

Exploring Undergraduate Transfer Student Pathways and Success in Microbiology

Jennifer Drew, Alexandria Ardissonne and Eric Triplett

UF | **IFAS CALS**
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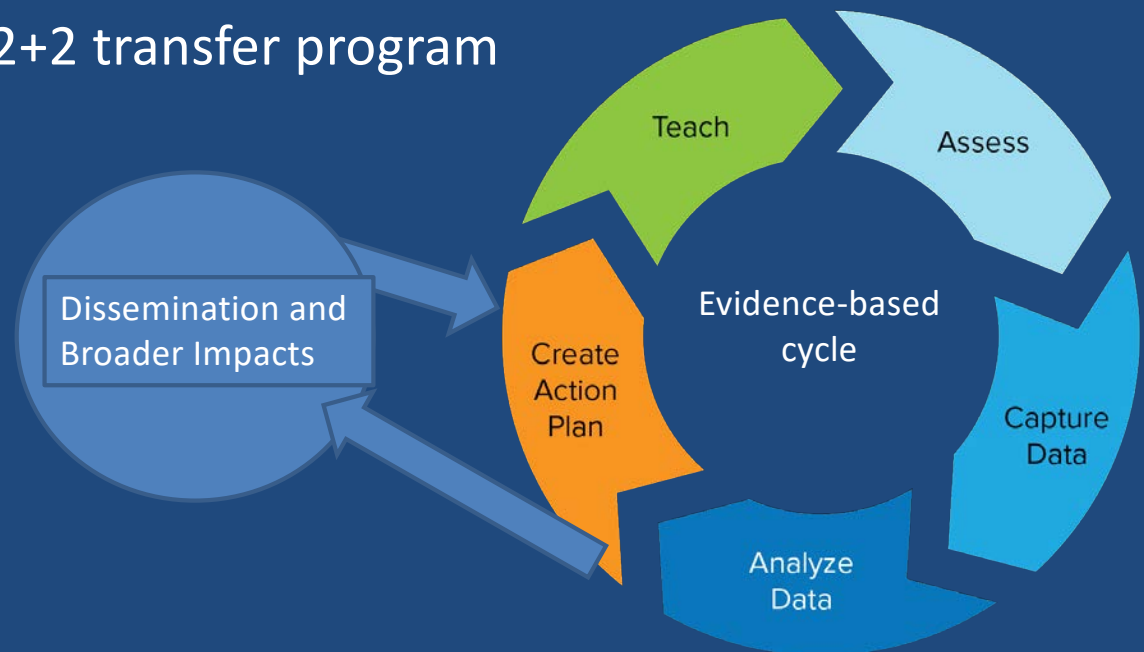


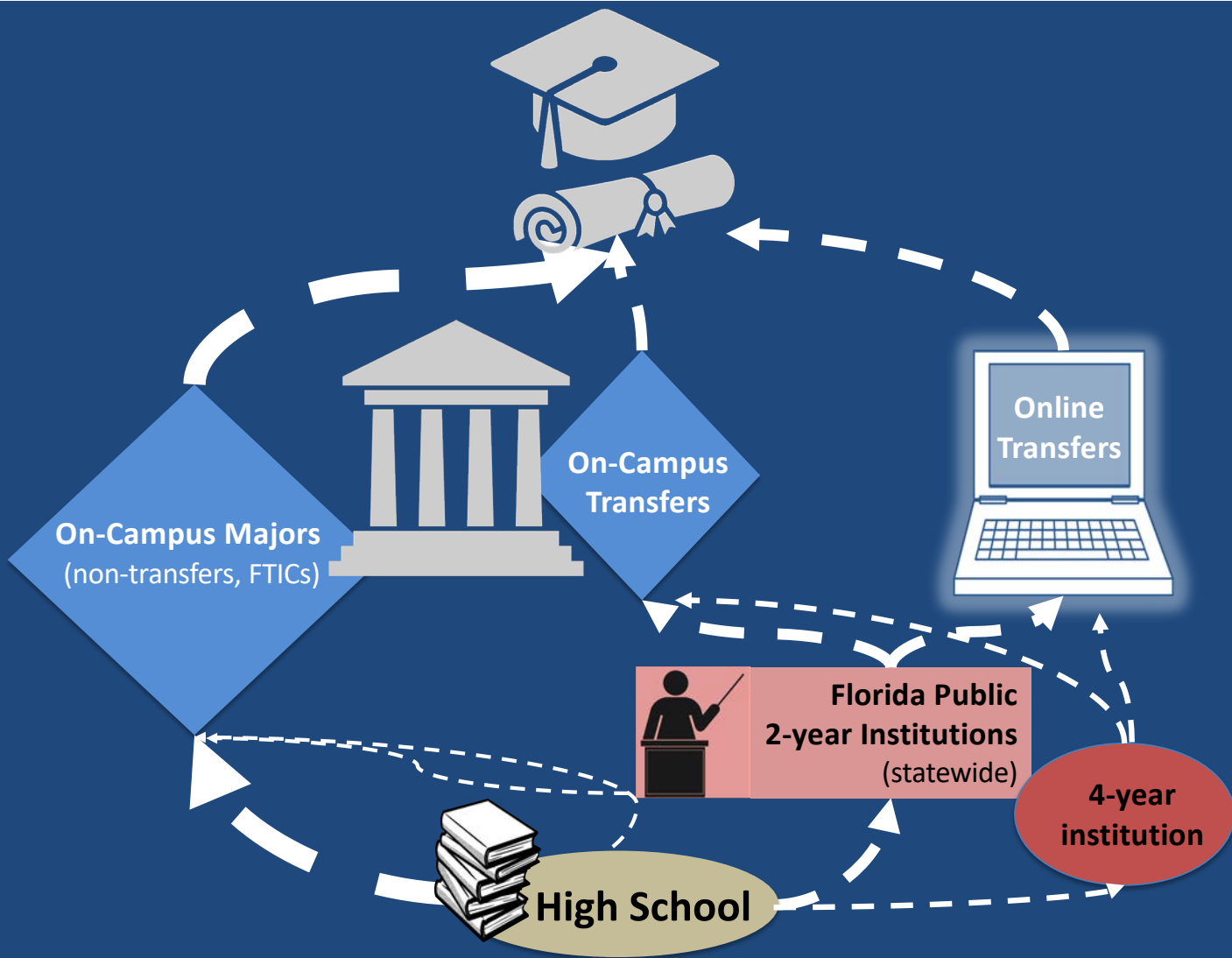
FLORIDA PATHWAYS
TRANSFER STUDENT
SCHOLARSHIPS

MICROBIOLOGY
& CELL SCIENCE

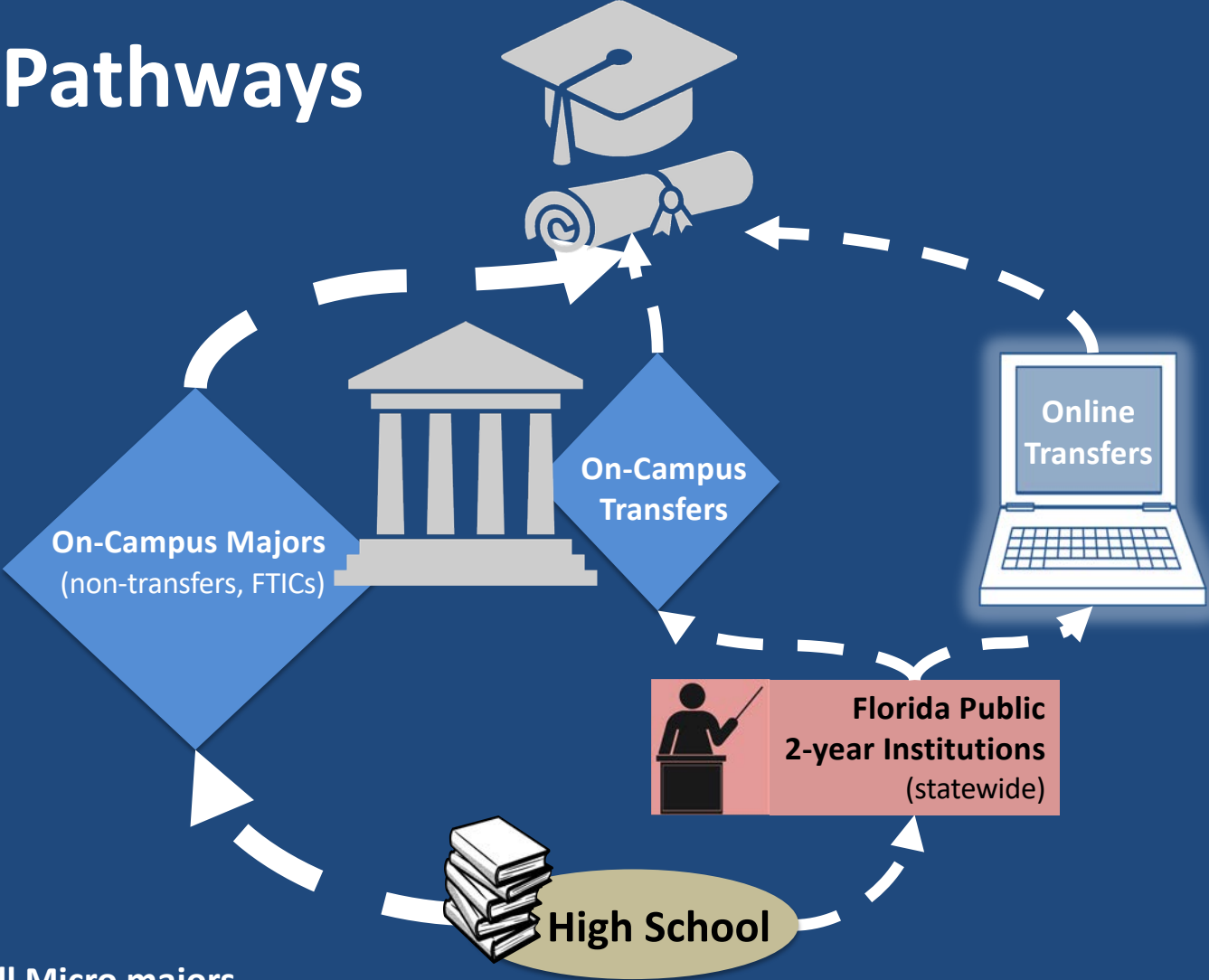
Our Aim Today

- Model our process of connecting to STEM
- Our connection is to increase access, participation, and success in STEM
- Understand the **transfer pathways** in STEM
- Micro online and on-campus 2+2 transfer program





3 Main Pathways



Captures 86% of all Micro majors

2-Year Public Institution to 4-Year Institution

TRANSFER STUDENTS

2+2 Transfer Students

- Challenging to analyze – collection of data, metrics
- Diverse students with unique challenges of their own
- Transfer gap – 13% of students who start an A.A. program earn a B.S. in 6 years
- Lower retention than their FTIC peers
- Transfer gap is wider for URM students:
 - > 50% of Latino 2-yr students are interested in B.S. degree, only 6% complete within 6 years

2+2 Students

Diversity and Challenges

- ✓ Women
- ✓ URM
- ✓ Lower income
- ✓ Working adults
- ✓ Financially independent
- ✓ Veterans
- ✓ Parents

2+2 Students

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Nontraditional Students
(or Adult Learners)

Nontraditional Students

- 24 years or older
- Part-time enrollment
- Financially independent
- Fulltime employment (> 35 hr per week)
- Have dependents (younger or older)
- Single parents
- GED instead of HS diploma

Nontraditional Students

- 24 years or older
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- GED instead of HS diploma
- **Up to 75% of all B.S. seeking students are nontraditional**
- **6-year completion rate is 48.9% for nontraditional (vs. 64.7% for traditional)**
- **Policies and models designed for traditional students**

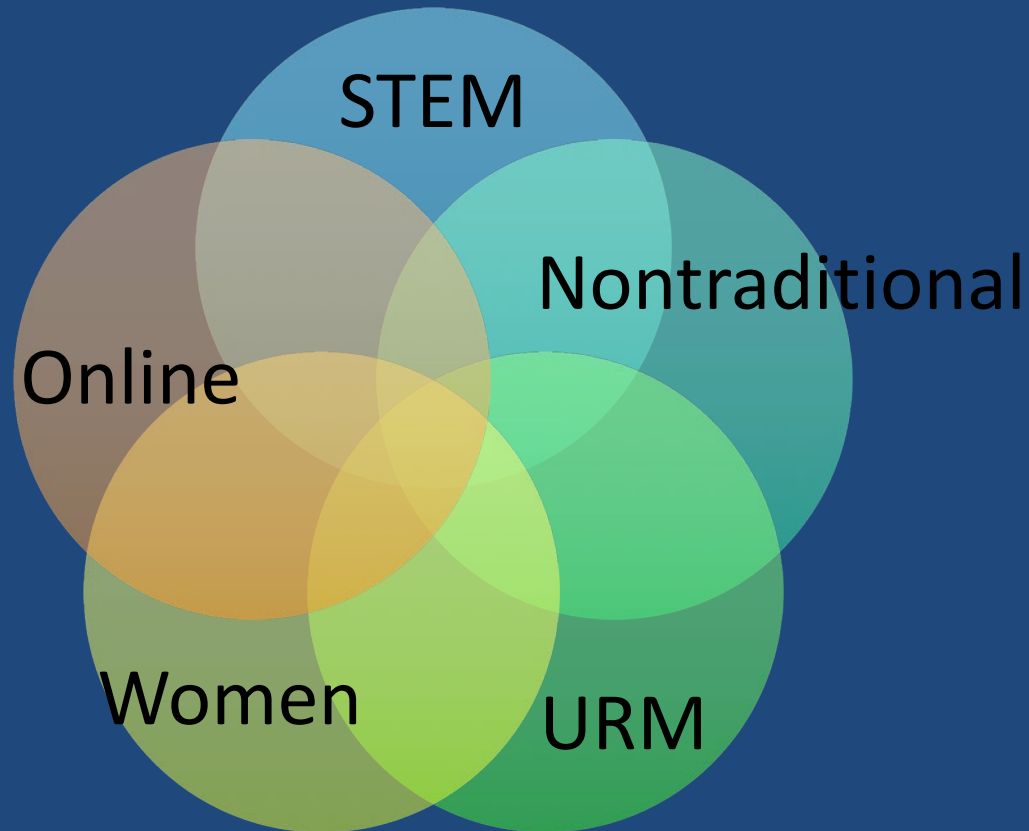
Role of Online Education

- Increases accessibility and broadens participation in general, but especially for nontraditional students?
- Expanding reach beyond our own borders and collaborating with community colleges
- Retention is lower than on-campus face-to-face programs

Challenges and Gaps for STEM

- 40% with a STEM B.S. have attended a community college
- 20% with a STEM B.S. transferred from a 2-year institution into 4-year program
- Lower retention and higher attrition than non-transfer peers
- URM in STEM have lower completion rates
- Difficult to study because of lack of resources, consistent reporting
- Gap in research of understanding 2+2 pathway
- National call for new pathways and entry points for STEM

Gaps in Understanding Pathways



Microbiology and Cell Science

MCS HYBRID ONLINE 2+2 TRANSFER PROGRAM

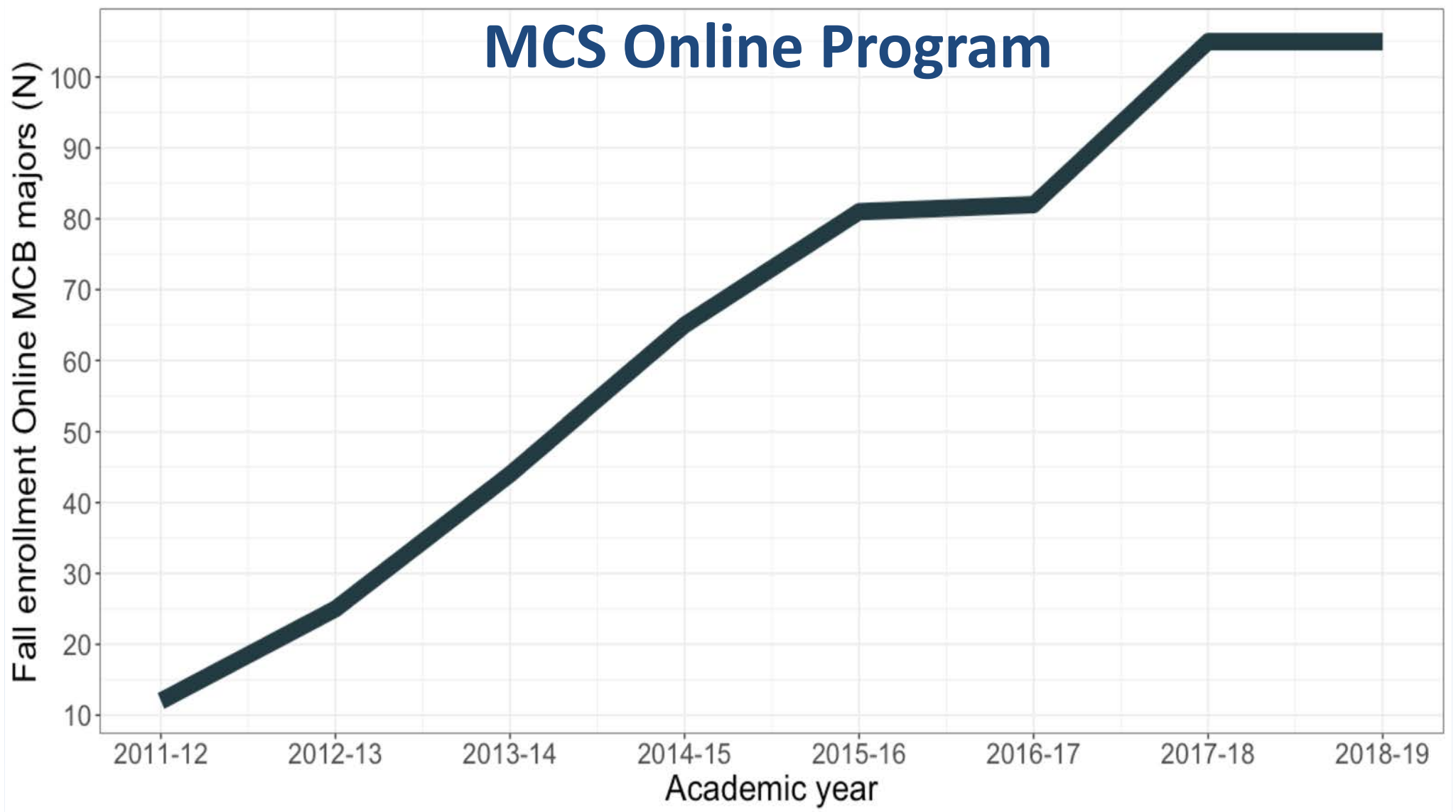


Think
big

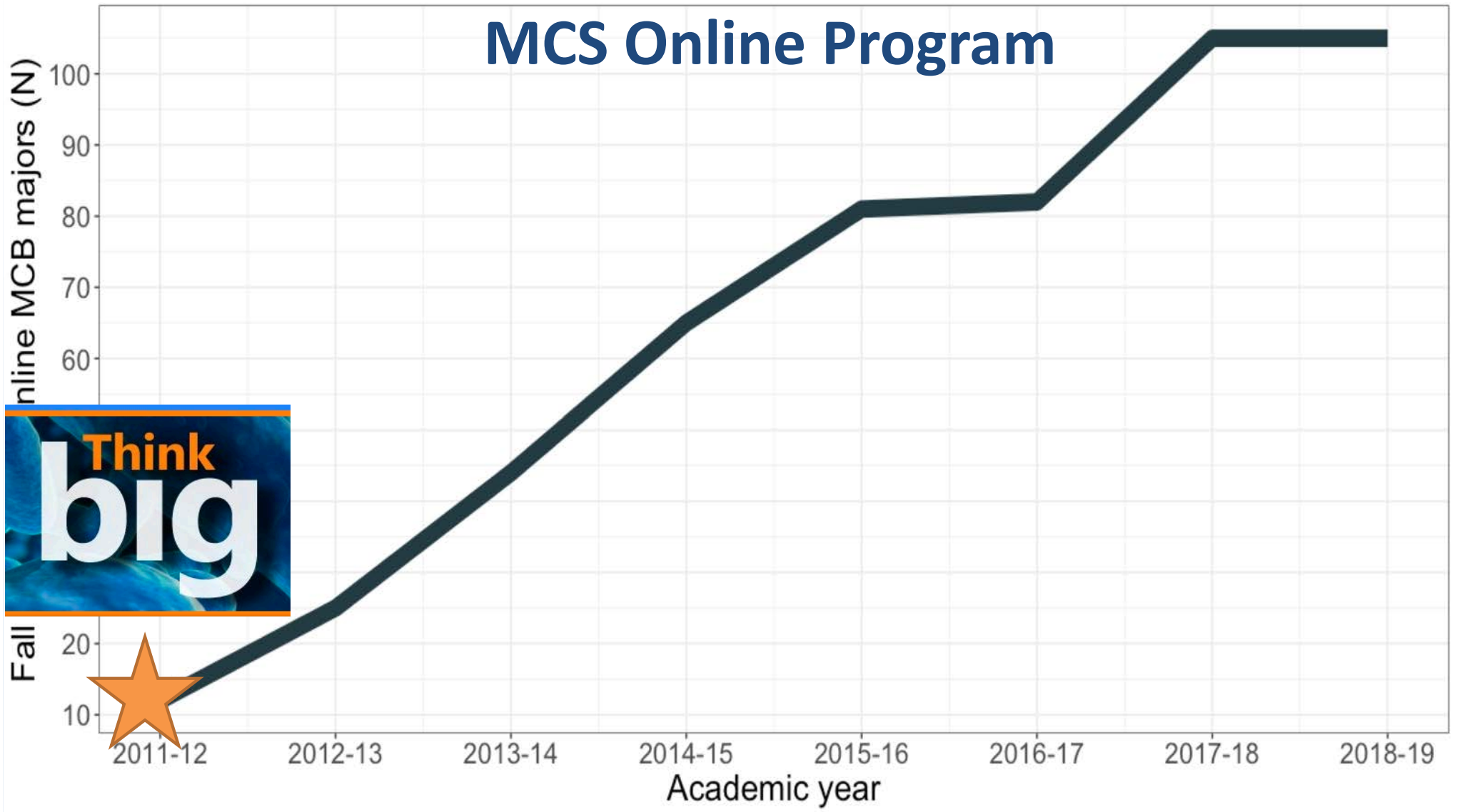
Online Bachelor of Science in
Microbiology & Cell Science

- 1st hybrid online STEM degree offered by a land-grant institution
- 2-yr students transfer into 4-yr program without relocating
- Courses, curriculum, and instructors are the same as on-campus program
- Began with Miami Dade College, largest minority-serving institution in the country and expanded statewide
- All lecture courses are online
- **ALL LAB COURSES ARE FACE-TO-FACE**

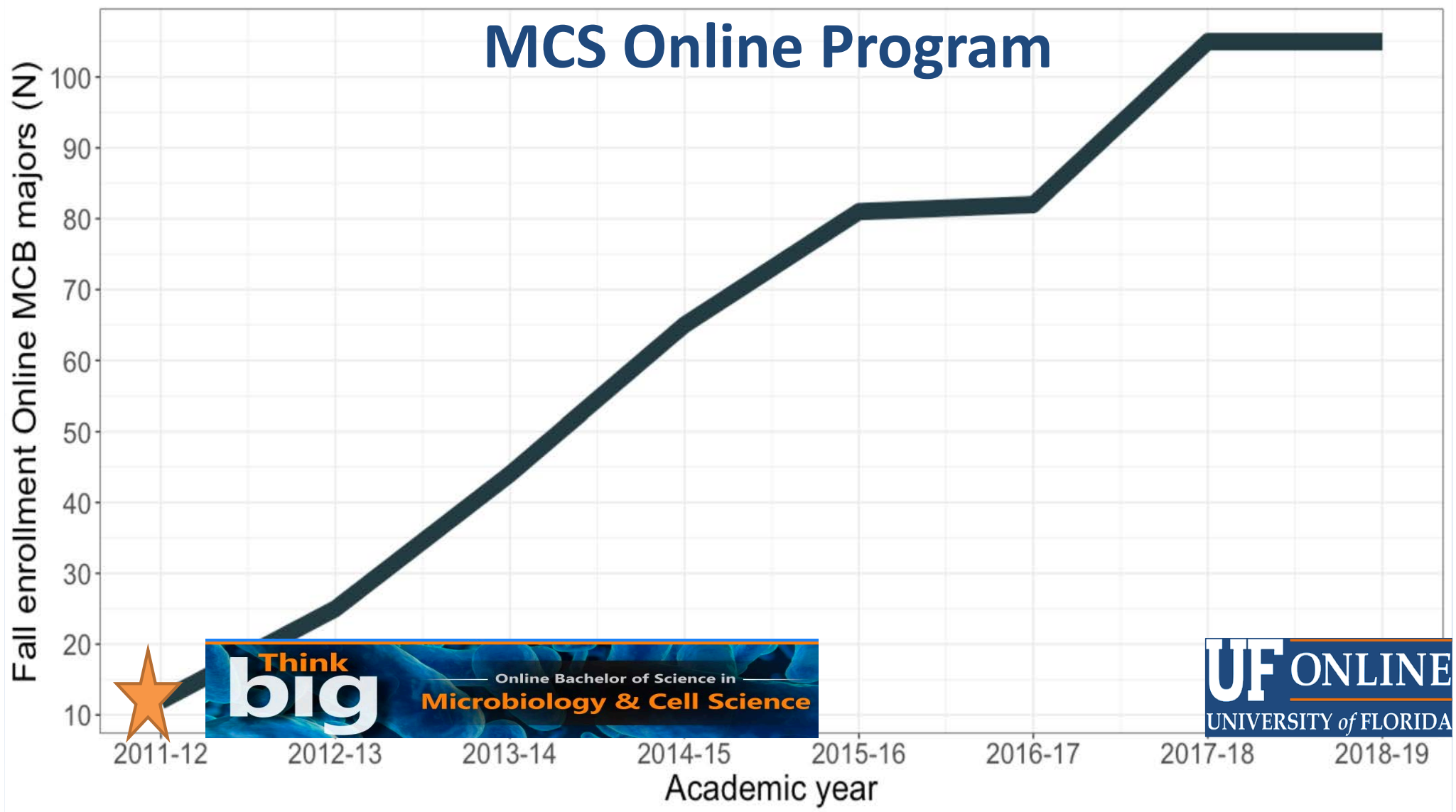
MCS Online Program



MCS Online Program



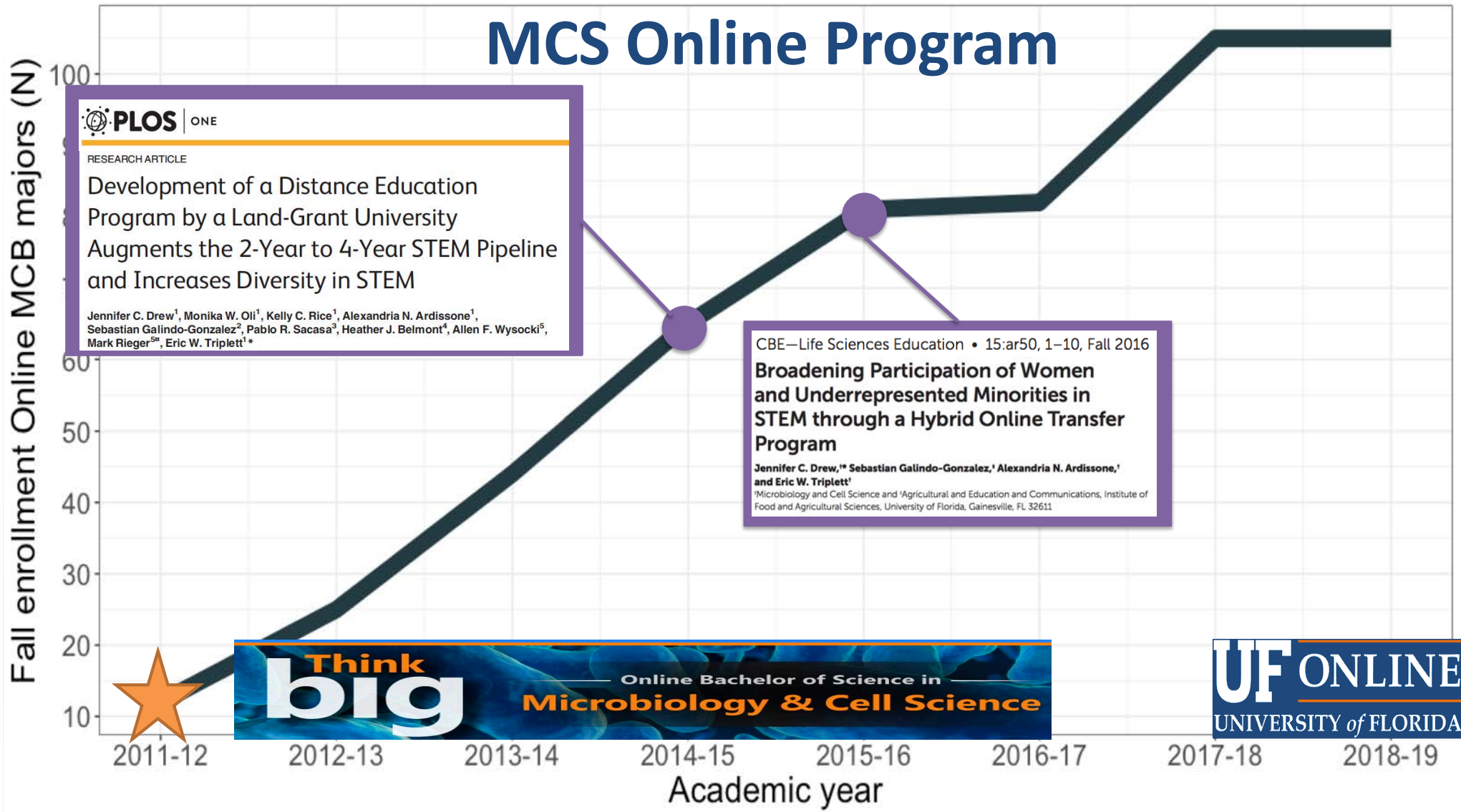
MCS Online Program



Think big
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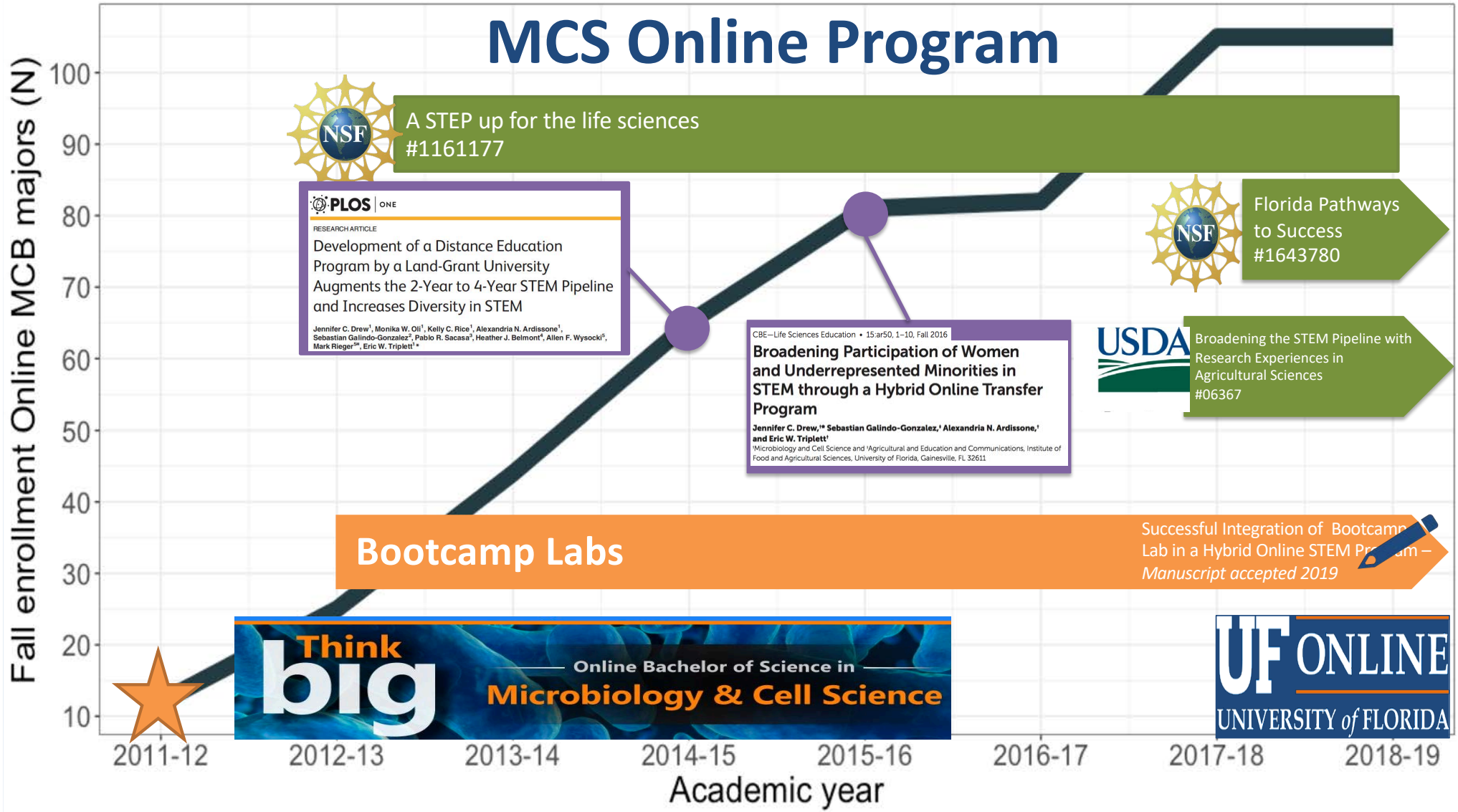
MCS Online Program



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Microbiology & Cell Science

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MCS Online Program



A STEP up for the life sciences
#1161177



RESEARCH ARTICLE
Development of a Distance Education Program by a Land-Grant University Augments the 2-Year to 4-Year STEM Pipeline and Increases Diversity in STEM

Jennifer C. Drew¹, Monika W. Oll¹, Kelly C. Rice¹, Alexandria N. Ardissone¹, Sebastian Galindo-Gonzalez², Pablo R. Sacasa², Heather J. Belmont², Allen F. Wysocki², Mark Rieger^{2*}, Eric W. Triplett^{1*}

CBE—Life Sciences Education • 15:ar50, 1–10, Fall 2016

Broadening Participation of Women and Underrepresented Minorities in STEM through a Hybrid Online Transfer Program

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Florida Pathways to Success
#1643780



Broadening the STEM Pipeline with Research Experiences in Agricultural Sciences
#06367

Bootcamp Labs

Successful Integration of Bootcamp Lab in a Hybrid Online STEM Program – Manuscript accepted 2019

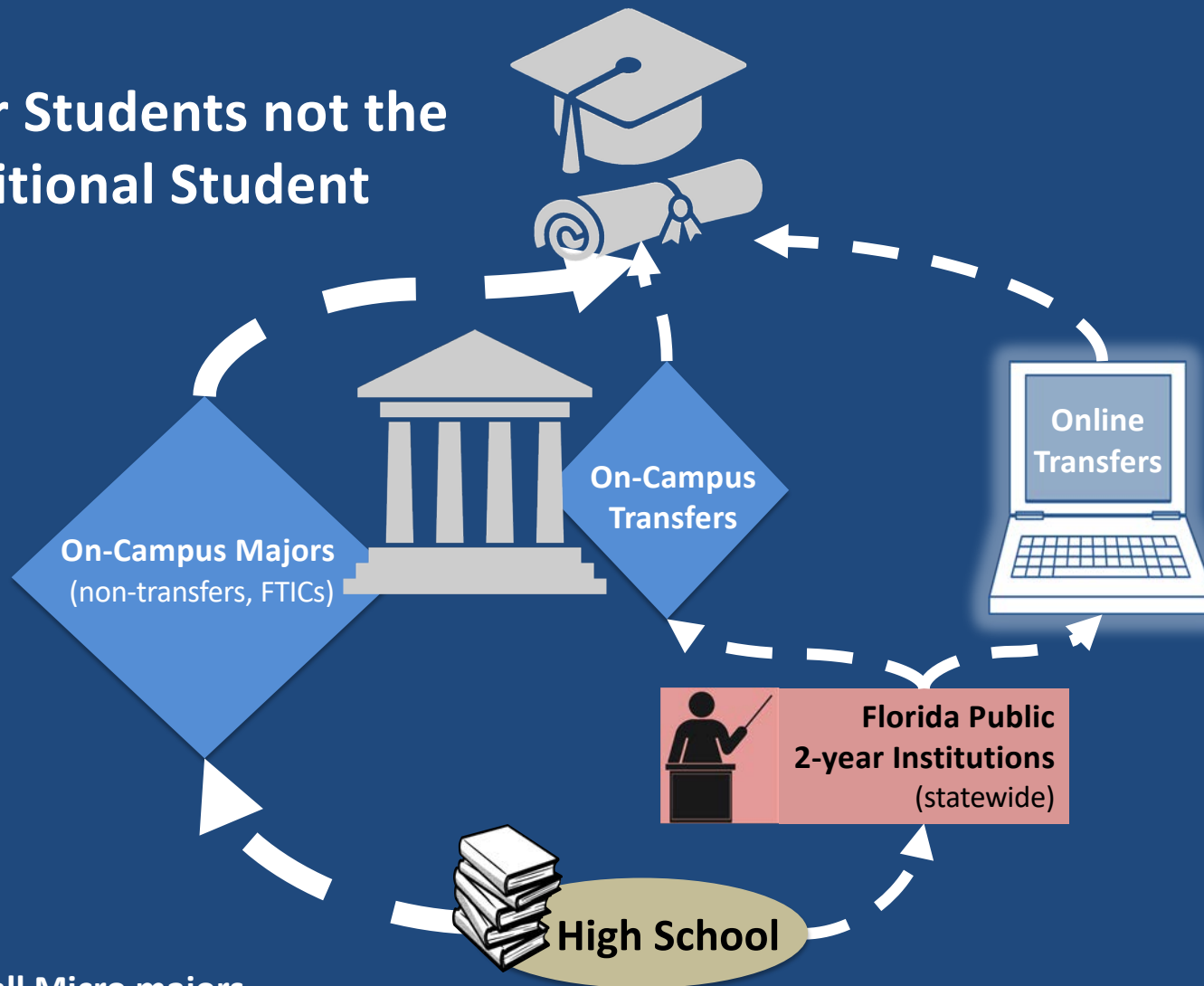
Think big

Online Bachelor of Science in Microbiology & Cell Science

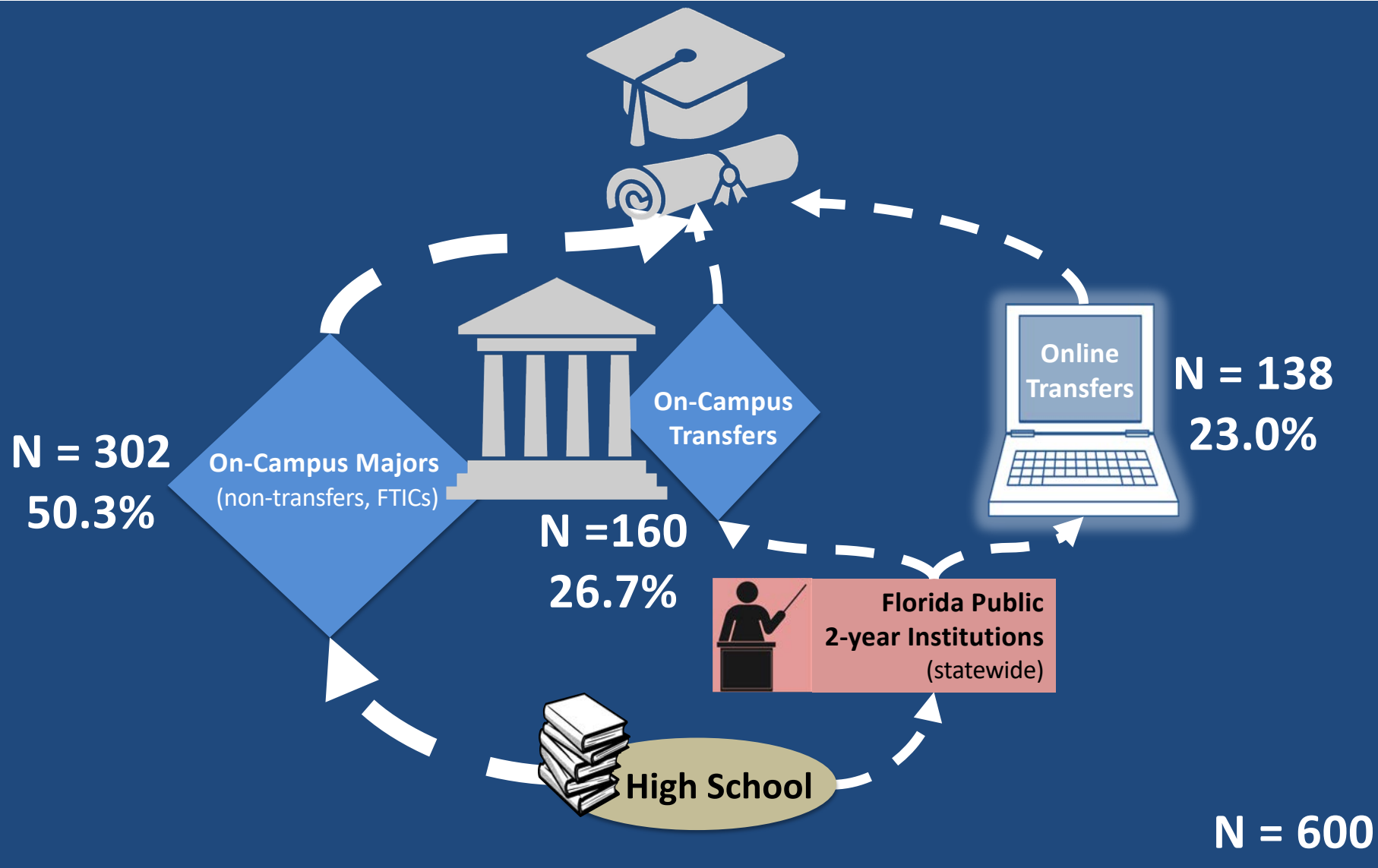
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MULTIPLE PATHWAYS

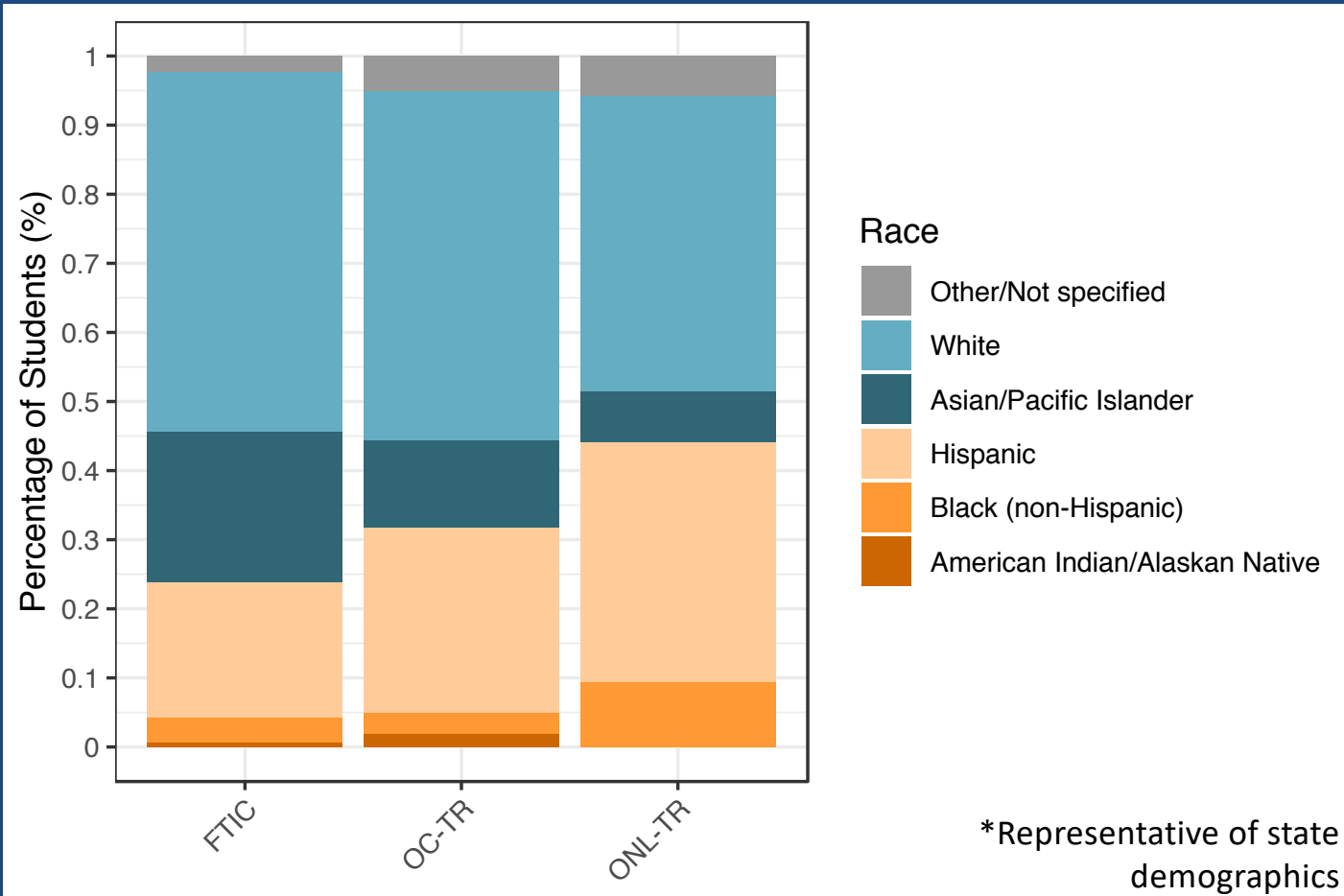
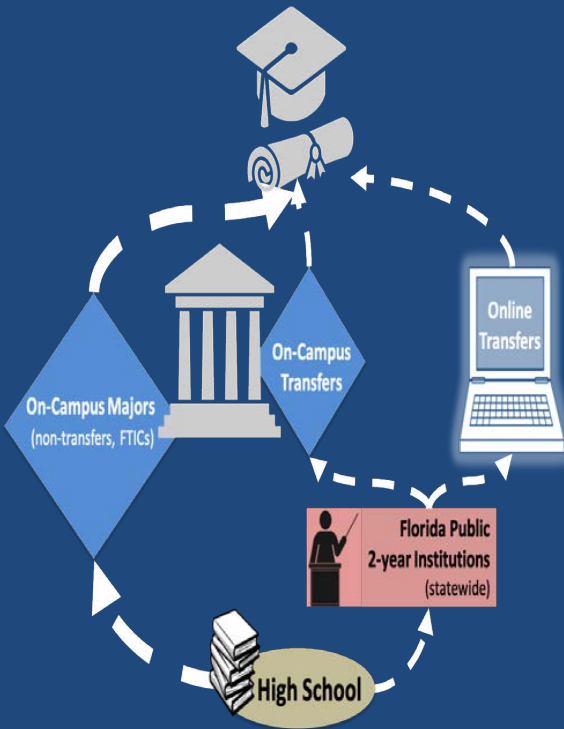
Transfer Students not the Traditional Student



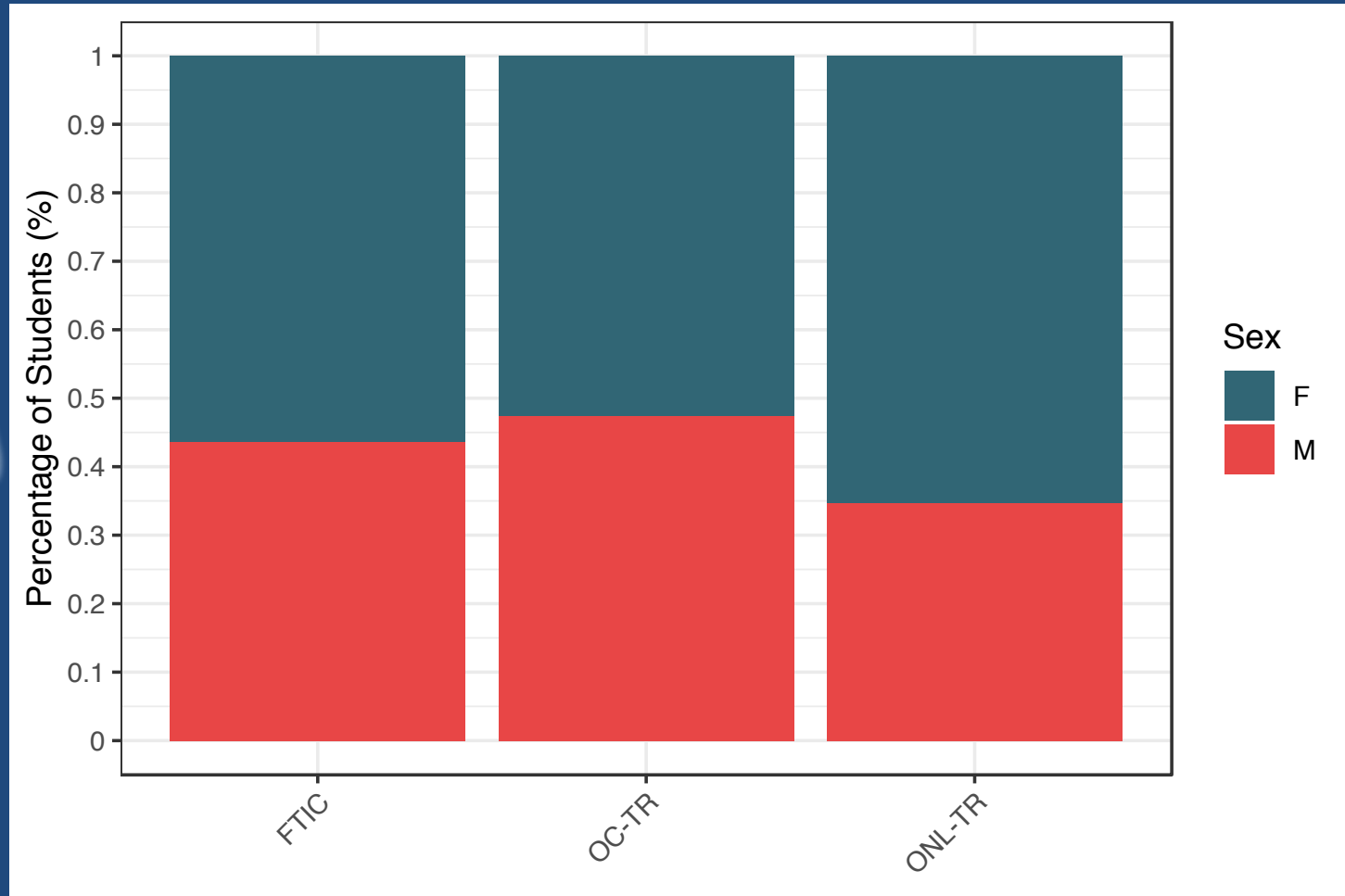
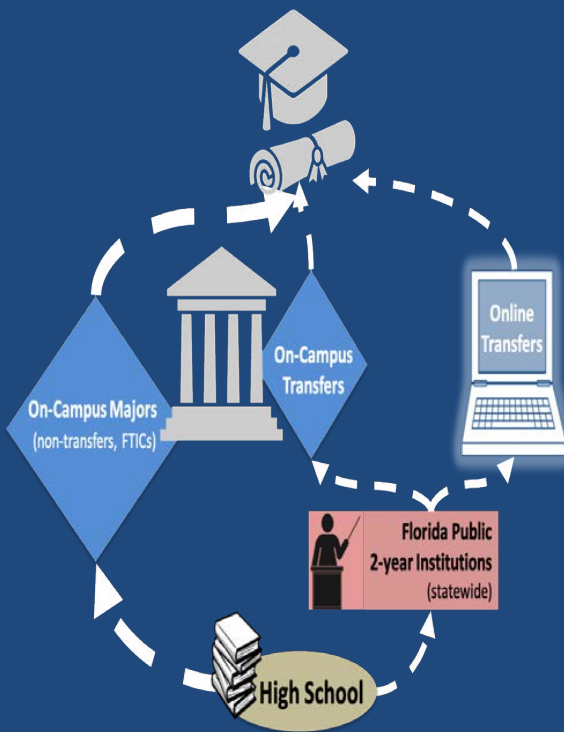
Captures 86% of all Micro majors



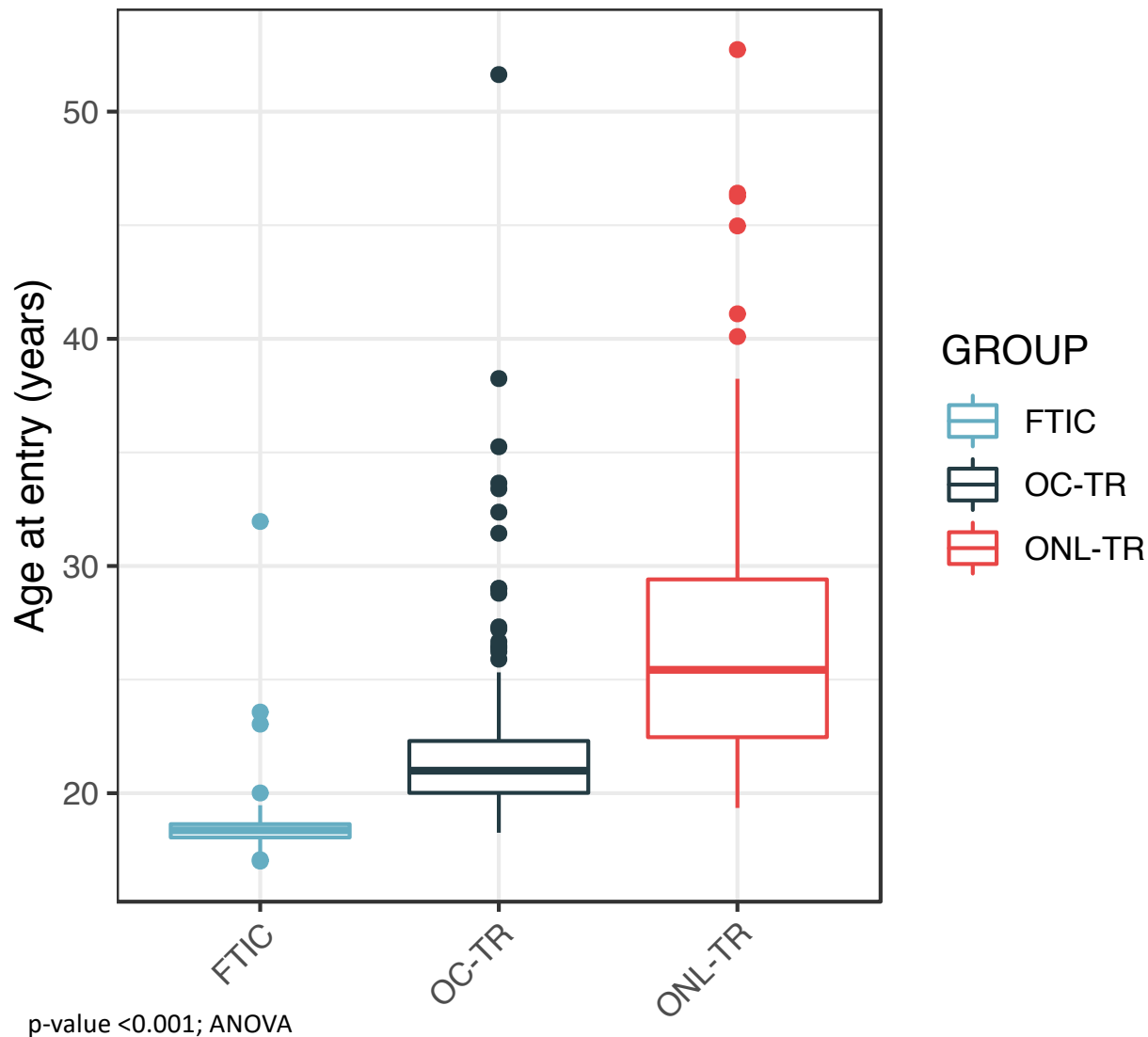
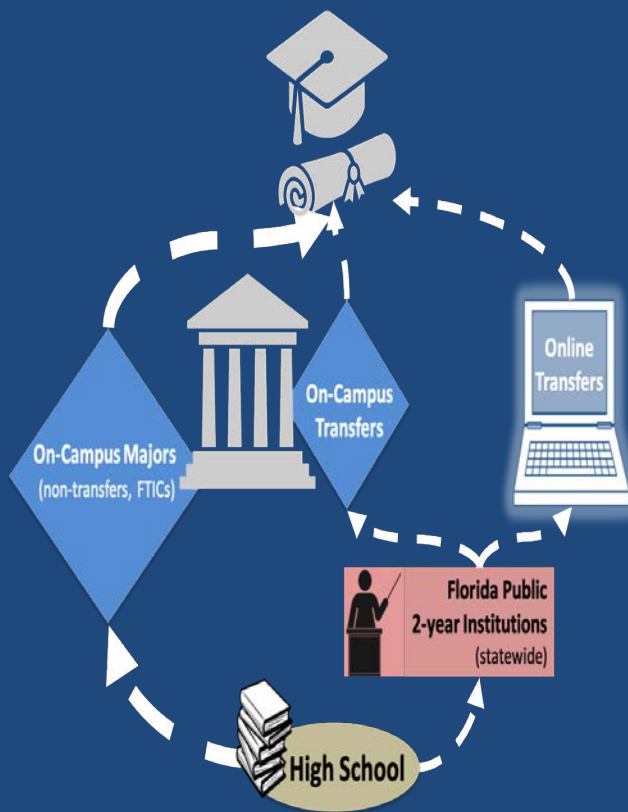
Transfer students, particularly online, are more diverse



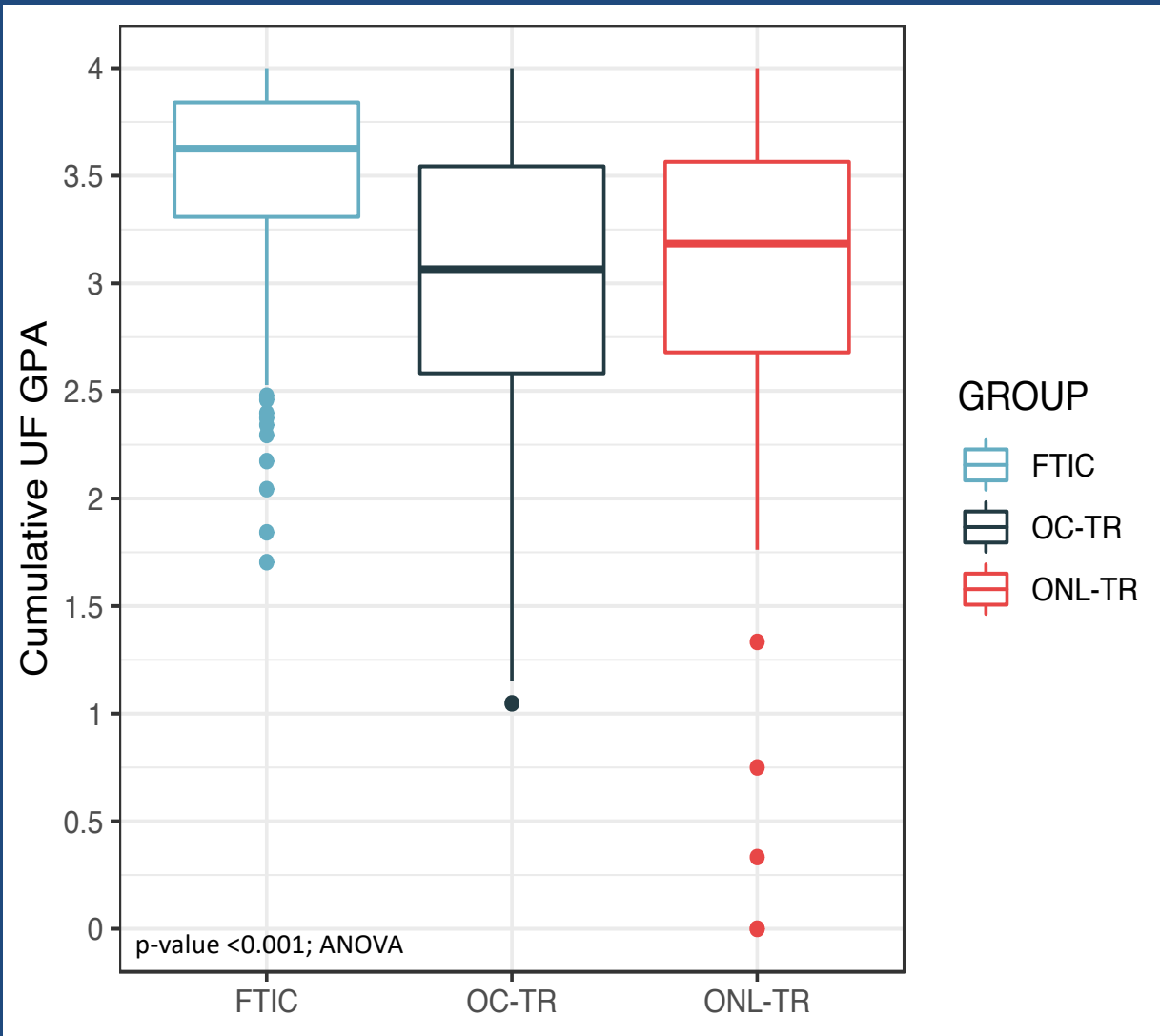
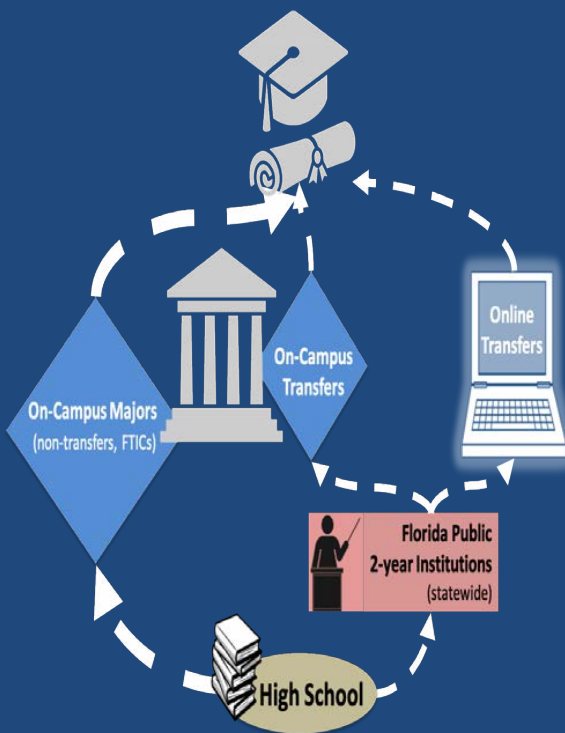
All pathways enroll more women than men



Transfer students are older. More nontraditional students in transfer cohorts

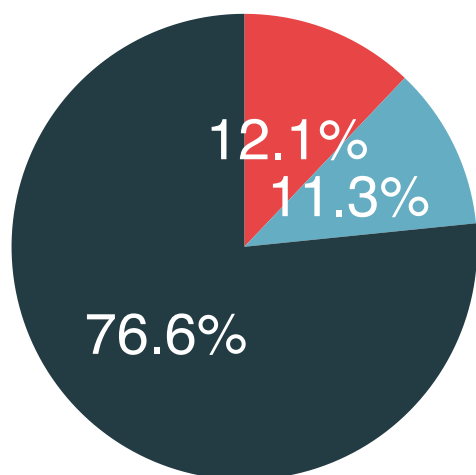


First time students (non-transfers) have higher GPA than transfer students

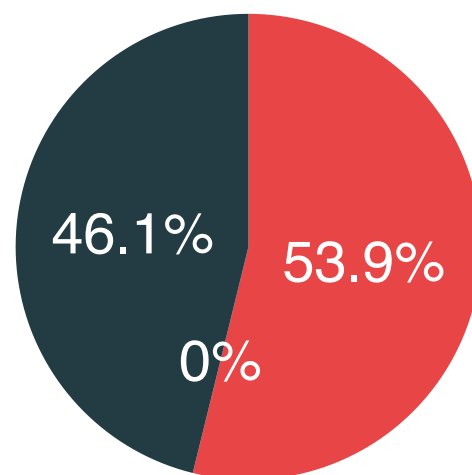


Transfer students have lower retention

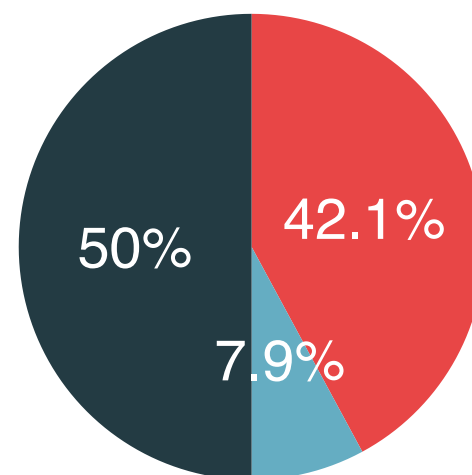
FTIC (N=124)



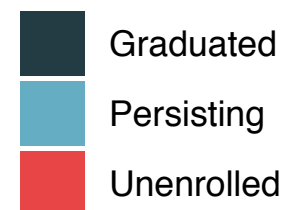
On-campus TR (N=65)



Online TR (N=38)



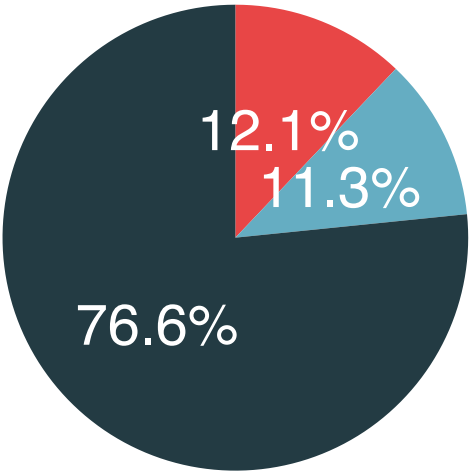
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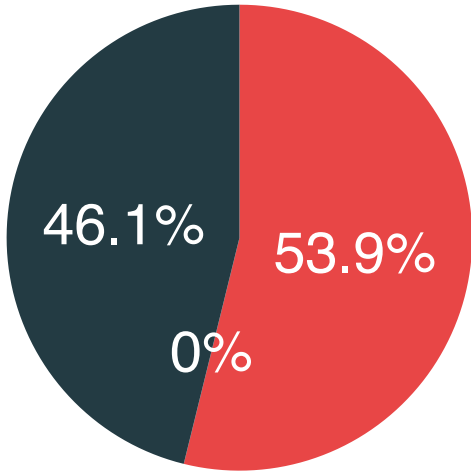
*4 year retention rates

Who is retained?

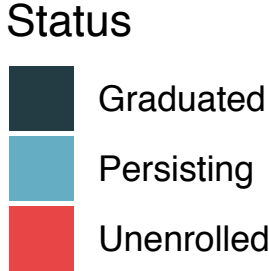
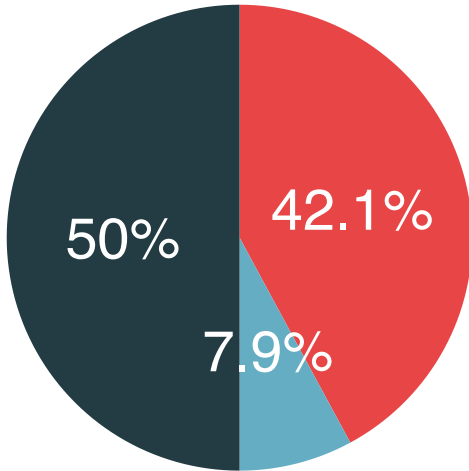
FTIC (N=124)



On-campus TR (N=65)

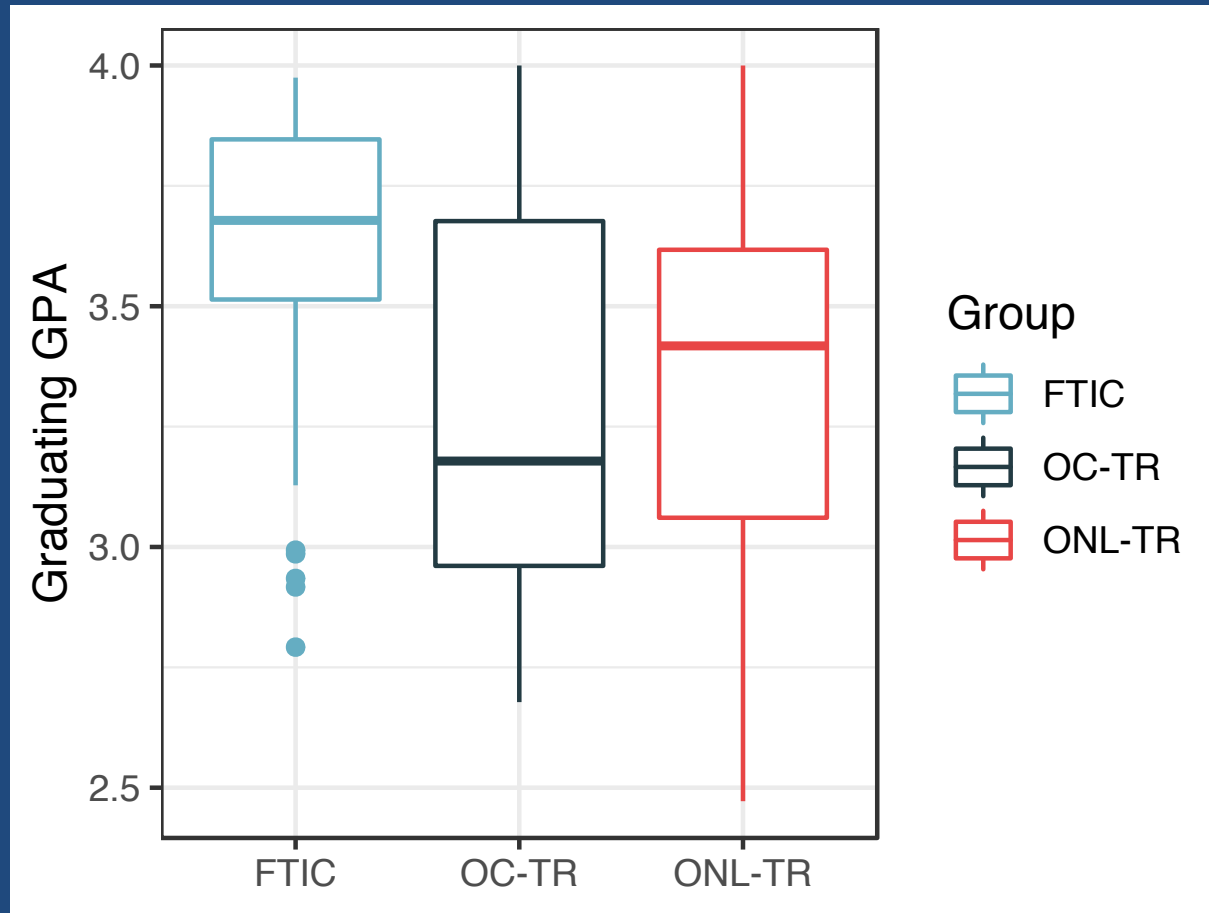


Online TR (N=38)



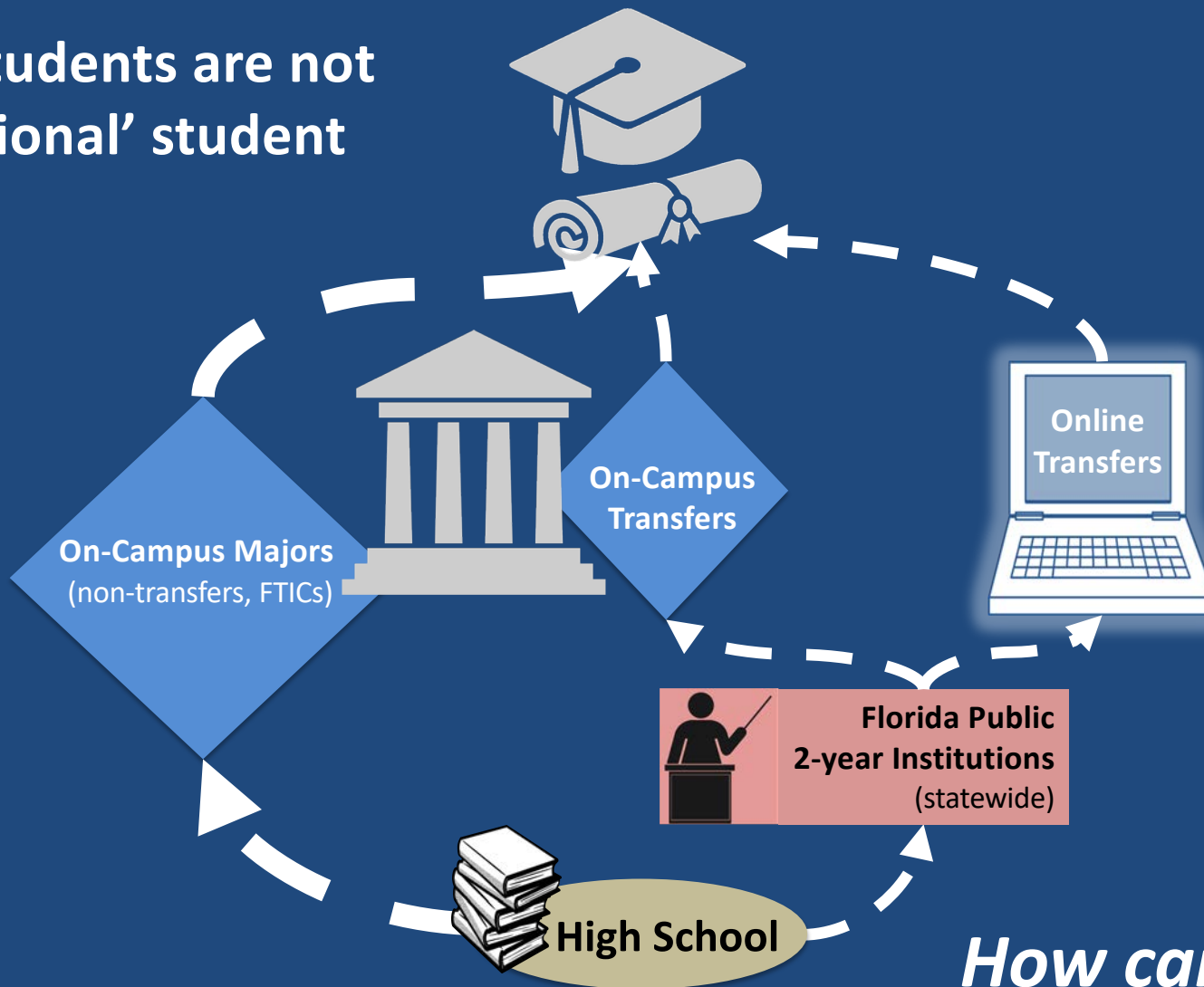
17%	30%	42%	URM
54%	30%	58%	Women
14%	10%	26%	URM Women

Transfer Students graduate with lower GPA



Transfer students are not the 'traditional' student

more diverse
more women
older
lower GPA
lower retention



How can we help?

Florida Pathways S-STEM Initiative

- NSF Award in 2017
- Miami Dade College is partner
- Providing substantial need-based scholarships to **full-time** transfer students (on-campus or online)
- Intention is to decrease time to degree, enhance success, increase retention, decrease debt and loans
- Provides research and other student support activities
- Research aim - study the multiple STEM 2+2 transfer pathways – predictors of success, design intelligent interventions



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**FLORIDA PATHWAYS
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SCHOLARSHIPS**

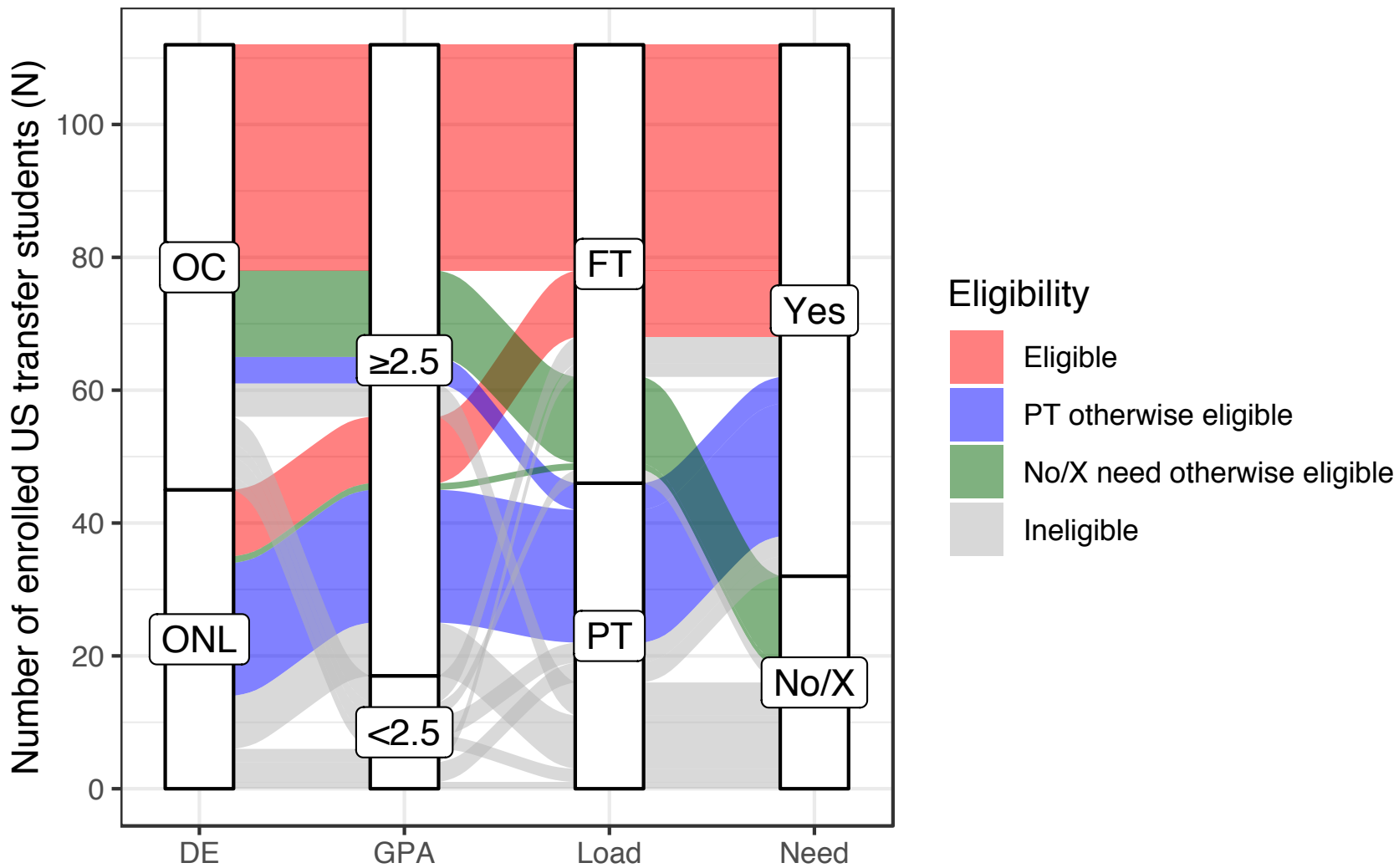
**MICROBIOLOGY
& CELL SCIENCE**

Eligibility Criteria:

- 1. Be a University of Florida, College of Agricultural and Life Sciences, Microbiology and Cell Science (MCB) undergraduate major who transferred with an A.A. from a 2-yr degree-granting Florida state college. Students who meet this criteria can be enrolled in the online or on-campus transfer tracks.**
- 2. Be a US citizen, permanent resident, national or refugee at the time of application submission as stipulated by NSF.**
- 3. Have a minimum GPA of 2.5.**
- 4. Be enrolled full-time (12 credits).**
- 5. Demonstrate financial need based on the FAFSA.**

**ONLY CAPTURING 39% OF ELIGIBLE TRANSFER
STUDENTS. WHY?**

Spring 2019



Needs Assessment

112

Spring 2019 US
Transfer Students (J)

On-Campus

Online

67

US Citizens

45

84% remaining, 16% lost

56

GPA ≥ 2.5

39

87% remaining, 13% lost

70% remaining, 13% lost

47

Full-time (≥ 12 credits)

11

24% remaining, 62% lost

51% remaining, 19% lost

34

Financial Need

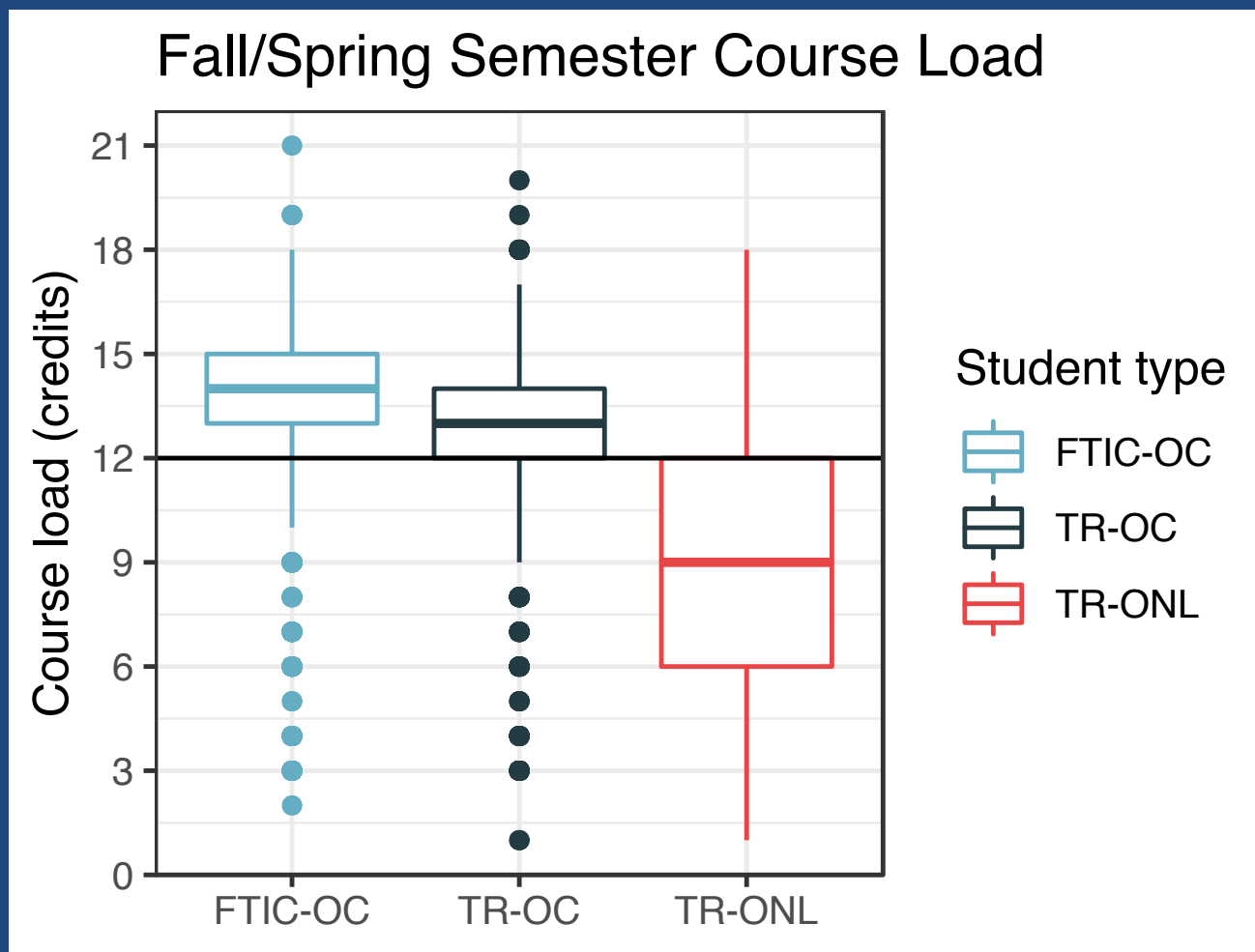
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22% remaining, 2% lost

Key Findings:

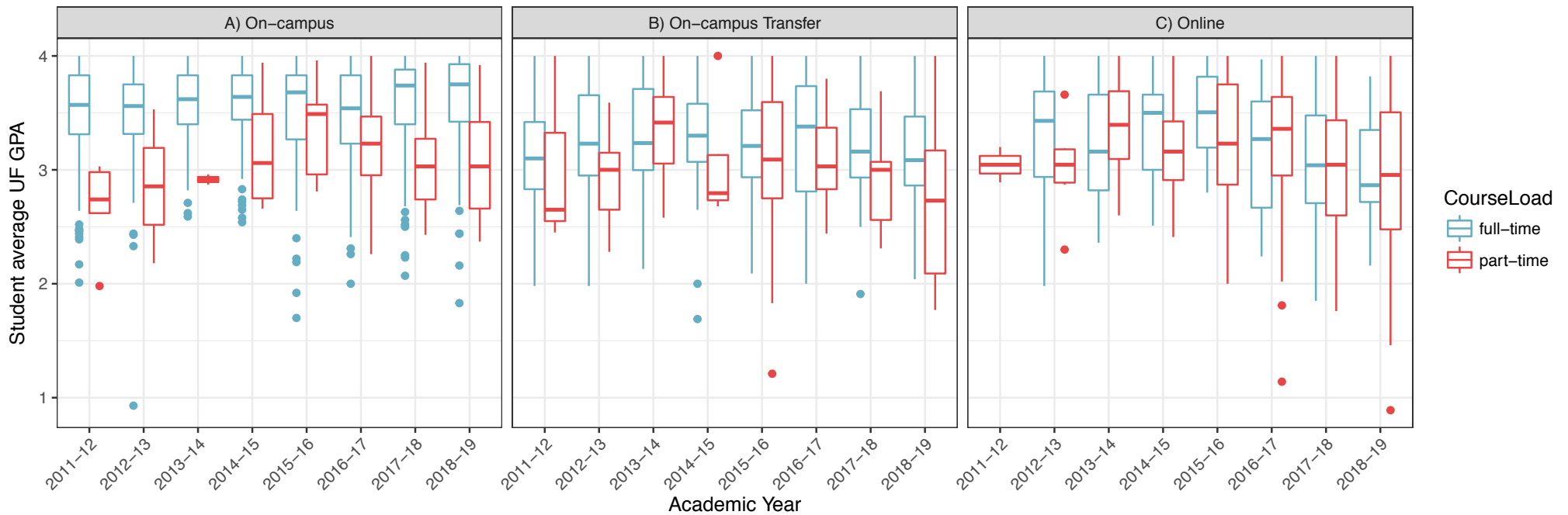
- Only 39% (N=44) of the MCB transfer student population met all eligibility criteria to receive an S-STEM award Spring 2019
- The proportion of eligible on-campus transfer students is more than two-fold higher than that of online students (p value < 0.05)
- 44% of online transfer students are ineligible to receive an S-STEM award solely due to enrollment status (< 12 credits).
- 12% of S-STEM scholars become ineligible because of part-time enrollment

Online Transfer students are primarily part-time

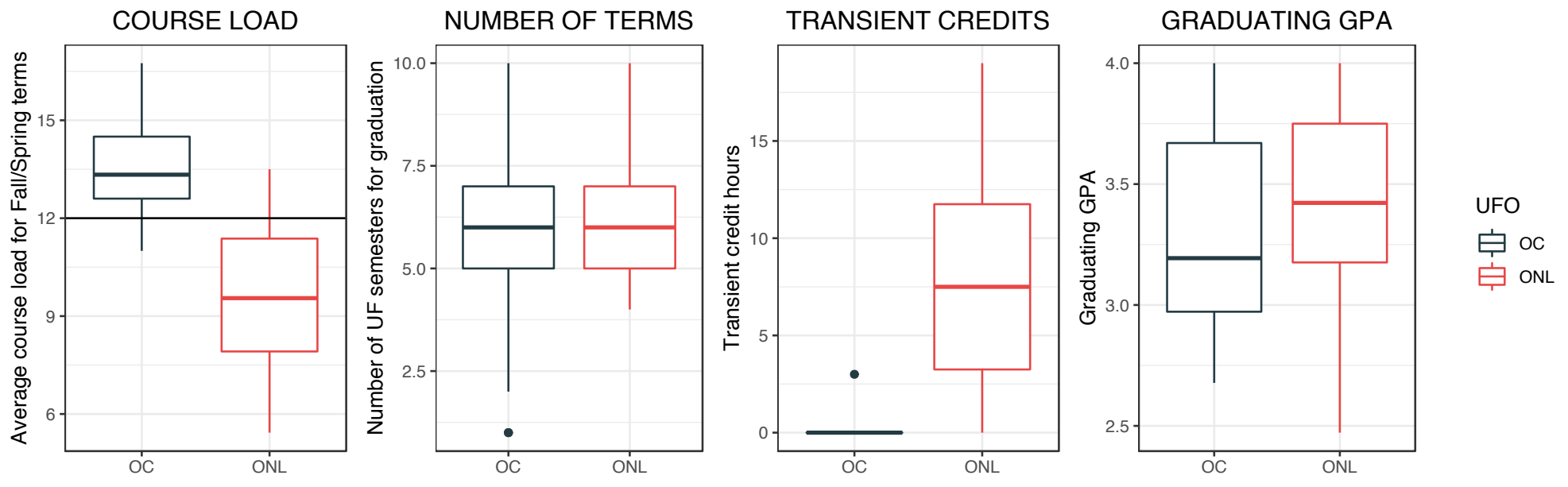


What about GPA?

- For on-campus students, GPA is associated with full-time status
- NOT the case for Online students



Part-time enrollment of online transfer students does not affect outcome.



Conclusions

- Online 2+2 transfer students 9X more likely to enroll <12 credits than on-campus counterparts...
- ...despite this, have higher retention.
- Both online and on-campus 2+2 completers have similar time-to-degree, but online 2+2 completers have higher GPA.
- At 4 years, over half of on-campus transfer students have left major, so there is definite room for improvement in both tracks of transfer students
- Nontraditional Students need nontraditional approaches

Next Steps

- Requesting policy change to reconsider the definition of full-time for online students and adjust the minimum course load criteria to 8 credits.
 - 10 additional online student could have been awarded, doubling the number of women and URM students.
- Allow transient courses taken by 2+2 transfer students to count towards total semester credits for full-time status
- Conduct a survey of all students to identify motivations for enrolling full- vs. part-time. (does the online structure post a barrier to full-time enrollment?)
- Further identify factors as predictors of success (including at the course level) to improve retention for both tracks of transfer students.

Long-term tracking & broader impact

- Gathering tracking data – where are they now?
 - Institutional resources (exit survey and clearinghouse)
 - External tracking service
- Develop in house surveys and methods – qualitative follow up with students who have graduated and left
- New and unexpected directions for STEM education research - bootcamp labs, better understanding traditional and nontraditional pathways

Acknowledgements

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Miami Dade College
Valencia College

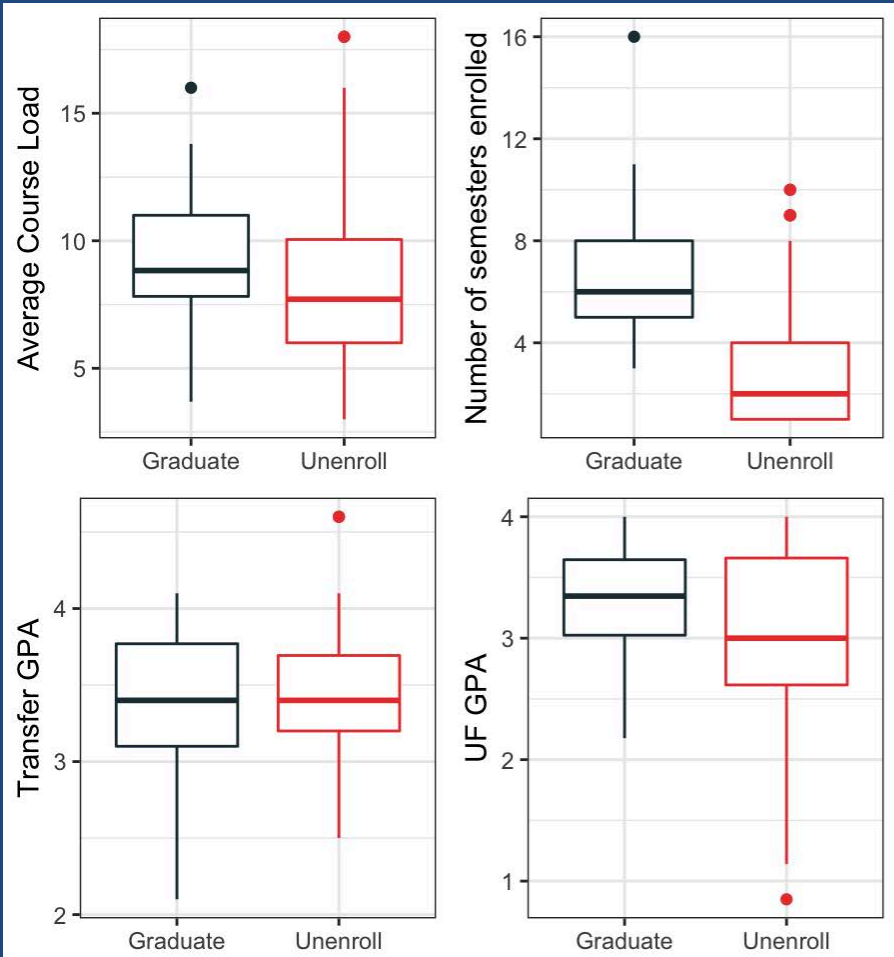
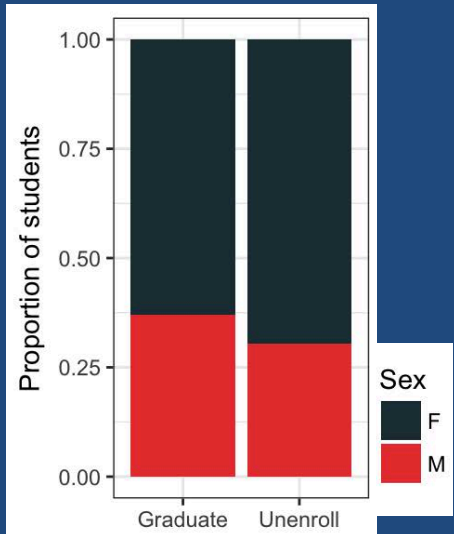
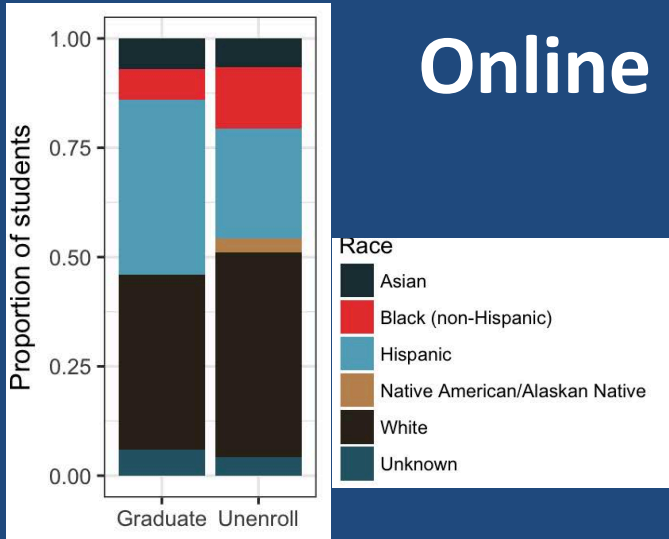


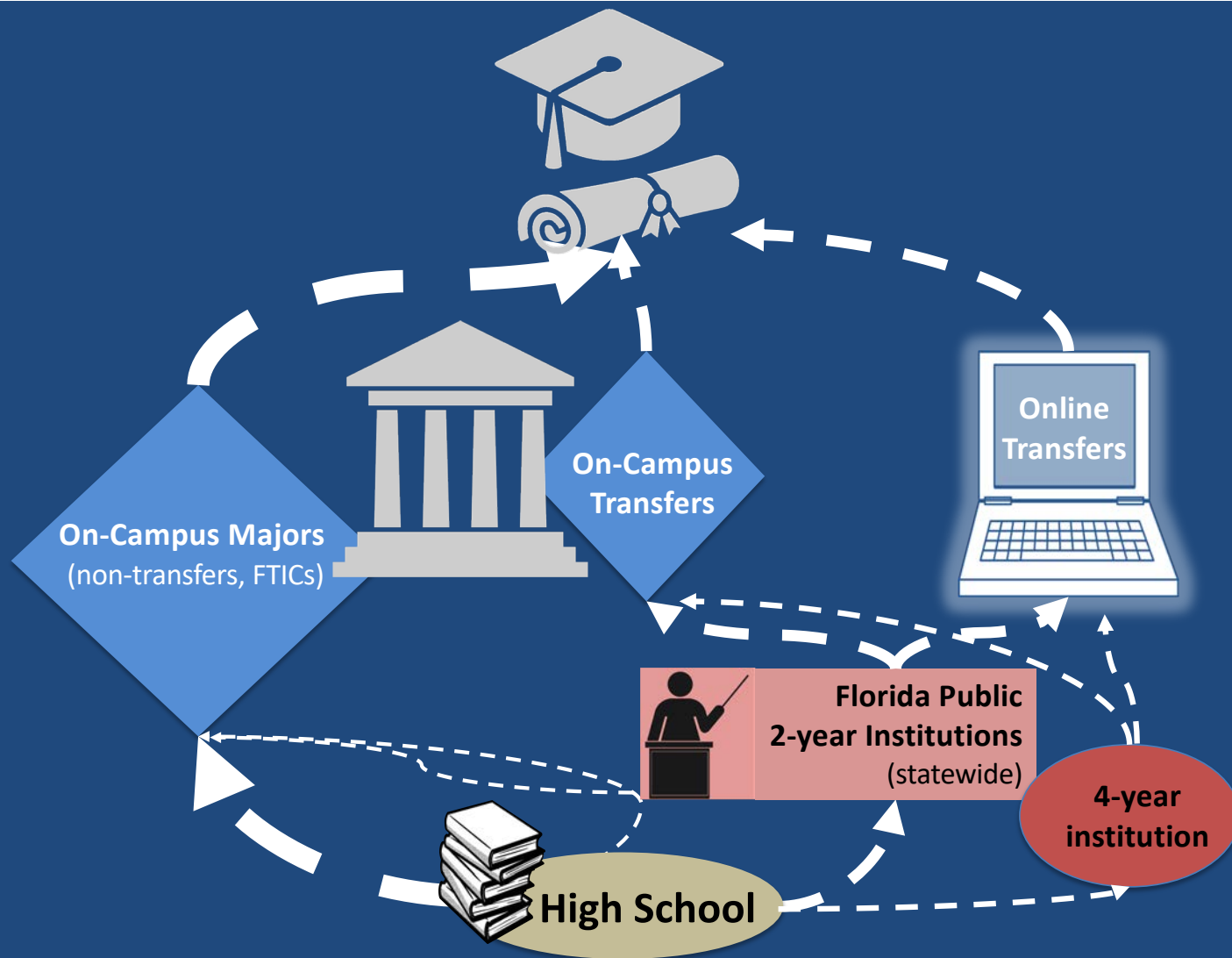
United States Department of Agriculture
National Institute of Food and Agriculture



SUPPLEMENTAL SLIDES

Online Graduates vs. Unenrolled Students

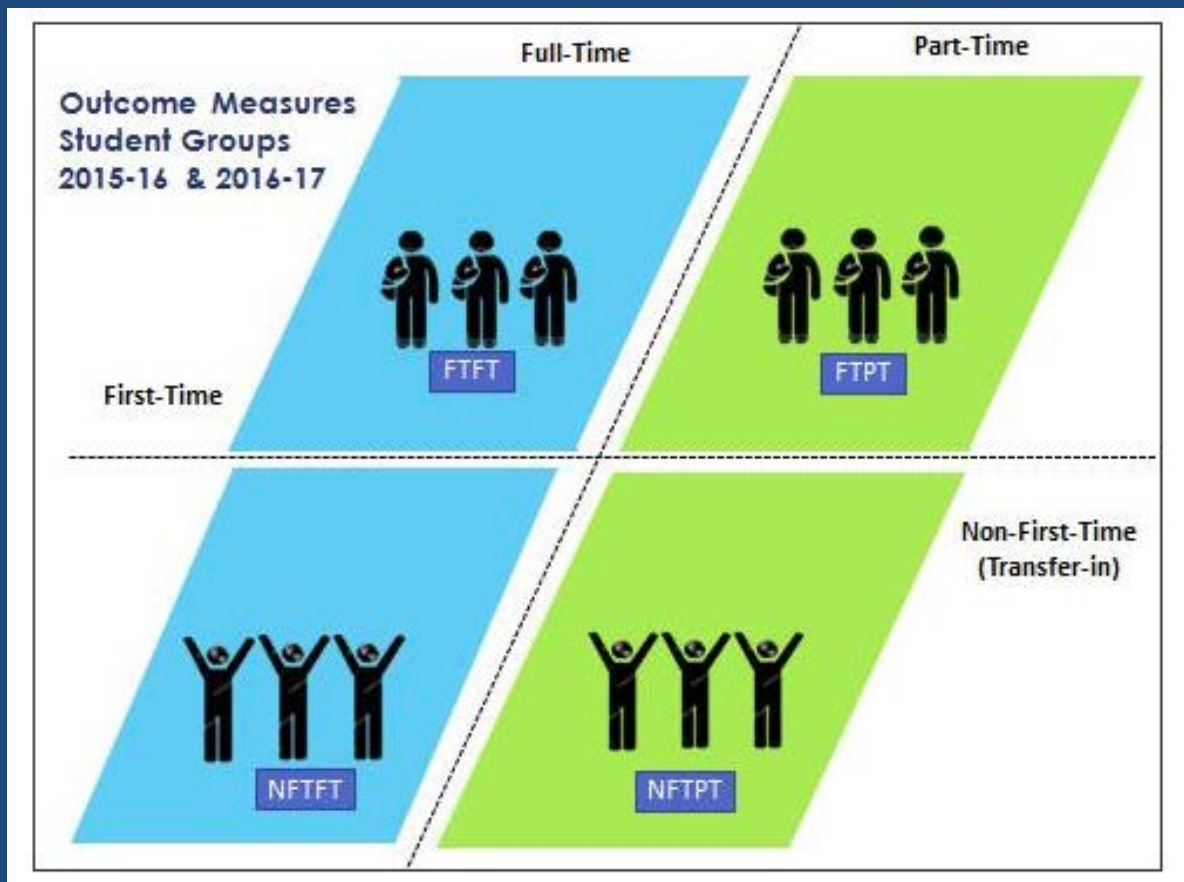




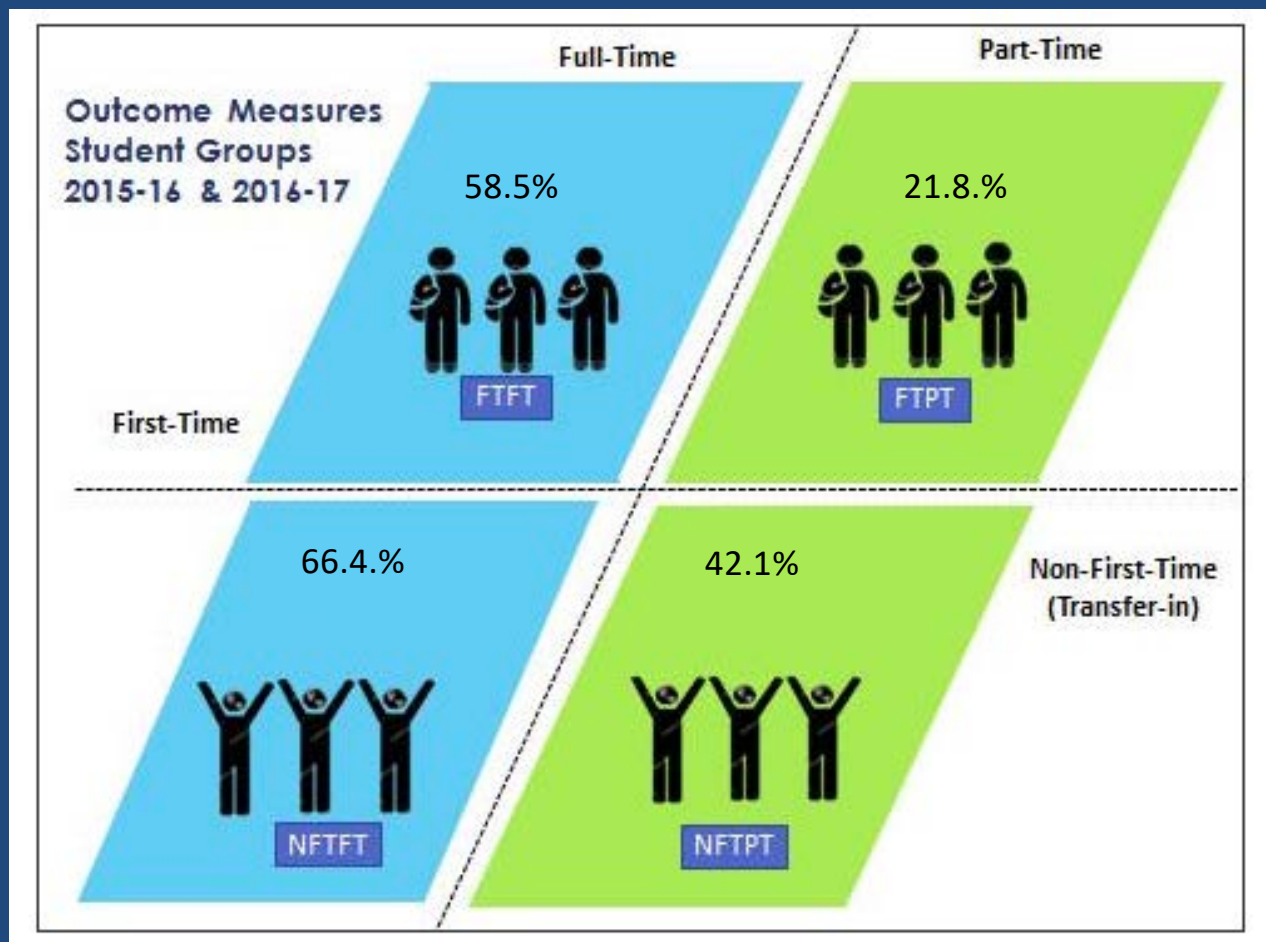
Challenge: How to evaluate retention?

- At what time point? (4 years post transfer does not equal 4 years post on-campus enrollment)
- For non-transfers who change majors, do we track them when they declare as freshmen? 3rd year major?- Use data strategically
- Institutions report overall retention for non-transfers
- Most data is collected and published for 4 year and 6-year rates
- IPEDS just recently started to collect and publish transfer student retention as 8 –year rates

IPEDS now reports on 4 types of students



IPEDES now reports on 4 types of students



Challenge - How to Evaluate Other Metrics and Resources to Consider

- 13% complete the 2+2 journey within 6 years (National Student Clearinghouse Research Center)
- Estimated that 35 – 50% 6-year graduation rate for online BS program (no clear repository for this metric)
- Estimated 48% attrition for STEM BS undergrads (NCES)
- 80% for STEM transfer students with a A.A. at 4 years (Institutional Research)