

June 15, 2016

Metrics Overview & Discussion of Data

Why Multiple Measures are Applicable: Limitations to Placement Exams

- Predicts levels of success more accurately than predicting failure (Scott-Clayton, 2012, p. 16).
- Decreased placement validity when targeting “C” attainment.
- More effective when reviewed with multiple measures.
- Varies by exam design and purpose.

Challenges to Using Multiple Measures

- Lack of national methodology of applying multiple measures in a systemic way
- Uncertainty of how to combine metrics into a simple scalable placement algorithm
- Uncertainty of how to collect information
- Identifying predictive information applicable to varying institution types, degrees levels, and attrition risk factors.

(Hughes & Scott-Clayton, 2011)

Multiple Measures for Placement

- Nationally normed entrance exams
- High School GPA (overall and by subject area)
- High School courses completed by subject area
- Age at entry (years since high school graduation)
- Grit tests and other measures of motivation/engagement
- Other variables—discussion by institutional type & mission

Metric: HS GPA and HS Credits

- High School Grade Point Average—captured and weighted through the following:
 - Overall and in cumulative numbers of college-preparatory units, overall and by relevant subject.
 - Scores on the relevant placement exam by subject area
 - By student characteristics (years since HS graduation; intended engagement in ancillary activities)—measures for motivation and maturity
 - Scott-Clayton, 2012 noted non-local students to have more “motivation” factor p. 13

Student Success Analysis

ACTS Courses Analyzed:

Composition I
Composition II
College Algebra
College Math
Introduction to Statistics
Quantitative Literacy

Student Success Analysis

Data Parameters:

Success defined as a student earning a course grade of A, B, or C.

(All other outcomes including a withdrawal or incomplete status were considered unsuccessful. This resulted in 57,440 student records that we could analyze from Fall 2010-Fall 2014. The average success for the state was 69.5% for all courses analyzed).

▪

Student Success Analysis

Scope:

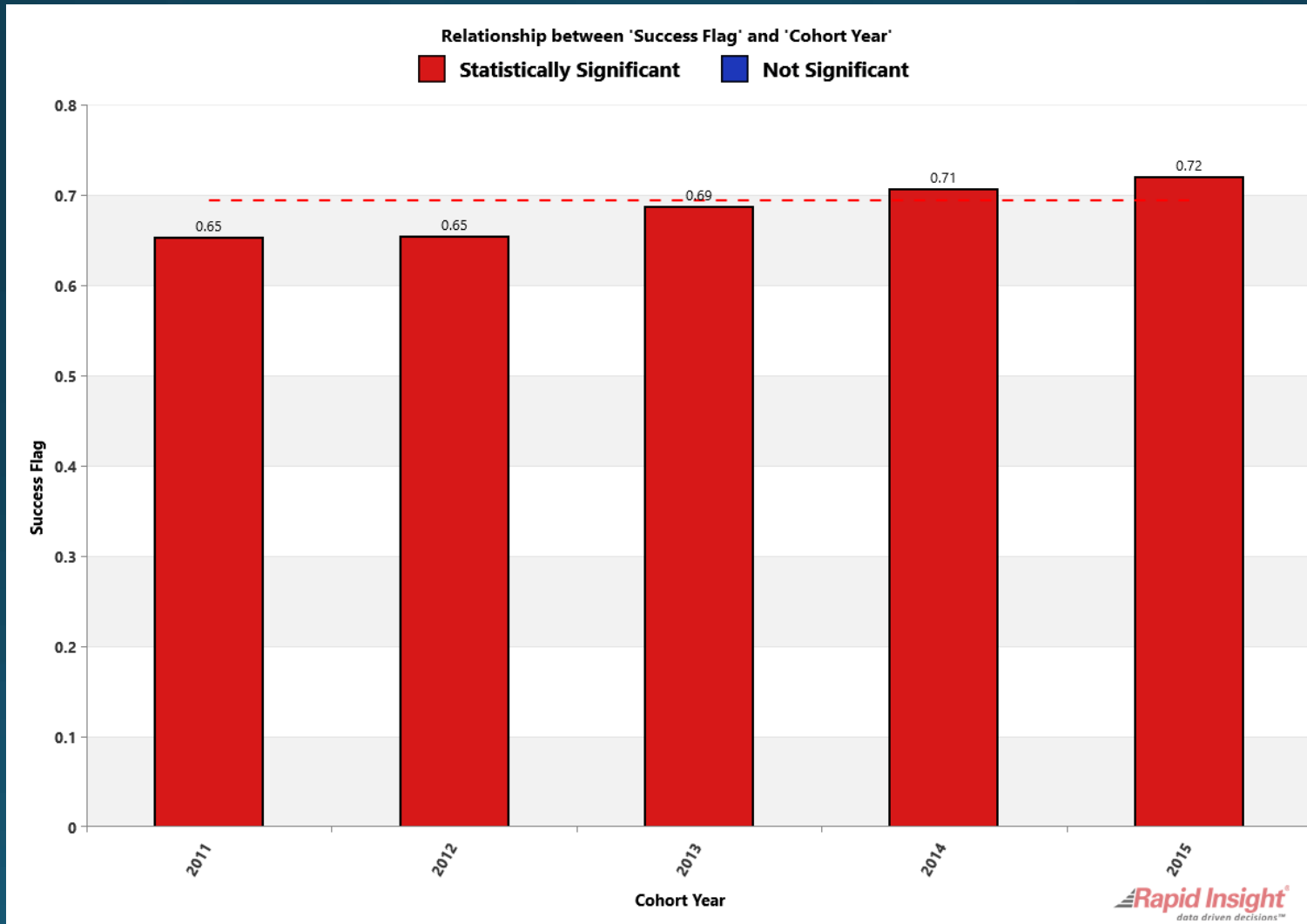
Analysis includes Arkansas as a whole; followed by four specific public institutions by varying geographic regions and missions.

Purpose:

Examine a number of metrics to determine if there are significant indicators of student success in Arkansas gateway courses.

Good News: Gateway Course Success

Gradual increase for the past 5 fall cohorts

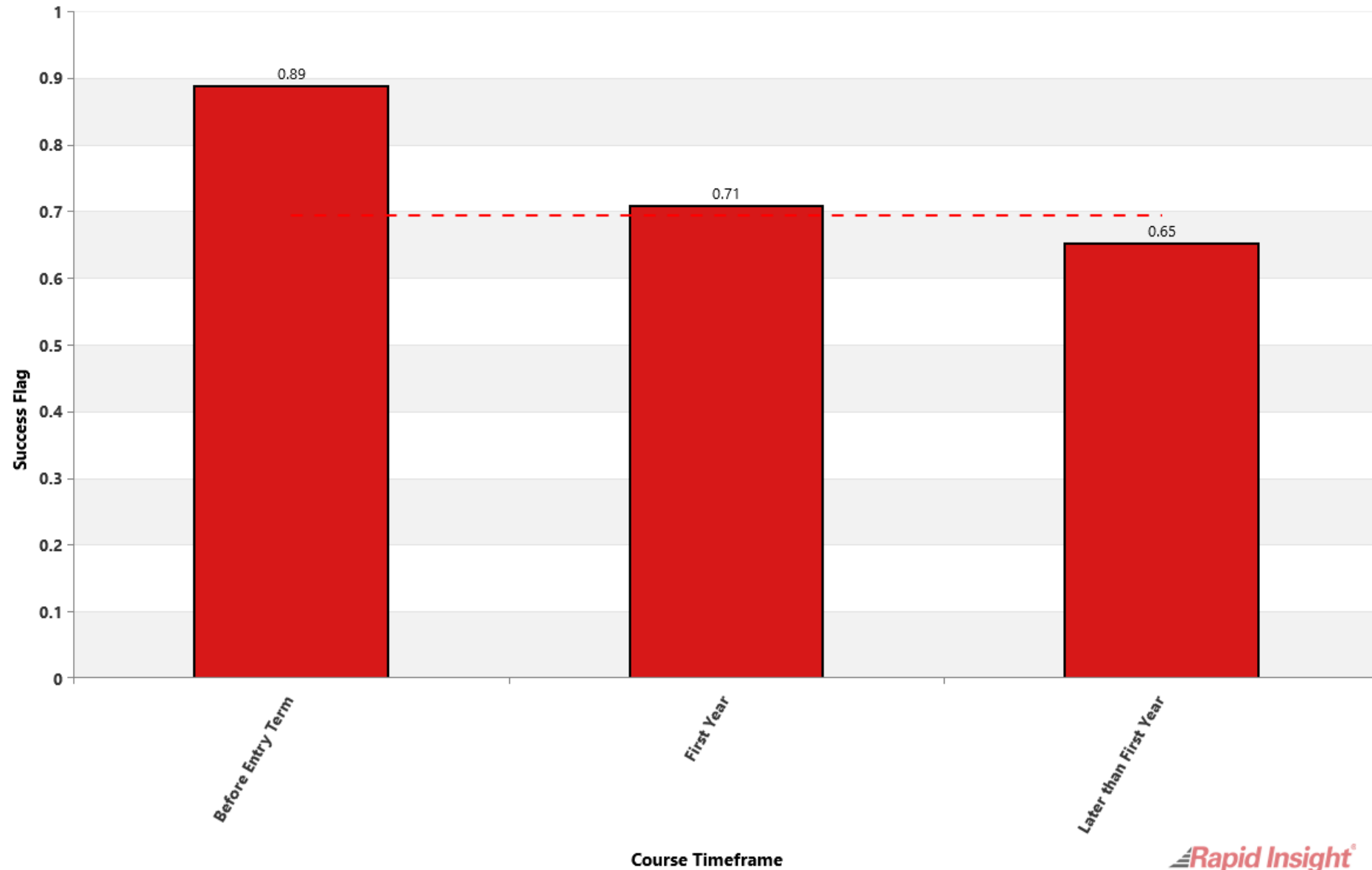


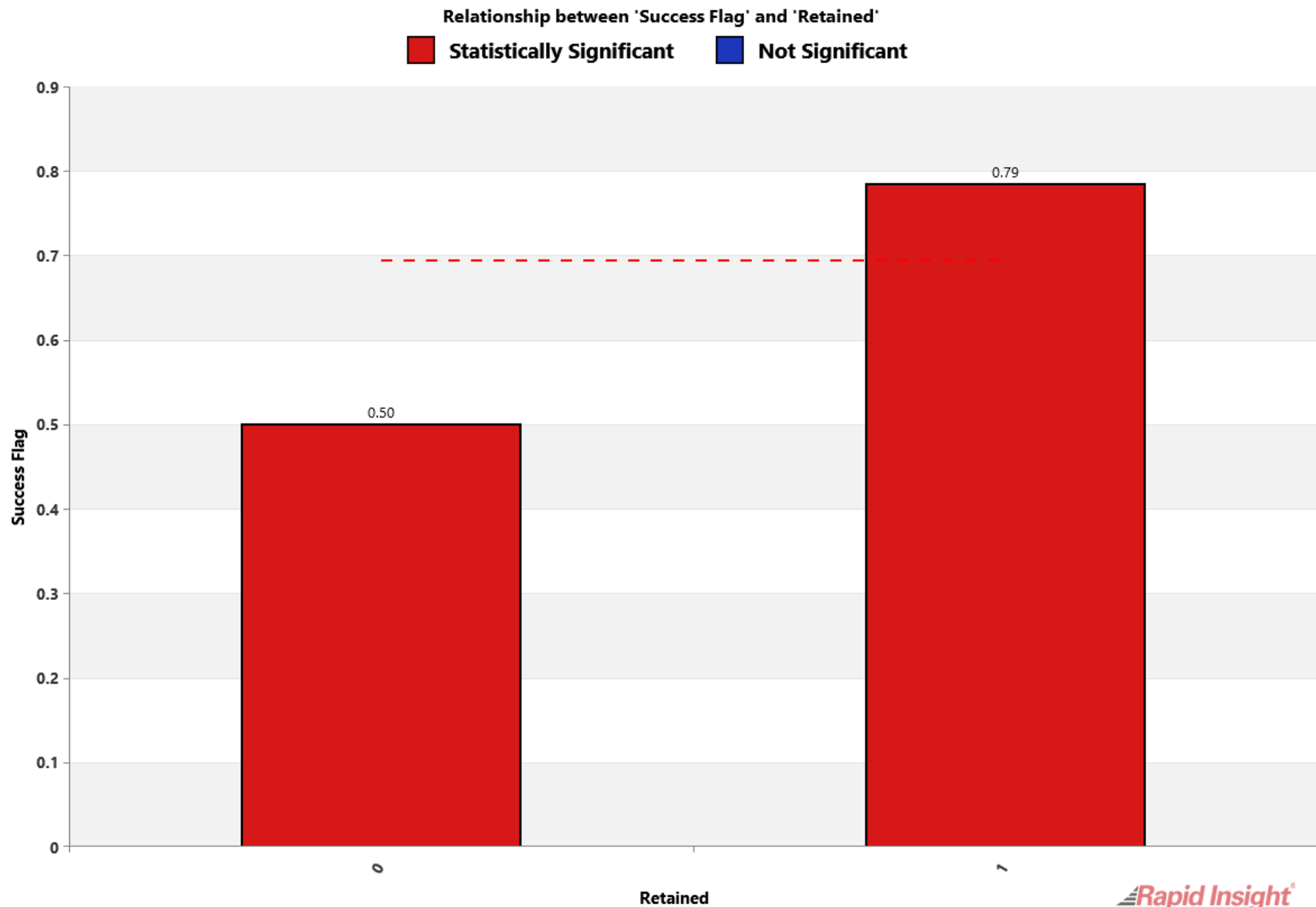
Notable Observations: Timing

- If students took the course prior to their entry term (majority of cases were the summer prior to the first fall) they had a success rate of 89%.
- If the course was attempted in the first year (entry term, spring, summer) a success rate of 71%.
- If a student took the course any later than first year, average success rate was 65% with a gradual decline from time of entry.
- Retention Impact:
Students who were successful had a retention rate of 79% to the following year; whereas, students who were unsuccessful were retained at a 50% rate.

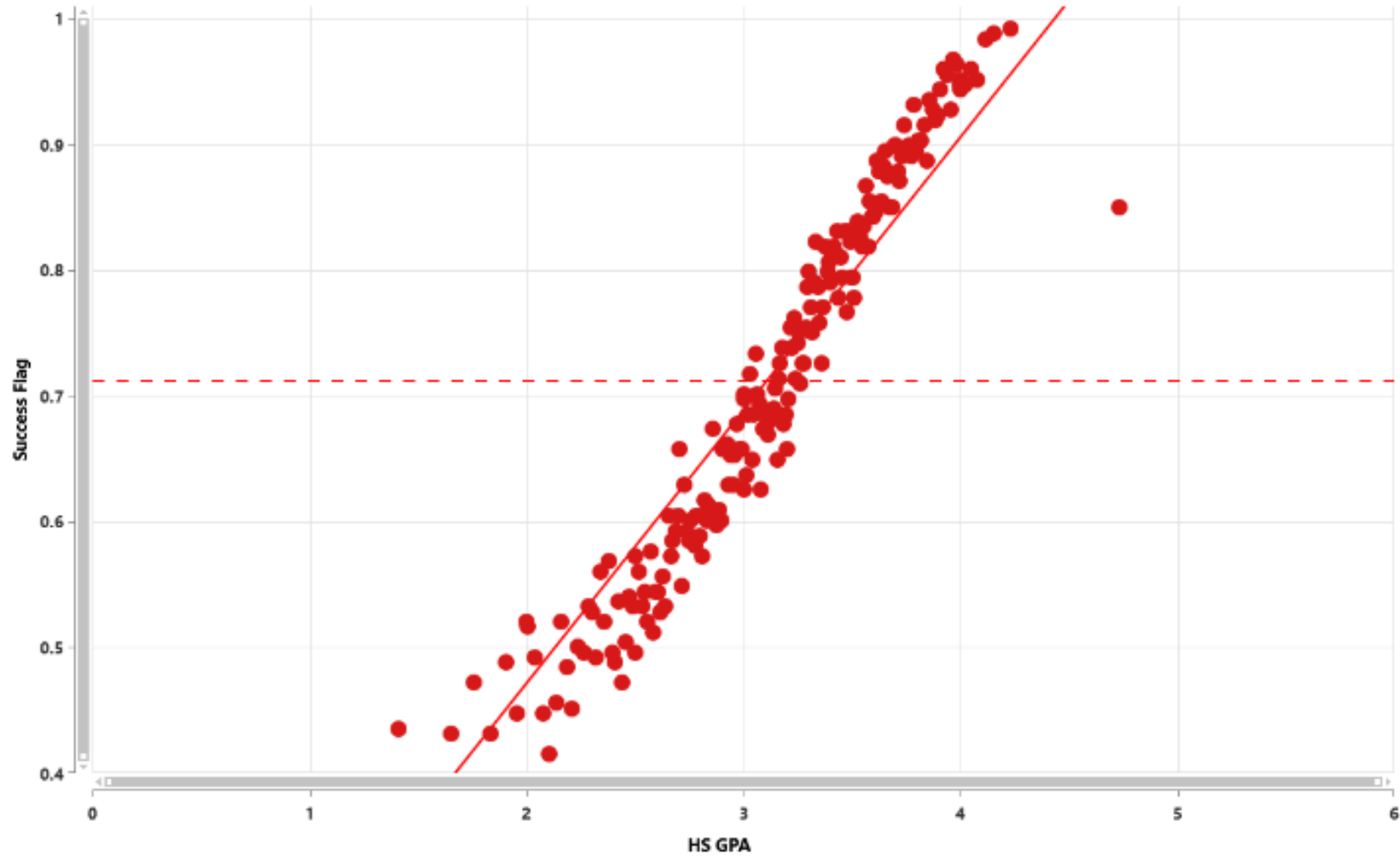
Relationship between 'Success Flag' and 'Course Timeframe'

Statistically Significant Not Significant



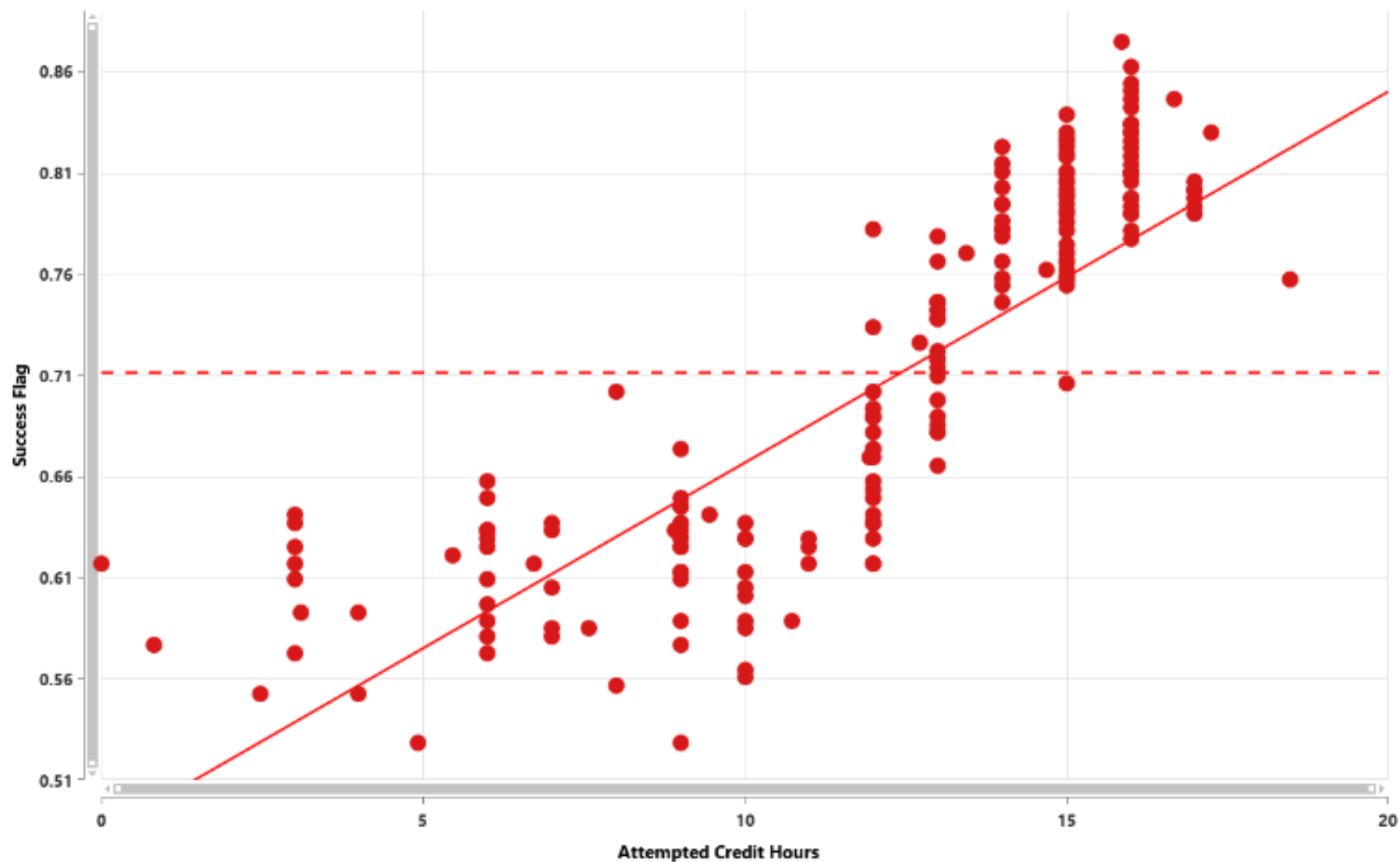


Relationship between 'Success Flag' and 'HS GPA'



Filter: WHERE HS GPA > 1

Relationship between 'Success Flag' and 'Attempted Credit Hours'



Filter: WHERE HS GPA > 1

Profile: Key Findings

- Not all institutions have the same student population, mission, or data.
- Significant indicators of success will vary from institution to institution and in some cases certain variables may have an inverse relationship.

Profile: Key Findings

Example of Varying Metrics:

- Age is shown to be a negative indicator of success at some institutions, meaning that the older the student is in the course the less likely he/she will experience success. However, for other institutions age has a positive relationship to success.
- HS GPA is a significant indicator of success for all schools, but the scales are drastically different based on mission and type, at 4-yr successful students have an average GPA of 3.57 and at 2-yr successful students have an average GPA of 2.69.

Conclusion:

Each institution needs to examine metrics independently to identify the specific data relationships significant to predicting student outcomes for the purpose of placement and support interventions.

Quintile Analysis

- Grouped students into 5 equal bins, by HS GPA and placement score (two consistent indicators of student success in the state-wide analysis). Example: quintile 1 for HS GPA is the 20% of students with the highest HS GPAs.
- Completed a cross tab and looked at the success rate in the different groupings. Findings indicate these two fields alone are good indicators of the predicted rate of success, but there are certainly other variables to consider.
- Also note that outcomes of these factors differ by institution.

Quintile Analysis

All Public Institutions

	ACT Quintile					
HS GPA Quintile	1	2	3	4	5	Grand Total
1	97.47%	95.97%	88.96%	78.27%	36.99%	91.98%
2	92.50%	91.32%	87.05%	75.27%	35.88%	81.43%
3	87.81%	86.37%	79.78%	71.28%	33.69%	70.37%
4	82.05%	80.31%	75.68%	62.60%	31.65%	60.95%
5	73.37%	74.00%	62.91%	54.77%	26.92%	50.77%
Grand Total	90.34%	88.35%	79.32%	66.45%	31.05%	71.10%

Quintile Analysis

2-yr A

	ACT Quintile					
HS GPA Quintile	1	2	3	4	5	Grand Total
1	100.00%	93.33%	89.66%	88.89%	75.00%	91.78%
2	100.00%	83.33%	82.98%	83.33%	86.36%	84.62%
3	71.43%	77.27%	72.34%	80.43%	80.36%	77.53%
4	69.23%	73.91%	72.50%	68.66%	67.35%	69.29%
5	63.64%	57.58%	58.82%	63.04%	59.47%	60.28%
Grand Total	81.48%	74.36%	75.13%	71.31%	66.49%	71.18%

2-yr B

	ACT Quintile					
HS GPA Quintile	1	2	3	4	5	Grand Total
1	91.89%	87.50%	87.10%	83.33%	83.33%	87.50%
2	68.57%	76.47%	79.22%	80.00%	87.10%	78.22%
3	65.79%	55.17%	66.41%	62.59%	67.29%	63.53%
4	50.00%	45.65%	43.64%	59.74%	54.86%	52.87%
5	31.25%	38.64%	34.67%	44.04%	51.27%	44.03%
Grand Total	67.12%	62.26%	58.73%	61.55%	58.91%	60.79%

4-yr A

	ACT Quintile					
HS GPA Quintile	1	2	3	4	5	Grand Total
1	93.85%	94.39%	91.90%	86.67%	NA	93.72%
2	83.18%	87.46%	82.61%	80.16%	100.00%	84.74%
3	71.77%	75.56%	74.75%	72.28%	61.54%	73.95%
4	52.87%	62.84%	63.08%	63.21%	68.75%	61.72%
5	62.50%	61.11%	47.62%	61.54%	80.00%	60.00%
Grand Total	87.81%	84.78%	77.67%	73.42%	73.33%	83.89%

4-yr B

	ACT Quintile					
HS GPA Quintile	1	2	3	4	5	Grand Total
1	97.83%	94.94%	83.33%	88.57%	91.67%	93.08%
2	86.96%	81.69%	89.47%	82.09%	78.26%	84.31%
3	78.57%	85.71%	76.36%	74.39%	65.91%	73.67%
4	60.00%	66.67%	58.54%	65.71%	65.57%	64.26%
5	44.44%	69.23%	33.33%	38.78%	45.95%	44.18%
Grand Total	86.15%	84.65%	74.52%	69.97%	60.82%	72.63%

Comparison of 2-yr and 4-yr

- Both models show that at each institution HS GPA and timing of course enrollment as significant indicators of success
- EFC is still a factor, but much less significant at 4-yr
- ACT scores are more common at the 4-yr and thus are more significant when looking at success, specifically the ACT Math score.
- While there was a particular HS found to be negatively correlated to success in College Algebra at one 2-yr institution, students coming from Texas were actually more likely to succeed at one sample 4-yr.

Variables Found to have an Impact on Predicting Course Success or Need for Support

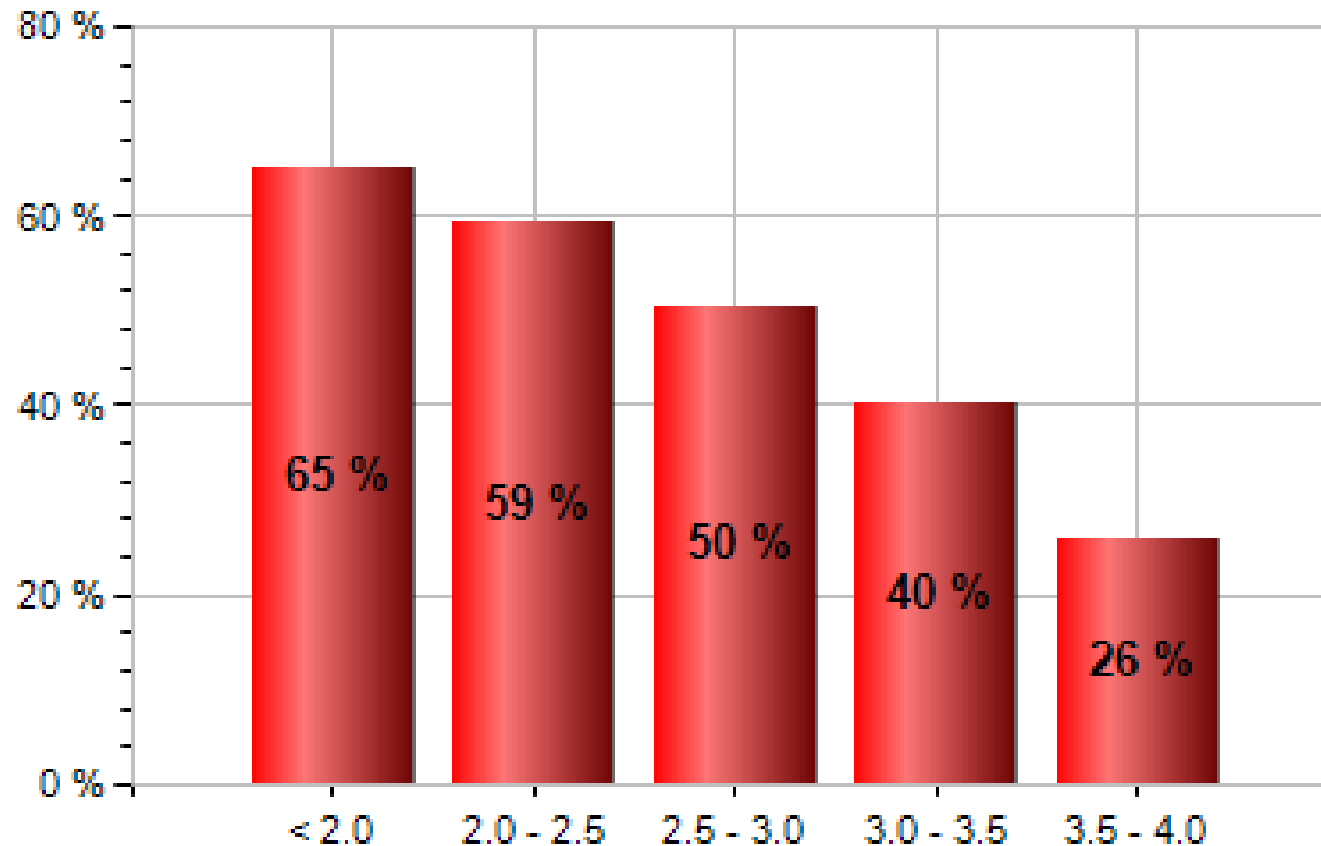
- Students preparedness
 - HS GPA
 - ACT Composite (or other nationally validated exam)
- Student enrollment status
 - FT/PT
 - Transfer status
 - Attempted Credits in First Term
 - Degree level
- Student background
 - In State/Out of State
 - Estimated family contribution
- Course detail
 - Course being offered
 - When the student attempted the gateway course

Beyond Gateway Course Success

- First-year Retention
- Completion

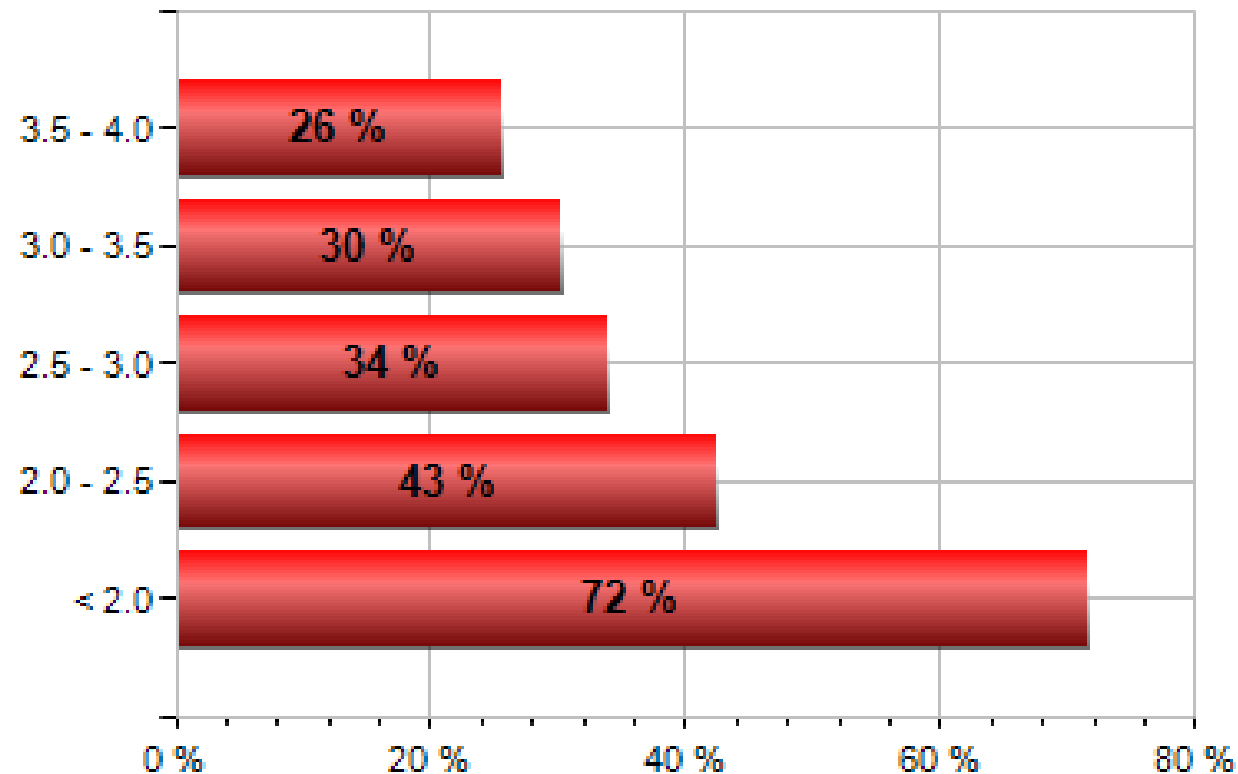
Arkansas: 1st Year Attrition by HS GPA

Predicted Attrition Rate By HS GPA



Predicted Attrition by 1-st Term GPA

Predicted Attrition Rate By 1st Term GPA



Discussion

Contact ADHE: Research@adhe.edu