Factors Related to Student Retention & Success: A Study of FTFT First-Generation Students at UNC Pembroke

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Overview

- Introduction
- Conceptual Framework
- Methodology
- Data Analysis
- Findings & Results
- Conclusions & Further Studies

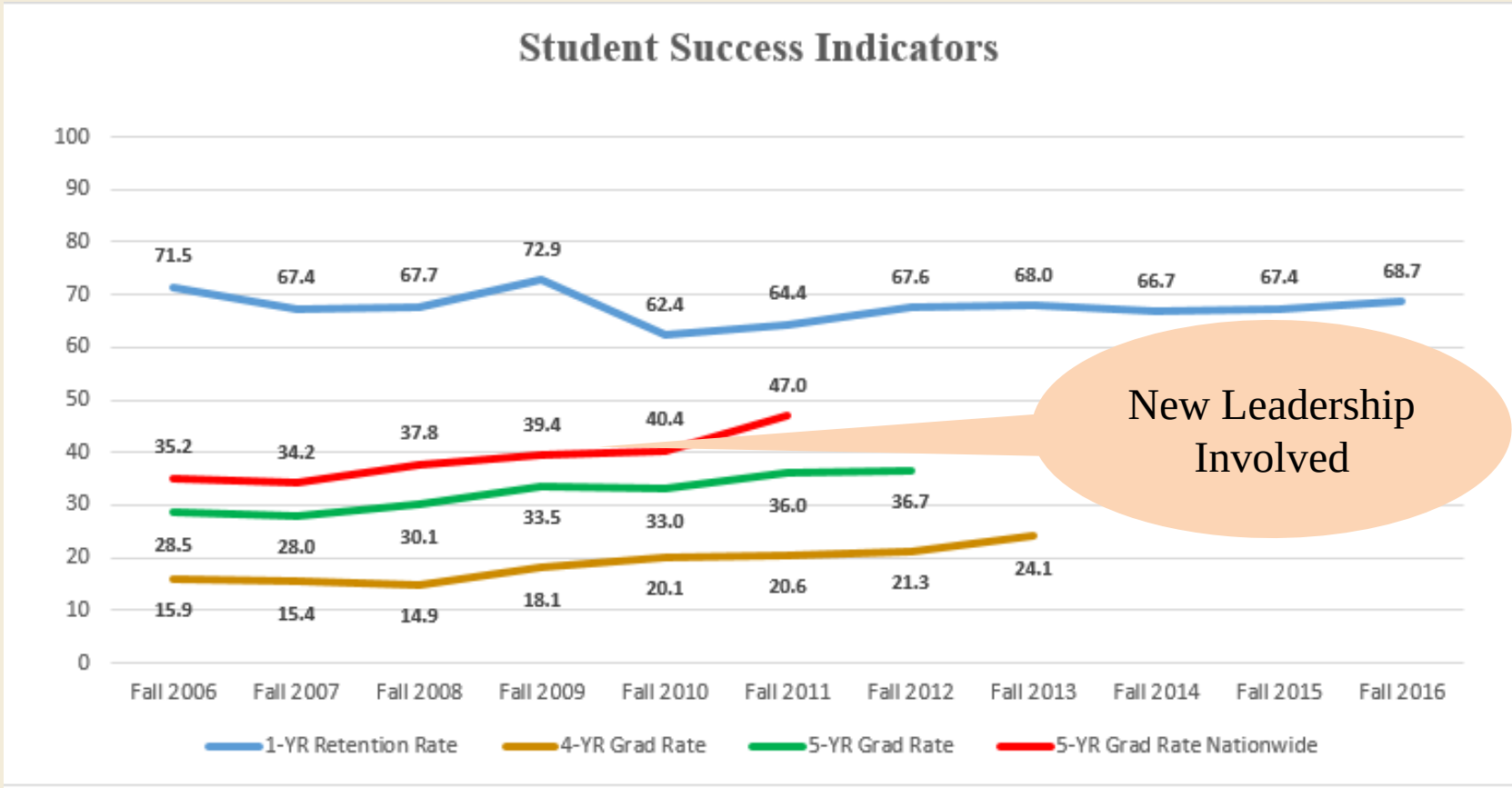
Introduction

UNC Pembroke, 1887

Introduction Cont.

- Issues & Challenges in the Past
  - Retention & Graduation Rates (chart)
  - Transfer-out/Drop-off Rates
  - Freshmen in COP & Summer Bridge Programs
  - Degree Efficiency Ratio
    - Undergraduate degree credential award by per 100 FTE (6-YR average)

$$\frac{\text{Number of Undergraduates Credential Awards}}{\text{Annual Total Student Credit Hours} / 29.6} \times 100$$


Student Success Indicators
100
90
80
70
60
50
40
30
20
10
0
71.5
67.4
67.7
72.9
62.4
64.4
67.6
68.0
66.7
67.4
68.7
35.2
34.2
37.8
39.4
40.4
47.0
28.5
28.0
30.1
33.5
33.0
36.0
36.7
15.9
15.4
14.9
18.1
20.1
20.6
21.3
24.1
Fall 2006
Fall 2007
Fall 2008
Fall 2009
Fall 2010
Fall 2011
Fall 2012
Fall 2013
Fall 2014
Fall 2015
Fall 2016
1-YR Retention Rate
4-YR Grad Rate
5-YR Grad Rate
5-YR Grad Rate Nationwide
New Leadership Involved

Introduction Cont.

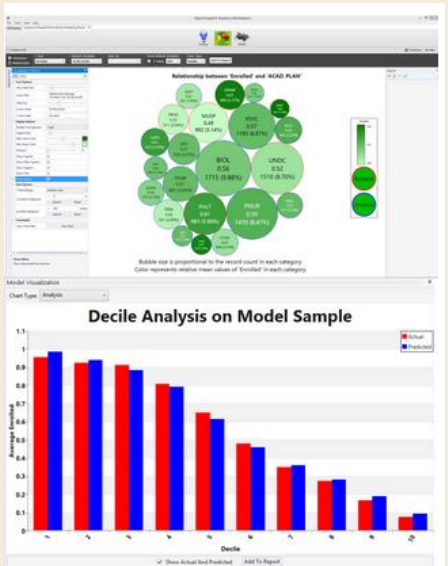
- Issues & Challenges in the Past
  - Lumina Study in Fall 2011
  - Male Student Success
    1. Faculty advising & tutoring – 51% (B/AI)
    2. Family support – 51% (AI)
    3. Personal goals – 48% (AI)
    4. Financial support – 45% (All)
    5. High school preparation – 44% (AI/B)
    6. Social connection and belonging – 36% (B)

Introduction Cont.

- Current Focus & Change
  - Learning Community: COP
  - Initiatives
    - Re-structure Advising & Tutoring -- CSS
    - Leadership Change in Admission, Advising & Tutoring
    - Building University College
  - Campus Planning
    - Student Success Grant -- $266k
      - Student Success Coaches
      - 3 Math Supplemental Instruction
      - 4 New English Composition Faculty positions

Introduction Cont.

- Current Focus & Change on Technology
  - Predictive Modeling
    - Rapid Insight – Veera & Analytics
    - EAB – Education Advisory Board
    - PAR Framework



Rapid Insight

Analyze the Past, Understand the Present, Predict the Future

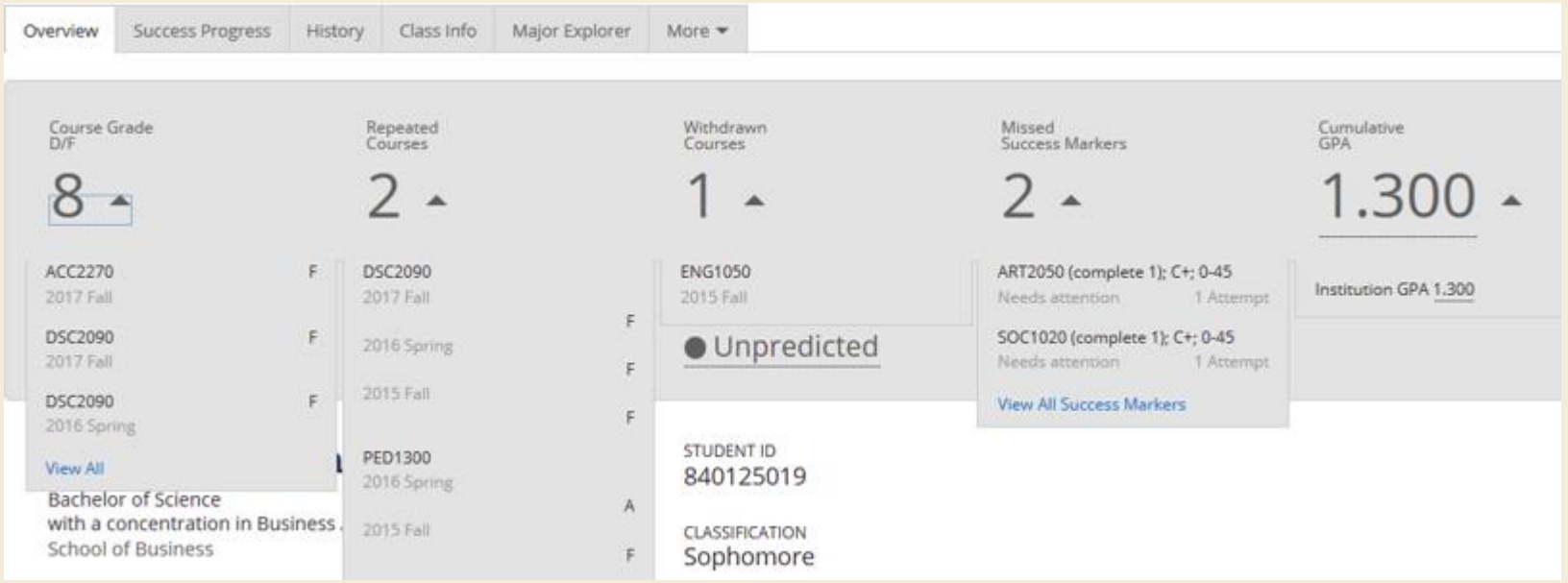
Attrition Probability Matrix

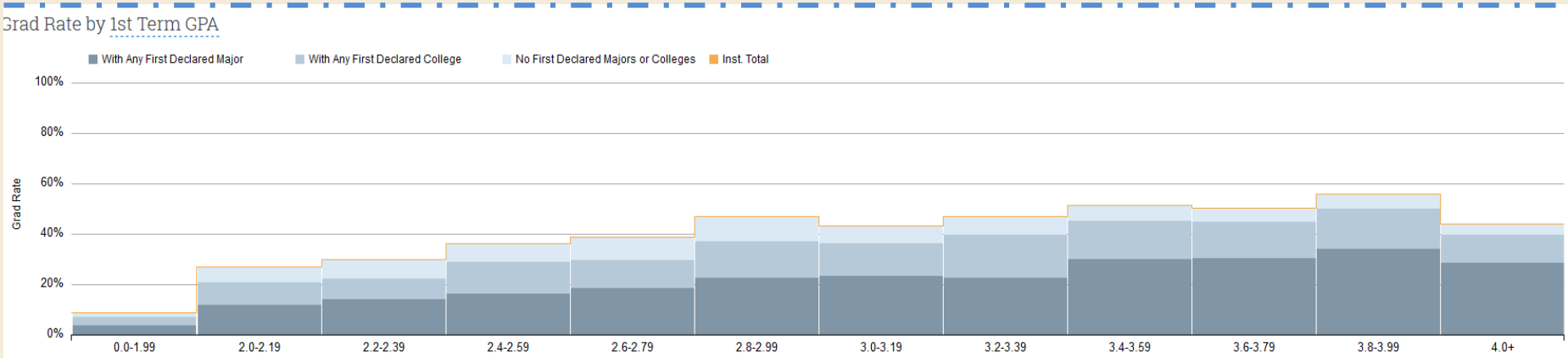
Group	Count	Risk Probability		Risk Level
		Small	Large	
1	103	56%	90%	High Risk
2	115	48%	56%	
3	117	43%	48%	
4	117	39%	43%	
5	118	34%	39%	Medium Risk
6	117	30%	34%	
7	118	27%	30%	Low Risk
8	117	22%	27%	
9	118	15%	22%	
10	117	1%	15%	

2nd Focus Group

1st Focus Group

EAB: Student Success Collaborative





PAR Framework

Student Success Matrix

Student Success Matrix › Interventions Matrix

Predictor Categories	Total	Connection	Entry	Progress	Completio
LEARNER CHARACTERISTICS 0 Intervention(s) in Draft	7	3	7	3	3
LEARNER BEHAVIORS 1 Intervention(s) in Draft	2	0	1	2	1
FIT/LEARNER PERCEPTIONS OF BELONGING 1 Intervention(s) in Draft	10	3	9	6	3
OTHER LEARNER SUPPORTS 0 Intervention(s) in Draft	2	0	2	2	2
COURSE/PROGRAM CHARACTERISTICS 1 Intervention(s) in Draft	5	2	4	2	1

Research Questions

- What factors significantly predicted first-year retention and six-year graduation for FTFT Freshmen who were first-generation

- What we knew about more our students?
  - Student Commitment: **Short-term Goal vs. Long-term Goal**
  - Student Engagement
  - Students-Faculty Interaction
  - Students attended advising and tutoring
  - Early Alert

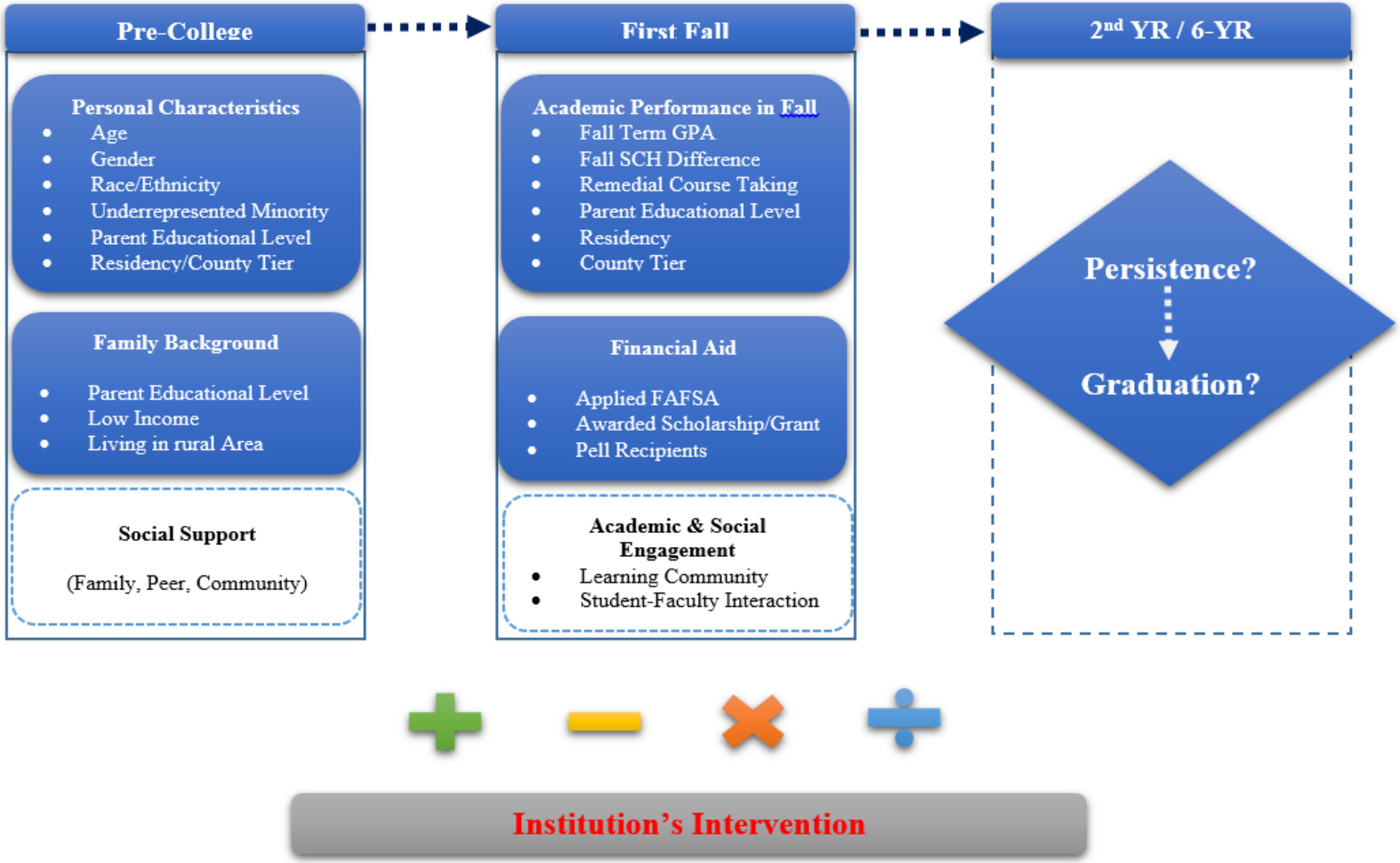
Methodology

- Literature Review
- Conceptual Framework
- Research Questions
- Database Building & Cleaning***
- Population
- Research Variables
- Modeling
- Limitation

Literature Review

- First Generation Students
  - It is well documented in the literature that college student retention and graduation are impacted by many factors across different categories.
  - More likely to be unprepared for college academically, financially, and socially.
  - Factors such as demographic characteristics, academic performance, financial status, and so forth are very important predictors for retention and graduation.

Conceptual Framework



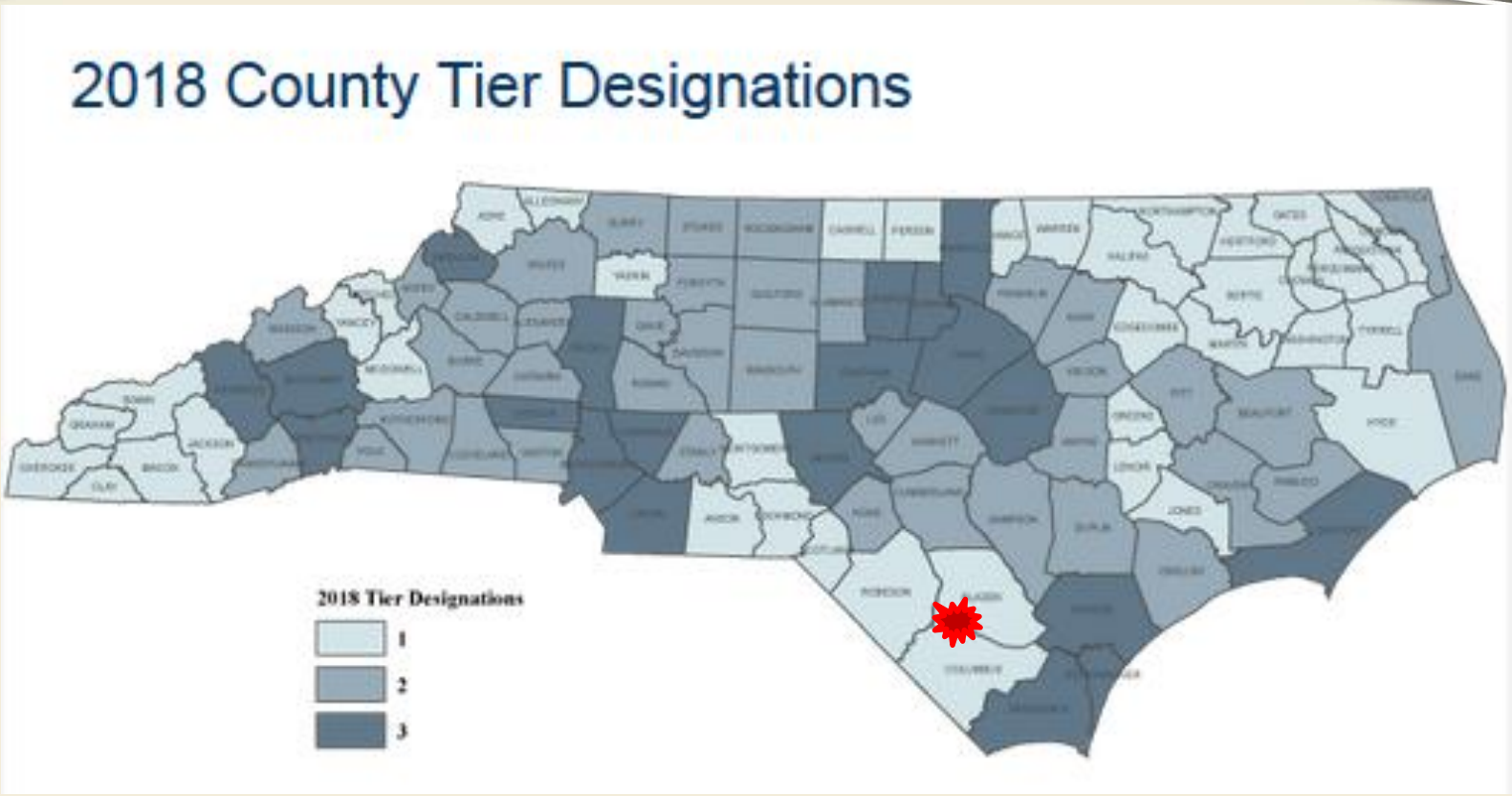
Population

- Building Database***
  - Cohort: Fall 2008-2010
  - FTFT Freshmen who were first-generation students
  - Including Financial Aid Info and Course Taking Pattern.
- Exclusion
  - Int'l Students
  - Students who dropped off before the first Fall term
- Limitations

Independent Variables		Reference
Demographic	Age	≥ 19
	Gender	Female
	Race/Ethnicity	White
	Residency	Out-of-state
	County Tier	Out-of-state
	Living on Campus (Y/N)	No
	Underrepresented Minority (Y/N)	No
	First Generation (Y/N)	No
Academic Performance	High School GPA	Numeric
	SAT Reading Score	Numeric
	SAT Math Score	Numeric
	SAT Combined	Numeric
	Admission Type	Fully Admitted
	Fall Term GPA (# or Grouped)	< 2.0
	Fall Term DFWs (# or Y/N)	No
	Difference Credit Hours in 1st Fall	Numeric
	Fall Major Decision (Y/N)	No
	Fall Remedial Flag (# or Y/N)	No
Financial Aid	FAFSA Application (Y/N)	No
	Scholarship & Grant (Y/N)	No
	Low Income Family (Y/N)	No
Interaction	1st generation*Low Income	No
Dependent Variables		
Model 1	First-year Retention (Y/N)	
Model 2	Six-year Graduation (Y/N)	

Special Coding

1. Age: <19 & ≥19
2. Underrepresent Minority
3. First Generation
   FAFSA Application = Yes
   Either Father and Mather Educational Level: high school and below
4. Low-Income Family
   FAFSA Application = Yes
   Pell recipients = Yes
5. Rural Areas
   County Tiers: https://www.nccommerce.com/research-publications/incentive-reports/county-tier-designations
   Rural Areas = Tier 1 & Tier 2***



1. NC Department of Commerce
2. Annual Assessment and Rank
3. 100 counties based on economic well-being and assigns each a Tier designation

Special Coding Cont.

- Fall Term GPA (#, Yes/No)
    1. Fall_Term_GPA (≥3.5)
    2. Fall_Term_GPA (≥3.0 & <3.5)
    3. Fall_Term_GPA (≥2.5 & <3.0)
    4. Fall_Term_GPA (≥2.0 & <2.5)
    5. Fall_Term_GPA (<2.0)
- Fall Term DFW Flag (#, Yes/No)
- Remedial Course Taking Flag (#, Yes/No)
- Major Decision (Decided/Undecided)
- Difference SCH (Attempted SCH - Earned SCH)

Model Building

- **Descriptive Analysis for Non-Returning Students**
- **Univariate Tests:** how a single variable influences first-year retention and six-year graduation
- **Logistic Regression:**
  - How multiple variables interplay and were associated with first-year retention and six-year graduation.
  - First-year retention and six-year graduation were treated as the dependent variable, respectively.

Limitations

- Each type of institution may have their own influential factors on student retention and success.
  - Reginal University
  - Diversity
- First generation students were identified using FAFSA application.
- Only three cohorts from Fall 2008 to Fall 2010 were included in the study.

Descriptive Analysis

Non-Returners

Before presenting the results from the binary logistic regression model, we would like at first to report the key statistical summary for non-returners in the second year (N = 1066).

Race/Ethnicity	Female		Male		Grand Total	
	#	%	#	%	#	%
White	233	49.5	238	50.5	471	44.2
Black or African American	161	50.6	157	49.4	318	29.8
American Indian	79	59.4	54	40.6	133	12.5
Hispanic	20	51.3	19	48.7	39	3.7
Two or more races	11	73.3	4	26.7	15	1.4
Unknown	31	47.0	35	53.0	66	6.2
Others	13	54.2	11	45.8	24	2.3
Grand Total	**548**	51.4	**518**	48.6	**1066**	**100**

HS GPA	Female		Male		Grand Total	
	#	%	#	%	#	%
Outstanding (GPA> =3.5)	111	66.5	56	33.5	167	15.7
High (3 >= GPA < 3.5)	150	53.0	133	47.0	283	26.5
Medium (2.7 >= GPA < 3)	128	55.4	103	44.6	231	21.7
Low (GPA < 2.7)	159	41.3	226	58.7	385	36.1
Grand Total	**548**	51.4	**518**	48.6	**1066**	**100**

Residency	Female		Male		Grand Total	
	#	%	#	%	#	%
In-state	506	51.5	477	48.5	983	92.2
Out-of-state	42	50.6	41	49.4	83	7.8
Grand Total	**548**	51.4	**518**	48.6	**1066**	**100**

Academic Standing in 1st Fall	Female		Male		Grand Total	
	#	%	#	%	#	%
Academic Warning	179	45.1	218	54.9	397	37.2
Good Standing	331	53.9	283	46.1	614	57.6
Placed on Probation	34	72.3	13	27.7	47	4.4
Missing	4	50.0	4	50.0	8	0.8
Grand Total	**548**	51.4	**518**	48.6	**1066**	**100**

Major Decision	Female		Male		Grand Total	
	#	%	#	%	#	%
Decided	476	52.7	428	47.3	904	84.8
Undecided	72	44.4	90	55.6	162	15.2
Grand Total	**548**	51.4	**518**	48.6	**1066**	**100**

Other Factors	Female		Male		Grand Total	
	#	%	#	%	#	%
Applied FA	507	52.2	465	47.8	972	91.2
First Generation	168	57.3	125	42.7	293	27.5
Pell Recipents	323	55.2	262	44.8	585	54.9

Model Diagnosis

First-year Retention Model

- Goodness-of-Fit Test
  - Hosmer and Lemeshow, *Chi*-square = 8.5397, *p*-value = 0.383 > 5%
- McFadden $R^2 = 0.1570$
- Overall Accuracy: 74.8%
- Nagelkerke $R^2 = 0.246$

Model Diagnosis

Six-year Graduation Model

- Goodness-of-Fit Test
  - Hosmer and Lemeshow, *Chi*-square = 1.4331, *p*-value = 0.994 > 5%
- McFadden R^2 = 0.1950
- Overall Accuracy: 70.3%
- Nagelkerke R^2 = 0.312

Table 2: ***Tests for Individual Variables Associated with First-YR Retention and 6-YR Graduation (N = 3151).***

Model	Reference	First-year Retention			6-YR Graduation		
		B	Sig.	Exp(B)	*B*	Sig.	Exp(B)
Age Group	>=19	0.272**	0.005	1.312	0.252**	0.009	1.287
Gender	Female						
Male ★		-0.163*	0.037	0.85	-0.385***	0.000	0.68
Race/Ethnicity	White						
American Indian or Alaska Native		0.239	0.054	1.27			
Black or African American		0.300**	0.001	1.349			
Underrepresented Minority (URM)	No						
Yes		0.271**	0.001	1.311			
Residency	Out-of-state						
In-state		0.832***	0.000	2.298	0.581**	0.003	1.788
County Ties ★	Out-of-state						
Tier 1		-0.705***	0.000	0.494	-0.433*	0.031	0.649
Tier 2		0.199*	0.026	1.22	0.230**	0.007	1.259
Tier 3		0.254*	0.041	1.289	0.230*	0.045	1.258
Fall_Term_GPA_Group	< 2.0						
Fall_Term_GPA_Coded: A (>=3.5)		1.711***	0.000	5.533	2.744***	0.000	15.545
Fall_Term_GPA_Coded: B (>=3.0 & <3.5)		1.827***	0.000	6.214	2.446***	0.000	11.542
Fall_Term_GPA_Coded: C (>=2.5 & <3.0)		1.682***	0.000	5.378	2.053***	0.000	7.792
Fall_Term_GPA_Coded: D (>=2.0 & <2.5)		1.347***	0.000	3.847	1.555***	0.000	4.733
Fall_Term_DFW (Y/N)) ★	No						
Yes		-0.902***	0.000	0.406	-1.192***	0.000	0.517
Fall_Remedial_Flag (Y/N)	No						
Yes		-0.212*	0.021	0.809	-0.370***	0.000	0.691
Low Income Family ★	No						
Yes					-0.177*	0.016	0.838
First Generation*Low Income Family ★	No						
Yes					-0.189*	0.028	0.828
Scholarship & Grant	No						
Yes		0.223*	0.012	1.25			
HS GPA	Numeric	0.834***	0.000	2.303	1.105***	0.000	3.021
Fall_Term_GPA	Numeric	0.961***	0.000	2.614	1.21***	0.000	3.355
Diff_Credit Hours (#) ★	Numeric	-0.137***	0.000	0.872	-0.178***	0.000	0.837
Fall_Term_DFW (#) ★	Numeric	-0.489***	0.000	0.613	-0.66***	0.000	0.517

Note. 1. Significant levels: *** P < 0.001, ** *P* < 0.01, * *P* < 0.5.

Significant Predictors

Testing Individual Variables:

- Age ≥ 19
- Male
- African American
- Underrepresented Minority
- Residency
- County Tier 1, 2, & 3
- Fall Term GPA (Numerical & Categorical)
- Fall Term DFW Flag (Numerical & Categorical)
- Fall Term Remedial Flag (Numerical & Categorical)
- Low Income
- Scholarship/Grants
- High School GPA
- Difference Between Attempted & Earned SCH
- Interaction Variable: 1st Generation*Low Income

Table 3-2. ***Estimation of Results for FTFT Freshmen Cohorts from Fall 2008 to Fall 2010 (N = 1393).***

		First-year Retention			Six-Year Graduation		
	Reference	***B***	**Sig.**	**Exp(B)**	***B***	**Sig.**	**Exp(B)**
Age Group (Age<19)	Age ≥ 19	0.415*	0.014	1.515	0.268	0.12	1.307
Gender	Female						
Male ★		0.083	0.544	1.087	-0.235	0.068	0.79
Race/Ethnicity	White						
American Indian or Alaska Native		0.343	0.125	1.409	0.355	0.093	1.426
Black or African American ★		**0.905*** **	0.0000	2.471	**0.975*** **	0.0000	2.651
Hispanic		0.18	0.573	1.198	0.267	0.41	1.306
Two or more races		1.07	0.115	2.917	0.412	0.457	1.509
County Tier	Out-of-state						
Tier 1		**1.301*** **	0.0000	3.673	0.886**	0.007	2.425
Tier 2		1.148**	0.001	3.152	0.817*	0.019	2.264
Tier 3 ★		0.931**	0.002	2.536	0.449	0.178	1.567
Fall Term GPA (Group)	< 2.0						
Fall_Term_GPA_Coded(≥3.5)		**1.565*** **	0.0000	4.783	**2.457*** **	0.0000	11.669
Fall_Term_GPA_Coded(≥3.0 & <3.5)		**1.566*** **	0.0000	4.786	**2.220*** **	0.0000	9.209
Fall_Term_GPA_Coded(≥2.5 & <3.0)		**1.612*** **	0.0000	5.014	**1.699*** **	0.0000	5.47
Fall_Term_GPA_Coded(≥2.0 & <2.5)		**1.034*** **	0.0000	2.811	**1.269*** **	0.0000	3.557
Fall Term DFW (Group)	No						
Yes		0.384	0.079	1.468	0.032	0.859	1.033
Fall Remedial Flag	No						
Yes		0.236	0.176	1.266	-0.026	0.886	0.974
Fall Major	Undecided						
Decided		-0.132	0.464	0.876	0.05	0.765	1.051
Low Income Family ★	No						
Yes		-0.497**	0.004	0.609	-0.330*	0.035	0.719
Scholarship & Grant	No						
Yes		0.462*	0.016	1.587	0.2	0.272	1.222
High School GPA		0.534**	0.001	1.706	0.517**	0.001	1.678
Diff_Credit Hours (#) ★		-0.069**	0.003	0.934	-0.05	0.067	0.951

Note. Significant levels: *** P < 0.001, ** *P* < 0.01, * *P* < 0.5.

Significant Predictors Cont.

Testing First-year Retention

- African American: (+) ***
- County Tier 1: (+) ***
- Fall Term GPA (all four subgroups): (+) ***
- Low Income (-) **
- High School GPA (+) **
- Difference between Attempted and Earned SCH (-) **
- County Tier 2 & 3 (+) **
- Scholarship/Grants (+) *
- Age ≥ 19 (+) *

Significant Predictors Cont.

Testing Six-year Graduation

- African American: (+) ***
- Fall Term GPA (all four subgroups): (+) ***
- County Tier 1: (+) **
- High School GPA (+) **
- Low Income (-) *
- County Tier 2 (+) *

Performance is the KEY for student success

Major Findings

- As expected, students' academic performance in high school and in first fall term in college were key predicting factors for student success, both for first-year retention and six-year graduation.
- The difference between students' attempted and earned credit hours in first fall term had a negative impact on first-year retention, but it did not have significant impact on students' long-term goal of six-year graduation.

Major Findings Cont.

- First-generation students who were from rural areas in NC had a positive impact on first-year retention and six-year graduation, particularly the students from Tier 1 counties.
- However, the students from Tier 3 counties are only positively associated with first-year retention, but not with six-year graduation. Further study should be done to examine whether this factor was somehow related to the high transfer rate when students were in their senior year.

Major Findings Cont.

- First-generation students awarded with scholarships and grants showed positive impact on first-year retention, but not on six-year graduation.

- First-generation students with low-income had a significantly negative effect on both first-year retention and six-year graduation.

Major Findings Cont.

Non-significant Variables:

- SAT/ACT testing scores
- Living on campus
- Number of remedial course taking (#, Categorical)
- Number of DFW (#, Categorical)
- Major decision in first fall semester
- Being underrepresented minority students
- Being male students

Further Study

- Focus on transfer-out in first year and senior year, particularly students who were from Tier 3 counties.
- Add other potential influential factors:
  - Students attending advising/tutoring;
  - Students on early alert;
  - Using high school index to include other influential factors (HS GPA+SAT/ACT).

Questions?