

Predicting & Facilitating Community College Transfer Student Success

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Learning objectives

- Become aware of the relatively low graduation rates among transfer students at UNC system schools.
- Be able to list factors which have been found to impact graduation rates among new transfer students.
- Think creatively about what can be changed at our institutions to improve success rates (defined as timely graduation) for new transfer students.

National context

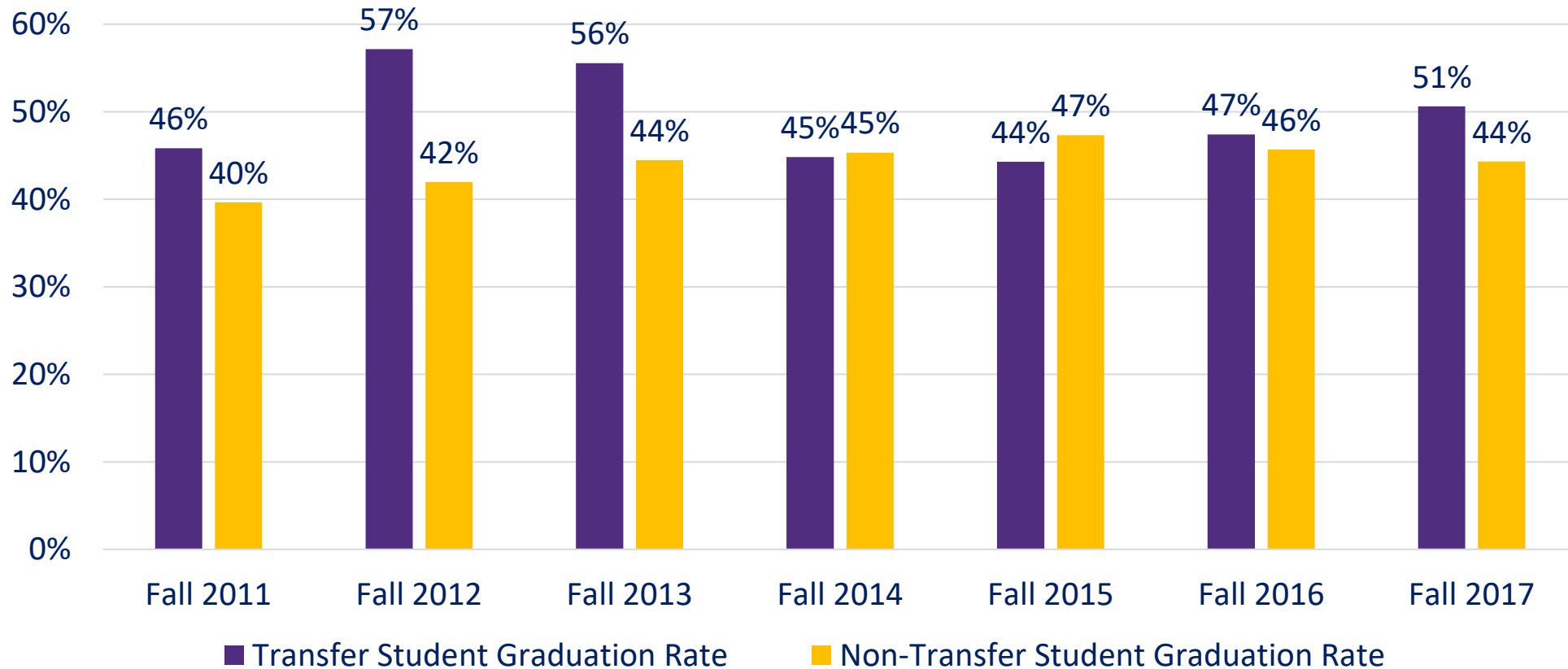
- Source: National Student Clearinghouse Research Center (9/23/21)
 - 31% of community college starters in Fall 2014 transferred to a four-year institution within six years.
 - 47.4% of these students completed their bachelor's degree by August 2020.
 - Only 15% of the students who began community college in Fall 2014 earned a bachelor's degree within six years of that initial enrollment.

NCCCS Transfer and ECU First-time Freshman Graduation Rate Comparisons

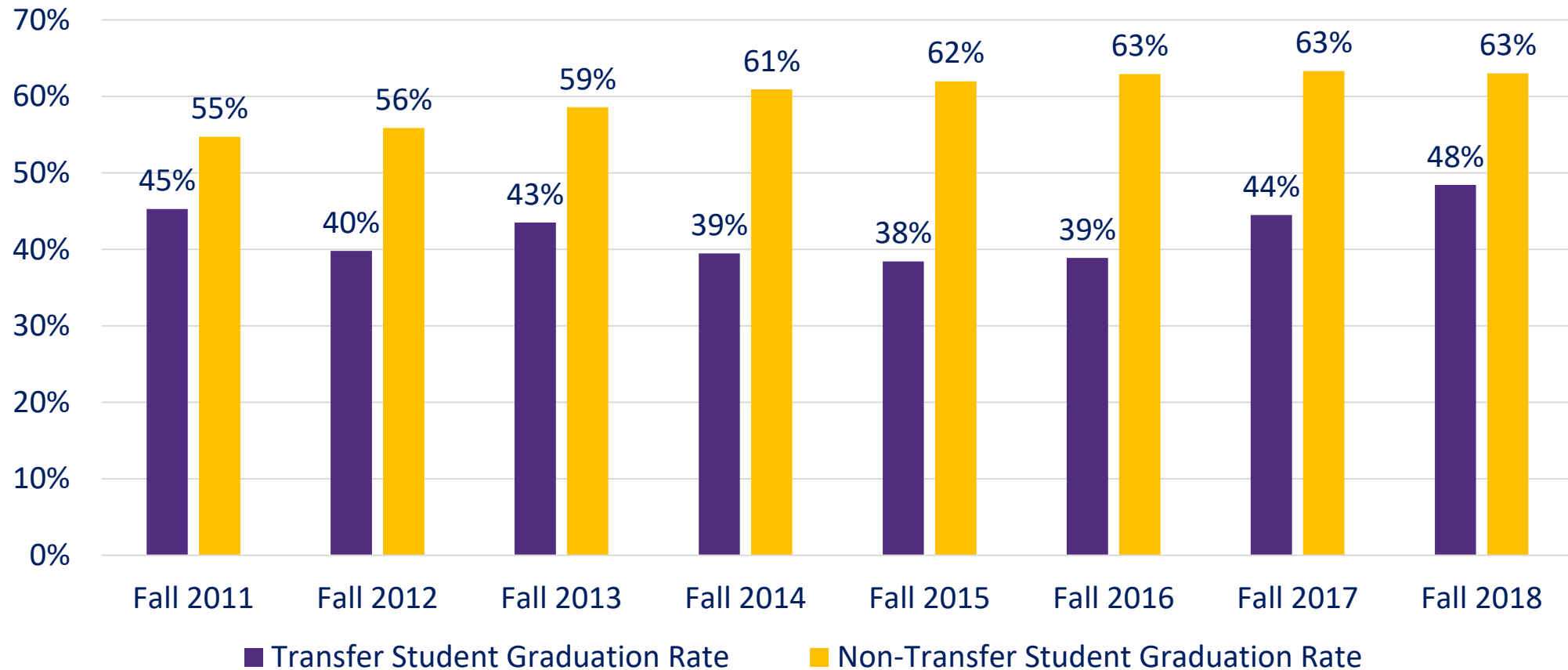
Data Source: [UNC System Transfer Dashboard](#)



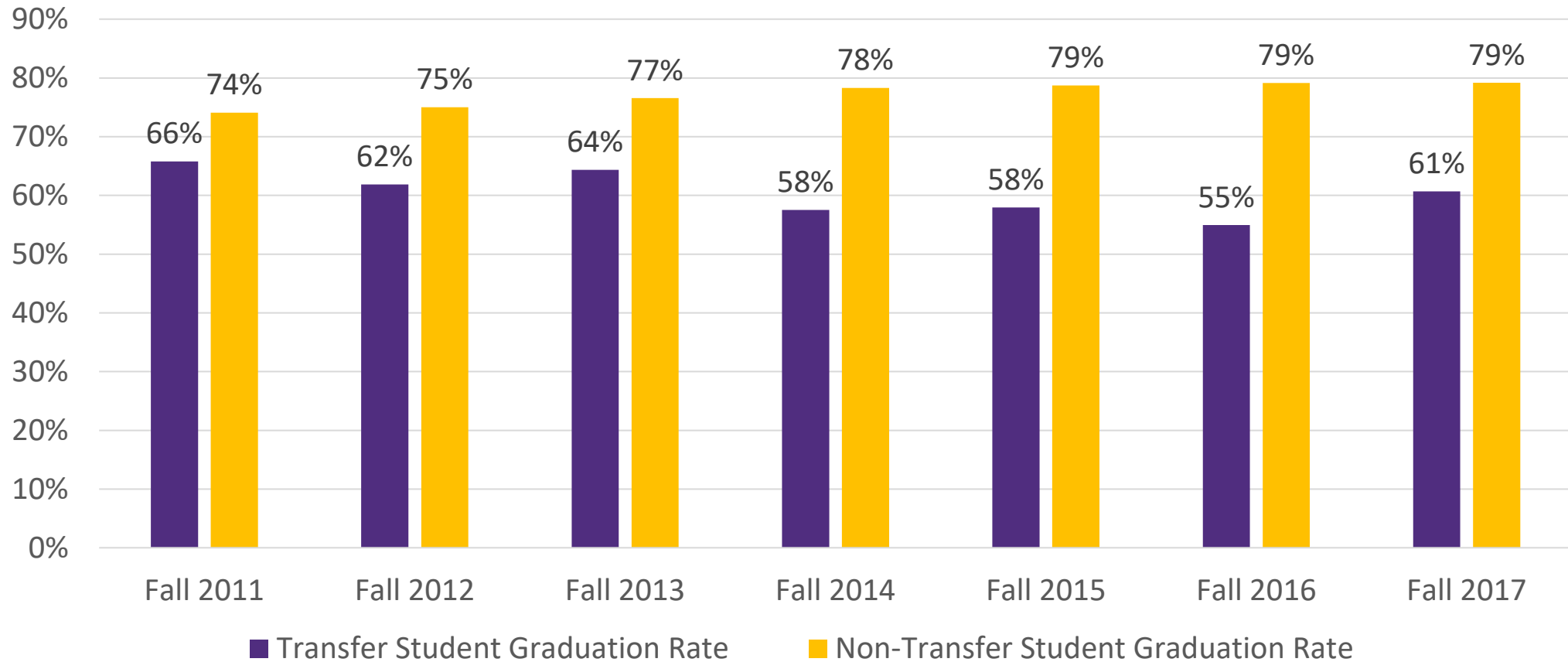
Enter as freshmen (<30 Credit hours) from NCCCS 4-year graduation rates



Enter as sophomores from NCCCS 3-year graduation rates

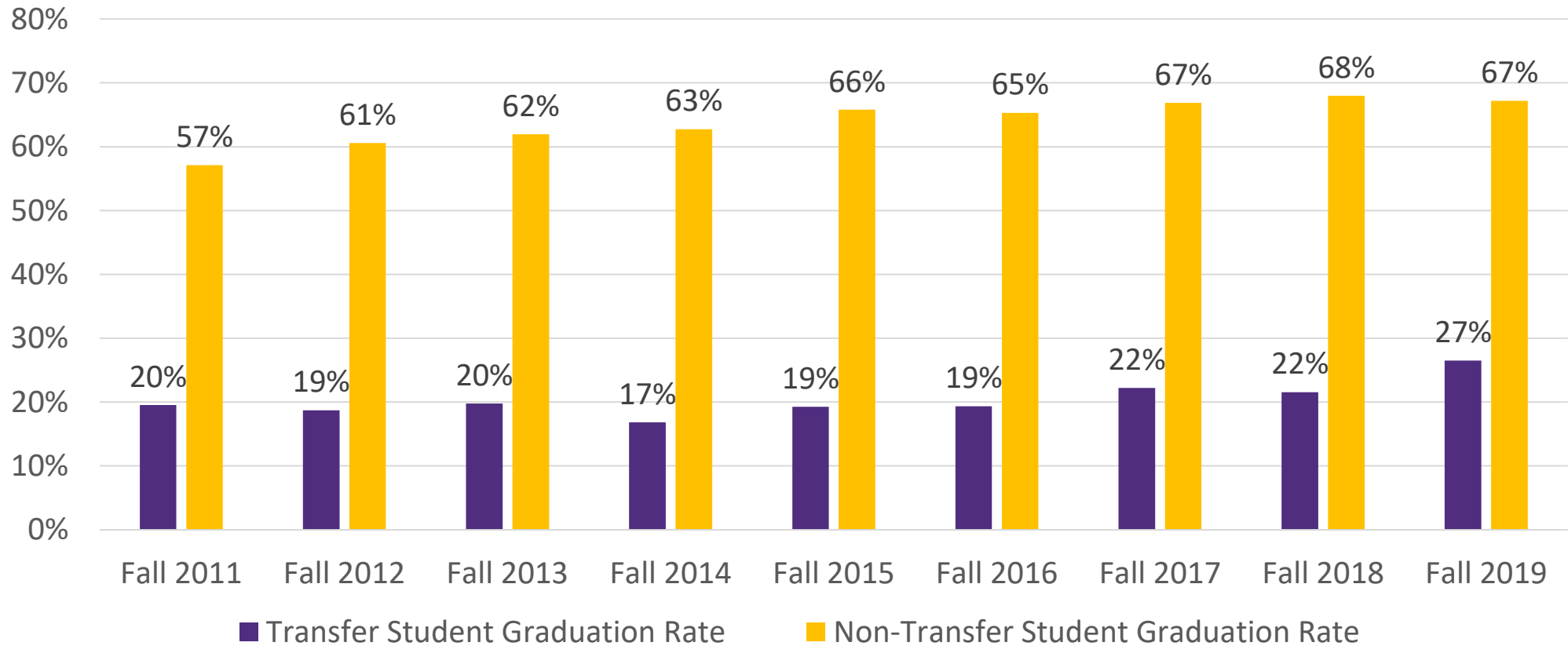


Enter as sophomores from NCCCS 4-year graduation rates



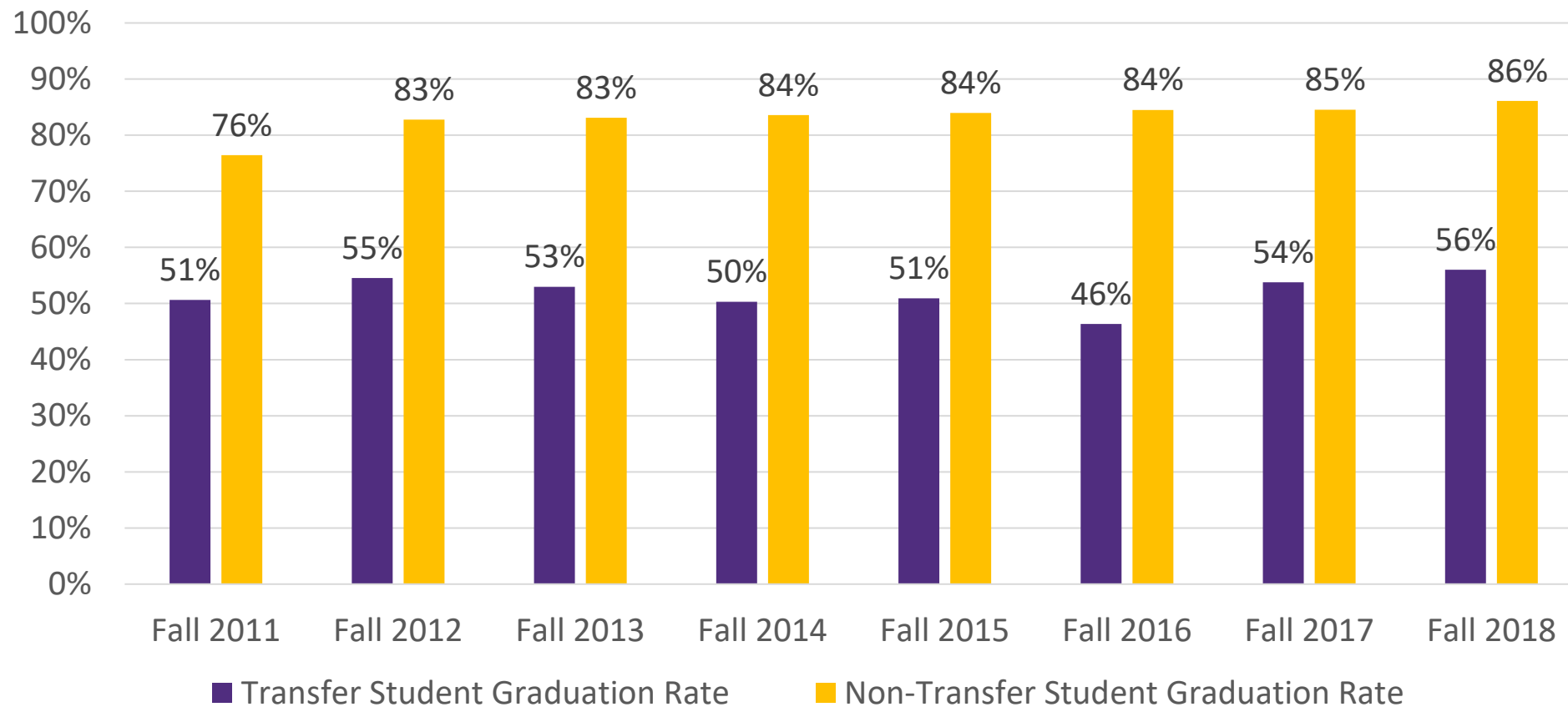
Enter as juniors from NCCCS

2-year graduation rates



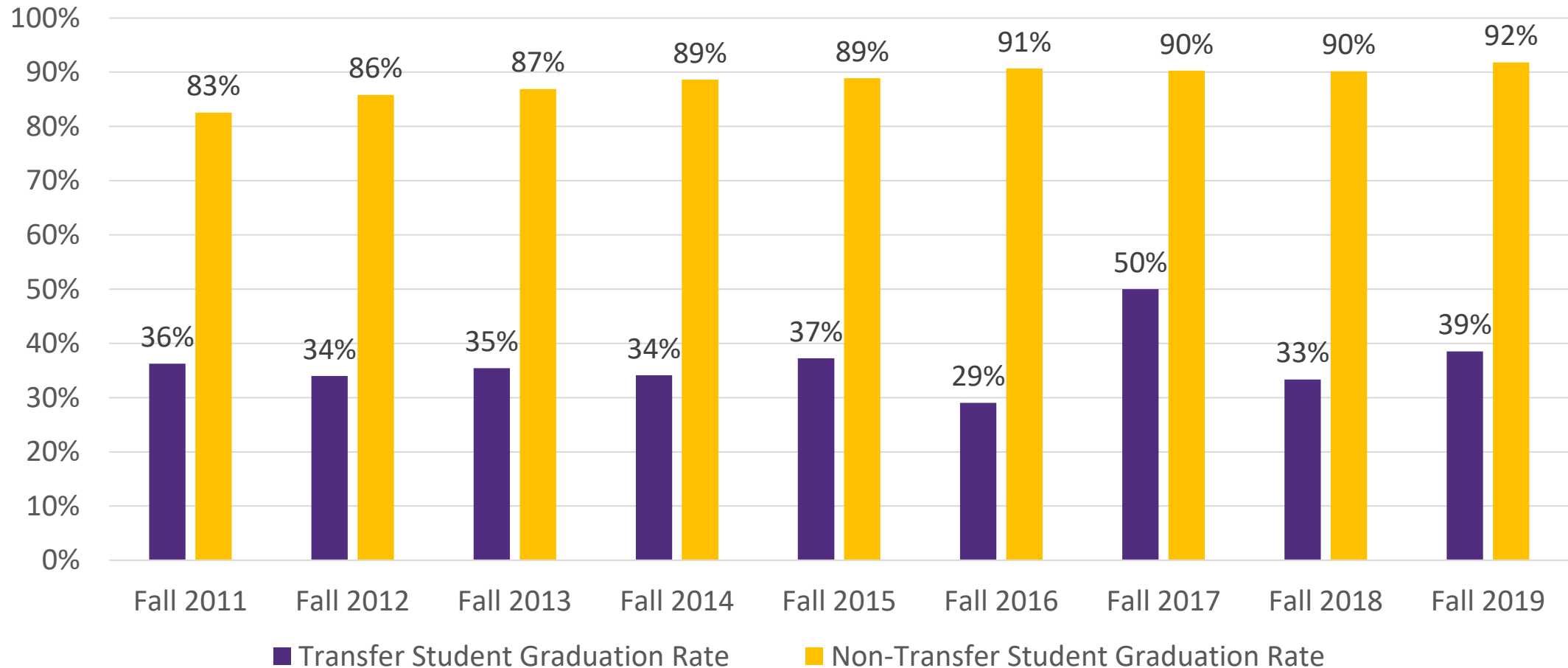
Enter as juniors from NCCCS

3-year graduation rates



Enter as seniors from NCCCS

2-year graduation rates



What factors influence transfer student success defined as graduation?

FACTORS THAT CAN NEGATIVELY IMPACT PERSISTENCE, RETENTION, AND COMPLETION RATES OF TRANSFER STUDENTS

(Literature review by Smith, Sturtevant, & Bullough, 2021)

- Social isolation & feeling they don't belong
- Credits earned before transfer
- GPA
- Finances
- Distance between old and new institutions
- Major declaration
- Academic preparedness
- Work/life/school balance
- Time to completion
- Unclear or incomplete information for students about credit transfer (leading to credit loss)
- Requirements for remedial courses
- Student population size at the new institution
- Transfer shock
- All the above may be compounded by gender, race, first generation status, academic ability, prior academic preparation


WHY COMMUNITY COLLEGE STUDENTS QUIT DESPITE BEING ALMOST FINISHED (Skinner, Ortagus, & Tanner, 2022; <https://theconversation.com/why-community-college-students-quit-despite-being-almost-finished-175420>)

- Costs were too high
- Living expenses were too high
- Ran out of financial aid
- Unpredictable schedules
- Student lacked key information
- Students wrongly thought they had holds placed on their accounts
- Health emergencies
- Students got new jobs or lost their jobs
- Math and science courses were too difficult
- Students lacked strong connections to campus

Cazares et al. (2016)

Predicting transfer student success: Early identification of at-risk students to improve time-to-degree and graduation rates

- Binary logistic regression
- Junior and Senior transfer students to CSUSB Fall 2008 to Fall 2013
- Significant predictors of 2-year graduation ($p < .05$)
 - Pell grant recipient, STEM major, First-year GPA, Passing all first-year courses, Changed major, Earning 36 or more credit hours in first year
- Significant predictors of final 4-year graduation ($p < .05$)
 - STEM major, Changed major, Passing all first-year courses, Earning 36 or more credit hours in first year
 - Significant predictors accounted for 32% of the variance in the outcome variable; Overall group classification success was 74.1%



Replication of Cazares et al. study at ECU

- Dataset: Transfer students to ECU Summer 2010 to Fall 2019 (+/- depending on model) with 60 or more credit hours
 - 2-year model: 2010 summer to 2019 fall
 - 4-year model: 2010 summer to 2017 fall
- Method: Binary logistic regression
- Software: Minitab
- Conclusion:
 - Academic performance and financial situation are the key to graduation for transfer students.
 - Major changing and STEM or non-STEM affect the time of graduation for transfer students.

2-year model: 2010 summer to 2019 fall

Response Information

Variable	Value	Count
Graduate_in_2	Y	3343 (Event)
	N	2925
	Total	6268

Model Summary

Deviance R-Sq	Deviance R-Sq(adj)	AIC	AICc	BIC	Area Under ROC Curve
23.41%	23.22%	6669.43	6669.53	6790.80	0.8094

Regression Equation

$$P(Y) = \frac{\exp(Y')}{1 + \exp(Y')}$$

$$Y' = -6.714 - 0.00639 \text{ AGE_AT_MATRIC} + 0.01989 \text{ TRANSFER_CREDIT_HOURS} + 0.0015 \text{ TRANSFER_UG_GPA} + 0.0049 \text{ First Year attempt hours} + 0.1813 \text{ First year earned hours} + 0.4754 \text{ First year GPA} + 0.0 \text{ Associate_Degree_0} + 0.0710 \text{ Associate_Degree_1} + 0.0 \text{ NCCCS_TRANSFER_IND_N} - 0.0038 \text{ NCCCS_TRANSFER_IND_Y} + 0.0 \text{ UNC_TRANSFER_IND_N} - 0.045 \text{ UNC_TRANSFER_IND_Y} + 0.0 \text{ CHANGED_MAJOR_N} - 0.2914 \text{ CHANGED_MAJOR_Y} + 0.0 \text{ STEM_MAJOR_N} - 0.2177 \text{ STEM_MAJOR_Y} + 0.0 \text{ FIN_AID_RECEIVED_N} + 0.174 \text{ FIN_AID_RECEIVED_Y} + 0.0 \text{ NEED_BASED_N} + 0.074 \text{ NEED_BASED_Y} + 0.0 \text{ MERIT_N} - 0.118 \text{ MERIT_Y} + 0.0 \text{ PELL_N} - 0.2624 \text{ PELL_Y} + 0.0 \text{ LOAN_N} - 0.3003 \text{ LOAN_Y} + 0.0 \text{ FT_PT_Correction_FT} + 0.294 \text{ FT_PT_Correction_PT}$$

4-year model: 2010 summer to 2017 fall

Response Information

Variable	Value	Count
Graduate_in_4	Y	3696 (Event)
	N	1160
	Total	4856

Model Summary

Deviance R-Sq	Deviance R-Sq(adj)	AIC	AICc	BIC	Area Under ROC Curve
22.48%	22.16%	4175.36	4175.50	4292.15	0.8097

Regression Equation

$$P(Y) = \frac{\exp(Y')}{1 + \exp(Y')}$$

$$Y' = -4.027 - 0.01193 \text{ AGE_AT_MATRIC} + 0.00558 \text{ TRANSFER_CREDIT_HOURS} - 0.0460 \text{ TRANSFER_UG_GPA} - 0.0806 \text{ First Year Attemptd Hrs} + 0.2346 \text{ First Year Earned Hrs} + 0.6969 \text{ First Year GPA} + 0.0 \text{ Degree_Title_0} - 0.0247 \text{ Degree_Title_1} + 0.0 \text{ NCCCS_TRANSFER_IND_N} + 0.230 \text{ NCCCS_TRANSFER_IND_Y} + 0.0 \text{ UNC_TRANSFER_IND_N} - 0.139 \text{ UNC_TRANSFER_IND_Y} + 0.0 \text{ CHANGED_MAJOR_N} - 0.054 \text{ CHANGED_MAJOR_Y} + 0.0 \text{ STEM_MAJOR_N} - 0.0667 \text{ STEM_MAJOR_Y} + 0.0 \text{ FIN_AID_RECEIVED_N} - 0.266 \text{ FIN_AID_RECEIVED_Y} + 0.0 \text{ NEED_BASED_N} + 0.232 \text{ NEED_BASED_Y} + 0.0 \text{ MERIT_N} - 0.222 \text{ MERIT_Y} + 0.0 \text{ PELL_N} - 0.264 \text{ PELL_Y} + 0.0 \text{ LOAN_N} - 0.021 \text{ LOAN_Y} + 0.0 \text{ FT_PT_Correction_FT} + 0.448 \text{ FT_PT_Correction_PT}$$

Coefficients

Term	Coef	SE Coef	Z-Value	P-Value	VIF
Constant	-6.714	0.409	-16.41	0.000	
AGE_AT_MATRIC	-0.00639	0.00428	-1.49	0.135	1.42
TRANSFER_CREDIT_HOURS	0.01989	0.00193	10.30	0.000	1.22
TRANSFER_UG_GPA	0.0015	0.0738	0.02	0.984	1.23
First Year attempt hours	0.0049	0.0139	0.35	0.723	9.20
First year earned hours	0.1813	0.0119	15.28	0.000	6.57
First year GPA	0.4754	0.0683	6.96	0.000	1.54
Associate_Degree					
1	0.0710	0.0655	1.08	0.278	1.11
NCCCS_TRANSFER_IND					
Y	-0.0038	0.0957	-0.04	0.968	1.57
UNC_TRANSFER_IND					
Y	-0.045	0.144	-0.31	0.755	1.48
CHANGED_MAJOR					
Y	-0.2914	0.0952	-3.06	0.002	1.06
STEM_MAJOR					
Y	-0.2177	0.0695	-3.13	0.002	1.05
FIN_AID_RECEIVED					
Y	0.174	0.289	0.60	0.547	17.15
NEED_BASED					
Y	0.074	0.287	0.26	0.798	17.46
MERIT					
Y	-0.118	0.158	-0.75	0.455	1.20
PELL					
Y	-0.2624	0.0776	-3.38	0.001	1.67
LOAN					
Y	-0.3003	0.0838	-3.58	0.000	1.92
FT_PT_Correction					
PT	0.294	0.114	2.58	0.010	3.22

Odds Ratios for Continuous Predictors

	Odds Ratio	95% CI
AGE_AT_MATRIC	0.9936	(0.9853, 1.0020)
TRANSFER_CREDIT_HOURS	1.0201	(1.0162, 1.0240)
TRANSFER_UG_GPA	1.0015	(0.8667, 1.1573)
First Year attempt hours	1.0049	(0.9780, 1.0327)
First year earned hours	1.1987	(1.1712, 1.2269)
First year GPA	1.6087	(1.4071, 1.8392)

Odds Ratios for Categorical Predictors

Level A	Level B	Odds Ratio	95% CI
Associate_Degree			
1	0	1.0736	(0.9443, 1.2207)
NCCCS_TRANSFER_IND			
Y	N	0.9962	(0.8258, 1.2017)
UNC_TRANSFER_IND			
Y	N	0.9561	(0.7213, 1.2674)
CHANGED_MAJOR			
Y	N	0.7473	(0.6201, 0.9005)
STEM_MAJOR			
Y	N	0.8044	(0.7020, 0.9217)
FIN_AID_RECEIVED			
Y	N	1.1903	(0.6752, 2.0982)
NEED_BASED			
Y	N	1.0763	(0.6134, 1.8885)
MERIT			
Y	N	0.8884	(0.6513, 1.2119)
PELL			
Y	N	0.7692	(0.6606, 0.8955)
LOAN			
Y	N	0.7406	(0.6284, 0.8727)
FT_PT_Correction			
PT	FT	1.3416	(1.0730, 1.6775)

Odds ratio for level A relative to level B

2-year
graduation
model

Coefficients

Term	Coef	SE Coef	Z-Value	P-Value	VIF
Constant	-4.027	0.496	-8.12	0.000	
AGE_AT_MATRIC	-0.01193	0.00509	-2.34	0.019	1.44
TRANSFER_CREDIT_HOURS	0.00558	0.00243	2.30	0.022	1.16
TRANSFER_UG_GPA	-0.0460	0.0977	-0.47	0.638	1.23
First Year Attemptd Hrs	-0.0806	0.0157	-5.13	0.000	8.72
First Year Earned Hrs	0.2346	0.0132	17.78	0.000	5.55
First Year GPA	0.6969	0.0810	8.61	0.000	1.55
Degree_Title					
1	-0.0247	0.0836	-0.30	0.767	1.10
NCCCS_TRANSFER_IND					
Y	0.230	0.120	1.91	0.056	1.55
UNC_TRANSFER_IND					
Y	-0.139	0.181	-0.77	0.441	1.48
CHANGED_MAJOR					
Y	-0.054	0.120	-0.45	0.651	1.07
STEM_MAJOR					
Y	-0.0667	0.0910	-0.73	0.464	1.06
FIN_AID_RECEIVED					
Y	-0.266	0.406	-0.66	0.511	20.67
NEED_BASED					
Y	0.232	0.403	0.58	0.564	20.95
MERIT					
Y	-0.222	0.221	-1.01	0.314	1.19
PELL					
Y	-0.264	0.103	-2.57	0.010	1.73
LOAN					
Y	-0.021	0.109	-0.19	0.848	1.93
FT_PT_Correction					
PT	0.448	0.147	3.05	0.002	3.56

Odds Ratios for Continuous Predictors

	Odds Ratio	95% CI
AGE_AT_MATRIC	0.9881	(0.9783, 0.9981)
TRANSFER_CREDIT_HOURS	1.0056	(1.0008, 1.0104)
TRANSFER_UG_GPA	0.9550	(0.7886, 1.1566)
First Year Attemptd Hrs	0.9225	(0.8945, 0.9514)
First Year Earned Hrs	1.2644	(1.2321, 1.2975)
First Year GPA	2.0074	(1.7129, 2.3527)

Odds Ratios for Categorical Predictors

Level A	Level B	Odds Ratio	95% CI
Degree_Title			
1	0	0.9756	(0.8281, 1.1493)
NCCCS_TRANSFER_IND			
Y	N	1.2590	(0.9945, 1.5938)
UNC_TRANSFER_IND			
Y	N	0.8699	(0.6105, 1.2397)
CHANGED_MAJOR			
Y	N	0.9473	(0.7494, 1.1975)
STEM_MAJOR			
Y	N	0.9355	(0.7826, 1.1182)
FIN_AID_RECEIVED			
Y	N	0.7662	(0.3459, 1.6969)
NEED_BASED			
Y	N	1.2617	(0.5728, 2.7795)
MERIT			
Y	N	0.8006	(0.5191, 1.2348)
PELL			
Y	N	0.7678	(0.6279, 0.9390)
LOAN			
Y	N	0.9794	(0.7917, 1.2116)
FT_PT_Correction			
PT	FT	1.5656	(1.1733, 2.0892)

Odds ratio for level A relative to level B

4-year
graduation
model

Best practices for transfer student success according to researchers in this area

Advising to help students create degree plans, avoid credit loss, & set realistic expectations	Mandatory targeted orientation programs	Bridge and integration programs	Collaboration with two-year community colleges	Positive interactions with faculty
Scholarships specifically for transfer students	Opportunities for socialization	Financial advising	Faculty and/or peer mentoring	Research internships
Cohorts to help build social support networks	Service learning	Dual enrollment	Transfer student "Center"	Student success courses specifically designed for transfer students

Smith, Sturtevant, & Bullough (2021)

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