Predicting Online Student Success

By Josh Johnson

Online Learning

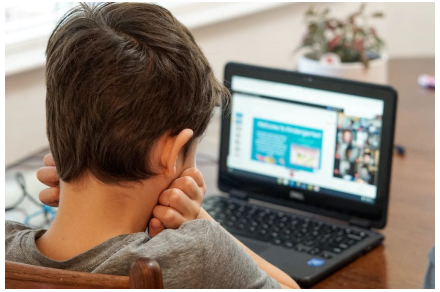


Photo by Thomas Park www.unsplash.com

University Students Online

- In 2018:
  35.3% of students took enrolled in an online course
  16.6% took all courses online[1]

- After Covid-19: ????

The Problem: Retention

- Online university courses have a *10-20% higher dropout*
- Other online courses have a *drop out rate between 40% and 80%*[2]

1. https://nces.ed.gov/fastfacts/display.asp?id=80
2. https://journals.sagepub.com/doi/pdf/10.1177/2158244015621777#:~:text=Online%20courses%20have%20a%2010,Smith%2C%202010).

Can Predictive Modeling Improve Student Success And Prevent Course Withdrawals?

Photo by Frank Romero www.unsplash.com

Only if we know who needs help!

The Solution

Identify students in danger of failing

- Flag students halfway through the course
- In time for interventions to be successful

The Data

Online University: Years 2012/2013 - 2013/2014

- 24743 registrations
- 22424 unique students
- 7 course modules
- 22 cohorts

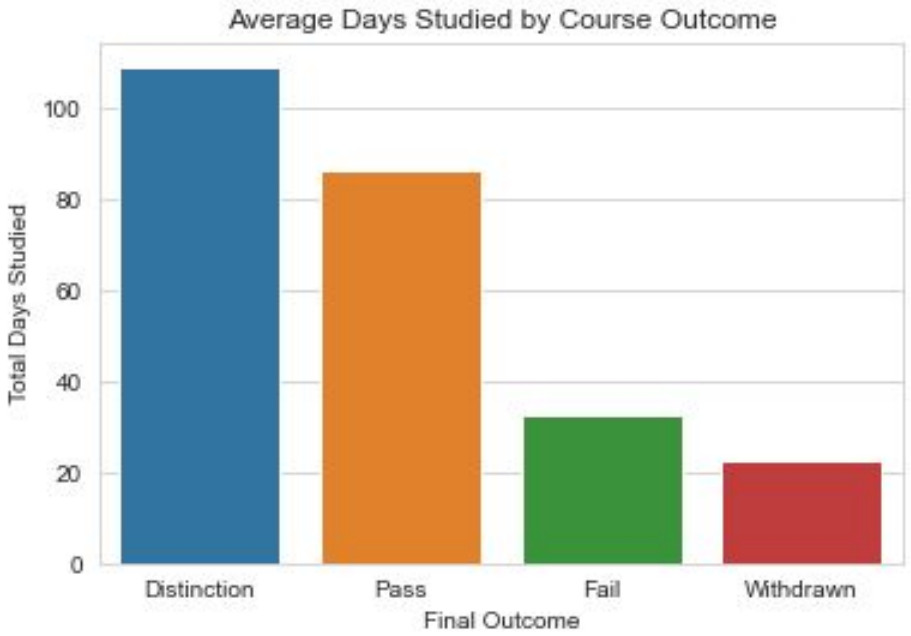
10,655,280 Student VLE interactions

Features to Model

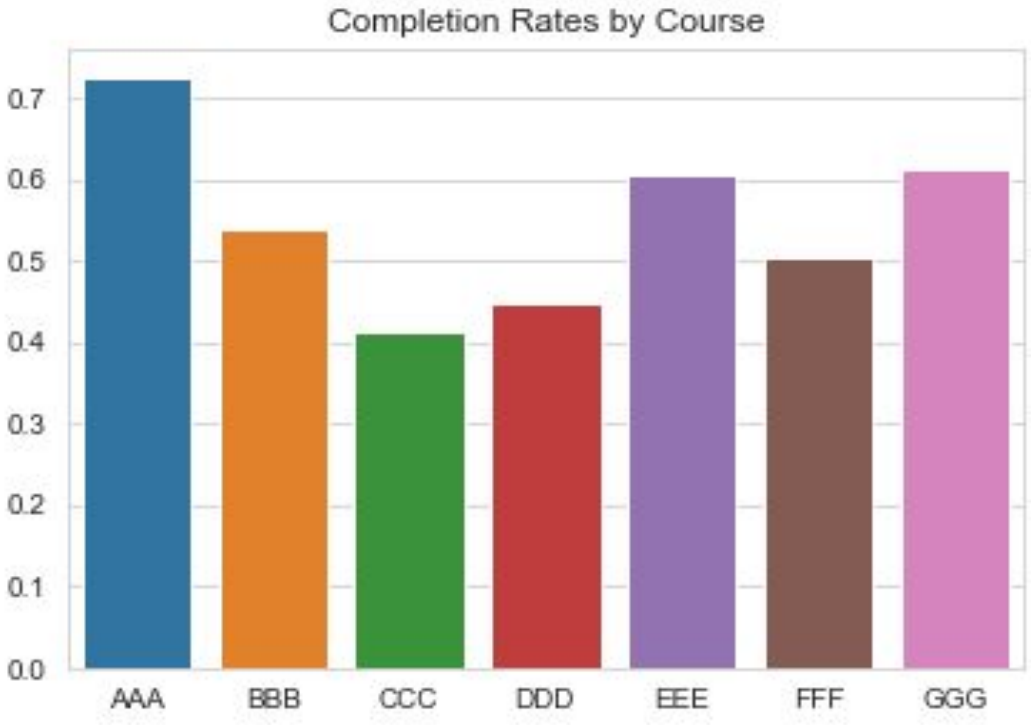
Image by Steinar Engeland, courtesy of Unsplash.com

1. Average assessment scores
2. Number of assessments completed
3. Number of days studied
4. Number of activities engaged
5. Total number of clicks
6. Times repeated the course

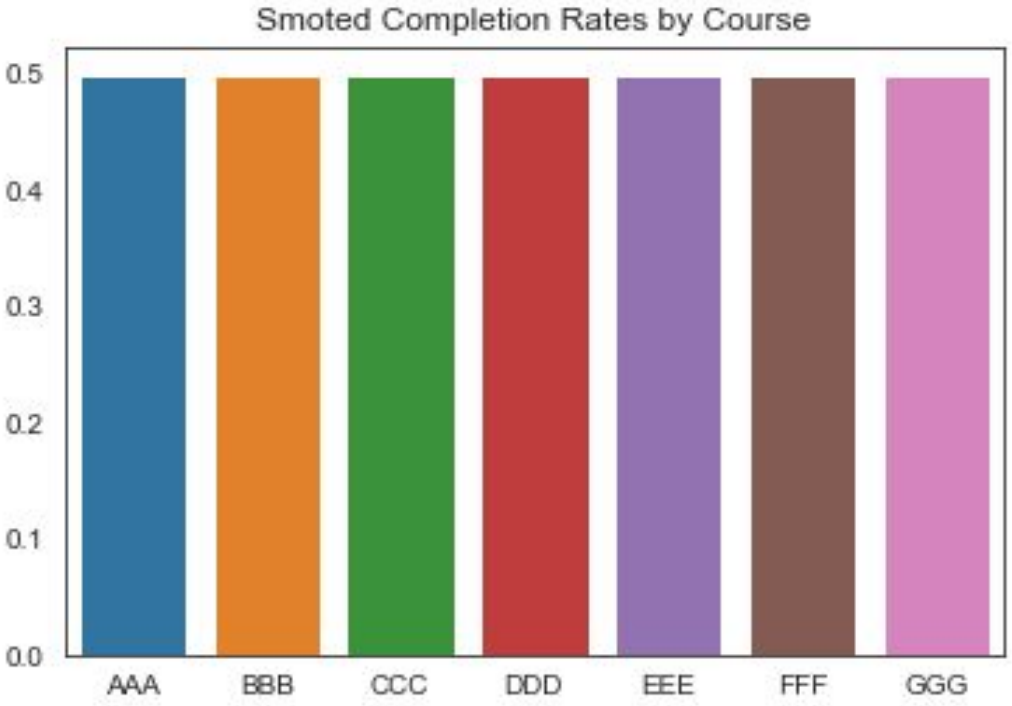
More Days Studying Correlates to Success



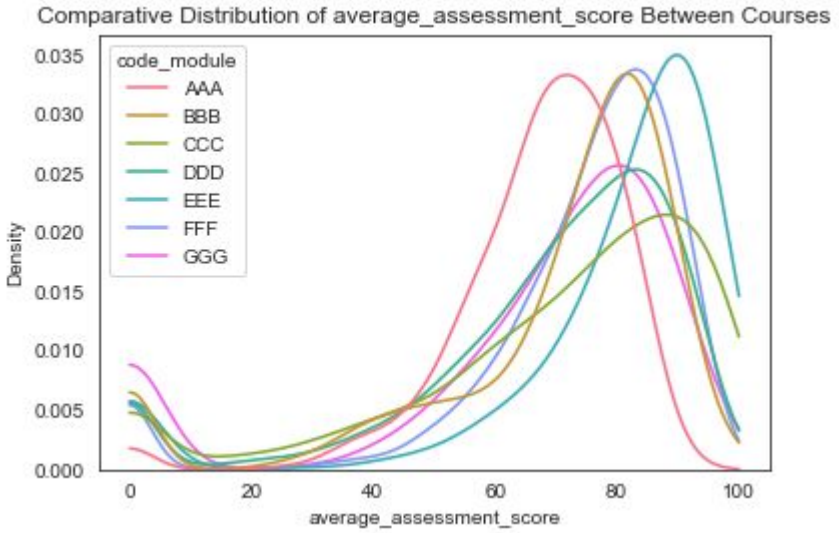
Some Courses are Harder Than Others.



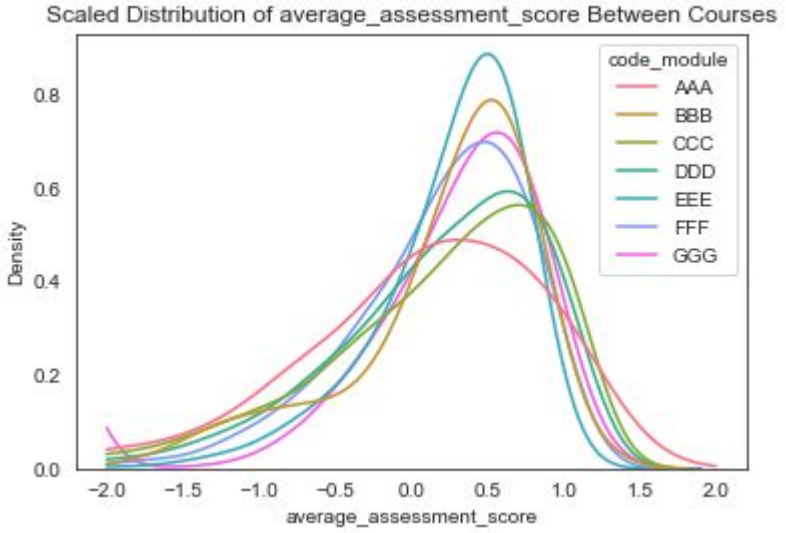
...But My Model Shouldn't Know That.



Distribution of Assessment Scores by Course



Before Normalizing

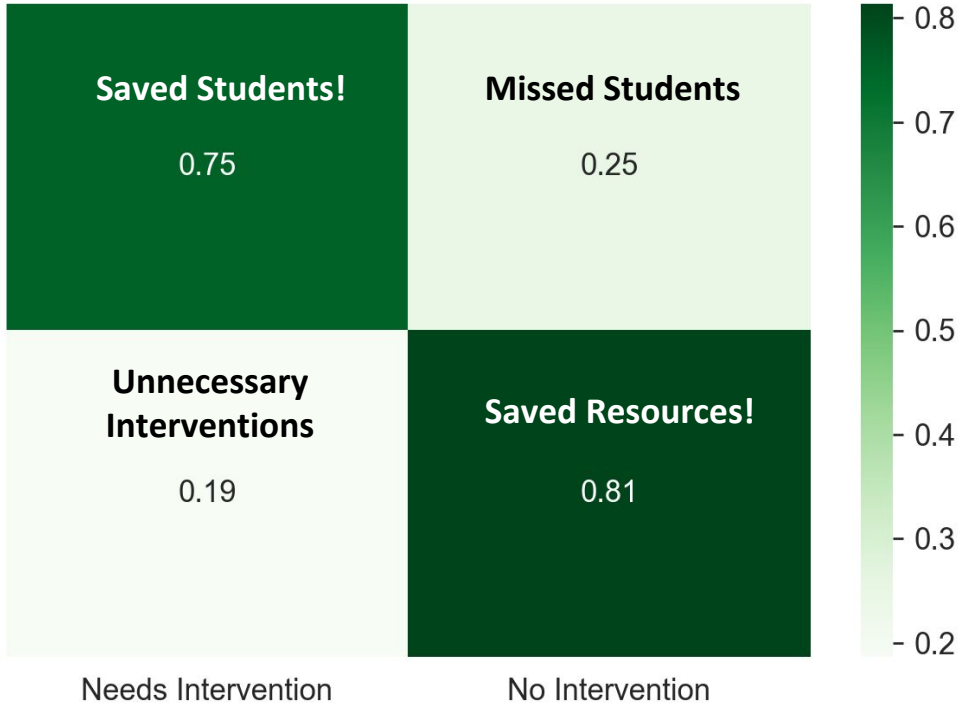


After Normalizing

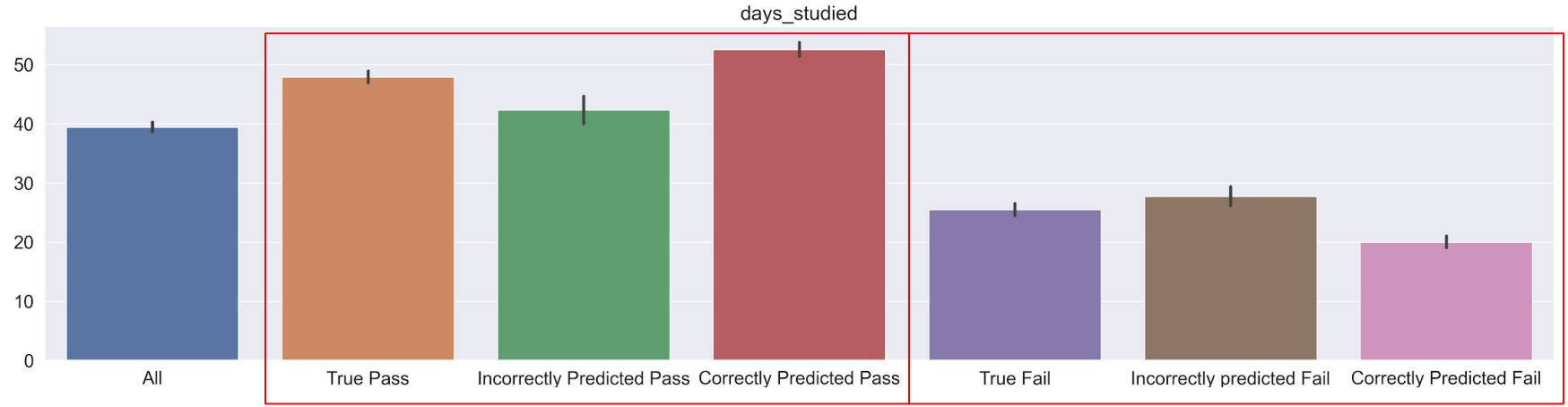
XGBoost Accuracy After the First Half of Courses: 79%

Needs Intervention:
75% Accuracy

No Intervention Needed:
81% Accuracy



Error Analysis:
Average Days Studied



Next Steps

- Try engineering new features, or using time-series analysis on student activity interactions.
- Evaluate model results to find insights to help more students succeed
    - For instance, will doing fewer activities but over more days still help you succeed compared to doing more on fewer days?
- Apply model to new datasets.
- Deploy model in a live learning environment.

Contact

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