An Exploration into the Factors of Student Success

PURDUE UNIVERSITY | The Data Mine

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Background Information

- The aim of student life is to maximize the potential student success at Purdue
- Given the student data our question became "How can we extract value from this data set such that we improve student success at Purdue?"
- Student success is operationalized to term GPA, there is a positive correlation between GPA and student success
- Our Goal: Creating a linear regression model which reveals the factors behind student success
- Data received from 2021 University Sensus, SAO Survey, PMO Survey, et al.

Research Methodology

- Data was divided students and identifying information and survey data from Purdue students
- Data was added to one central dataset to promote clarity and efficiency
- Data was analyzed through R and ran linear regression models as well as machine learning
- Tested all variables against GPA to determine significance

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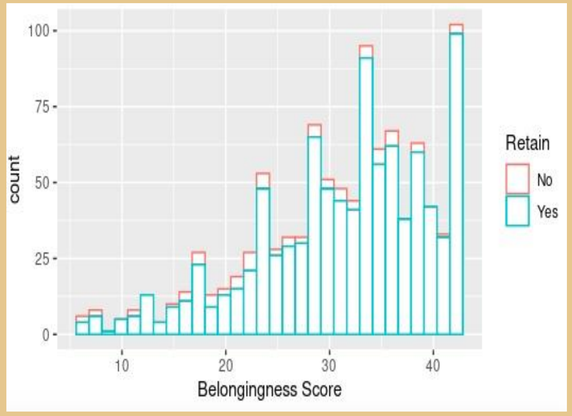
Team 1: Purdue Guide App

If students were given access to an app that had an easy to navigate interface with up-to-date information on clubs and events happening around campus, then student participation would be higher. This will ultimately lead to students feeling a higher sense of belonginess, which will increase retention rate and overall GPA.

Explanation

- According to a study by Cloud State University, a student's GPA and retention increased as the level of belonginess increased
- This was echoed within our dataset
- GPA:
  - PMO: p-value 0.02639
  - Learning Community: p-value 1.28e-09
  - Band: p-value: <2.2e-16
- Retention:
  - Learning Community: p-value <2.2e-16
  - Band: p-value: 1.217e-06
  - Belongingness Score: p-value: 1.266e-07



Conclusion

We should invest more resources into improving student experiences because it improves a student's belongingness, as well as their GPA and retention rate.

Future Work

- Renovate the existing Purdue Guide app or create an entirely new one.
- Create a new way for clubs and organizations to submit their events so they can be listed on said app.
- Turn this into a potential Corporate Partners group.

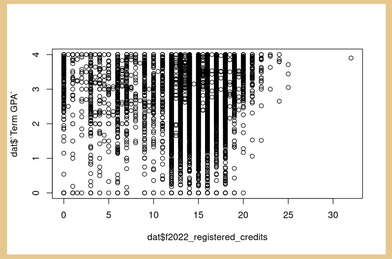
Source: Davis, Glenn M, et al. "Students' Sense of Belonging: The Development of a Predictive Retention Model." *View of Students' Sense of Belonging: The Development of a Predictive Retention Model*, https://scholarworks.iu.edu/journals/index.php/josotl/article/view/26787/32303.

Team 2: How do credit hours affect GPA?

Problem Statement: There is no clear relationship between credit hours and GPA.

How did we come to this conclusion?

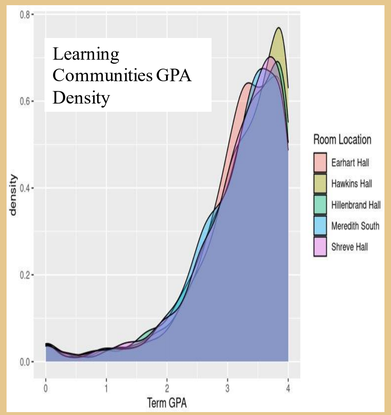
Our linear model:
- R-squared: 0.3042
- P-value: < 2.2e-16

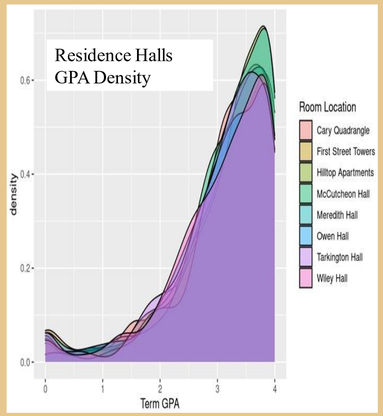


FINDINGS: Credit hours are volatile as they are influenced by many confounding variables. Thus, the link between credit hours and GPA is more so based on the confounding variables that impact credit hours.

Further research into our dataset, has not led to statistically significant conclusions about credit hours impacting GPA. This implies the presence of extraneous variables.

Confounding variables





Learning Communities is one factor that influences credit hours taken. Students who are in learning communities have higher GPA's than those who aren't.

Different majors require students to take different classes with varying credit hours (e.g engineering students take more 4 credit hours classes than students in CLA)