



Student Success Analysis

Adam Meadows, Jennifer Robert, Kyra Hull



Student Success Analysis - Topic Selection

- Factors that contribute the greatest student success in K-12 education
- Reasons:
 - More education choices than ever before
 - Would different factor combinations yield greater academic success than others



Student Success Analysis - Data

- National Center for Education Statistics
 - Responsible for the collection, analysis and reporting of data pertaining to education within the U.S.
 - 2019 National Household Education Surveys Program
 - Parent and Family Involvement in Education (PFI) survey
- Questions we hope to answer
 - What combination of factors yield the greatest student success?
 - How do those factors differ with different education paths?



Student Success Analysis - Data Exploration Phase

- Narrowed down original csv containing categorical data to potential columns
- Removed missing or incomplete data
- Binned categories
 - 80+ different ages combined into 5 ranges
 - Homework hours combined into 4 ranges
 - Total HH income reduced to 4 ranges
- Clean dataframe written to Postgres



Student Success Analysis - Analysis Phase

- Data split 75/25
- Tried Random Forest Classifier and Extremely Random Forest
- AdaBoost Classifier
- Noise elimination

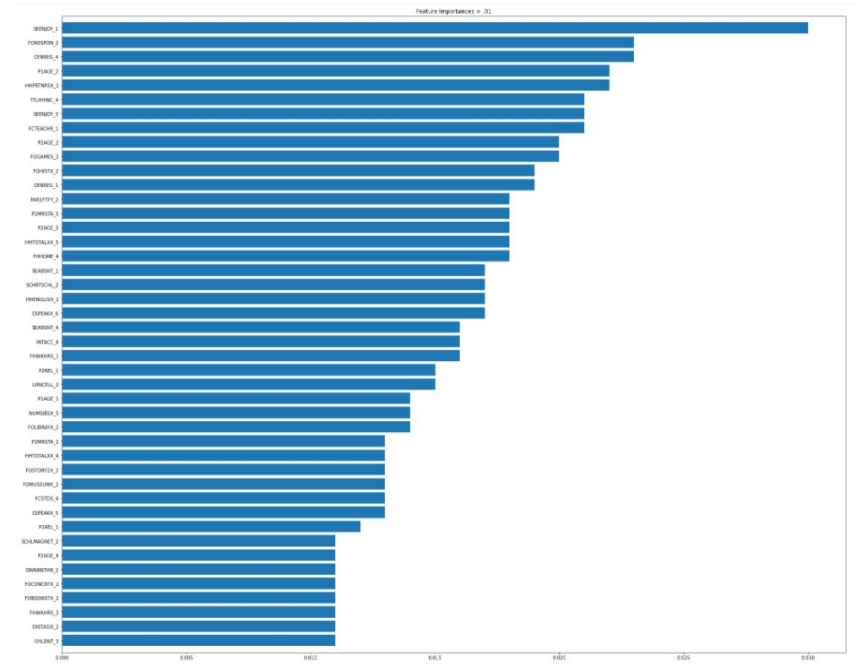
	precision	recall	f1-score	support
fail	0.66	0.47	0.55	804
pass	0.72	0.85	0.78	1285
accuracy			0.70	2089
macro avg	0.69	0.66	0.66	2089
weighted avg	0.69	0.70	0.69	2089

Training Score: 0.6893358876117497

Testing Score: 0.7012924844423168

Student Success Analysis - Analysis Phase

- Reviewed Feature Importances
- Reviewed findings
- Stored Features with an importance value greater than .01
- Determine features for dashboard



Student Success Analysis - Dashboard

- [Front end](#)
- Backend authentication for resource management

Student Success Survey

Submit Resource to Database

Enter URL

Enter Group

Enter a Brief Description

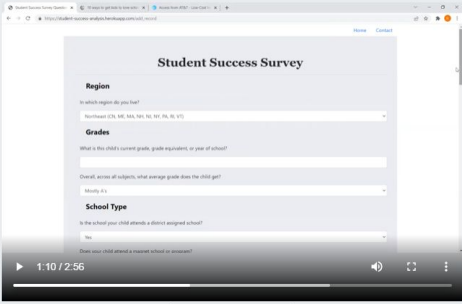
[Submit Answers](#)

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Student Success Survey

Due to recent events, student success has never been more in the spotlight than now. With remote learning, class size restrictions and even economic burdens, parents and students alike need to find new ways to succeed.

The purpose of this page is to help parents to find resources that may help enhance their child's success. This is done through analyzing the answers to 20 submitted questions. These questions are derived from the [National Household Education Surveys Program](#). Each of these questions, through the use of machine learning, have been proven to significantly impact student success. Below is a brief video demonstration:



1:10 / 2:56

[Submit Answers](#)



Student Success Analysis - Dashboard

Capturing responses and storing in the database

Student Success Survey

Region

In which region do you live?

Northeast (CN, ME, MA, NH, NJ, NY, PA, RI, VT) ▾

Grades

What is this child's current grade, grade equivalent, or year of school?

Overall, across all subjects, what average grade does the child get?

Mostly A's ▾

School Type

Is the school your child attends a district assigned school?

Yes ▾

Does your child attend a magnet school or program?

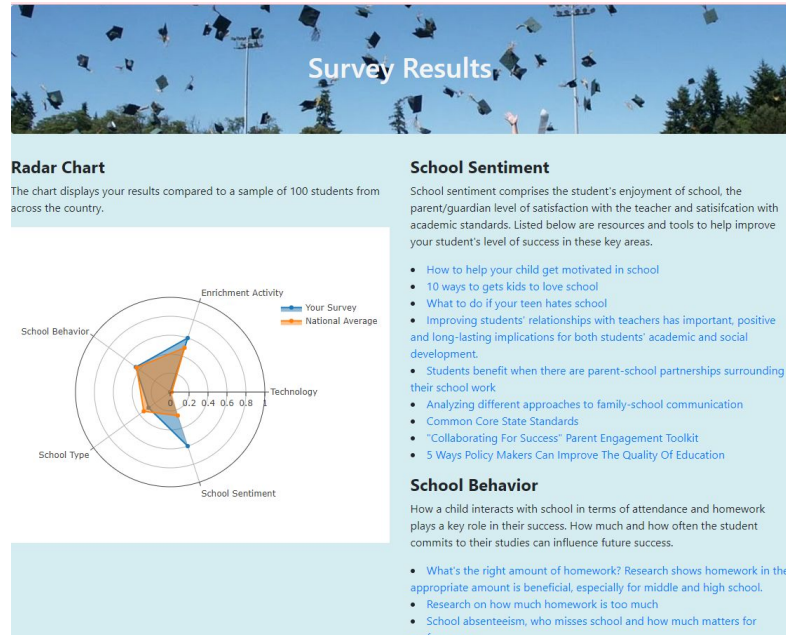
Yes ▾

Does your child attend a charter school?

Yes ▾

Student Success Analysis - Dashboard

- Radar chart
- Dynamic Resource links





Student Success Analysis - Technologies

- Technologies, languages, tools and algorithms used throughout the project
 - Excel
 - Jupyter Notebook
 - Python
 - Matplotlib
 - AdaBoost Classifier
 - Heroku
 - Postgres
 - Bootstrap
 - Flask
 - SQLAlchemy
 - HTML
 - Plotly
 - Java
 - WT Forms