenditures per student correlate with academic outputs such as the number of articles published in international journals and world university rankings. At the same time, the inflation effect will be investigated.

## **Problem Definition**

Higher education is a critical driver of personal development and societal progress. Understanding the influence of financial resources on academic outcomes can guide policy decisions and institutional strategies. This project seeks to identify patterns and correlations between financial inputs and academic achievements in HEIs.

## **Dataset Sources**

For the project "Analyzing the Impact of Educational Expenditures on Academic Success in Higher Education," we will utilize three primary data sources to analyze the relationship between financial investments in higher education and academic success. Below is a detailed explanation of each dataset:

### **1. Turkish Statistical Institute - Education Expenditure and Inflation Statistics 2019-2022:**

Turkish Statistical Institute (<https://data.tuik.gov.tr>) for data on expenditures in higher education institutions in Turkey. This dataset provides comprehensive statistics on the

expenditures made in the education sector in Turkey for the years 2019-2022 and inflation statistics for the same period.

**A. Education Expenditure Statistics** (<https://data.tuik.gov.tr>):

- **Content:** Comprehensive statistics on the expenditures made in the education sector in Turkey. It includes both public and private spending across various levels of education, with a focus on higher education.
- **Key Variables:**
  - Total expenditure in the higher education sector.
  - Breakdown of expenditures (operational, capital, research, etc.).
- **Use in Project:**
  - To understand the overall financial landscape of higher education in Turkey.
  - To analyze per-student spending and institutional expenditures.

**B. Inflation Statistics** (<https://data.tuik.gov.tr>):

- **Content:** Annual and monthly inflation rates in Turkey, providing insights into the general economic environment during the study period.
- **Key Variables:**
  - Annual Inflation Rates: Year-over-year percentage change in the consumer price index (CPI) or a similar measure of inflation.
  - Monthly Inflation Data (if applicable): To analyze more granular trends or seasonal effects.
- **Use in Project:**
  - To adjust education expenditure data for inflation, allowing for more accurate comparisons over time.
  - To examine the impact of economic factors, such as inflation, on education funding and policy decisions.
  - To analyze the relationship between inflation and educational expenditures in the context of higher education's financial stability and planning.

## **2. Council of Higher Education (YÖK) - University Monitoring and Evaluation Reports**

These are detailed reports for each university in Turkey, providing specific data on their performance, including academic, administrative, and financial aspects.

- **URL:** [University Monitoring and Evaluation Reports](#)

- **Key Variables:**

- Individual university expenditures and budget allocations.
- Detailed academic performance indicators per university.
- Rankings and accreditation information where available.

- **Use in Project:**

By examining individual university reports, we can conduct a more granular analysis and potentially identify unique patterns or case studies within specific institutions.

## **3. Council of Higher Education (YÖK) – 2019-2022 University Monitoring and Evaluation General Report**

This report by the Turkish Council of Higher Education provides an in-depth analysis of the performance and status of universities in Turkey. It covers a wide range of topics including academic outputs, faculty statistics, and student performance.

- **URL:** [2022 University Monitoring and Evaluation General Report](#)

- **Key Variables:**

- Number of academic publications and citations.
- Faculty-to-student ratios.
- Various performance indicators for universities.

- **Use in Project:**

This report will be instrumental in quantifying academic outputs, allowing us to correlate these metrics with financial expenditures.

### **Data Integration and Analysis:**

- **Integration Challenges:** The main challenge lies in harmonizing data from these diverse sources, each with its own format and level of detail. We will need to standardize data formats for effective comparison and analysis.
- **Analysis Approach:** We will employ statistical methods like correlation analysis, regression models, and possibly machine learning techniques to uncover patterns and insights. Time-series analysis might also be applied to track trends over the years.

This comprehensive dataset combination will provide a robust foundation for analyzing the impact of financial investments on the academic success of higher education institutions in Turkey.

### **Possible Research Questions**

There are a few research questions that could be addressed by this study using the available datasets. Some examples of potential research questions include:

1. Is there a significant correlation between the total expenditure of a higher education institution and its academic output?
2. How does expenditure per student affect the quality and quantity of academic publications?
3. Are there noticeable trends or anomalies in the relationship between financial investment and university rankings on a global scale?

This project aims to provide valuable insights into the financial dynamics of higher education and their impact on academic performance. Through rigorous data analysis and ethical consideration, we aspire to contribute to the broader understanding of education economics and policy-making.