NJIT’s Student Centered GenAI Strategy

Ed Wozencroft
Vice President for Digital Strategy & CIO
Internet2 Community Exchange
NJIT Makes
Innovations, Opportunities, Leaders

#1 public university nationally for alumni earnings, economic mobility, and academic profile, according to *The New York Times'* college ranking tool

The #1 public university in New Jersey and #28 nationally, according to *Forbes*

Ranked #30 in the U.S. for Entrepreneurship by *The Princeton Review*

A Top 100 National University, according to *U.S. News & World Report*
Organizationally, we are ____ AI:

Multiple Choice Poll  
- 35 votes  
- 35 participants

All in on - 10 votes
- 29%

Cautiously embracing - 22 votes
- 63%

Running in the other direction from - 0 votes
- 0%

Undecided on - 3 votes
- 9%

Live poll at event
My organization has an AI strategy

- Yes - we have developed a comprehensive, organization-wide strategy - 4 votes (13%)
- We have components of a strategy and are working to formalize - 16 votes (50%)
- We don’t have a strategy but recognize the need - 12 votes (38%)
- We’re not ready to explore AI - 0 votes (0%)
News! AI Isn’t New, and it’s on All Over Campus!!!

/A.I. TIMELINE/

1950 TURING TEST Computer scientist Alan Turing proposes a test for machine intelligence. If a machine can trick humans into thinking it is human, then it has intelligence.

1955 A.I. BORN Term "artificial intelligence" coined by computer scientist John McCarthy to describe "the science and engineering of making intelligent machines."

1961 UNIMATE First industrial robot Unimate, given to work at GM replacing human assembly line.

1964 ELIZA Pioneering chatterbox developed by Joseph Weizenbaum at MIT holds conversations with humans.

1966 SHAKEY The first electronic humanoid from Stanford, Shakes is a general-purpose mobile robot that reasons about its own actions.

1969 A.I. WINTER Many false starts and dead-ends leave A.I. out in the cold.

1997 DEEP BLUE Deep Blue, a chess-playing computer from IBM defeats world chess champion Garry Kasparov.

1998 KISMET Cynthia Breazeal at MIT introduces Kismet, an emotionally intelligent robot inside a home environment.

2002 AIBO Sony launches first consumer robot pet called AIBO (AI robot) with skills and personality that develop over time.

2011 ROOMBA First mass-produced autonomous robotic vacuum cleaner from iRobot learns to navigate and clean homes.

2011 SIRI Apple integrates Siri, an intelligent virtual assistant with a voice interface, into the iPhone 4S.

2011 WATSON IBM’s question answering computer Watson wins first place on popular TV quiz show Jeopardy!

2014 EUGENE Eugene Goos van den Boogert passes the Turing Test with a third of judges judging Eugene is human.

2014 ALEXA Amazon launches Alexa, an intelligent virtual assistant with a voice interface that completes shopping tasks.

2016 TAY Microsoft’s chatbot Tay goes rogue on social media making inflammatory and offensive racist comments.

2017 ALPHAGO Google’s A.I. AlphaGo beats world champion Ke Jie in the complex board game Go, notable for its vast number (2^{12}) of possible positions.
Understanding your constituents.
What does AI for student success mean to you?

- **Anonymous**
  - Equity

- **Anonymous**
  - Just in time access to information in the way students have come to demand it.

- **Anonymous**
  - Exposure to advancing technologies

- **Anonymous**
  - 24x7 Assistants for students getting through their education, level playing field, competitiveness after graduation

- **Anonymous**
  - Helps them navigate through all of the information that we poorly provide to them.

- **Anonymous**
  - Students learn to use AI and graduate with an ethical understanding of when and how to use.

- **Anonymous**
  - Using AI to deliver the best student experience

- **Anonymous**
  - Jobs developing AI after graduation

- **Anonymous**
  - Improved productivity

- **Anonymous**
  - Enhance student experience

- **Anonymous**
  - Meeting students where they are

- **Anonymous**
  - Students are prepared to use AI tools after they leave our institution. Students are identified early for intervention

- **Anonymous**
  - A tool students can use to help chart their journey to academic and personal success

- **Anonymous**
  - Targeted Supports and Interventions

- **Anonymous**
  - Helps meet different learning styles.

- **Anonymous**
  - Equitable learning

- **Anonymous**
  - Use as a tool, not a crutch. Ability to discern facts from invention.

- **Anonymous**
  - Access to answers for all students where and when they need it.

- **Anonymous**
  - Critical thinking about the results

- **Anonymous**
  - Creates more benefits and opportunities for all students

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**Live poll at event**
NJIT in 2030.
Six Trends Impacting Our Future

- Changing Demographics
- Emerging Competition
- Changing Needs of Students
- Rapid Tech Change
- Public Perception
- Changes in Research Funding
The transistor was invented (in NJ!) in 1947; today more than 13 sextillion transistors have been manufactured. That’s 13 followed by 21 zeros.

**NJIT’s Strategy**

Set the standard for integrating technology across all facets of an academic institution. As a polytechnic university, we will pioneer the pervasive use of technology not just as a tool but as a foundational element of our identity.
A User Experience Discovery consists of interviews with individuals to give insights into what they think and feel about their environment, digital applications, services, process or policy. They can share both positive and negative experiences as well as ideas they have for improvements.

**PROJECT FACTS**
- Research Study kicked off January 2023
- 100+ individuals interviewed for 1 hour
- Students (Undergrad, Grad, International, Transfer)
- Faculty (Adjunct, Lecturers, Research, Tenured etc.)
- Staff (Administrators, Advisors, Deans, Specialists, Managers/Supervisors, etc.)

**PROJECT GOALS**
- Gain an understanding of what’s working and what isn’t
- Determine potential solutions
- Set priority and create a roadmap
- Share findings with all participating and interested parties

**RESEARCH RESULTS**

**Students**
- 15 High-level topic areas
- 40 Subtopics
- 163 Insights
- 29 Themes (2+ people said the same thing)

**Faculty & Staff**
- 62 High-level topic areas
- 136 Subtopics
- 677 Insights
- 149 Themes (2+ people said the same thing)
What We Asked Our Students

1. Please tell me about your background. What type of student are you? How far along are you? What are you involved in?
2. What is your impression of the student digital experience at NJIT?
3. If you could have your preferred digital experience what would that look like?
4. What is your overall impression of your experience of the Highlander Pipeline and the Website?
5. When you have a question what resources do you use to get the answer?
6. Tell me about your experience applying to NJIT.
7. Tell me about your enrollment and orientation experience.
8. Tell me about your course registration experience.
9. Tell me about your advising experience.
10. Tell me about your degree audit or planning experience.
11. Tell me about your experience taking courses at NJIT.
12. Tell me about your grades experience.
13. Tell me about your financial aid and loans, scholarship or grants experience.
14. Tell me about your billing experience.
15. Tell me about your gradation preparation experience. (only for students about to graduate)
16. Tell me about your communications and engagement experience.
17. Tell me about your student working experience. (only for students who are also student workers)
18. Any other pain points you’d like to share or ideas/recommendations you’d like to make?
# NJIT Journey Mapping

## Student Journey Map

Mapping feedback about student interactions with products and processes and aligned with:
- Learning/Transfer
- Admissions/Enrollment
- Advising
- Registration
- Financial Aid/Bill Pay
- Degree Plan/Transcript
- Courses
- Grades

### Admissions/Enrollment
- Apply for admission
- Receive notification
- Attend Orientation or Open House
- Pay application fee
- Pay deposit
- Start classes

### Advising
- Get advice on what courses to take, what major to declare
- Get advice on how to manage time
- Get advice on academic support services
- Get advice on academic achievements

### Registration
- Email or call for information on course changes
- Register for courses
- Pay for courses
- Complete course requirements

### Financial Aid/Bill Pay
- Pay for courses
- Pay for course materials
- Pay for room and board
- Pay for parking

### Degree Plan/Transcript
- Attend orientation
- Attend classes
- Attend seminars
- Attend workshops

### Courses
- Attend classes
- Attend seminars
- Attend workshops

### Grades
- Attend orientation
- Attend classes
- Attend seminars
- Attend workshops

## Happy Experience
- Everything worked well
- Nothing unexpected

## Neutral Experience
- Worked but not memorable

## Somewhat Bad Experience
- Nothing out of the ordinary

## Unhappy Experience
- Everything went wrong
AI and campus strategy.
NJIT’s transformation occurs at the intersection of six institutional priorities. The objectives and actions within each priority are aimed at tackling the challenges presented by the trends facing higher education in general and NJIT in particular.
Connecting Experiences, The Way Students Expect Them

OLD PROCESS

- Dept
- Dept
- Dept
- Dept

Departments work independently to create content experiences in a large variety of applications

- Degree Works
- Banner Registration
- Cornerstone
- Canvas

Student Experience

Students learn over time from orientation, advisors, staff, and other students how to get to what they need

IMPROVED PROCESS

- User Feedback
  - Student Need
  - Dept
  - AI

Student expectation, feedback drive the direction

- Departments work collaboratively to determine student needs & full workflows in order to plan a simplified and connected solution, leveraging AI at its core.

The Student Experience

Solutions are selected, implemented, communicated and tested with students

Students are provided opportunities to provide feedback for improvements on a regular basis.
As student success is a university-wide priority, so is AI.
I have business partners for AI adoption

Multiple Choice Poll   29 votes   29 participants

Yes - 18 votes

62%

No - 11 votes

38%
NJIT's position is to responsibly embrace AI in all aspects of teaching, learning, research and the student experience. We are committed to preparing graduates for the AI tools they will use in the future.

- In response to demand, NJIT was one of the first universities to publish **Guidelines for AI for Instructors**.
- NJIT's **Institute for Teaching Excellence** hosted AI panels, presentations, and workshops throughout 2023 to help faculty explore the challenges and understand the positive and ethical use cases for AI.
- Select **faculty are developing AI ethics modules** that are open-source and can be embedded in any course at any institution.
- The university is **leveraging AI-enhanced educational technology** to support student learning and engagement:
  - Generative AI in online discussions
  - Adaptive/self-paced learning
  - Tutoring/support for writing
- NJIT is adopting AI into our **enterprise analytics and decision making** in support of student success.
NJIT’s Artificial Intelligence Initiative

Building Blocks

• Stand-alone College of Computing
• M.S., PhD in Artificial Intelligence
• Graduate Certificate in A.I.
• >1600 students in A.I. related degree programs in last 4 years
• $60M+ of sponsored research in A.I.

Four Focal Areas

• Education
• Research
• Operational Excellence
• Infrastructure
## Artificial Intelligence Initiative – Four Dimensions

<table>
<thead>
<tr>
<th>Education</th>
<th>Research</th>
<th>Infrastructure</th>
<th>Operational Excellence</th>
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<tbody>
<tr>
<td><strong>Cutting Edge Programs</strong> - Train students as creators of the next generation of AI by standing up a Ph.D. and B.S. program to complement our M.S. and Certificate programs.</td>
<td><strong>Invest in Existing Faculty Projects</strong> – Leverage AI to advance research programs ranging from architecture to biology to management and engineering.</td>
<td><strong>Build the Infrastructure</strong> – Ensure that NJIT has the infrastructure necessary to enable the previous three focal areas building rapidly and allowing our community to utilize the next gen infrastructure that makes AI possible.</td>
<td><strong>Staff Empowerment</strong> – Provide staff across NJIT with the training and tools to utilize AI in their workspace. Ensure all are acquainted with the promise and perils of AI.</td>
</tr>
<tr>
<td><strong>AI Across the Curriculum</strong> – Infuse AI into all disciplines, ensuring students have the knowledge and tools to use AI appropriately, no matter what their career path.</td>
<td><strong>Invest in Building AI Expertise</strong> – Build on our unique strengths in our academics to grow our AI expertise.</td>
<td></td>
<td><strong>AI and Student Success</strong> – Leverage AI as a tool in student success, leveraging the large amounts of data we have, and the many opportunities to improve student services, the student experience, and ultimately, student outcomes.</td>
</tr>
<tr>
<td><strong>Innovative AI-Enabled Approaches to Education</strong> – Develop new approaches such as personalized tutoring or optimized degree paths that are only possible with the advent of AI.</td>
<td><strong>Catalyze New AI Expertise</strong> – Incentivize the hiring of faculty across colleges with AI expertise.</td>
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<td><strong>Industry Partnership</strong> – Leverage NJIT to bring our AI expertise to industry.</td>
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NJIT New Jersey Institute of Technology
AI Teaching/Learning Working Group

**Objective**: Enhance NJIT’s instructional framework with AI to propel transformative initiatives in curriculum, instruction, and student learning experiences to better meet the needs of the changing learner and the evolving technological landscape.

**Initiative**: A short and long-term roadmap for targeted AI innovations and policies that NJIT can implement based on a SWOT (strengths, weaknesses, opportunities, and threats) analysis and research.

**Key Result**: Revised curricula innovated with AI to strategically leverage adaptive and personalized learning, focused on equipping NJIT students with the competencies that prepare them for the dynamic demands of the future workforce.

**Key Result**: Adapted and expanded modes of instruction that address the evolving needs of learners in alignment with innovative curricula.

The working group will include stakeholders from each college along with members from the IST Division, the Library, the Provost’s Office, the Office of Online Programs, the Institute for Teaching Excellence, and the Faculty Senate, and will report directly to the Provost.
We get by with a little help from our friends.
Thinking small is a self-fulfilling prophecy. Leaders create and communicate a bold direction that inspires results. They think differently and look around corners for ways to serve customers.
Two Days at the AWS Executive Briefing Center
### Transfer Students – J Doe

**ABOUT:** J Doe was formerly at a 4 year institution but took time off. Currently enrolled at a community college. Trying to get definitive answers from advisors on completing a program in 4 years in the least expensive way possible.

**PAIN POINTS:** Advisors not supportive (CC and NJIT), conflicting information, getting approvals

**GOAL:** Complete program in 4 years in least expensive way possible.

<table>
<thead>
<tr>
<th>AGE</th>
<th>24 years old</th>
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</thead>
<tbody>
<tr>
<td>PROFESSION</td>
<td>Student</td>
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<tr>
<td>EDUCATION</td>
<td>NJ Community College</td>
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<tr>
<td>LIVING IN</td>
<td>New Jersey</td>
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**Motivated**  **Frugal**

### International Students – Joe B

**ABOUT:** Joe B is pursuing a masters degree at NJIT. He has a background in software and engineering, he is a native of southeast Asia.

**PAIN POINTS:** Visa and authorization, finding employment, frequent target of employment opportunity scams, adapting to American culture.

**GOAL:** Wants a good education, to stay in the country, and get a job with status (cultural status).

<table>
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<tr>
<th>AGE</th>
<th>22 years old</th>
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</thead>
<tbody>
<tr>
<td>PROFESSION</td>
<td>Student</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>Masters Student at NJIT</td>
</tr>
<tr>
<td>LIVING IN</td>
<td>Adjacent to Campus</td>
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**Anxious**  **Hopeful**
Exploring Current Use Cases

- Conversational AI to support the student experience, specifically for transfer students
- Virtual tutors/reasoning coaches for most challenging STEM courses
- GenAI analytics services for analyzing and predicting trends
- GenAI in the “virtual” classroom – facilitated discussions
- Research Facilitation bot – moving away from administrivia and helping PI’s do what matters most
- Automated workflows with a lens on efficiency for Students
- AI Sandbox for experiential and experimental learning
Big Idea Scoring and Prioritization - AI for Students

1. Transfer Promise
   Value: 10 Execution: 7

2. Virtual Tutor for STEM Reasoning
   Value: 10 Execution: 5

3. AI Analytics
   Value: 10 Execution: 5

4. GenAI Discussions
   Value: 10 Execution: 8

Quick Wins
Low effort
High impact

Fill-Ins
Low effort
Low impact

Major Projects
High effort
High impact

Thankless Tasks
Low effort
High impact
AI & ML to Understand Student trends
Curriculum reviews are ongoing across colleges to determine where AI is currently or should be incorporated.

A Teaching and Learning AI Working Group has been established.
- The group includes diverse stakeholders from each college along with members from IT, the Library, the Provost's Office, the Office of Online Programs, the Institute for Teaching Excellence, and the Faculty Senate.

Forming additional working groups for Research, Infrastructure and Operational Excellence

Fall 2024 call for proposals will be launched soon to increase faculty partnership with the Office of Digital Learning and the Institute for Teaching Excellence to incorporate generative AI into teaching and learning.

Aggressively pursuing new use cases with our faculty!
Looking Ahead at Connected Student Services
Looking Ahead

What we’re excited by:
✓ Removing barriers for students
✓ Personalized/Adaptive learning
✓ Predictive/early detection of learning disabilities
✓ Diverse Language support
✓ Automated accessibility features
✓ Insight into student performance, gaps, engagement
✓ Growth in continuing/lifelong learning philosophy

What we’re nervous about:
➤ Security and privacy concerns
➤ Academic Integrity
➤ Low quality input = low quality output
➤ Bias, fairness, hallucinations
➤ Over-reliance on AI rather than human connection
➤ Digital Divide
E-mail   Ed.Wozencroft@njit.edu
LinkedIn  http://www.linkedin.com/ewozencroft