ECU BOARD OF TRUSTEES

AGENDA
University Affairs Committee
September 26, 2024

I.	Approval of Minutes – April 11, 2024	Action
II.	Operational Metrics	Information Only
III.	ECU's Prioritization of Key Student Success Goals	Information
IV.	Leveraging the Power of Artificial Intelligence in Teaching & Research	Information
V.	Closed Session	

Meeting of the Board of Trustees
University Affairs Committee
September 26, 2024

AGENDA ITEM

I. Approval of Minutes – April 11, 2024 ..... Dave Fussell
Committee Chair

Situation: Approval of the minutes from the University Affairs Committee April 11, 2024, is required.

Background:

Assessment:

Action: This item requires a vote by the committee.

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Minutes from the University Affairs Committee
April 11, 2024 – Main Campus Student Center and Online Meeting

The University Affairs Committee of the ECU Board of Trustees met in person on Thursday, April 11.

Committee members present:
Dave Fussell (chair); Jeffrey Roberts (vice chair); Tom Furr; Javier Limon; Vince Smith; Vanessa Workman

Other Board members present:
Jason Poole, Van Isley, Cassie Burt

Trustee Dave Fussell, Chair of the Committee, convened the meeting at 3:01PM. Chairman Fussell read the conflict-of-interest provisions as required by the State Government Ethics Act and asked if anyone would like to declare or report an actual or perceived conflict. None were reported.

Chairman Fussell called role and a quorum was established.

I. Approval of Minutes

Chairman Fussell asked for the approval of the minutes of the February 15, 2024 joint meeting of the University Affairs Committee and the Committee on Strategy and Innovation. Trustee Furr motioned and received a second. All in favor.

Action Item

The minutes of the February 15, 2024 joint committee meeting were approved with no changes.

II. Operational Metrics

Board members were encouraged to reach out to Provost Coger with any questions about the updated operational metrics available in board materials.

III. Regional Transformation: Painting Eastern North Carolina Purple and Gold

Chairman Fussell briefly introduced the informational topic for the afternoon, offering that the committee would see how ECU is creating opportunities for ECU faculty, staff and students and the impact ECU is having on our region.

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Minutes from the University Affairs Committee
April 11, 2024 – Main Campus Student Center and Online Meeting

Dr. Paynter shared that she would give an overview of the Purple and Gold Bus Tour before turning it over to the team from Student Affairs for a presentation, both demonstrating ECU's commitment to regional transformation.

She introduced two faculty members, Dr. Jessica Cooke Bailey and Dr. Stephen Moysey, and described their background and contributions to their fields, before turning it over to them to share the ways in which the bus tour impacted them.

Dr. Bailey enthusiastically told the board about herself and her experience with the bus tour, sharing that it helped her to connect with Eastern North Carolina as a region in terms of professional outreach but also personally, even influencing her desire to stay at ECU / in Eastern NC.

Dr. Moysey described his experience with the bus tour using three terms: orientation, collaboration, and cultural transformation. He shared with the committee how the tour helped him orient himself at the institution, learn about the work of others here and how to better collaborate with them, and how the structure and support of the bus tour allowed a framework for him to go and create or enrich partnerships.

Trustee Roberts described his home county as being a health care desert with great health care disparities and thus how regional transformation and ECU and its expertise is very important.

Trustee Fussell thanked Dr. Paynter and the faculty who joined the committee.

Lauren Howard, Iyaira Williams, Dr. Dennis McCunney and Heather Joyner then joined the committee to share a bit from the Center for Leadership and Civic Engagement in Student Affairs. Lauren Howard shared her role at ECU and noted that the discussion would share ways in which their Days of Service impact regional transformation. Heather Joyner was an undergrad at ECU who fell in love with the service learning community and made a career out of it, now working at the Boys and Girls Club of the Coastal Plain. Graduating Senior Iyaira Williams shared her experience as a current student at ECU who had a student leadership role as the MLK Day or Service Coordinator. Dr. McCunney concluded the discussion by expressing his gratitude for and pride in the way that ECU and our community partners work together to fulfill the mission pillar of regional transformation and how those efforts are recognized by various Carnegie classifications.

Chair Fussell thanked the team for joining.

IV. Conferral of Degrees

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Minutes from the University Affairs Committee
April 11, 2024 – Main Campus Student Center and Online Meeting

Provost Coger requested the Committee consider the candidates for degrees to be conferred at the upcoming May commencement ceremony. There are about 4,800 students graduating this Spring.

Trustee Limon moved that the candidates for degrees, as approved by the Chancellor and the Faculty Senate, be authorized for conferral at the annual Spring Commencement on Friday, May 3, 2024 and recommended this item for full board consideration. Motion was seconded. All in favor.

Action Item

The Committee voted to approve the candidates for degrees at May commencement and recommend for full Board consideration.

VI. Closed Session

Trustee Limon made a motion that the committee go into closed session to consider personnel related matters. Motion was seconded. All in favor.

At 3:40 the Committee went into closed session.

The committee returned from closed session at 3:52PM.

Trustee Furr requested an update on enrollment. Provost Coger shared current standings (up or down in various areas), and also shared some insights that could be affecting enrollment, including the recent changes and difficulties in FAFSA processes.

With no further business before the committee, they were adjourned at 3:54PM.

_____

Respectfully submitted,
Madeleine Bade Griffith, Office of the Provost

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Meeting of the Board of Trustees
University Affairs Committee
September 26, 2024

AGENDA ITEM

II. University Affairs Operational Metrics ..... Dr. Robin Coger
Provost & Senior Vice Chancellor
for Academic Affairs

Situation: Presentation of the metrics monitored by the University Affairs Committee.

Background:

Assessment:

Action: This item is for information only.

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ECU

CEO Tracking Sheet
Fiscal Year - 2025
University Affairs Committee

KPI	Measurement	Prior Year	Target	Variance	Fiscal Year 2025 July	August	September	October	November	December	January	February	March	April	May	June	Total
New First-Year Applications	Number of new first-year applications submitted.	28,918	28,918	Monthly Plan	0	377	3,466	15,579	3,817	1,393	2,095	1,126	676	323	31	35	**28,918**
				Monthly Actual		342											
				Monthly +/-		-35											
				YTD Plan		377											
				YTD Actual		342											
				YTD +/-		-35											
New First-Year Enrollment Deposits	Number of enrollment deposits paid by new first-years.	4,634	4,634	Monthly Plan	0	0	19	131	162	219	597	645	1,045	1,275	478	63	**4,634**
				Monthly Actual													
				Monthly +/-													
				YTD Plan													
				YTD Actual													
				YTD +/-													
New Transfer Applications	Number of new transfer applications submitted.	2,857	2,857	Monthly Plan	0	33	204	327	118	114	370	281	350	362	384	314	**2,857**
				Monthly Actual		27											
				Monthly +/-		-6											
				YTD Plan		33											
				YTD Actual		27											
				YTD +/-		-6											
New Transfer Enrollment Deposits	Number of enrollment deposits paid by new transfers.	1,300	1,300	Monthly Plan	0	0	4	20	49	34	66	170	200	256	256	245	**1,300**
				Monthly Actual													
				Monthly +/-													
				YTD Plan													
				YTD Actual													
				YTD +/-													
New Graduate Applications	Number of new graduate applications submitted.	5,412	5,412	Monthly Plan	554	1,497	386	324	385	325	652	347	258	232	255	197	**5,412**
				Monthly Actual	993	2,333											
				Monthly +/-	439	836											
				YTD Plan	554	2,051											
				YTD Actual	993	3,326											
				YTD +/-	439	1,275											
New Graduate Admits	Number of new graduate admits.	2,058	2,058	Monthly Plan	3	22	33	76	82	151	163	417	373	287	256	195	**2,058**
				Monthly Actual	5	45											
				Monthly +/-	2	23											
				YTD Plan	3	25											
				YTD Actual	5	50											
				YTD +/-	2	25											
Fundable Student Credit Hours	Number of fundable student credit hours for the calendar year.	552,002	552,002	Monthly Plan	0	0	0	0	224,352	16,898	9,341	507	130,391	131,702	23,666	15,145	**552,002**
				Monthly Actual													
				Monthly +/-													
				YTD Plan													
				YTD Actual													
				YTD +/-													
Total Enrollment	Number of registered students.	24,861	24,861	Monthly Plan	0	0	0	0	0	0	0	0	9,517	11,105	2,274	1,965	**24,861**
				Monthly Actual													
				Monthly +/-													
				YTD Plan													
				YTD Actual													
				YTD +/-													
Sponsored Awards	Sponsored awards, excluding ECUP and SoDM contracts.	$83,818,837	$83,818,837	Plan	$9,038,490	$9,634,064	$4,485,532	$5,395,746	$4,053,048	$3,442,023	$8,023,640	$3,829,517	$4,067,061	$7,659,968	$6,695,462	$17,494,286	**$83,818,837**
				Actual	$3,731,131	$9,523,916											
				+ / -	-$5,307,359	-$110,148											
				YTD +/-	-$5,307,359	-$5,417,507											
Research Awards	Research awards.	$37,791,463	$37,791,463	Plan	$4,969,945	$3,320,522	$2,842,930	$2,485,025	$2,457,699	$991,454	$2,631,345	$1,568,903	$2,989,809	$3,495,839	$4,441,059	$5,596,933	**$37,791,463**
				Actual	$1,982,438	$5,537,482											
				+ / -	-$2,987,507	$2,216,960											
				YTD +/-	-$2,987,507	-$770,547											
F&A Awarded	Sum of indirect cost of sponsor awards awarded	$12,339,488	$12,339,488	Plan	$1,464,300	$1,316,703	$958,068	$639,896	$778,697	$450,858	$811,583	$745,002	$696,948	$1,222,824	$1,217,880	$2,036,729	**$12,339,488**
				Actual	$658,153	$1,733,456											
				+ / -	-$806,147	$416,753											
				YTD +/-	-$806,147	-$389,394											
Housing Contract Commitments Fall 2025 First-Time First-Year Students	On campus housing contract commitments.	3,888	3,900	Plan		0	0	0	0	0	500	410	820	1,050	825	295	3,900
				Actual													
				+ / -													
				YTD +/-													
Counseling Center Visits	Annual Visits	8,178	8,040	Plan	215	450	1,000	1,050	900	375	675	1,000	1,000	900	225	250	8,040
				Actual	221	454											
				+ / -	6	4											
				YTD +/-	6	10											
Total Counseling Visits	Annual Visits	9,179	9,145	Plan	245	500	1,100	1,100	1,000	425	850	1,200	1,100	1,050	275	300	9,145
				Actual	247	521											
				+ / -	2	21											
				YTD +/-	2	23											

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Meeting of the Board of Trustees
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AGENDA ITEM

III. ECU's Prioritization of Key Student Success Goals..... Robin N. Coger, PhD
Provost & Senior Vice Chancellor for Academic Affairs

Brandon Frye, PhD
Vice Chancellor for Student Affairs

Situation: East Carolina University's funding allocations from the state are dependent on enrollment and the performance metrics of our students. As the number of high school graduates choosing to attend college continues to decline, it is more important than ever for ECU to emphasize the success of every student as a key recruitment and retention strategy. Doing so is critical to ECU's mission and fiscal health.

Background: ECU's deep commitment to student success is longstanding and evident from our mission: *To be a national model for student success, public service and regional transformation*. and our *Future Focused. Innovation Driven* Strategic Plan. Today's higher education playing field is dynamic and strongly influenced by multiple factors external to a university. The result is an increased intensity of competition in student recruitment among institutions within and outside of North Carolina. In such an environment the importance of East Carolina University being effective in helping current students succeed is even more critical.

Assessment: To ensure ECU's progress on key performance indicators associated with enrollment (recruitment and retention) and graduation, Academic Affairs and Student Affairs collaborated to codify ECU's Student Success agenda. This presentation will share examples of strategic and coordinated actions in progress for ensuring that East Carolina University's students are successfully progressing throughout their journey toward degree completion. The components of ECU's Student Success agenda and this year's short-term priorities will be shared. While there are multiple opportunities for continuous improvement -- decreasing the leakiness of students from ECU and continuing to expand the students we attract to ECU -- will be highlighted.

Reference Materials:
1. BOT UAC Meeting Presentation on Student Success
2. Committee on Strategic Initiatives Presentation from the UNC System Board of Governors September 11, 2024 Meeting

Action: This item is for information only.

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A Key Element Of Student Success: Undergraduate Student Persistence

University Affairs Committee
September 26, 2024

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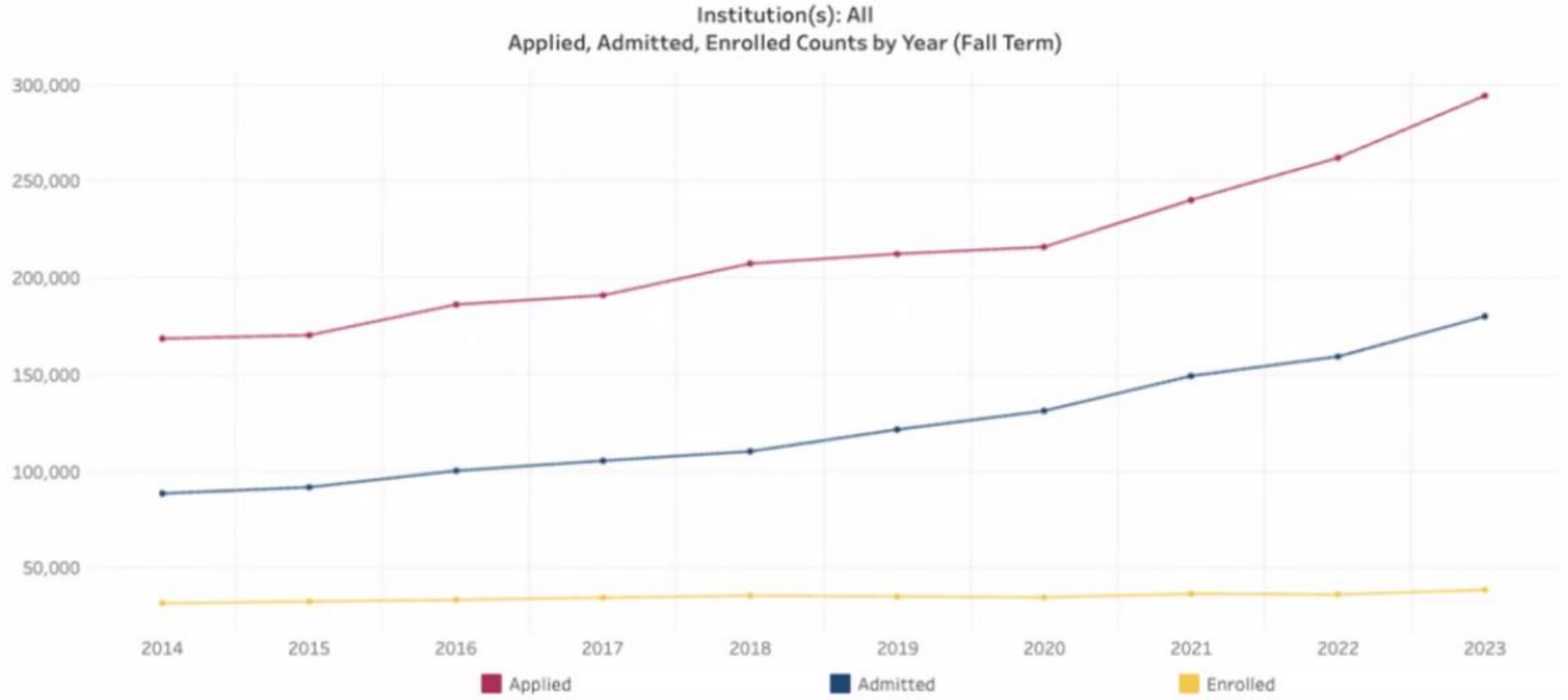
Trends Reflect Data From Across the UNC System

Lower Yield Rates Result In Increased Intensity of Competition In Recruiting Students

First…A Note On Matriculation Trends: Applications are Up, Yield Rates are Down!



	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Applied	168,433	170,198	186,038	190,837	207,227	212,212	215,805	240,055	261,887	293,980
Admitted	88,373	91,612	100,134	105,269	110,154	121,414	131,050	149,111	159,148	179,941
Enrolled	31,668	32,525	33,420	34,522	35,537	35,133	34,700	36,535	36,145	38,529
Admit Rate (Admitted/Applied)	52.5%	53.8%	53.8%	55.2%	53.2%	57.2%	60.7%	62.1%	60.8%	61.2%
Yield Rate (Enrolled/Admitted)	35.8%	35.5%	33.4%	32.8%	32.3%	28.9%	26.5%	24.5%	22.7%	21.4%

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ECU's Student Success Ecosystem

The Student Experience

Student Well Being

Learning Environment

Professional Readiness

Data Informed Policies, Procedures & Practices

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ECU's Student Success Ecosystem

The Student Experience

Student Well Being

Learning Environment

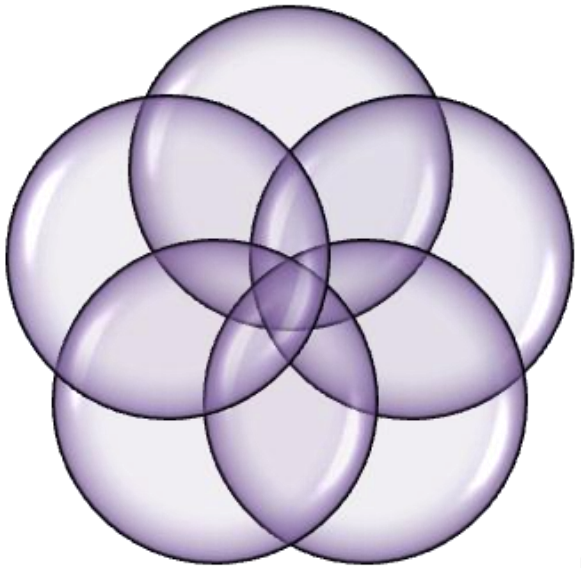
Professional Readiness

Data Informed Policies, Procedures & Practices

Because All 5 Are Interrelated -- Our Strategies Must Also Connect

The Student Experience

Data Informed Policies, Procedures & Practices



Student Well Being

Professional Readiness

Learning Environment

ECU

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1st to 2nd Year Retention Rate of New Full-Time Freshmen Entering Fall 2023

82.7%

Prior Cohort: 81.7% (+1.1%)

End of 4th Year Graduation Rate of New Full-Time Freshmen Entering Fall 2020

43.4%

Prior Cohort: 44.6% (-1.2%)

End of 5th Year Graduation Rate of New Full-Time Freshmen Entering Fall 2019

60.0%

Prior Cohort: 59.5% (+0.5%)

End of 6th Year Graduation Rate of New Full-Time Freshmen Entering Fall 2018

62.5%

Prior Cohort: 62.0% (+0.5%)

Select a Cohort Type...

New First-Year (Freshmen), Full-Time

Select an Entry Term Type...

Fall

Display Students in Their Program as of...

Program in First Term

New Full-Time First-Years Entering in the Fall and Retained 1st to 2nd Year

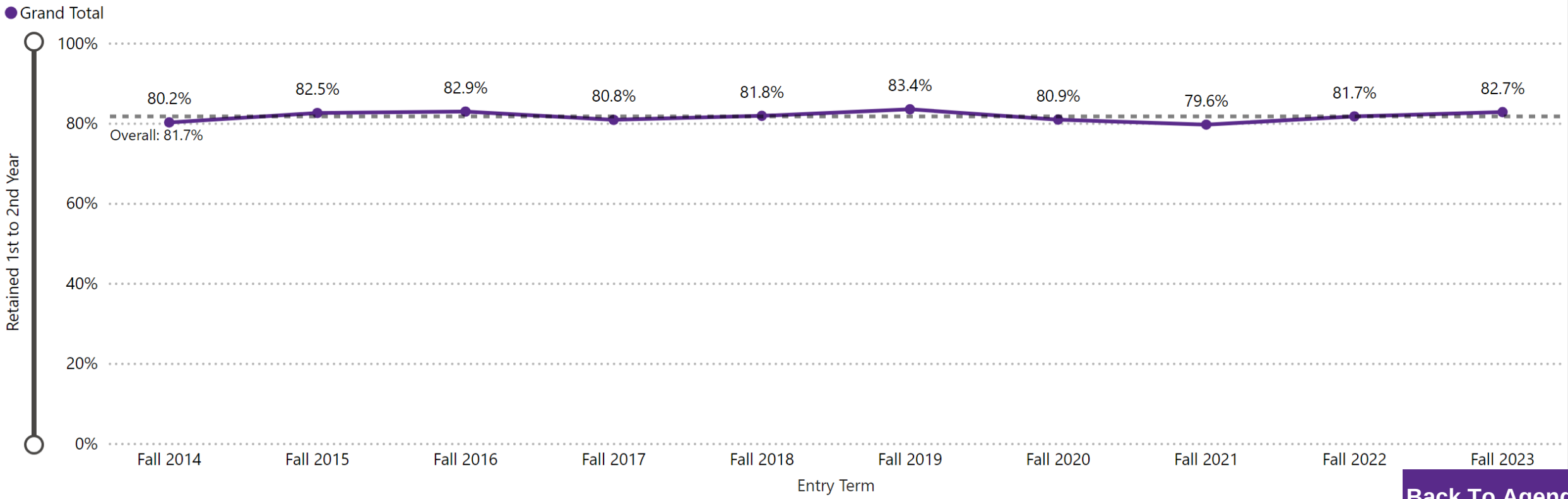
UG Student Persistence Trends: Year 1→2

Select a Persistence Rate...

Retained 1st to 2nd Year

Select a Comparison Group...

Grand Total



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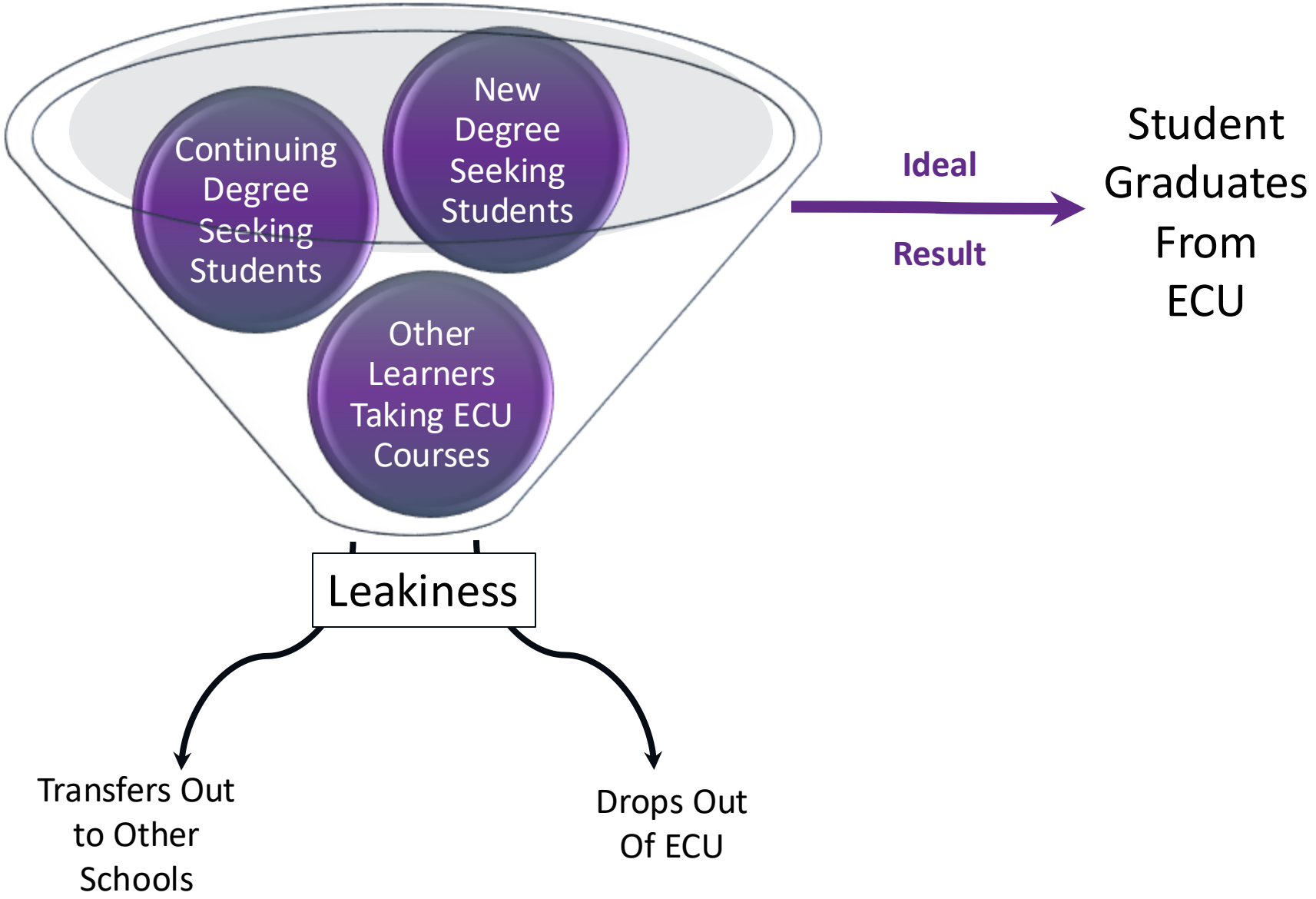
Understanding Why Student Persistence So Important



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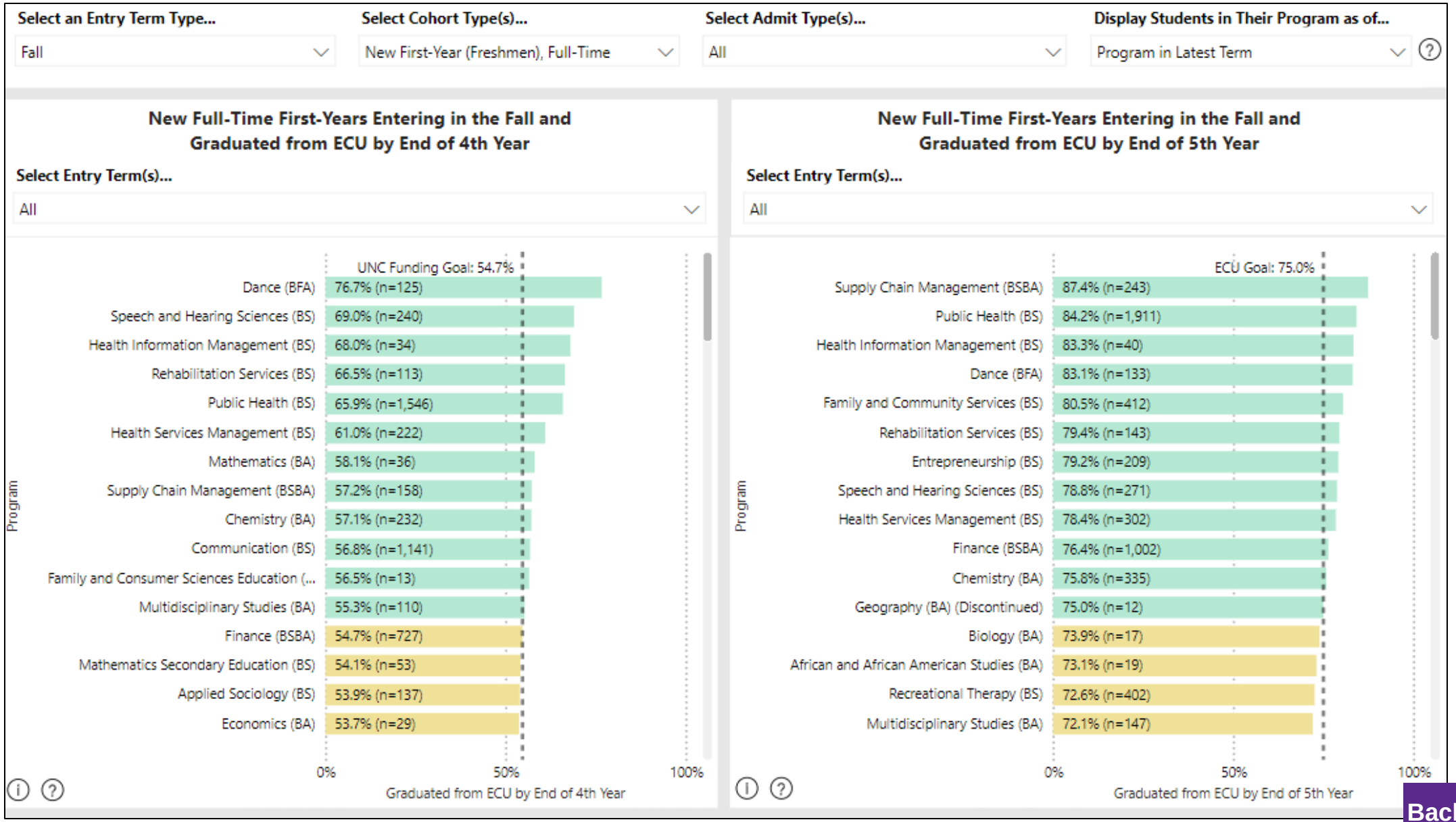
One of Our Short-Term Goals Focuses On College Specific Targets



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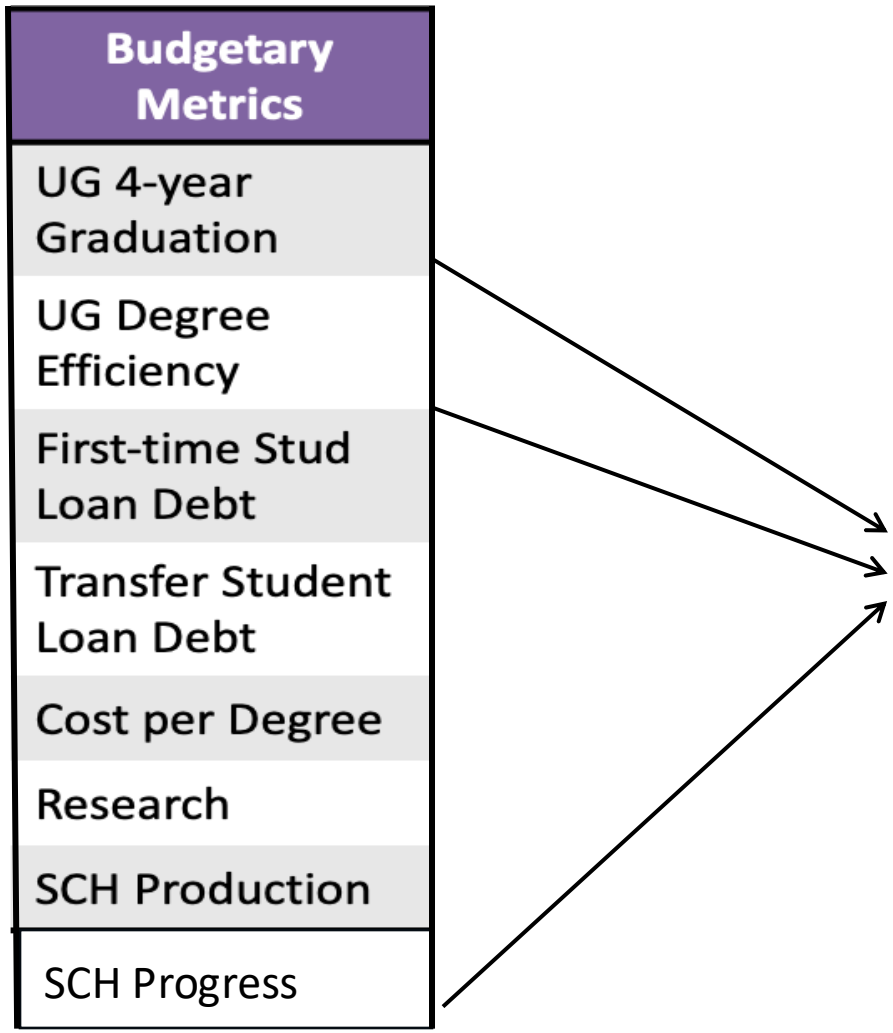
Reconnecting the Dots:



By helping students navigate their academics, the processes of registration &financial aid, mental health, engagement and belongingness at ECU, etc.. we help their success, their Pirate experience, and achieve the University's performance metrics.

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A High Functioning “Student Success Ecosystem” Results In more Pirates Graduating On Time

New Pirate Students

The Student Experience

Data Informed Policies, Procedures & Practices

Student Well Being

Professional Readiness

Learning Environment

New Pirate Graduate

Career Launch & Success

Pirate Alum

ECU

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AGENDA ITEM

A-3. Understanding and Addressing Enrollment Trends ..... Andrew Kelly
Shun Robertson

Situation: As a significant portion of revenues at UNC System institutions are enrollment dependent, monitoring historical and projected trends has become a matter of fiscal importance as enrollment fluctuations can impact institutions' long-term viability.

Background: The System's in-state enrollment has declined over the past decade, while out-of-state enrollment has increased. This trend helps to explain, in part, why the System may experience a decrease in state appropriation even though overall enrollment is stable or up.

What explains this pattern? Many internal and external drivers impact enrollment trends at UNC System institutions, including macroeconomic factors, demographic shifts, college-going rates, institutional matriculation practices, and student persistence and completion practices.

Assessment: The committee will receive a presentation on national, state, and UNC System enrollment trends and the drivers behind those trends. The committee will also hear an update on internal System efforts to develop an enrollment projection model to help institutions navigate the financial impact of enrollment changes. The additional materials will be available in hard copy on the day of the meeting and via BoardEffect at the conclusion of the meeting.

Action: This item is for discussion only.

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THE UNIVERSITY OF NORTH CAROLINA SYSTEM

UNDERSTANDING & ADDRESSING ENROLLMENT TRENDS

September 11, 2024
Committee on Strategic Initiatives

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Outline

- Trends in college enrollment (national and UNC)
- Drivers of enrollment trends
  - Demographics
  - Macroeconomic conditions
  - College-going rates
  - Application and admissions practices
  - Student success practices
- Implications for UNC System policy and practice

Trying Times Ahead for Higher Education

TODAY'S BIG QUESTION

America's 'cataclysmic' drop in college enrollment

"The slide in the college-going rate since 2018 is the steepest on record"

THE SATURDAY ESSAY

Why Americans Have Lost Faith in the Value of College

Three generations of 'college for all' in the U.S. has left most families looking for alternatives.

A Generation of American Men Give Up on College: 'I Just Feel Lost'

The number of men enrolled at two- and four-year colleges has fallen behind women by record levels, in a widening education gap across the U.S.

June 07, 2024

A Rough Month for Campus Cuts

The end of the academic year brought announcements of job and program cuts at many institutions. Some colleges are eliminating dozens of jobs to reduce operating costs.

THE HIGHLIGHT

The incredible shrinking future of college

The population of college-age Americans is about to crash. It will change higher education forever.

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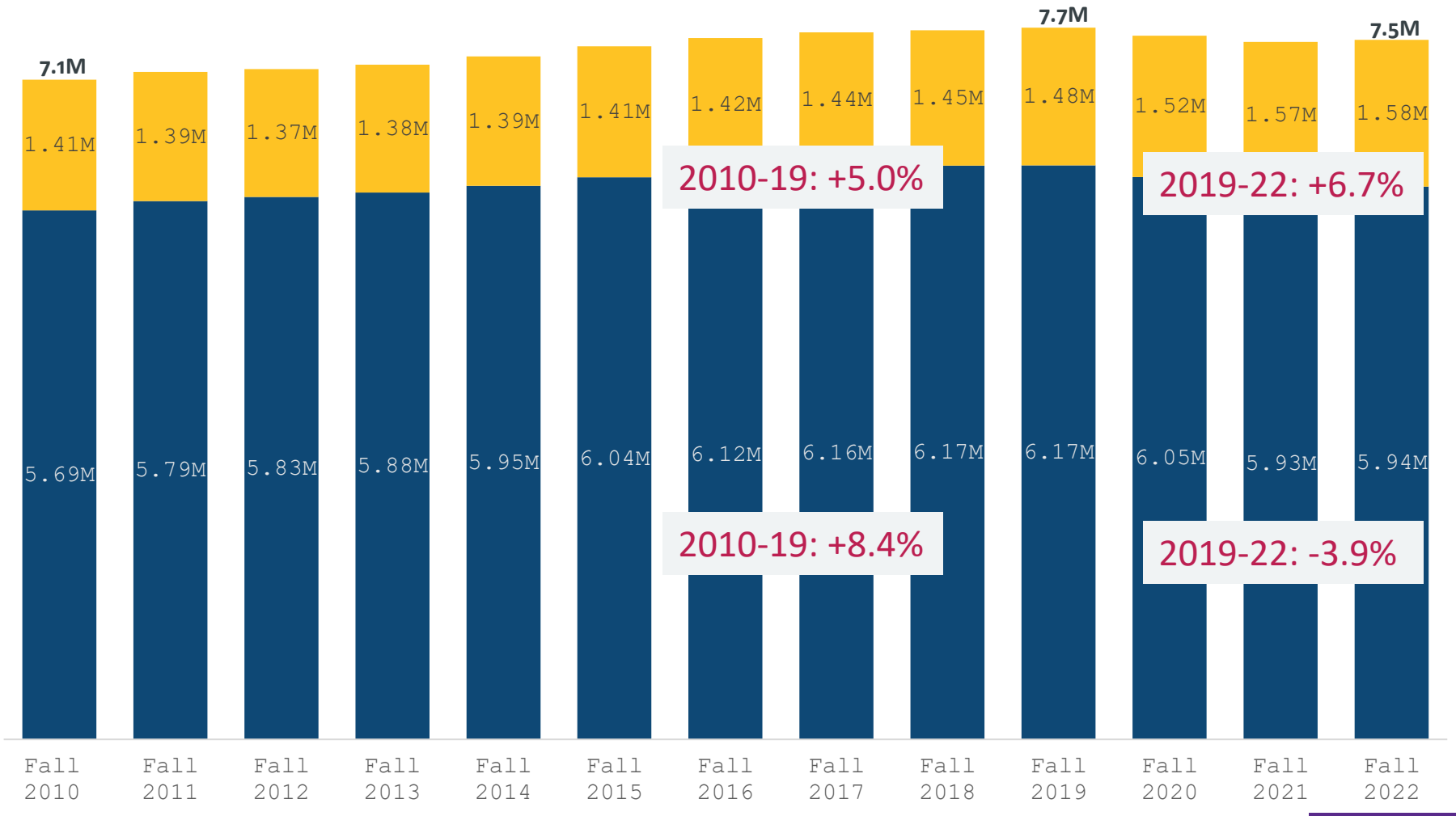
US College Enrollment:

Undergraduate and Graduate Enrollment at Public 4-Year Institutions



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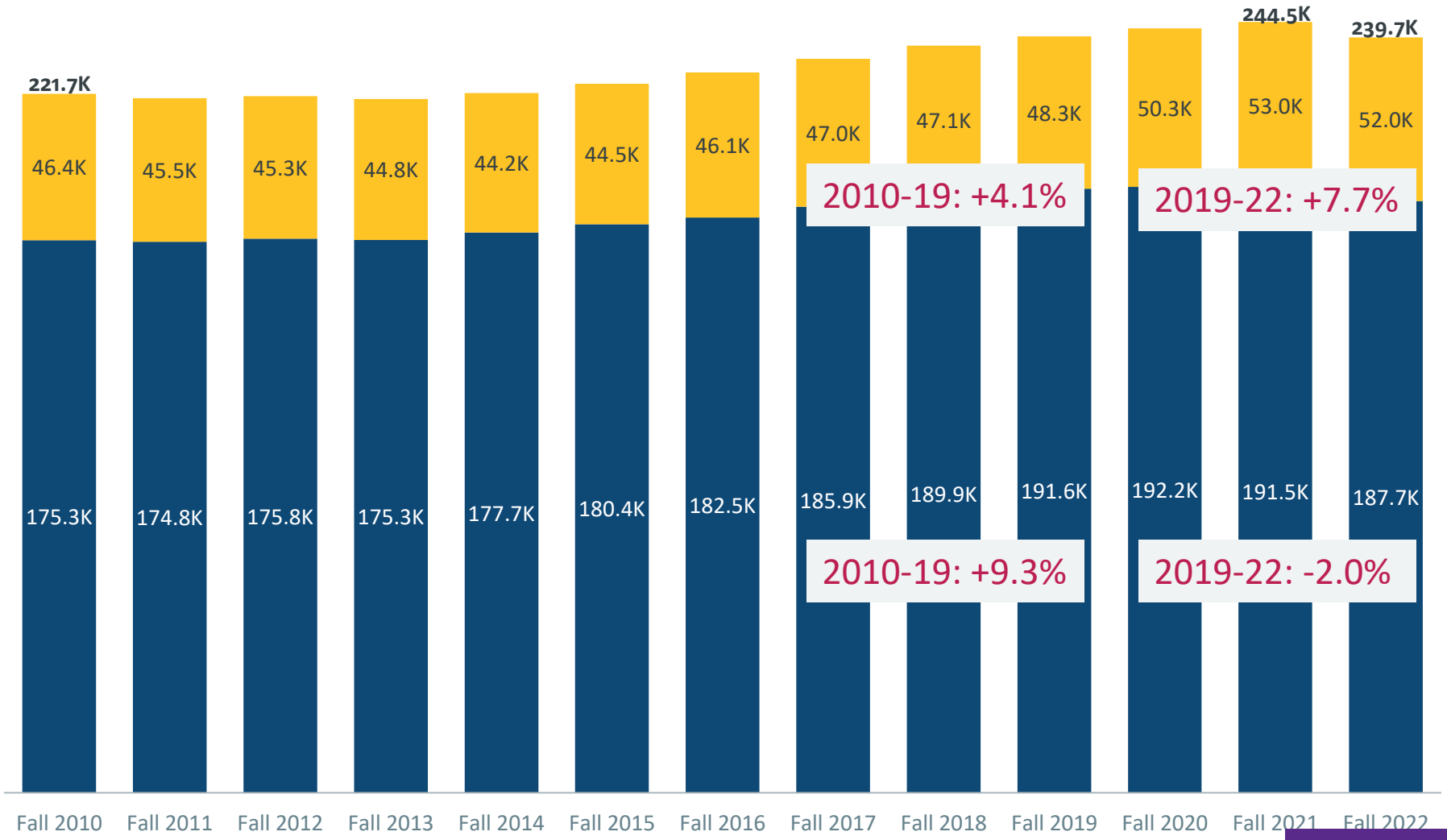
Source: IPEDS, Public 4-Year, Primarily Baccalaureate Institutions
Note: Fall 2023 IPEDS data not released at time of analysis.

UNC System Enrollment:

Undergraduate and Graduate Enrollment (2010-2022)



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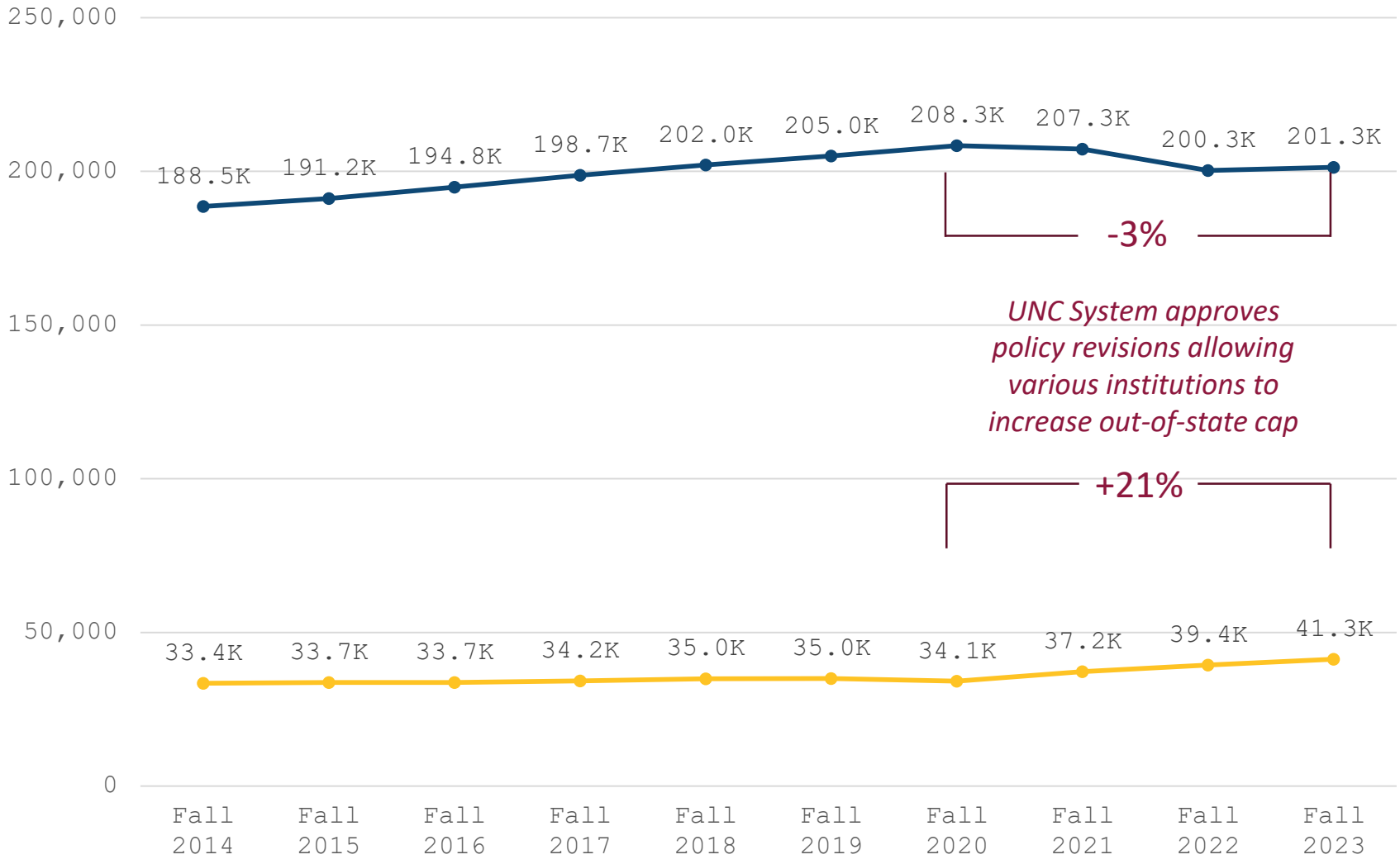
Source: UNC System Interactive Dashboards & UNC System SDM.

Note: While UNC System Fall 2023 enrollment is available on public dashboard, it was excluded here to provide comparison with US enrollment. As of date of analysis, Fall 2023 UNC System enrollment is 242.5K (192K UG + 51.5K Grad).

UNC System Enrollment:
In-State vs. Out-of-State Students



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Source: UNC System Inter

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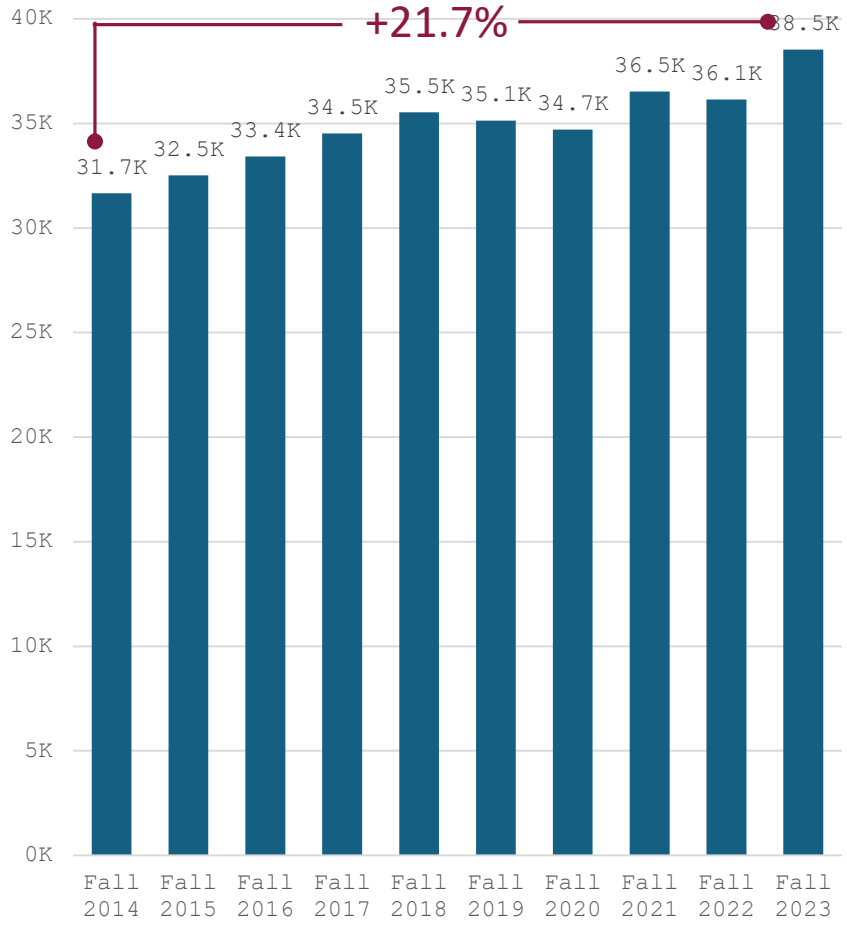
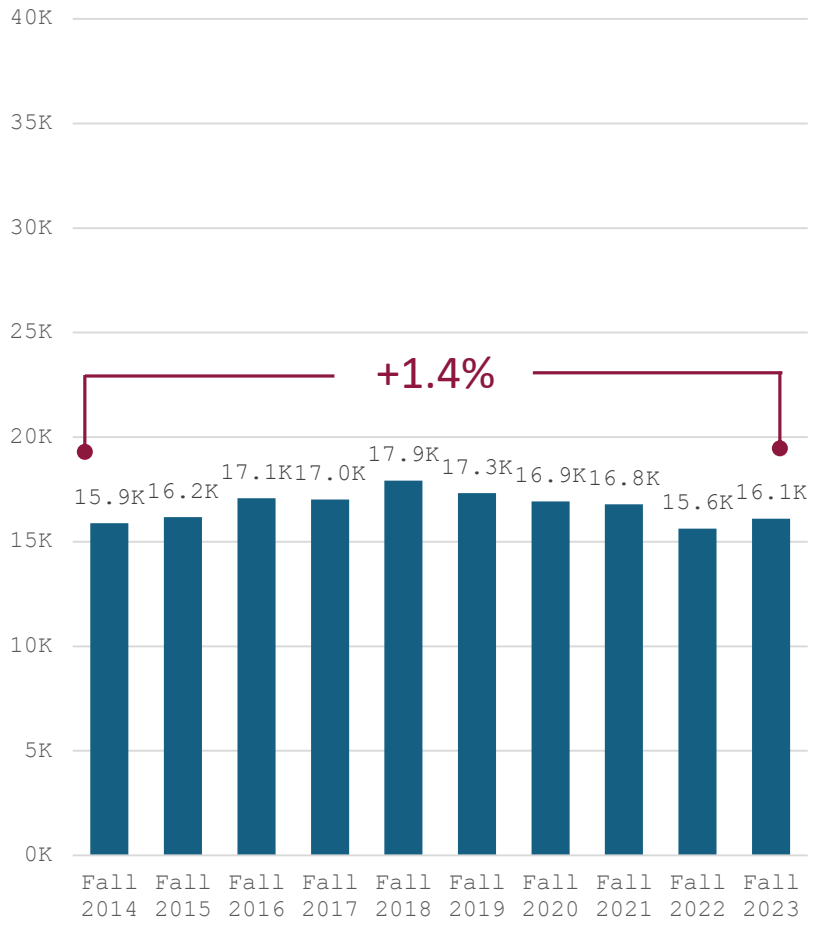
UNC System Enrollment:
New Undergraduate Students

New, **First-Time**, Degree-Seeking Undergraduate Students



New, **Transfer**, Degree-Seeking Undergraduate Students



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Source: UNC System Inter

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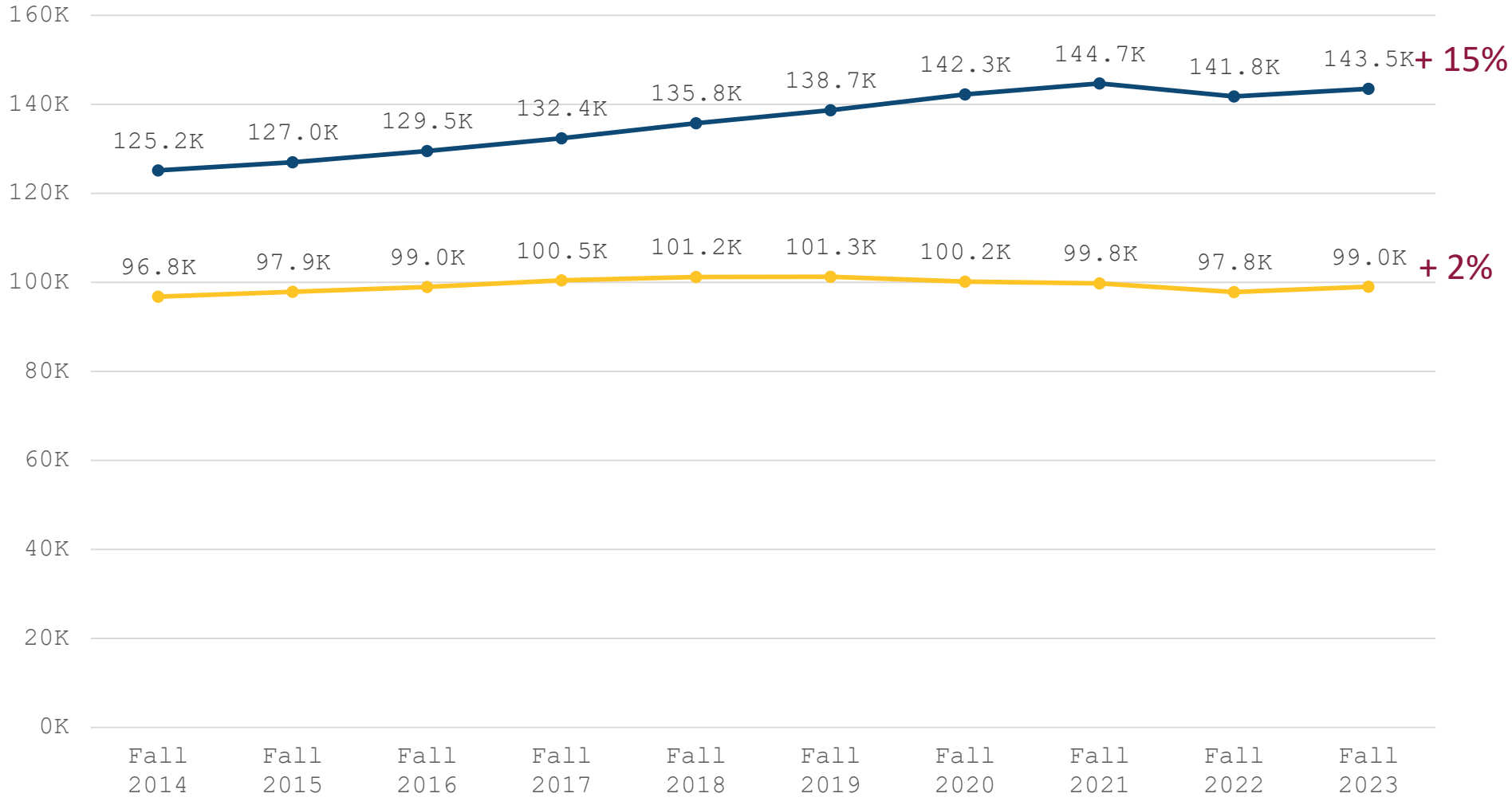
UNC System Enrollment:
Female vs. Male Students



THE UNIVERSITY OF NORTH CAROLINA SYSTEM

Source: UNC System Inter

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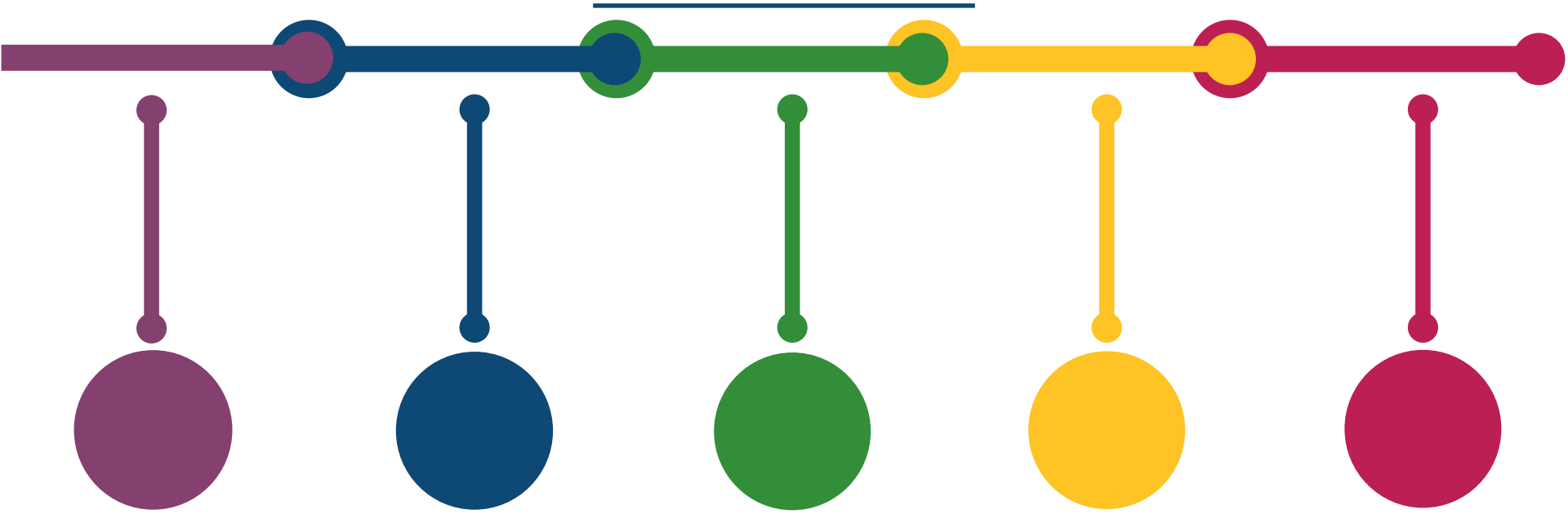
What Drives Enrollment?



Demographic Shifts

- Declining birth rates
- Int'l student migration patterns

Macroeconomic Drivers

- Business cycles and unemployment rates
- Household finances (e.g., savings rate)

College-Going Rates

- Declining perception of value of degree
- Rising wages for jobs post high school

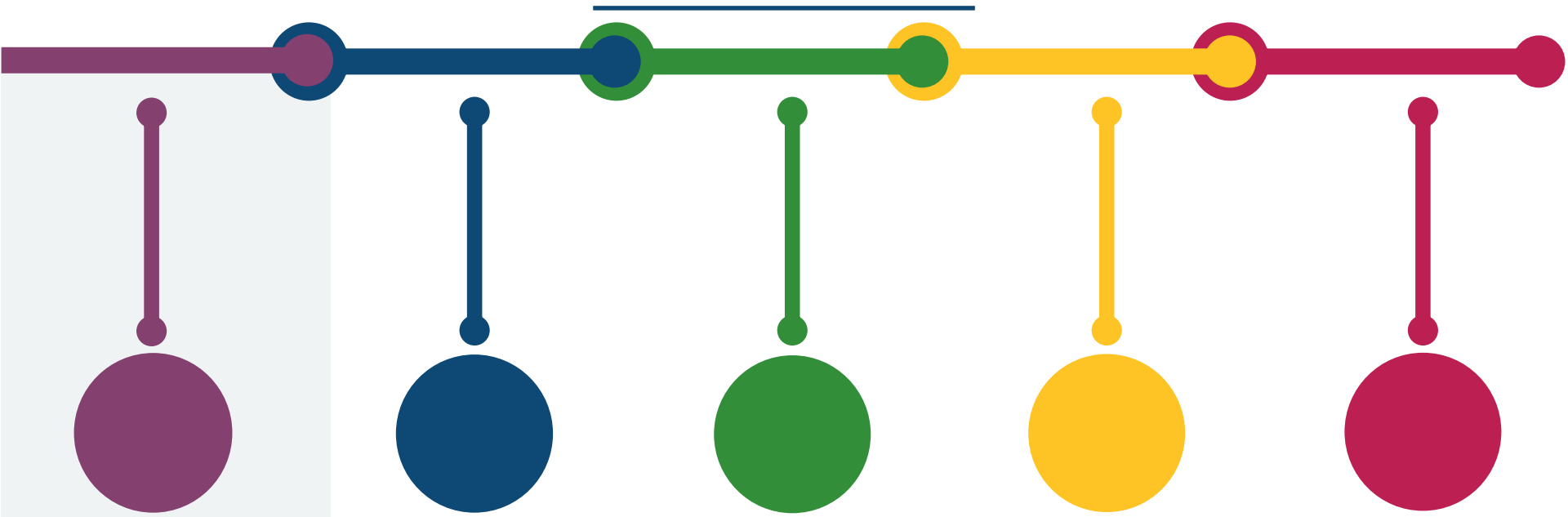
College Access Practices

- Simplified application process
- Personalized acceptance videos/letters
- Expedited financial aid award letters

Student Outcomes Practices

- Increased focus on retention
- Decreased time-to-degree

What Drives Enrollment?



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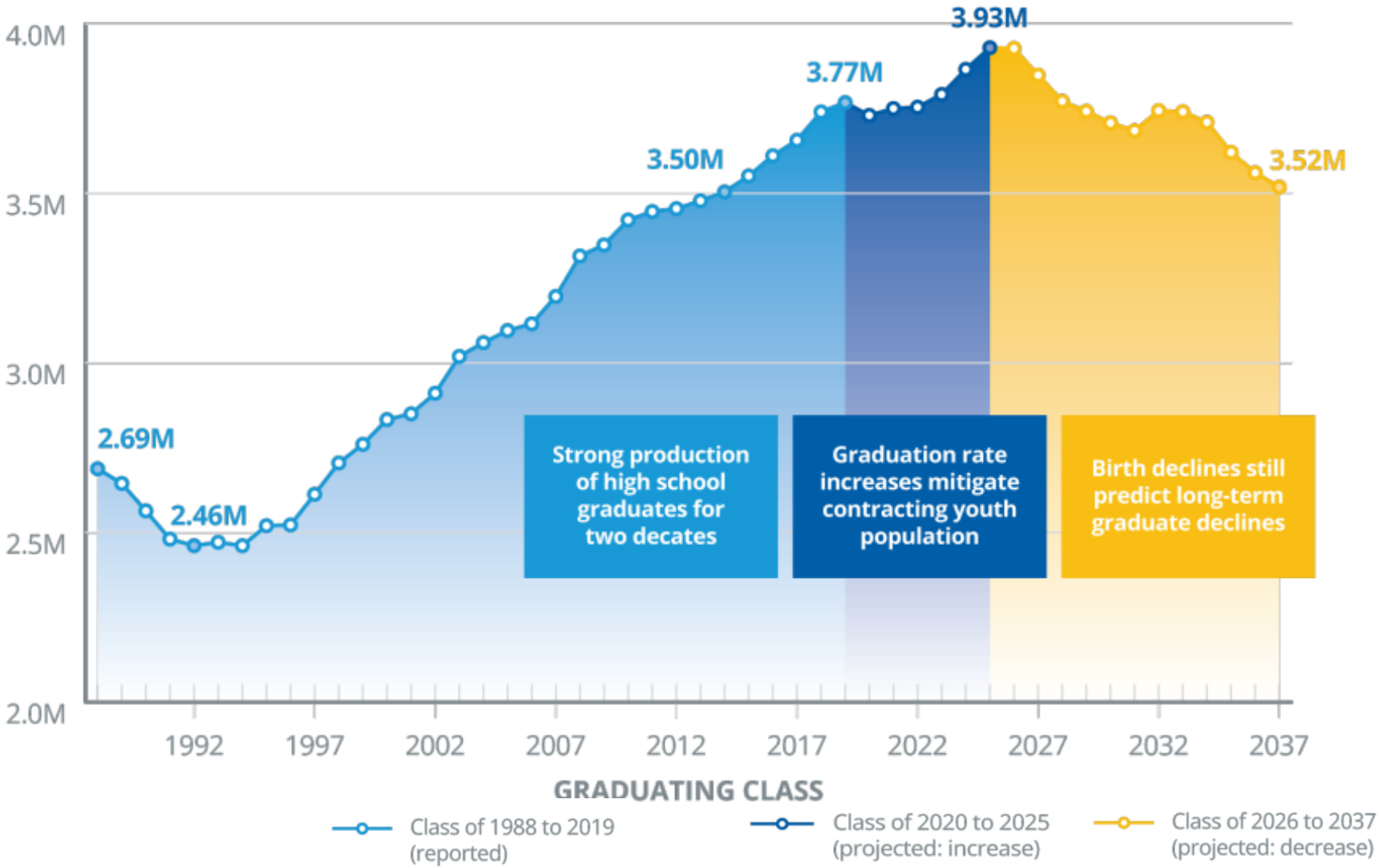
US: Projections of High School Graduates



THE UNIVERSITY OF NORTH CAROLINA SYSTEM

Source: WICHE, *Kn*

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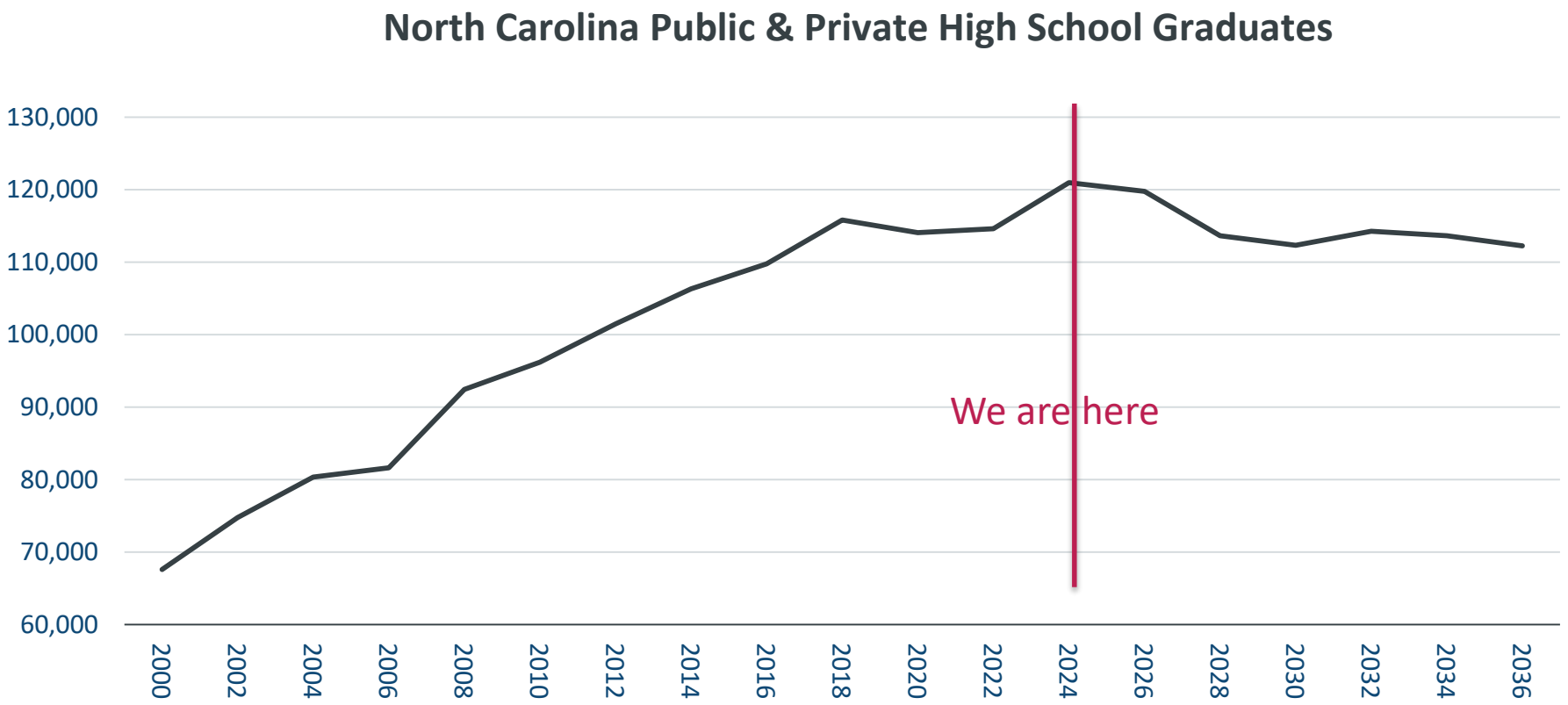
North Carolina: Projections of High School Graduates



The growth in High School Graduates from:			
2000-2007	2007 to 2017	2017 to 2027	2027 to 2037
32.18%	27.54%	1.54%	-2.97%

THE UNIVERSITY OF NORTH CAROLINA SYSTEM

Source: WICHE

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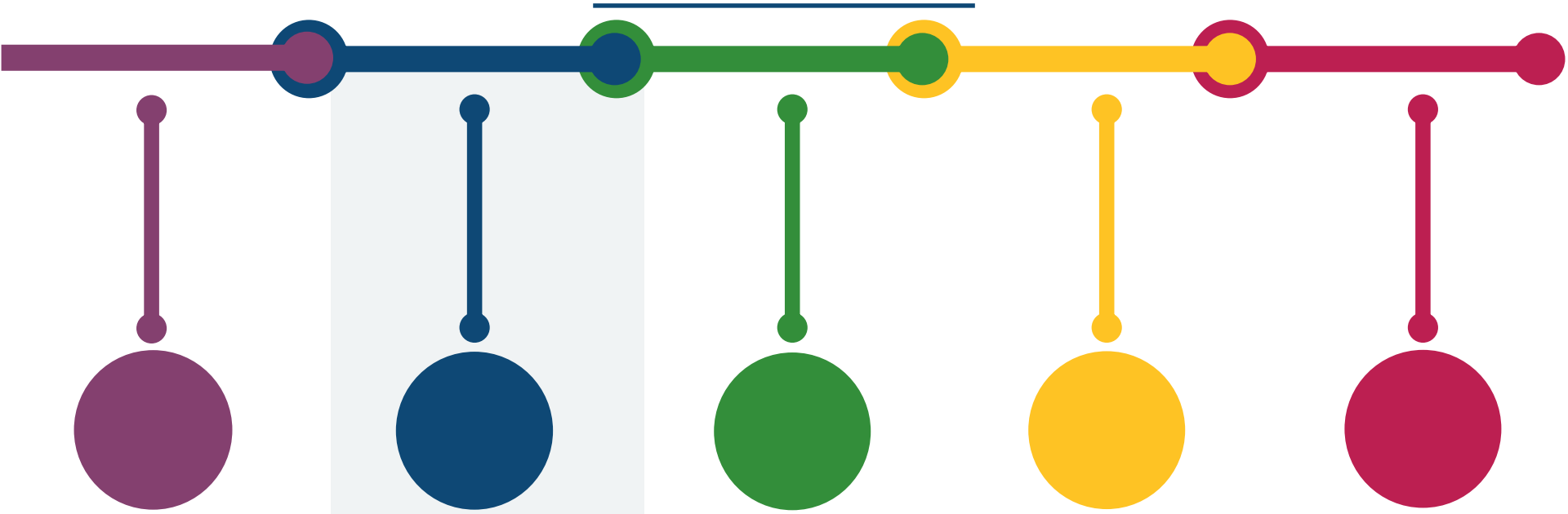
What Drives Enrollment?



Demographic Shifts

- Declining birth rates
- Int'l student migration patterns

Macroeconomic Drivers

- Business cycles and unemployment rates
- Household finances (e.g., savings rate)

College-Going Rates

- Declining perception of value of degree
- Rising wages for jobs post high school

College Access Practices

- Simplified application process
- Personalized acceptance videos/letters
- Expedited financial aid award letters

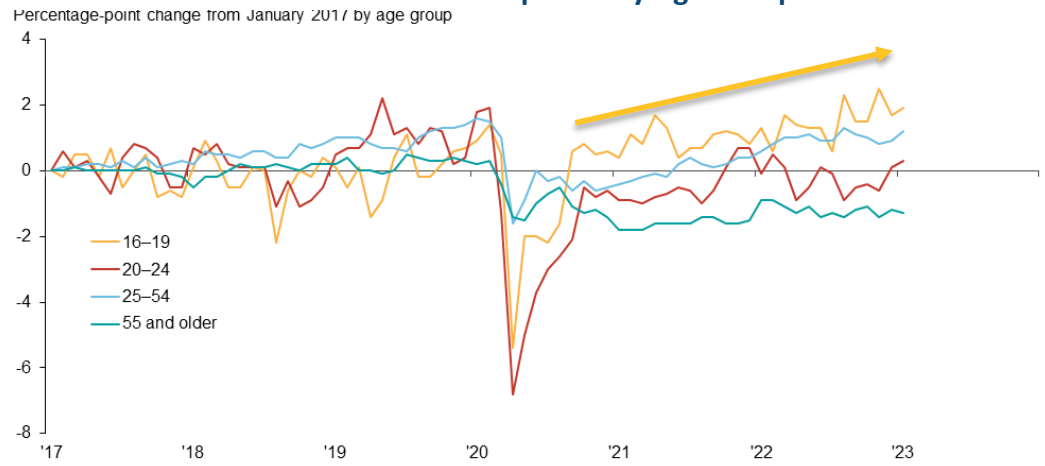
Student Outcomes Practices

- Increased focus on retention
- Decreased time-to-degree

US Labor Force Trends:

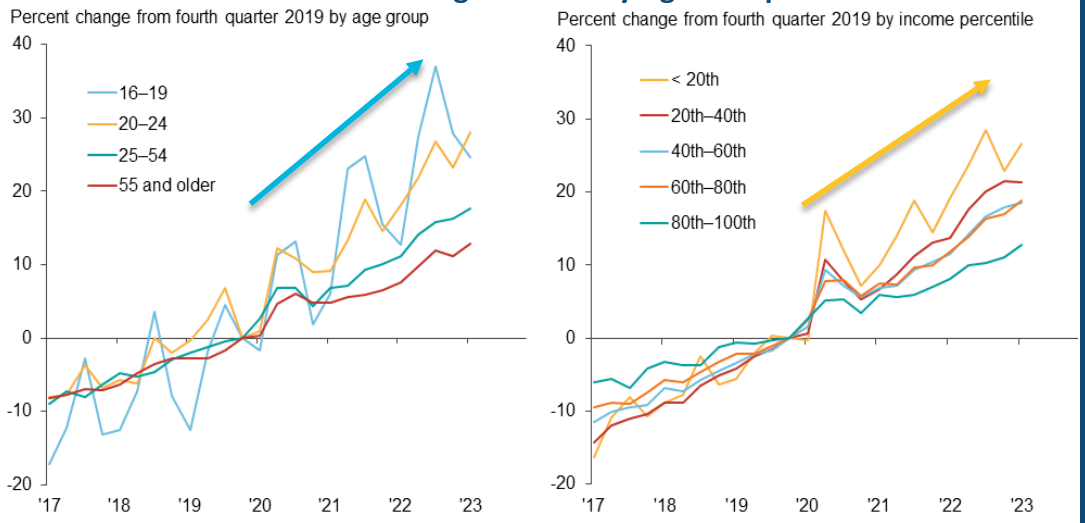
Suddenly, Joining the Labor Market is More Attractive

Labor Force Participation by Age Group



NOTE: Change is measured as the labor force participation rate of each age group minus the baseline labor force participation rate of the same age group in January 2017.
SOURCES: Federal Reserve Economic Data; authors' calculations.

Nominal Wage Growth by Age Group



NOTES: Data are measured as the percent change in the average wage of the indicated group compared with their average wage in fourth quarter 2019. As expected, younger workers show significant seasonability in their wages.
SOURCE: Current Population Survey.

> *"Young people face a trade-off between school and work. Over the past two years, **youths ages 16–19 have become more likely to enter the labor force**, increasing their labor force participation more than any other age group since January 2017….*
>
> *In addition, **individuals ages 20–24 have become "disconnected"** at higher rates during the pandemic, meaning that they are neither enrolled in college nor participating in the labor force."*
>
> Federal Reserve Bank of Dallas, 2024

Source: Federa

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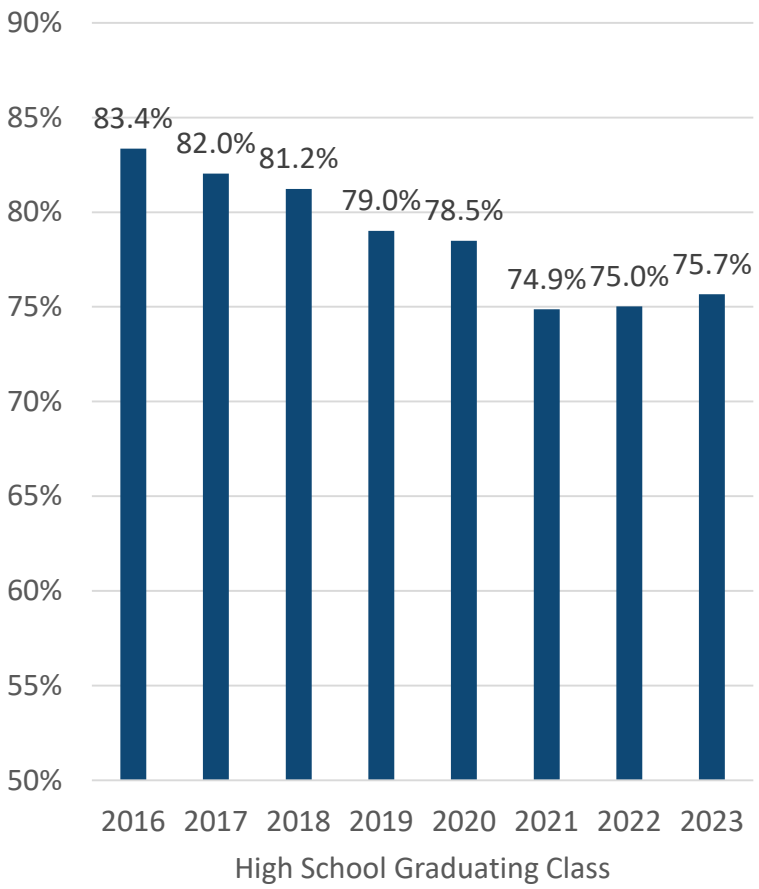
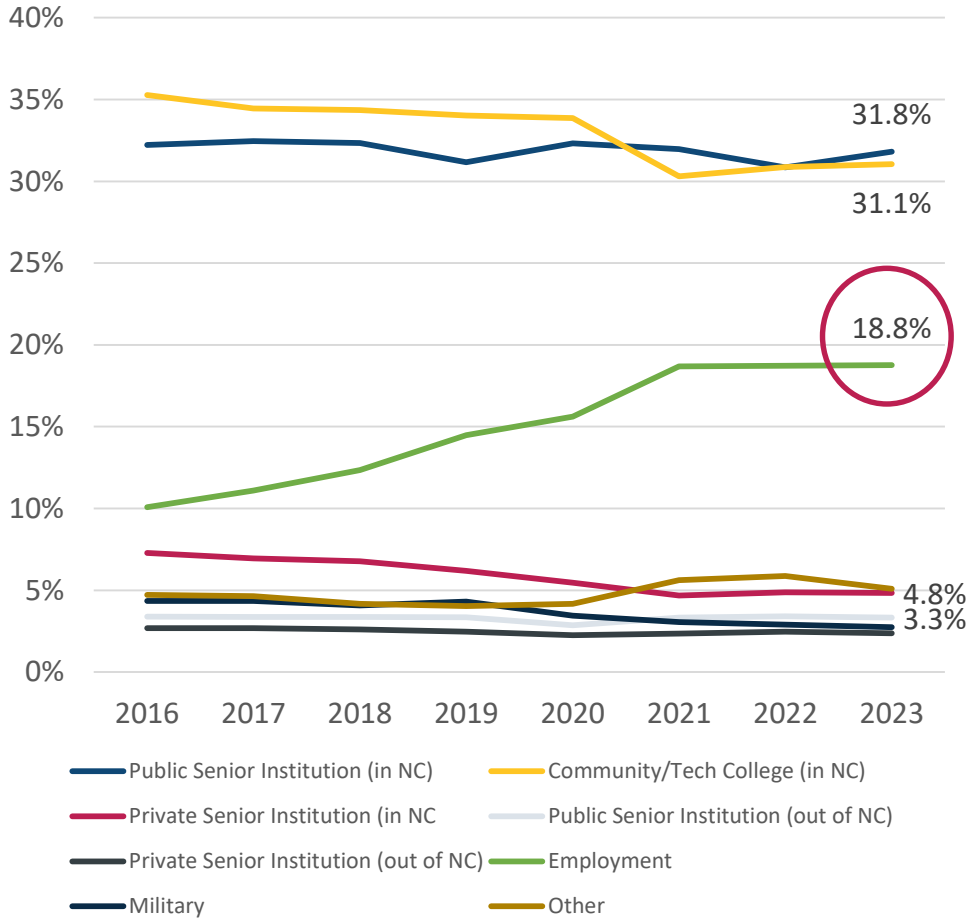
The Unanticipated Impact of Labor Force Trends

Intention to Attend Any Type of Postsecondary Institution After Graduation



NC High School Graduates Post Graduation Intentions



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Source: DPI-National

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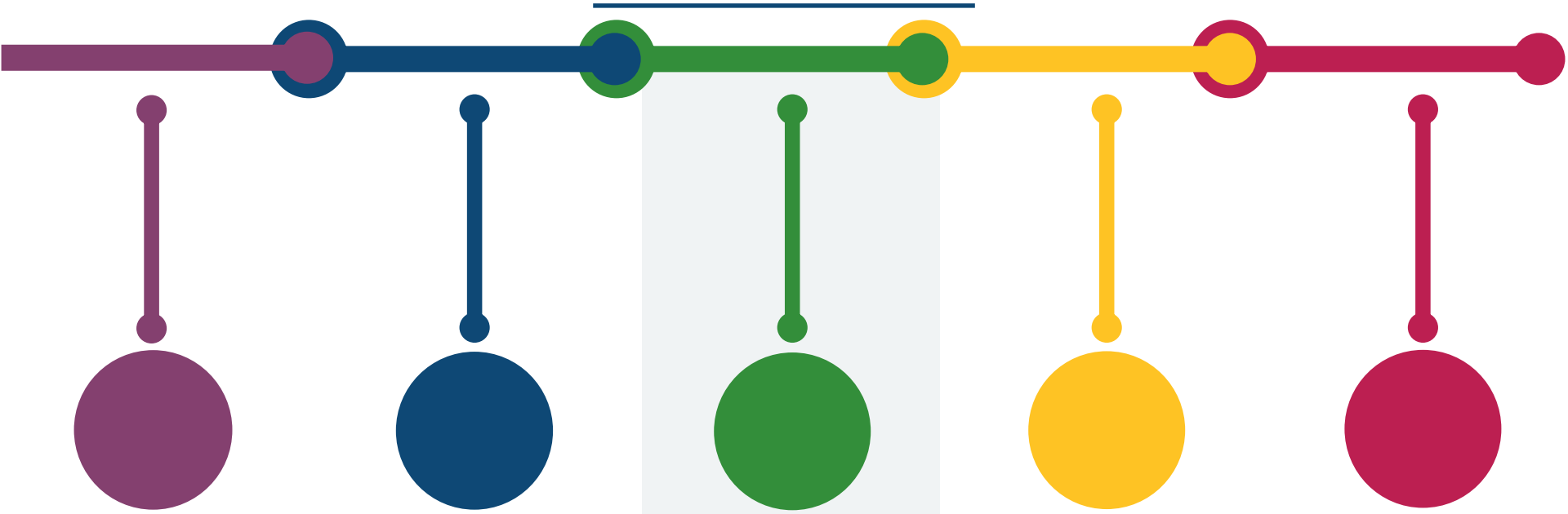
What Drives Enrollment?



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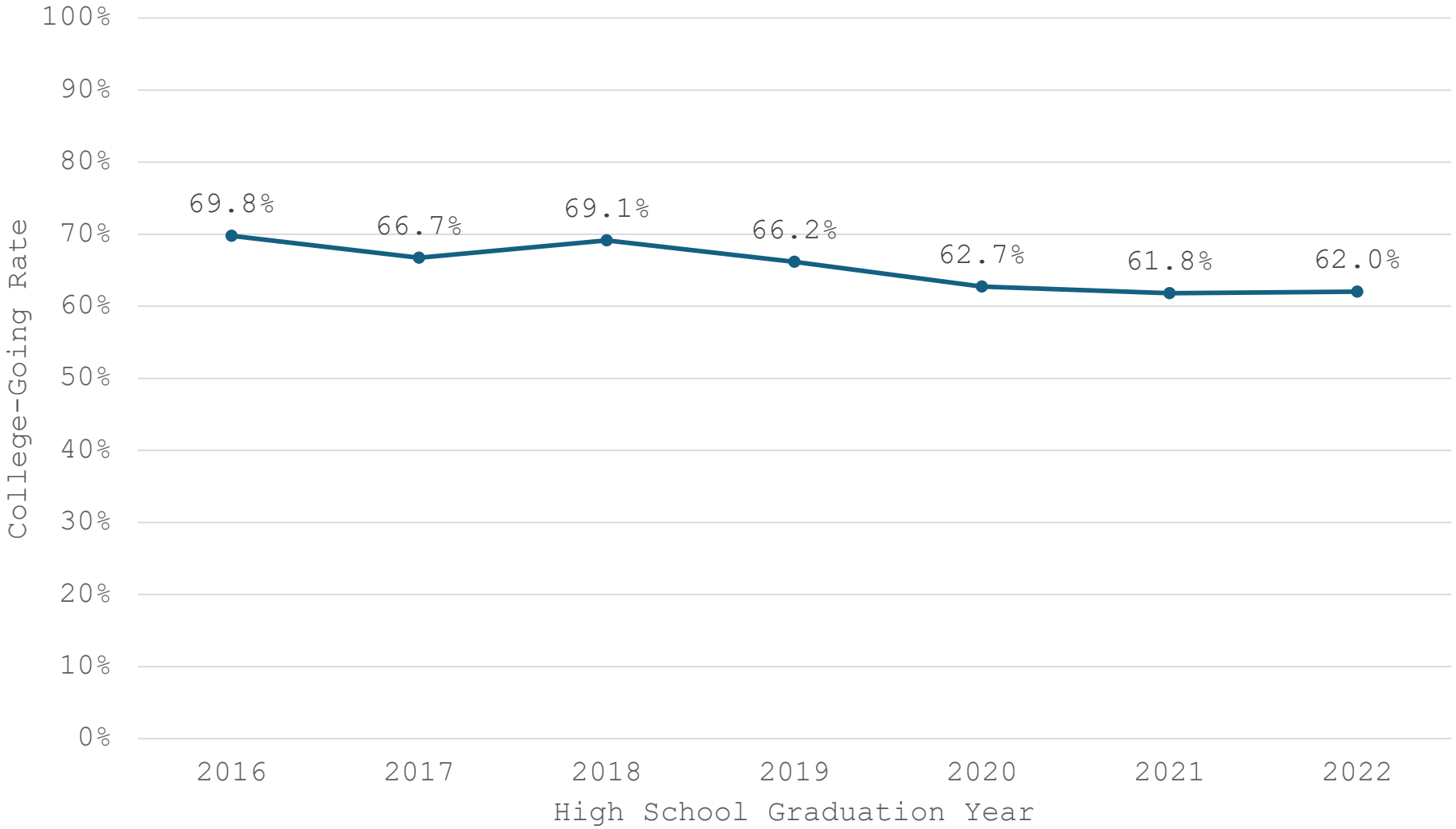
US: Immediate College-Going Rate of High School Graduates



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Source: https://nces.ed.gov/programs/digest/d23/ta

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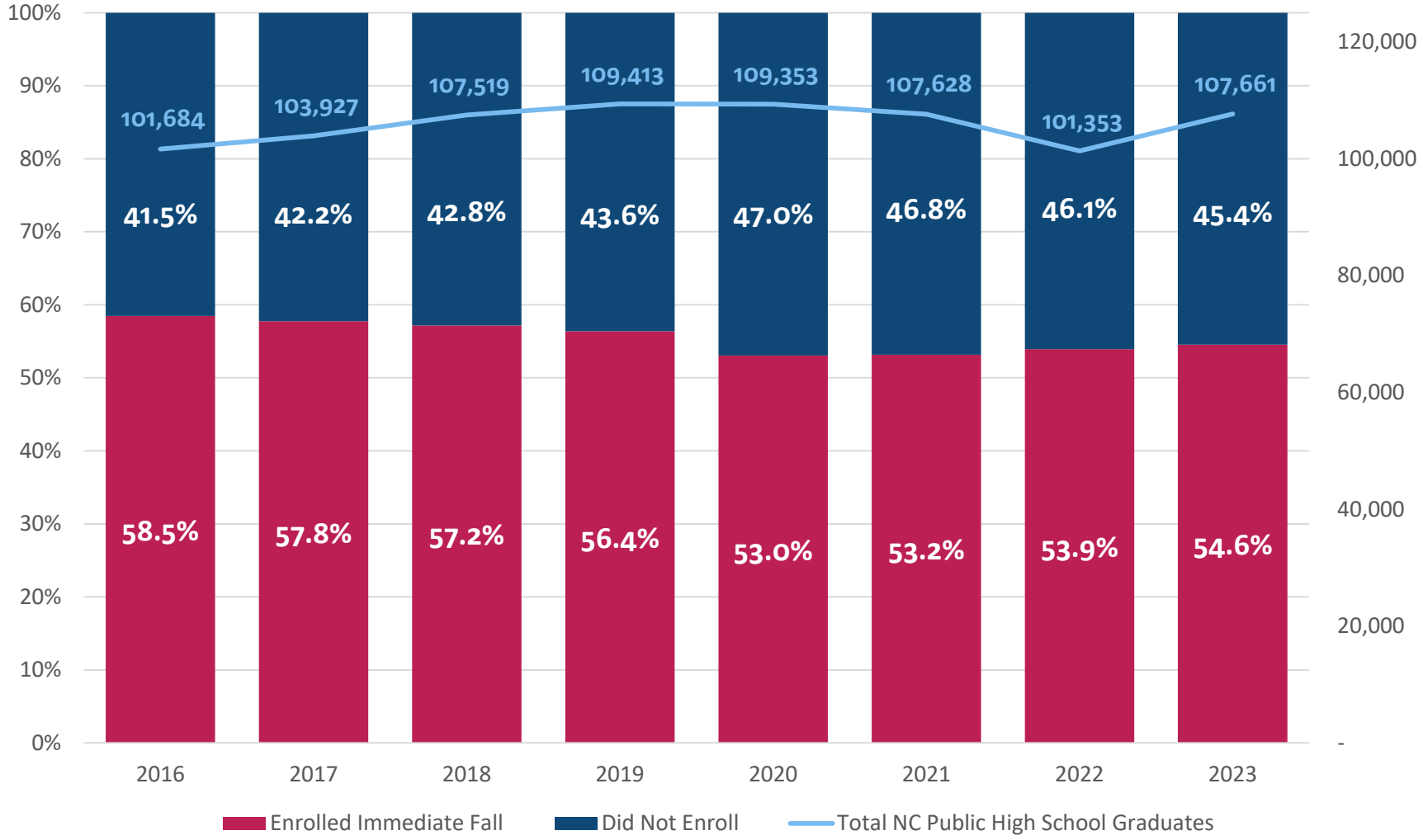
North Carolina: Immediate College-Going Rate of Public High School Graduates



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Source: DPI-National Stude

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Where did NC Public HS Graduates Go?

	All NC High School Graduates			College Attendees		
	2016	2023	+/-	2016	2023	+/-
Did not enroll	41.5%	45.4%	3.9%	-	-	-
UNC System	24.0%	24.3%	0.3%	41.1%	44.5%	3.4%
NCCCS	21.5%	19.5%	-2.1%	36.8%	35.7%	-1.2%
In-State Private 4-Year/Other	6.6%	4.4%	-2.2%	11.3%	8.1%	-3.2%
Out of State	6.3%	6.4%	0.1%	10.8%	11.7%	0.9%
Total HS Grads/College Attendees	101,684	107,661		59,453	58,732	

- Though the overall college-going rate has declined, the UNC System has continued to enroll approximately 24% of the high school graduating class.
- When considering only college attendees, the UNC System's market share has increased (~41% to ~45%), meaning the UNC System is enrolling a larger portion of an overall smaller pool of students.

Source: DPI-National Student Clearinghouse Dataset. "Did not enroll" may include students whose data are not in the dataset due to opting out under FERPA.

UNC System Prepares for Shifts: New Enrollment Projection Model

Goal: Develop a student credit-hour projection model to predict total number of **state-fundable** student credit hours produced by UNC institutions in future years

April-August 2024
Initial Model Development

→

September 2024
Preliminary Model Results Tested Against Actual Data

→

October 2024
Model Refined Based on Performance

→

Annually Each Spring
Updated Projections and Model Continuously Refined

What Drives Enrollment?

Demographic Shifts

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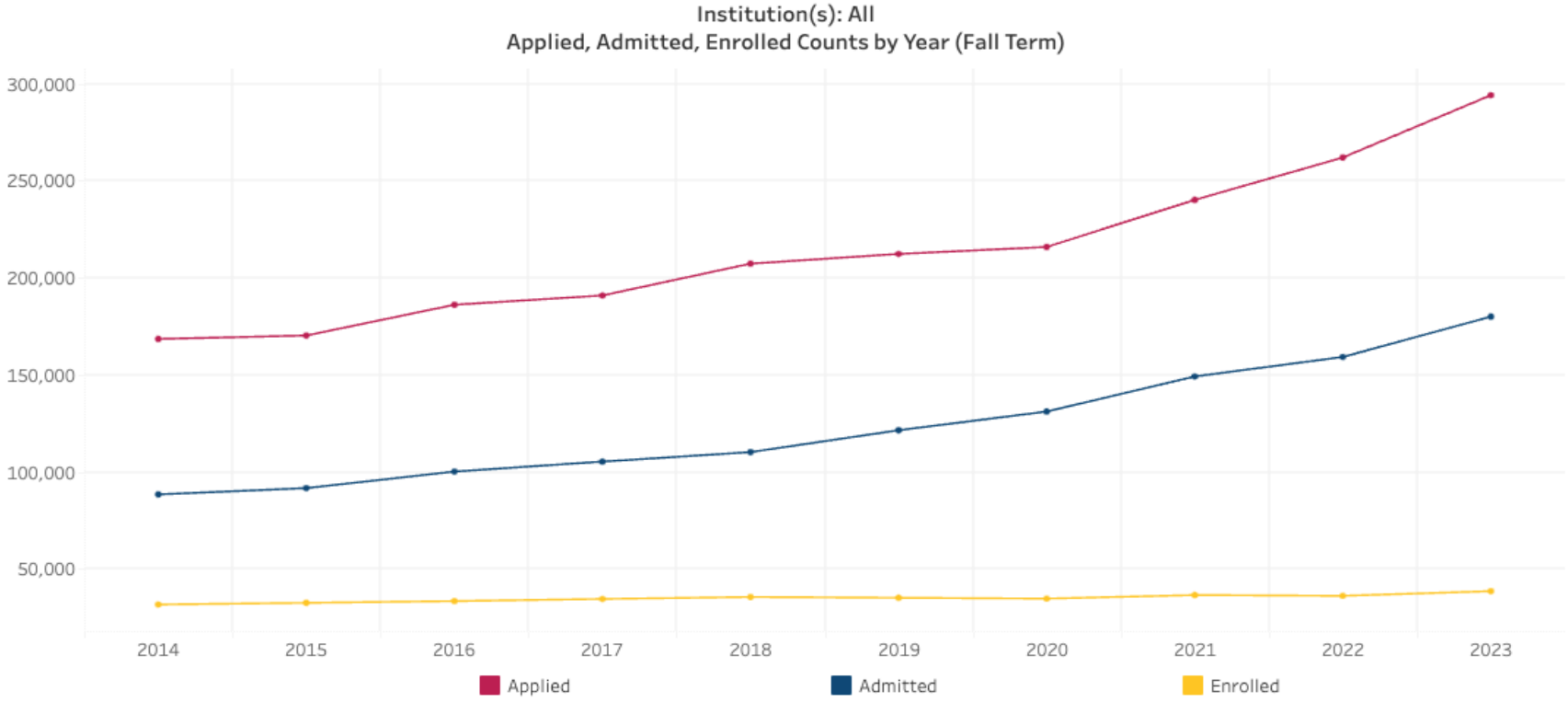
- Increased focus on retention
- Decreased time-to-degree

First…A Note On Matriculation Trends:
Applications are Up, Yield Rates are Down!



	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Applied	168,433	170,198	186,038	190,837	207,227	212,212	215,805	240,055	261,887	293,980
Admitted	88,373	91,612	100,134	105,269	110,154	121,414	131,050	149,111	159,148	179,941
Enrolled	31,668	32,525	33,420	34,522	35,537	35,133	34,700	36,535	36,145	38,529
Admit Rate (Admitted/Applied)	52.5%	53.8%	53.8%	55.2%	53.2%	57.2%	60.7%	62.1%	60.8%	61.2%
Yield Rate (Enrolled/Admitted)	35.8%	35.5%	33.4%	32.8%	32.3%	28.9%	26.5%	24.5%	22.7%	21.4%

THE UNIVERSITY OF NORTH CAROLINA SYSTEM

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College Access Best Practices

State System Policies & Practices

- 4-yr Fixed Tuition Guarantee
- Simplified State Scholarship
- State-coordinated redirect campaigns
- State-coordinated simplified application campaigns
- Subsidized tuition (i.e., NC Promises)
- CC transfer articulation agreements and transfer guides

Institution Policies & Practices

- Summer Bridge Programs
- Early Summer Orientation
- Expedited and Clear Financial Aid Award Letters
- Personalized communication strategies

NEXT NC SCHOLARSHIP

THE UNIVERSITY OF NORTH CAROLINA SYSTEM

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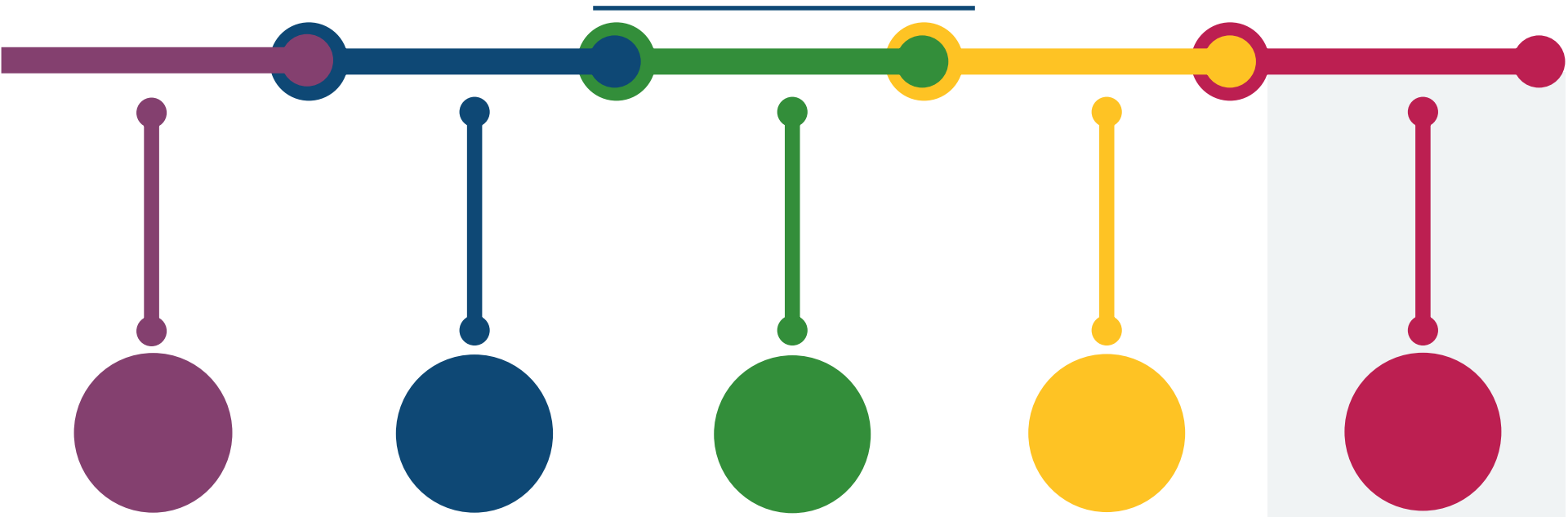
What Drives Enrollment?



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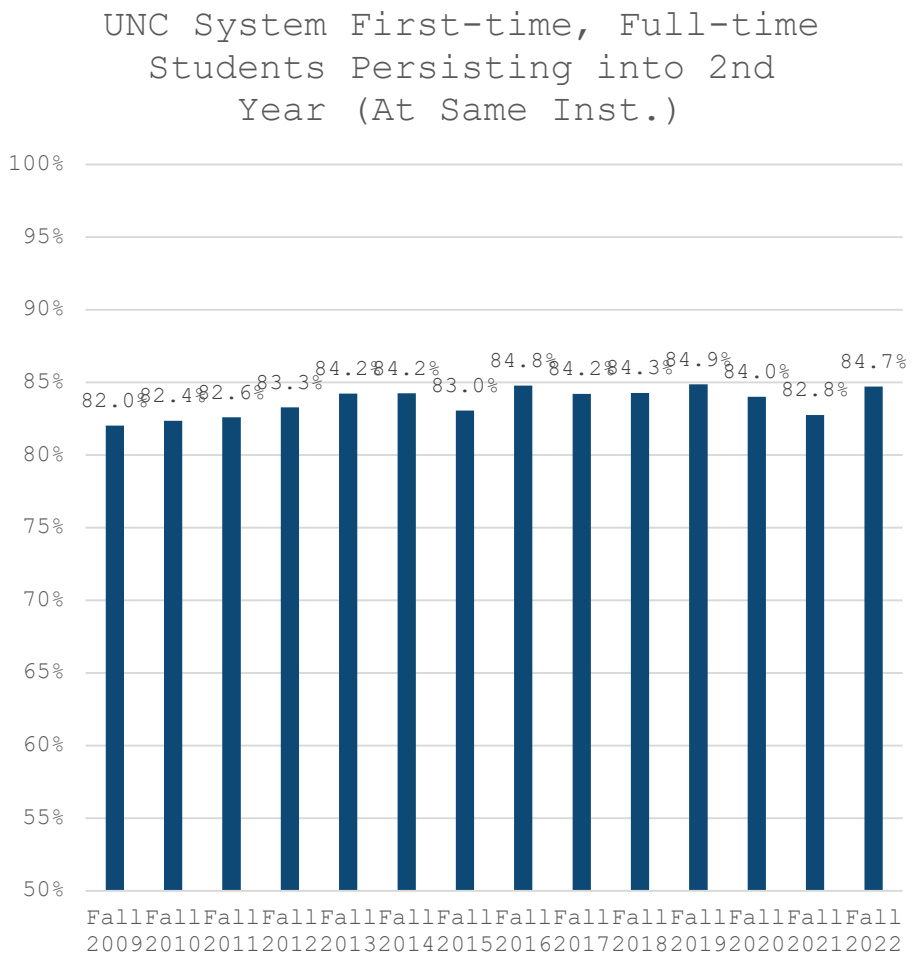
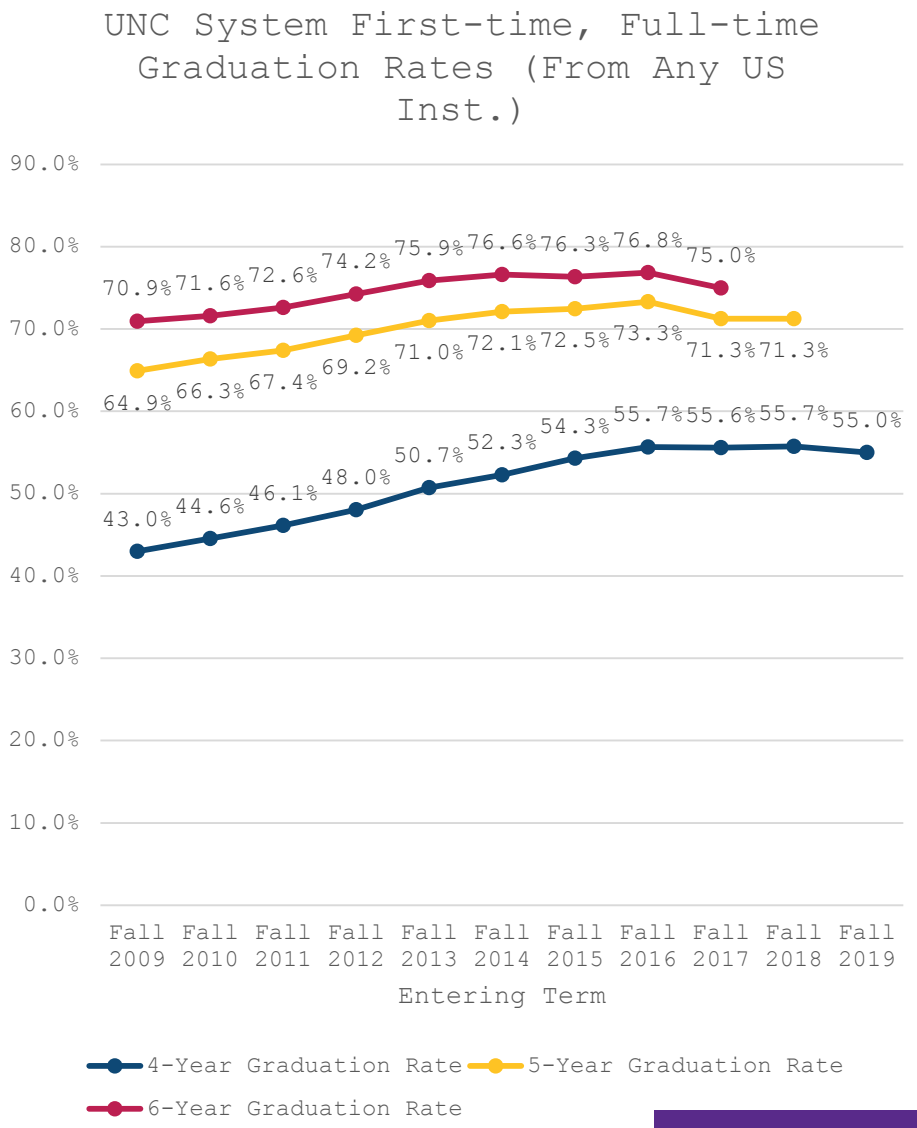
UNC System Making Steady Progress on Persistence & Graduation Rates





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Source: UNC System Inter

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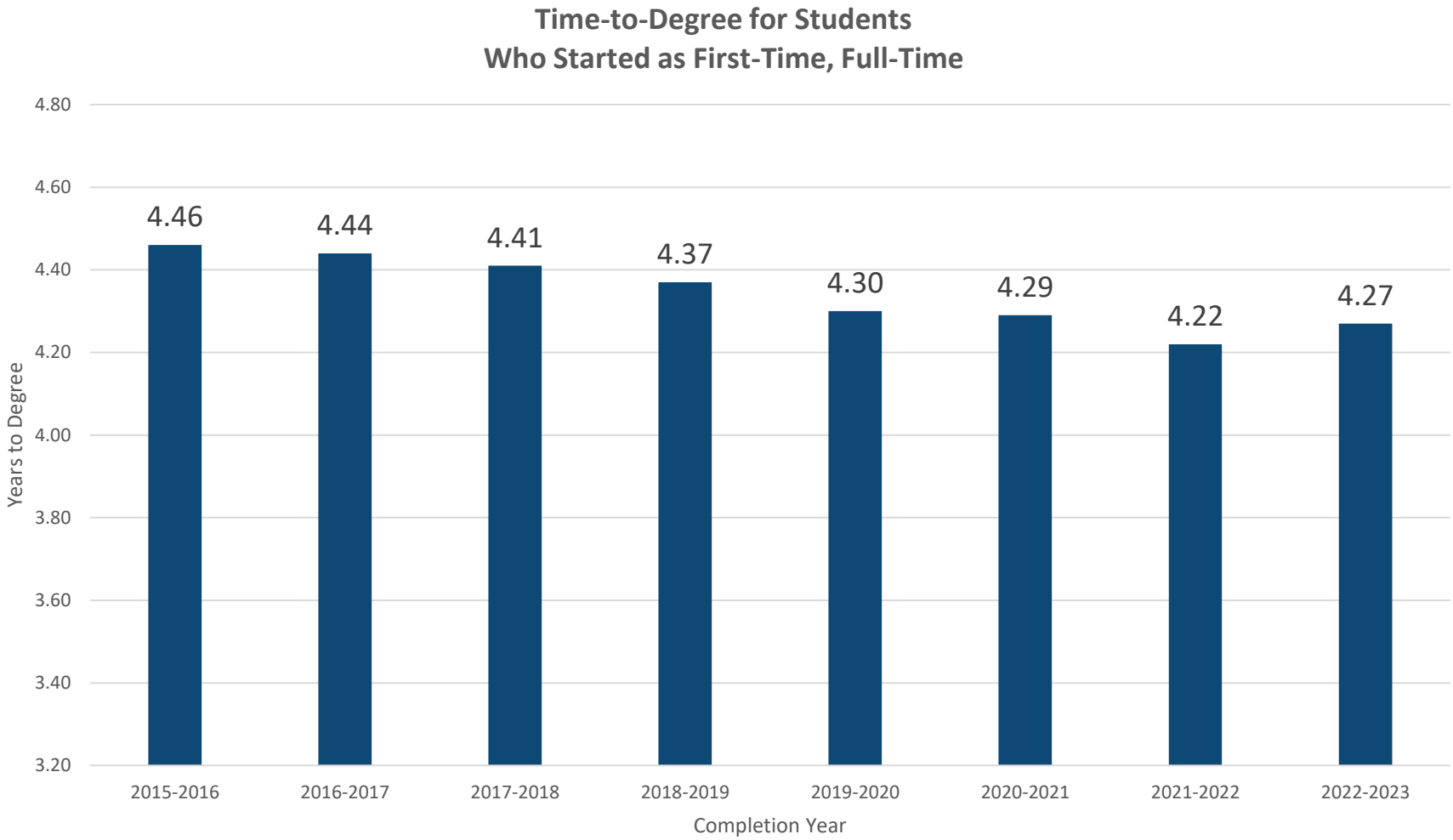
Time-to-Degree



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TrACE: Overview

Well-Researched Program for community colleges is adapted at UNC System

Fall '21: UNC System partners with CUNY to replicate ASAP|ACE student success model

ies WHAT WORKS CLEARINGHOUSE CUNY ASAP model included in "What Works Clearinghouse"

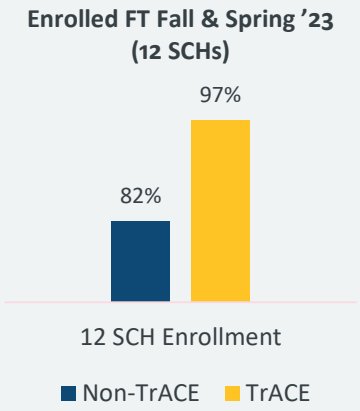
Fall '22 & '23: UNC System welcomes student cohorts (TrACE: Transfer, Accelerate, Complete & Engage)

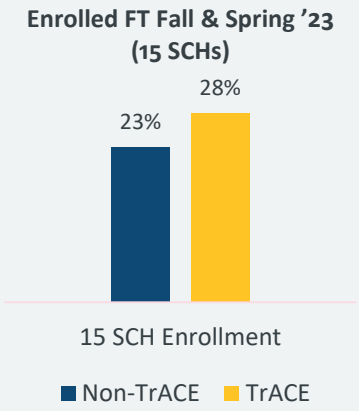
	Fall '22	Fall '23	Total
App State	49	75	**124**
ECU	53	75	**128**
UNCG	26	75	**101**
Total	**128**	**225**	**353**

Has TrACE Worked?

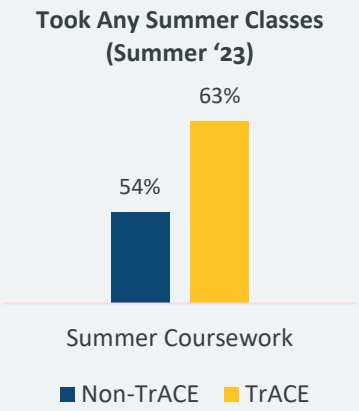
Enrollment Intensity

Full-Time Enrollment (12 & 15 SCHs)



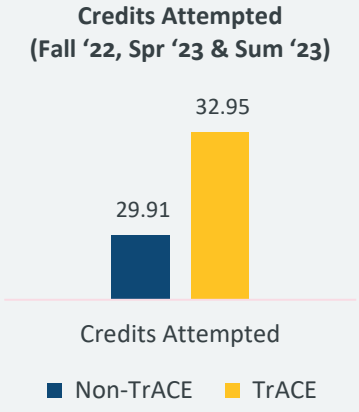


Summer Coursework

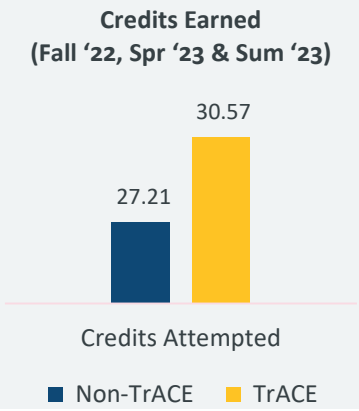


Credit Attainment

Credits Attempted (SCHs)



Credits Earned (SCHs)

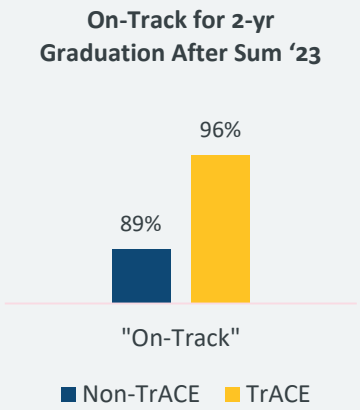


Has TrACE Worked? (cont'd)

Academic Achievement

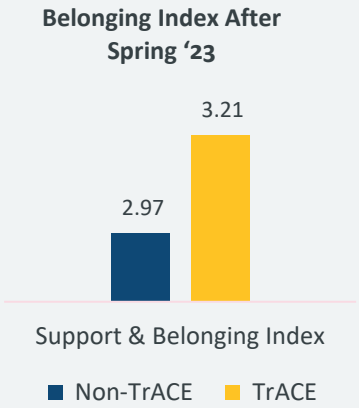
GPA

On-Track to 2-yr Graduation

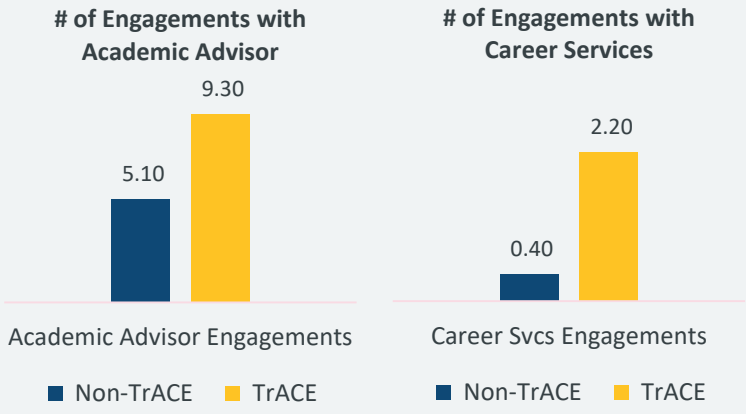


Integration & Belonging

Support & Belonging Index



Engagement w/ Campus Resources



Current System and Institutional Practices Driving Student Success

- ✓ Restructuring student advising
- ✓ Using financial aid to incentivize student success
- ✓ Cultivating year-round enrollment
- ✓ Increasing the out-of-state enrollment cap
- ✓ Embracing new markets

Implications for System Policy and Practice

- Exploring policies and practices related to credit transfer
  - Streamlined application process
  - Transcript review turnaround time
  - Technological solutions to make credit articulation and degree planning more transparent to students
  - Courses transfer into programs of study
- Optimizing academic program offerings

THANK YOU

QUESTIONS?

Meeting of the Board of Trustees
University Affairs Committee
September 26, 2024

AGENDA ITEM

IV. Leveraging the Power of Artificial Intelligence in Teaching and Research ..... Robin N. Coger, PhD
Provost & Senior Vice Chancellor for Academic Affairs

Sharon Paynter, PhD
Chief Innovation and Engagement Officer

Situation: East Carolina University is harnessing the power of artificial intelligence to transform educational practice, delivery, and research. This session will explore the dynamic ways AI has been integrated into teaching and learning environments as well as its impact on cutting-edge research and discovery.

Background: Artificial Intelligence (AI) is revolutionizing university classrooms by transforming teaching and learning processes. AI applications such as adaptive learning platforms tailor educational content to individual student needs, providing targeted feedback and resources that help optimize learning outcomes. AI's role also extends to research, where faculty explore solutions for complex problems across various fields, sometimes alongside partners in industry, military, government, and other external entities.

The synergy between AI in the classroom and faculty research underscores the importance of integrating cutting-edge technology with educational practices. It enhances learning experiences, prepares students for future careers, and advances knowledge through innovative research applications.

Assessment: This session will offer an understanding of the AI landscape at ECU, showcasing examples of real-world applications and discussing future possibilities. ECU faculty and students will share firsthand experiences and insights into AI integration to enhance personal learning, leverage faculty expertise, and foster innovative approaches to problem-solving in the classroom and outline AI-driven research initiatives that demonstrate how ECU is innovating to discover new ways of solving critical problems.

Reference Materials:

1. ECU Office of Faculty Excellence Workshops on Teaching and Research in the Age of Artificial Intelligence
2. Artificial Intelligence for Higher Education: What It is and What to Look Out For
3. Empowering Learners for the Age of Artificial Intelligence
4. How AI Is Shaping Scientific Discovery

Action: This item is for information only.

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artificial intelligence (ai)

Artificial Intelligence for Higher Education: What It Is and What to Look Out For

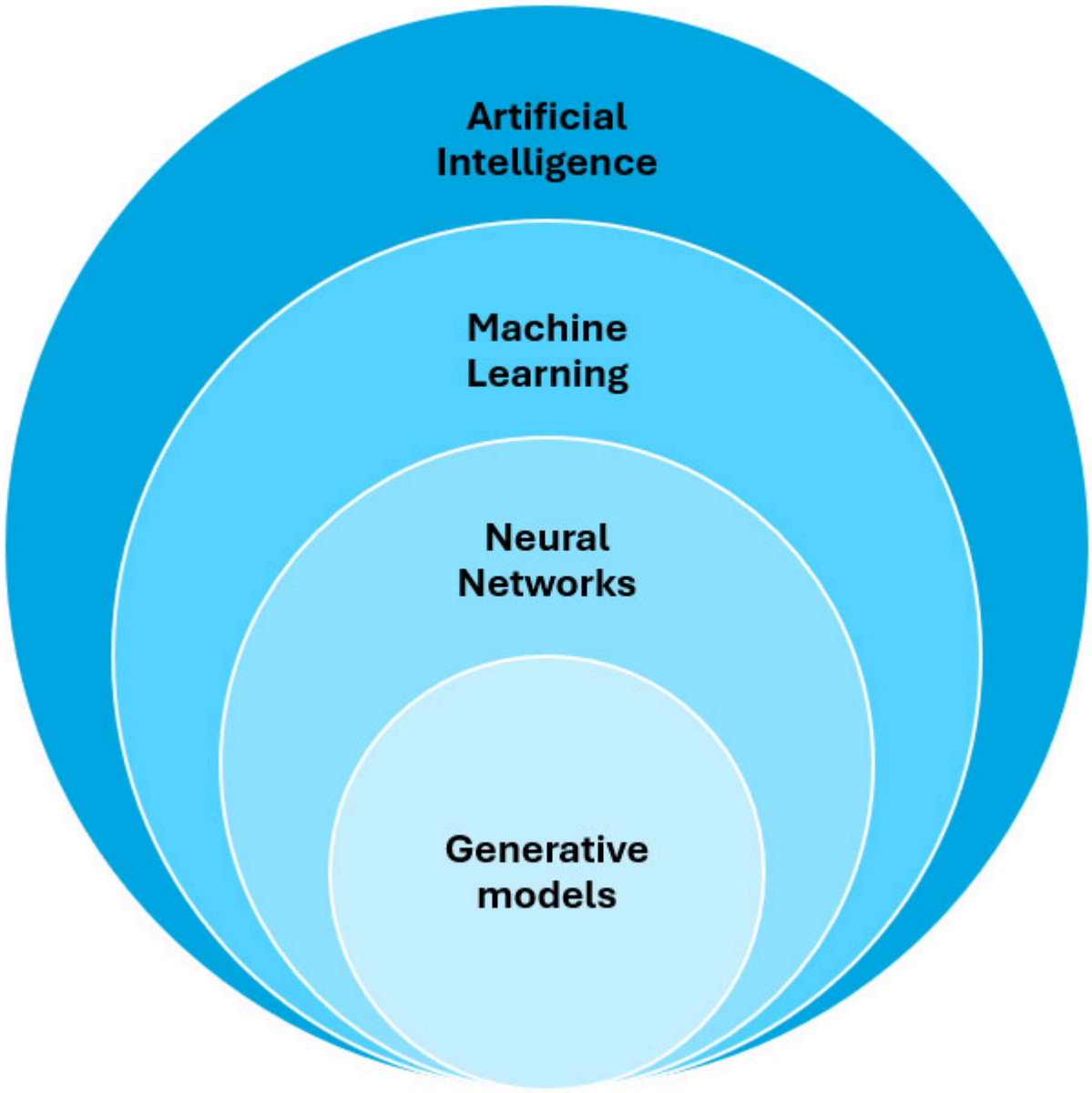
Rebecca Jenkins Director of AI Product Marketing July 7, 2024

This blog includes contributions from my RNL colleagues David Palmer, VP of Artificial Intelligence Technology Strategy, and Solomon Grey, Director Program Management.

Higher education is in the middle of an AI transformation. As advances in AI happen more rapidly, the impact of artificial intelligence on how we analyze data, recruit prospective students, serve current students, engage alumni, and work on campus advances so quickly, it can be difficult to keep up. In fact, while higher ed has been abuzz about AI in recent months, many campus professionals are unsure how AI works, how it helps, and how to use it responsibly.

RNL addressed these concerns in our webinar AI 101: Unveiling the Basics of AI University Innovation. My colleagues dove into detail about different AI models and the limits and risks of AI. We also have launched RNL Edge, our suite of AI solutions designed specifically for higher education. These solutions help you engage students and alumni, talk to your CRM to get instant insights, and work more efficiently than ever.

What is artificial intelligence for higher education?



Part of the confusion of understanding artificial intelligence for higher education is that there are many ways to experience AI. In fact, we all experience AI daily. If you have used Alexa or Siri on your mobile devices, you have used AI. The recommendations we receive from YouTube or Netflix are driven by AI. And of course, if you have used ChatGPT, that's also AI.

What is AI exactly? It's the development of computer systems capable of performing tasks that typically require human intelligence. AI tries to mimic human intelligence in a machine. While there has been a lot of discussion about whether AI can really "think," it cannot. Instead, it is a simulation of human intelligence and problem-solving capabilities.

There are related terms and subfields of AI. *Machine learning* gives computers the ability to learn by combining data with algorithms to train a model that can make decisions without being programmed to do so. *Neural networks* are a specific kind of machine learning model inspired by the human brain, and they can recognize patterns and make sense of complex data. *Generative AI* is also a subset of machine learning, using information captured in a neural network to create new data based on what it has learned, such as texts, images and audio.

Generative AI is the major AI advance that generated the greatest buzz in the last year, especially because of the popularity of ChatGPT. These are digital assistants or bots that use *Large Language Models (LLMs)*. LLMs are a type of generative AI that excels in understanding and generating human language, or natural language. This capability enables users to interact with AI conversationally in the form of digital assistants and chatbots. They allow you to interact with AI using natural language and then receive answers back to your questions and requests in natural language.

Open-source LLMs vs Proprietary LLMs aka public vs protected

Open-source LLMs are models whose code and training methods are publicly available, offering greater flexibility and customization. Unlike proprietary models, open-source LLMs are not controlled by a single entity; instead, they can be modified and improved by any user, which enables innovation and adaptation.

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This openness allows users to train the model on specific data sets tailored to their interests, such as using information from their own CRM to better reflect the specifics of their institution, rather than relying soley on knowledge based on publicly available data from the Internet.

Proprietary LLMs keep their technology, data, and research private. A well-known example is OpenAI's ChatGPT, which is trained on a broad range of texts from the Internet. While this type of model offers several benefits, it also has drawbacks related to accuracy, bias and reliability, which will be discussed shortly. Most importantly for higher education, the information used in these systems is not private, raising concerns including data security and governance.

What are the limits and risks of AI?

Understanding how AI works also helps us understand the limits and risks of artificial intelligence for higher education. The thing to remember is that conversational AI does not know it's having a conversation with you. It is relying on how it is trained and built to give you responses. That makes it very important to know how the AI tools you use are trained and what guardrails are in place, because there are limits and risks with AI that can (and have) caused real issues for organizations.

Unwanted behavior: These can range from inappropriate or irrelevant prompts from users (such as asking a chatbot for help with a homework problem) to inappropriate responses from the AI (sharing how to cheat on homework, for example). It also can also include privacy violations such as accepting or offering sensitive information like student records. You want to make sure that all the responses your AI tools provide are appropriate to the information that should be provided and appropriate to the voice of your institution.

Bias: Because many AI tools are trained on vast quantities of data that are already out in the world, bias can creep into the models. Those biases can then be propagated through all of your results from that AI. This can lead to skewed results, biases in data, biases introduced by user input, feedback loop biases, and a number of other pitfalls. You need to be able to trust how your AI tools are being trained and understand how biases are being addressed. Also, addressing bias is an ongoing process to ensure bias does not creep into models that already exist.

Accuracy: This is one of the more well-known risks as there has been media coverage of AI-generated pictures of people with too many fingers and high-profile cases of AI providing inaccurate information. Remember that AI has no inherent ability to know when it is telling you the truth, so it will produce results that it *predicts* are the most likely response according to its existing algorithms. These inaccuracies can be in terms of factual accuracy as well as accuracy of voice. Does your AI represent your mission and your voice accurately?

Security: As I already mentioned in the Open vs Closed system discussion, security is a key consideration when using AI tools. The simple rule of thumb is to use "generic" AI tools for generic purposes, but private AI tools when handling sensitive information. For instance, when summarizing a student transcript, that should absolutely be used on a closed AI system that is private and secure.

Regulation: Finally, when you are using AI tools, you want to know that the creators of those tools are keeping in compliance with current regulations as well as future regulations.

You can also read more about responsible AI for higher education to explore AI governance.

Evaluating AI solutions for higher education

Now that we understand how AI works and what risks you need to mitigate, how do you choose an AI solution for your institution? There are several things you need to consider:

- **Do the solutions follow responsible AI principles?** This is a foundational question because responsible AI guides your entire approach to implementing and managing AI. This is the first question every institution should ask.
- **Are the solutions secure?** To get the most out of AI, you will want to have your AI solutions handle information such as sensitive student and institutional information.
- **Are the solutions free of bias and inaccuracy?** This relates to responsible AI and security. Do your AI solutions provide factual information in a voice that aligns with your institution? Make sure you understand how the tools are trained so you can make a proper assessment about bias and inaccuracy.

We kept all of these factors and many others in mind when we developed the RNL Edge AI suite of solutions. Our solutions are secure, private, and rigorously trained, and developed specifically for higher education uses:

- RNL Compass is our digital assistant tool that seamlessly integrates with our CRM to provide 24/7 engagement to potential students, parents, and alumni. It can help answer questions about admissions, financial aid, fundraising, and more—accurately and in alignment with your voice.

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- RNL Insights allows you to have a conversation with your CRM, applying the massive benefits of an LLM to your own data. You can effortlessly unlock strategic insights from your data without having to wait for reports or navigate multiple dashboards.
- RNL Answers is your internal chat tool to get things done at your institution, whether you need a concise summary of a donor record, a detailed analysis of ROI from your latest eighth-day enrollment report, or assistance in crafting personalized communications. It's built on a secure server that ensures privacy.

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About the Author

Rebecca Jenkins offers more than 20 years of experience in strategic marketing and communications. She is responsible for crafting and implementing robust marketing strategies for RNL's AI solutions and communicating how they strengthen enrollment and...

Read more about Rebecca's experience and expertise

Reach Rebecca by e-mail at Rebecca.Jenkins@RuffaloNL.com.

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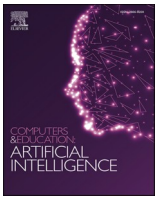

Empowering learners for the age of artificial intelligence

A B S T R A C T

Although studied for decades by the research community, artificial intelligence (AI) in education has recently sparked much public debate with the wide-spread popularity of systems such as ChatGPT and DALL-E. Existing literature offers a wealth of research on design, deploying and evaluating AI-driven systems in education. However, the challenges related to the growing influence of AI in the society, calls for revisiting research foundations of AI in education in order to inform decision-making in policy and guide future research. This special issue of *Computers & Education: Artificial Intelligence* brings 11 papers that explore the theme of empowering learners for the age of AI. The contributions of these papers can be broadly grouped into seven main themes: *intersection between AI and humans* that looks at the space of coordination; *assessment* that explores challenges and opportunities afforded by the use of AI in educational assessment; *explainability* in *AI* as a critical need for humans in education to understand and trust AI; *design for learning* that offers principles for designing AI-driven systems and educational opportunities; *conceptual AI and learning* exploring the need for the development of new theories of learning and their connections with existing theoretical foundations in education; *accurate predictions* and their role in future education; and *applications* of AI in classrooms and educational systems. The findings of these studies highlight pressing research and policies challenges and opportunities that arise with the broad penetration of AI in education. They also emphasize the need for future research that addresses issues of *ethics, bias and farness* in the use of AI in education; challenges associated with *data sources and ownership* as the key fuel and enabler of present-day AI generation; *AI literacies and competencies* of stakeholders who use and are impacted by AI in education; identification of *effective learning and teaching practices* with the use of AI; and policy development to increase *responsiveness of education systems* to rapid changes driven by AI.

Since AI's founding, researchers, theorists, and pundits have overstated how it would impact humanity. While periodic moments of dramatic achievement have occurred, such as DeepBlue and AlphaGo, most progress with AI has been behind the scenes and in labs. Public declarations of AI's coming dominance have continually failed to materialize, or when they do, to materialize much later than forecast. By late 2022, after a year of rapid developments with generative AI (technologies such as text to image, large language models that produce reasonably coherent text with only short prompts, and text to video tools) it appears that the early glimpses of how AI might intersect with humans is starting to emerge. Acts of creation are no longer the domain of human endeavor as AI produces novel text and images through GPT-3 and Stable Diffusion. Whether the *appearance* of creativity is an indication of *actual* creativity remains the domain of philosophers and cognitive scientists as they explore theory of mind, states of knowing, and even consciousness. For the general public, these advances of AI raise tantalizing prospects of future human-AI intersections in a range of creative and knowledge work, but also worrying concerns about bias, ethics, fairness, and accuracy. As critically are questions regarding the longer term role for humans to interact with AI systems (Johnson et al., 2013).

For the education sector specifically, consequential questions have emerged regarding innovations such as essay writing technologies. Notably - how should learners be assessed when a paper can be created of plausible writing quality in a matter of seconds with only a few strategic prompts. A new concern arises: how do researchers and educators define and articulate the *space of negotiation* between what AI is and does in learning and educational settings and how that relates to human learning and cognition.

This special issue is a substantive engagement around how learning will be impacted and the types of challenges the entire education sector faces. It is important to note that while AI has now burst out of university and corporate labs, even dedicated researchers have been taken aback by the apparent sophistication of large language models like ChatGPT. In late November 2022, prominent AI researchers shared their surprise at both the quality of ChatGPT's outputs and its periodic comically nonsensical responses. Education is concerned with preparing people to navigate complex futures. Going forward, this will involve active engagement and collaboration with AI. Significant challenges exist in laying core foundational theories of human and machine learning intersections, including machine-machine intelligence (Rahawan, 2019), and how to apply those frameworks into education systems.

This special issue has been in development for over 18 months and reflects leading thinking about AI and learning from scholars around the world. While it is a substantial contribution, it is part of what will become a crescendoing conversation regarding what it means to learn with AI. This conversation is now happening in labs and public spaces around the world and including the broad representation from all regions, sectors, and societies is vital to ensuring the future of education remains focused on the human student. Our theme for this issue is *Empowering Learners for the Age of Artificial Intelligence* - a focus on the need for AI in education to improve the experience of learners and the impact of their education.

Our special issue includes eleven articles and introduces surprising synthesis around a range of themes. Each of these papers contributed to

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a number of themes, so our summary below is intended to identify those areas where the contribution was to a primary theme. These themes are best seen as a network, rather than silos. We identified seven themes: intersection between human and machine, assessment, explainability and ethics, design, conceptual, predictions, and application.

The first and most prominent theme centres on what we describe as "the space of coordination" - the **intersection between AI and humans**. What is being coordinated in this space? Currently, almost everything related to learning is under examination. Molenar (2022) focuses on tasks that can be "offloaded from humans to AI" (p. 1) and then "onloaded from AI to humans" (p.1), focusing specifically on a hybrid systems to help develop self regulated learning skills in young learners. She offers a hybrid model of regulation, emphasizing four regulation degrees: AI, co-regulation, shared-regulation, and self-regulation with an intent to support SRL developing through interaction with AI. Markauskaite et al. (2022) explore this middle space by engaging a number of experts in the learning analytics and AI fields to articulate some direction of an "interconnected, fast changing world" where "agentic machines" (p. 1) are the norm. Their Table 1 captures the range of perspectives regarding what capabilities are needed, how we develop those capabilities in humans, and how we study the development of those capabilities. Siemens et al. (2022) suggest that intelligence is too broad a term to provide utility when assessing which specific tasks or activities should be conducted by human or machine. Instead, they argue that cognition and discrete cognitive activities should be the foundation for evaluating and assessing how people learn, sensemake, and make decisions when agents with cognitive capacity are present.

Assessment is another prominent theme, not only in this special issue, but a growing interest in large language models (Floridi & Chiriatti, 2020) and their ability to assist students in auto-generating essays. At the time of writing this editorial, there is wide ranging conversation in newspapers, news programs, and conferences regarding the utility of essays in colleges given the performance of ChatGPT. Swiecki et al. (2022) draw a contrast between standard assessment paradigm - where "a predefined set of items … is used to infer claims about learner's proficiency in one or more traits" (p.1) - and the emerging AI for assessment where tasks can be generated, peers can be recommended to grade work, and grading itself can be done automatically. They suggest that a number of inefficiencies in the existing model can be addressed in this new approach, including a move towards continuous, more authentic, and adaptive assessment. However, a number of challenges remain in this assessment model, including "sidelining professional expertise", "black-boxing" accountability by placing decisions in the hands of programmers, restricting the role that pedagogy plays in assessment, limiting accountability and the scope of learning, and surveillance pedagogy. Despite these substantial challenges, the authors remain optimistic that AI can at least partially address the limitations of the existing assessment model.

The third major theme of this issue relates to **explainability of AI**. Explainability refers to the ability of humans to understand and trust AI. This need will increase in importance, especially as the intersections between human and AI require greater collaboration and coordination (see Carvalho et al., 2022; Markauskaite et al., 2022; Molenar, 2022; Siemens et al., 2022). Khosravi et al. (2022) introduce the XAI-ED, detailing how existing explainable AI approaches can be applied to the education sector. XAI-ED incorporates insight from numerous fields, including cognitive and learning sciences, AI, human computer interaction, and learning analytics in order to present a "means for educational tool developers and researchers" (p. 4) with the means to support the "creation of trustworthy, AI-augmented, sociotechnical systems" (p. 18). They then present four case studies that detail how XAI-ED is reflected in different AIED systems: learner sourced, open-ended learning environments, writing analytics, and team-based learning. They conclude by advocating for broader discussion around explainable AI in education, increased research and adoption of these models, and involvement of multiple stakeholders in developing tools and systems.

In digital education, thoughtful and intentional design is critical to providing learners with the structure and support required during the learning process. **Design for learning** figures prominently in our special issue as well. Kay et al. (2022) promote design of learning data as part of the overall design process. Open Learner Models (OLMs) represent what learners know and the skills they possess. While an OLM can be seen from a range of perspectives, including the teacher, the implicit model in a system, the model of a set of learners, Kay et al. focus on the individual model of learners. As such, OLMs capture individual student progress and can serve as a progress indicator. Their approach to OLM involves adopting core concepts from AI in education (such as scrutability and model development) and applying this to learning design process, supported by data design. Carvahlo et al. (2022) take a broader view by focusing on learning in an AI world. They detail design implications, notably around defining the "*problem space* for education design in a world of AI" (p. 3) and advancing pedagogies for unknown futures. They recommend co-design approaches with humans in design in general, but when applied to AI settings, they conclude by articulating the need for teaming up with AI in various learning settings. This raises an unaddressed need in education today: design models for human-AI interactions have not yet been developed that provide guidance on how AI supports, augments, and directs learning.

Conceptual AI and Learning is the fifth theme of this issue. Do existing theories of learning (and related areas such as sensemaking, decision making, and self regulation) require new theoretical constructs? Can constructivism suitably capture the learning and design needs of AI-human learning interactions? All articles confronted this at a basic level. Yazdanian et al. question the implications of AI on systems, Poquet et al. (2021) on the experiences of various learning transitions, Siemens et al. (2022) on the relationship learner cognitive have with AI, Khosravi et al. (2022) on explainabilty, Molenar (2022) on self-regulation, and Kay et al. (2022) on learner models. Taken as a whole, these papers reveal the need for foundational discussions about learning theory and conceptualizations of learning actions and behaviours in AI-human settings.

A sixth theme relates to the holy grail of humanity: the ability to see into the future and make **accurate predictions**. Universities have started grappling with concerns about curriculum relevance, especially in technical fields where new skills and job categories quickly arise. Yazdanian et al. (2022) target this area of prominence given the complexity and pace of change of the modern workforce. They argue that they "are able to predict future emerging skills with good precision" (p. 1) and by doing so, "AI can help enable educational institutions to keep up with rapid changes in the labour market" (p. 9). This analysis can provide universities with a quick response to new trends, but the ability of universities to move at a pace fast enough to answer this call remains uncertain at best. Carvalho et al. (2022) address the design challenges of these complex issues, but it is important to emphasize that universities are competing with large technology providers, such as LinkedIn, who have granular insights into geographic regions, a topic that Yazdanian et al. raise for future work.

A final theme is on the **application** and use of AI. AI is not a future technology. It is currently in use in classrooms and courses around the world. Howard et al. (2022) explore educational data journeys. A data journey is presented as surfacing "how data was produced and used across different sites of practice" (Howard et al., 2022, p. 2). This journey has direct implications for AI and particularly, in the elements that underpin policy, teacher work and activities, literacies, and general educational data work. Data is used to achieve something in educational settings. In schools, this often involves reporting, tracking student progress, pursuing various state-level targets and personalized education. The authors conclude by arguing for future educational data journey research to meet the increased presence of emerging AI technologies. Poquet et al. (2022) offer a practical application where AI addresses the transition spaces that arise as learners move through life. Luckin et al. (2022) introduce *AI readiness*, noting that adoption requires

literacies and skills and an institutional focus on understanding the differences between human and AI.

1. Concerns regarding the future

We also note a series of four concerns that will shape how education systems adopt AI. Advances in automation and computation alone are not sufficient to ensure broad scale adoption. Ethics, data ownership, AI literacies, and systemic resistance to change are all areas that require greater scrutiny.

Ethics, bias, and fairness remain central to discussions of AI's growing influence. The data that is used to train AI is generally data that has bias embedded within it or within the process of creating algorithms. This bias then produces results that can be problematic over even harmful to certain populations. While responses such as explainable AI are possible avenues to improving the fairness of algorithms, important insights may be gleaned by adopting the methods of cognitive scientists who are used to working with the "black box" of the human brain (see Taylor & Taylor, 2021).

The topic of **data sources and ownership** was not prominent in the articles in this special issue, but as both datasets and models increase in size and the related computation needs increase dramatically beyond the scope of what an academic lab can afford, the presence of big technology companies becomes increasingly important. Many of the datasets used today to train models are open. However, data sets comparable to ImageNet or LAION to build learning models do not yet exist. This is partially due to the challenges of multi-faceted needs for creating even a rudimentary model of learner behaviour or knowledge, in contrast with ImageNet, where variables are constrained. The organizations that have large enough datasets to begin creating learner models are often private or for-profit (Microsoft, Google, Instructure). For educators, addressing a range of concerns around AI in education - including bias, ethics, and fairness issues - will require generating large open datasets for developing, training and validating models.

With the sudden public interest in AI, driven by the success of large language models, the need for **literacies and competencies** of all faculty, teachers, and learners in higher education becomes apparent (Long & Magerko, 2020; Ng et al., 2021). What should the general public know about AI? How do general competencies in AI differ from the reskilling of society in computer science literacies of the last several decades? Here vital questions emerge: what should academics (both students and faculty) know about AI and what should the general public know? How will entire sectors of society be reskilled and whose responsibility it is to initiate and support that reskilling? Should AI literacy be a state and national initiative? Or should the public and private education marketplaces be left to address this need? Regardless of how those decisions are made, having a functional understanding of what AI is, what it does, and possible implications on individuals and societies seem like a fundamental and basic need.

Trustworthiness and reliability of AI technologies will remain an open challenge. Many AI technologies that received much prominence recently are grounded in the concept of generative AI that is built on transformer-based architectures for training large language models. Such AI technologies generate exceptionally convincing human-like textual responses across a range of different genres. However, the architectural designs of such technologies do not have notions that can guarantee factual truthfulness and reason over causal and temporal relationships (Marcus & Davis, 2019). They can also produce eloquent responses written in an authoritative style on nonsensical topics (e.g., financial implications of pension plans and aged care for immune cells). Arguably, to address these issues requires a fundamental paradigm shift from contemporary AI technologies (DARPA, 2022; Marcus & Booch, 2023). While we work with the present (generative) incarnation of AI technologies, we see a need to identify ***effective learning and teaching practices*** that will harness the weaknesses of generative AI technologies as opportunities for promoting higher-order learning (e.g., analyze and scrutinize outputs produced by ChatGPT). In this process, we can not expect teachers and educators alone to fix the problem of AI in their classroom, but we need to have an extensive involvement of researchers, technology developers, and policy makers.

In late 2022, as generative AI technologies, including ChatGPT, gained increased media attention, the response by universities and academics is cause for concern. The impact of universities as institutions is measured in centuries and millennia in how humanity's knowledge is discovered and shared. As a result, universities are not measured by their rapid responses to potential trends. While this aspect of higher education systems is to be lauded in ensuring that small, but highly hyped, trends do not overwhelm the lofty long term goals of universities in supporting society and democracies while raising the quality of life for all people, this **slowness of universities and school systems to change** and respond at a systemic level to dramatic and possibly existential trends, and in the process, to conceive new contributions to a society where AI is prominent, is worrying. For university leadership, vital discussions emerge. First, do the early indicators of successful AI approaches in classrooms scale for large numbers of learners and increasingly diverse learner populations? Secondly, how fast should systems respond to AI and how aggressively should systems remake themselves in response to AI?

This special issue represents front line research on dramatic advances over the past several decades. Many AI researchers have seen trends rise and seen the field enter a number of "AI winters" where research funding and progress slow down. The constellation of trends, including computing advancements, scope and quality of data, and advances in algorithms, suggests that the short term future is one of continued advancement. As AI proceeds, however, educators and society in general face a new reality: what will we teach and how will we teach when artificial agents, now readily present in our daily lives, exceed our cognitive capacity in a growing number of domains?

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NATIONAL ACADEMIES Sciences Engineering Medicine

How AI Is Shaping Scientific Discovery

Feature Story | November 6, 2023

By Sara Frueh

Physicist Mario Krenn sees artificial intelligence as a muse — a source of inspiration and ideas for scientists. It's a description born from his past research and his current work at the Max Planck Institute for the Science of Light, where he and his colleagues develop AI algorithms that can help them learn new ideas and concepts in physics.

His efforts began years ago, when a research team Krenn was part of struggled to come up with an experiment that would let them observe a specific type of quantum entanglement. Krenn, suspecting that their intuition was getting in the way, developed a computer algorithm that can design quantum experiments.

"I let the algorithm run, and within a few hours it found exactly the solution that we as human scientists couldn't find for many weeks," he said. Using the blueprint created by the computer, his colleagues were able to build the setup in the laboratory and use it to observe the phenomenon for the first time.

In a subsequent case, the algorithm overcame a barrier by reviving a long-forgotten technique and applying it in a new context. The scientists were immediately able to generalize this idea to other situations, and they wrote about it in a paper for *Physical Review Letters*.

"But, if you think about it, none of the core authors of this paper came up with the idea that is described in the paper," said Krenn. "The idea came completely, implicitly from the machine. We were just analyzing what the machine has done."

Krenn was among the speakers at a recent two-day meeting hosted by the National Academies that looked at the present and future of AI in advancing scientific discovery.

AI is advancing science in a range of ways — identifying meaningful trends in large datasets, predicting outcomes based on data, and simulating complex scenarios, said National Academy of Medicine President Victor Dzau in his welcoming remarks. As the technology develops, it may acquire the ability to carry out independent investigations.

"As we envision AI for the future and using it to do independent scientific inquiry, there's a lot to consider," said Dzau. "We have to be very careful about understanding the potential of [emerging technologies] possibly affecting society in many different ways … cost, access, equity, ethics, and privacy." He noted that ongoing committees at NAM are exploring potential impacts in such areas.

Already speeding science

AI is accelerating research on complex neurodegenerative diseases like Alzheimer's disease and Parkinson's disease, explained Steven Finkbeiner, a senior investigator at the Gladstone Institutes.

When his team began using AI to analyze images of cells, "one of the very first things that surprised a lot of the biologists in my group was how rich their data might be, and it may contain information that basically we can't see as humans, or have overlooked," he said.

His team employed a deep-learning algorithm to try to identify the point at which a cell becomes destined to die — something human scientists have struggled to do, and a key endpoint in understanding neurodegenerative diseases. After being trained with 23,000 examples, the team's deep-learning network was able to identify changes in the cell nucleus that could predict with high accuracy which cells were destined to die.

Finkbeiner's team is now using deep learning to identify even earlier changes in a cell that predict its eventual death — early enough that intervening in the process may eventually be possible.

Amy McGovern, a professor at the University of Oklahoma, explained how AI is being applied to meteorology. Initially AI has been used to correct biases in existing weather prediction models, which can improve forecasts and save lives and property.

"Now we are using it to try to improve our foundational understanding of the science of specific events," she said. For example, researchers are using AI to generate synthetic storms and identify new precursors to tornadoes. Tornadoes are rare enough that real ones alone don't generate enough data to inform that effort.

Autonomy in the future?

Going forward, AI will likely be developed to go beyond tasks like identifying patterns in data and designing experiments. Speakers explored whether there will eventually be "AI scientists" that are able to act independently and also partner with human scientists.

Doing so would mean that AI scientists would have the capacity to perform scientists' core competencies, explained Yolanda Gil, principal scientist at the University of Southern California's Information Sciences Institute. This includes not only tasks like gathering and analyzing data but also a reflection process — what's a good hypothesis to work on? — and the creativity to come up with new paradigms and ideas. "These are big challenges for AI," said Gil.

Hiroaki Kitano, CEO of Sony AI, explained his proposal for the Nobel Turing Challenge — to come up with AI systems by 2050 that can make major discoveries autonomously, at the level of discoveries worthy of a Nobel Prize. "Can AI form a groundbreaking concept that will change our perception?" he asked.

It's both a challenge and a question, Kitano said. "If we manage to build a system like that, is it going to behave like the best human scientists, or does it show a very different kind of intelligence? Are we going to find an alternative form of scientific discovery that is something very different from what we do today?"

Navigating ethical dilemmas

Deborah Johnson, professor emeritus of engineering and society at the University of Virginia, expressed concern about the use of the words "autonomy," "autonomous," and "AI scientist," because they seem to distance human scientists from responsibility for the AI systems they create and any negative impacts that result. "I worry that this is going to lead to a deflection of accountability and responsibility for what happens."

Johnson was on a panel that explored ethical and societal issues that AI research raises — including how the benefits it yields can be distributed widely rather than reserved for a few.

"Much of the investment and excitement in the areas I work in — in medical artificial intelligence — is about pushing frontiers," said Glenn Cohen, deputy dean of Harvard Law School. "It's taking the work of top dermatologists or top brain surgeons and making it even better, helping people who already have access to very high-quality oncology survive longer."

While that's great, Cohen continued, much of the benefit of AI lies in its ability to democratize expertise — taking the expertise of average doctors and scaling it up to make it available to people in rural areas and all over the world. Right now, the investment and intellectual property and funding incentives don't match that ethical goal, and we need to think seriously about how to restructure those incentives, he said.

Vukosi Marivate, ABSA UP Chair of Data Science at the University of Pretoria, said that governance of AI is a team sport; ethical decisions and responsibility shouldn't rest solely with AI developers and scientists. Society should have a voice in what the expectations for limits on these technologies should be.

"And for society to have a voice, they must understand what is going on," said Marivate. "It can't just be that you have these discussions about societal impact, and then society's not there." AI developers and scientists should not be making decisions on their own that affect other people broadly, he said.

Moderator Bradley Malin, a professor at Vanderbilt University, emphasized the need to set up an ongoing process to reason about AI-related societal and ethical issues as they inevitably, unpredictably emerge. "These dilemmas are going to arise, and it's probably unlikely that we're going to know all of them beforehand."

- ***Watch the workshop sessions.***

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Meeting of the Board of Trustees
University Affairs Committee
September 26, 2024

AGENDA ITEM

V. Closed Session ..... Dave Fussell
Committee Chair

Situation: The committee requests to go into closed session to consider personnel related matters.

Background: It is the policy of the State of North Carolina that closed sessions shall be held only when required to permit a public body to act in the public interest as permitted in Chapter 143 of the North Carolina General Statues.

Assessment: The committee will go into closed session:

- To prevent the disclosure of confidential information under N.C. General Statues §126-22 to §126-30 (personnel information) and the federal Family Educational Rights and Privacy Act; and
- To consider the qualifications, competence, performance, character, fitness, or appointment of prospective and/or current employees and/or to hear or investigate a complaint or grievance by or against one or more employees
- To consult with an attorney to preserve the attorney-client privilege between the attorney and the Committee.

Action: This item requires a vote by the committee.

Back To Agenda