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Final Report: Task Force on Undergraduate Retention and Graduation

Executive Summary

Meeting during the spring 2011 term under a charge from NJIT President Robert A. Altenkirch, the Task Force on Undergraduate Retention and Graduation reviewed national, regional, and state demands for accountability in the areas of placement, admissions, and graduation in order to investigate empirically the environment of undergraduate education at the university. The Task Force voted five motions: (1) Students have access to timely and successful completion of an NJIT degree; (2) For both calculus-based and non-calculus based courses, there will be no more than one 3-credit intervention for underprepared students; (3) Incoming fall freshman students should be placed through valid test scores and previous educational experience by mid-April (or when such information is available); and (4) NJIT will create a uniform advisement model (5) All first year students will take at most 16 credits per semester, with 18 credits as the exception, not the rule.

To garner university support, the Task Force offered four recommendations: (1) NJIT examine and improve the placement rate of students into credit-bearing courses and develop an evidence-based plan to reduce substantially the remediation rate for first year students; (2) NJIT create a unified, professional advisement system for undergraduate students; (3) NJIT continue to contribute to the state's economic competitiveness by producing professionals who will graduate in a timely fashion and contribute to workforce development; and (4) NJIT permanently establish a mechanism to examine issues related to retention and graduation under a shared governance structure.

College Completion in the 21st Century: An Environment of Accountability

In the arena of post-secondary education in America, two events in the first decade of the 21st century are determining the direction of the second decade. The first event, technical in nature, was the 2006 publication of the third edition of *Educational Measurement* (American Council on Education/Praeger). In this volume assembled by the nation's leading researchers, the contributors took a position that concretized the future direction of educational measurement, a field that determines all research used to inform post-secondary policy decisions. Under the editorship of Robert L. Brennan, the volume documented three major shifts in research orientation: that validation is a process, not a stamp of approval; that a process approach must be adopted for important decisions such as admission, placement, and credentialing to ensure that differential impact does not occur for minority groups; and that an empirical, evidence base must inform any validation argument that recommends a course of action.

The second event, legal in origin, was the re-authorization of The Higher Education Opportunity Act (Public Law 110-315) and the attendant adoption of Negotiated Rulemaking. Congruent with the research stance adopted in *Educational Measurement*, the Negotiated Rulemaking provision of Public Law 110-315 enacts an on-going process of requirements for community colleges, colleges, and universities bearing the force of law. As a result, post-secondary institutions must establish frameworks to deal with the emergent ways that Congress and its agents decide that educational accountability will be enacted. Recent federal demands in key accreditation areas of substantive change, credit hour calculation, distance learning, and communication of graduation rates have substantially impacted the Middle States Commission on Higher Education (MSCHE) (www.msche.org/documents/NPRM-published-8-6-09.pdf). The seriousness of these federal policy requirements are everywhere apparent, especially as we recognize that MSCHE placed 62% of post-secondary institutions in its region on warning during the last round of review—a rigor that is currently reflected in regional accreditation agencies across the nation.

Recent national studies and policy reports reflect the current climate on increased accountability. *Crossing the Finish Line: Completing College at America's Public Universities* (Princeton: Princeton University Press, 2009), the new gold standard for research in the areas of admission, placement, retention, and graduation for liberal arts universities, raises serious empirical arguments surrounding care of students in the nation's colleges. Regarding admission, for instance, authors William G. Bowen, Matthew M. Chingos, and Michael S. McPherson find that singular use of nationally-normed placement tests (such as the SAT Reasoning Test or the ACT admissions test) fail to predict college grade point average, the standard criterion measure of success. A combination of high school grades with these tests, combined with other measures such as the College Board's Advanced Placement tests and the Subject Matter tests yield substantially stronger prediction of, and correlation to, performance. Regarding graduation, the authors are critical of the six year graduation rates, ranging from 86% for flagship universities to 51% for non-selective state systems. Allowing the six year calculation to be the base of graduation for programs that should allow students to graduate in four, the authors note, involve substantial costs to the education system. Reflecting the research of Bowen, Chingos, and McPherson, Secretary of Education Arne Duncan has recently noted in *A Blueprint for Reform: The Reauthorization of the Elementary and Secondary Education Act* (Washington, DC: U. S. Department of Education) that perhaps the greatest challenge today facing post-secondary

institutions is the fact that four of every ten new college students, including half at two-year institutions, take remedial courses (p.7).

On the state level, attention to the rising costs of remediation and lackluster graduation rates are also clear in *The Report on the Governor's Task Force on Higher Education* (January 4, 2011). The report explicitly recommends that workforce and economic development in New Jersey would be strengthened by a study undertaken to analyze the extent of the cost of remediation at its colleges and universities (p. 19). Further, the report recommends that plans be developed to address the issue. This recommendation is especially relevant to NJIT, identified in the report as the state's "only public institution devoted primarily to advanced instruction and research in the applied sciences and technology" (p.35). Attendant to NJIT's social mission, the report also praised the university for its dedication to increasing the number of low-income students preparing for college" (p. 69). Important in the report, then, is the connection between NJIT's unique position in the state, its dedication to equity, and its responsibility to increase the state's economic competitiveness.

The NJIT Graduation Environment

Graduation Rates

The analysis of graduation rates at NJIT properly begins with a comparison to benchmark institutions selected from schools the Carnegie Classification lists as STEM doctoral institutions. (Using IPEDS data, the list of STEM doctoral institutions was further refined based on enrollment, selectivity, research, and admissions profile.) As shown below in the table of 2009 data from the federal IPEDS peer analysis system, the six-year graduation rate at NJIT is in the bottom third of our selected benchmark institutions. The four-year graduation rate is even lower, placing NJIT in the bottom five among our benchmark institutions.

Benchmark Institutions (2009)	Graduation rate - 4 years (%)	Graduation rate - 6 years (%)
Wake Forest University	85	90
Lehigh University	76	86
Rensselaer Polytechnic Institute	64	82
Worcester Polytechnic Institute	68	80
Virginia Polytechnic Institute and State University	53	80
Georgia Institute of Technology-Main Campus	31	79
Clemson University	50	77
Stevens Institute of Technology	30	74
University of Vermont	57	73
Rochester Institute of Technology	28	68
Colorado School of Mines	40	67
Auburn University Main Campus	37	67
Michigan Technological University	22	66
Illinois Institute of Technology	5	66
Drexel University	25	66
Missouri University of Science and Technology	25	63
Texas Tech University	32	60
University of Maryland-Baltimore County	34	59
New Jersey Institute of Technology	17	55
University of Massachusetts-Lowell	29	53
Tennessee Technological University	22	53
Montana State University	19	52
University of Massachusetts-Dartmouth	32	48
University of Alabama in Huntsville	17	48
University of Louisiana at Lafayette	13	42
The University of Tennessee at Chattanooga	25	42
University of Alaska Fairbanks	12	35

This table demonstrates a compelling interest in understanding barriers to graduation at NJIT. The US News 2010 calculation of expected graduation rates for NJIT compared to peers, corrected for incoming SAT scores, shows the university underperforms the anticipated rate by 9%.

The large difference between NJIT's standing relative to benchmarks in the four year and six year graduation rate tells an important story about progress toward a degree at NJIT. The four year graduation rate resembles the less than four year graduation rate at most benchmark schools, while the six year rate resembles a five year rate at other schools. The next section examines barriers that delay progress toward degree completion.

Retention Rates

Retention rates at NJIT are more competitive with benchmarks than graduation rates, but being in the bottom half of benchmark institutions there is still room for improvement. The 2010-2015 Strategic Plan sets an 86% retention rate goal for FTFTF. This would move NJIT into the top half in comparison with benchmark institutions, based on the federal IPEDS peer analysis system, and would also contribute to the improvement of graduation rates. For the past decade retention rates have hovered around 81%, with exceptional years when the rate jumps toward 85%. The strategic plan sets the norm above 85%, rather than having that as the exceptional year.

Benchmark institution (2009)	Retention Rates			
	2007 %	2008 %	2009 %	Average %
Worcester Polytechnic Institute	95	93	94	94
Lehigh University	94	93	93	93
Georgia Institute of Technology-Main Campus	93	93	92	93
Rensselaer Polytechnic Institute	91	95	92	93
Virginia Polytechnic Institute and State University	91	91	93	92
Clemson University	90	91	90	90
Stevens Institute of Technology	90	88	89	89
Missouri University of Science and Technology	88	86	87	87
Illinois Institute of Technology	86	88	86	87
Auburn University	86	87	86	86
University of Vermont	85	86	86	86
Colorado School of Mines	89	84	83	85
University of Maryland-Baltimore County	85	87	84	85
Rochester Institute of Technology	85	84	84	84
Drexel University	83	86	83	84
Michigan Technological University	83	82	83	83
New Jersey Institute of Technology	84	82	79	82
Texas Tech University	81	80	83	81
University of Massachusetts-Lowell	81	79	75	78
University of Alabama in Huntsville	76	77	77	77
University of Alaska Fairbanks	80	73	72	75
University of Louisiana at Lafayette	76	74	75	75
University of Massachusetts-Dartmouth	73	74	76	74
Tennessee Technological University	72	71	73	72
Montana State University	72	72	71	72
The University of Tennessee at Chattanooga	67	61	65	64

The NJIT First-Year Student: Admission, Placement, and Reform

Placement at NJIT has been based primarily on specific placement exams. These exams include the Maplesoft exam in mathematics, the Toledo exam in chemistry, and an in-house exam in computer science. The mathematics placement exam also serves as the primary placement vehicle for physics. (Humanities placement does not employ a special placement exam; it was reconfigured in fall 2008 and now uses results from the SAT writing component.) The specialized placement exams are all used in tandem with certain other criteria including SAT scores and, occasionally, high school course performance in an opaque placement process.

The placement exam based process has come under increased scrutiny because of inconsistently rising remediation rates, particularly in mathematics. Consider for example evidence from the SAT Math section. The national average has risen slightly from 514 to 516 since 2000. The NJ average has also risen from 513 to 514. The NJIT average has risen from 579 to 591. During the same period enrollment in remedial mathematics (Math 098 and 099) has risen from 4% to 23%. During the same period, the total percentage of students who must take any course intervention prior to beginning the calculus requirement has remained roughly the same, rising only from 54% to 55%. The increase in Math 098 and Math 099, however, means that a dramatically larger percentage of the class requires at least three semester of remediation rather than one or two semesters of preparation as was the standard in 2000.

Course progress through remedial and preparatory math courses has also proven a challenge for students. Almost 25% of FTFTF do not successfully complete the lowest remedial course. This requires them to complete two full years of remedial and preparatory math before beginning the required math curriculum. More than 40% of the students starting in the second lowest remedial course do not successfully complete the first course and take a minimum of three semesters before beginning the required calculus curriculum.

Considering the evidence of four year and six year graduation rates and the failure rates for remedial and preparatory math courses, the Task Force focused on issues of placement and remediation to helping NJIT meet the Strategic Plan's graduation rate goal of 60%. Toward this end, the task force encouraged initiatives to explore fundamental changes to the placement and remediation process, particularly in mathematics. This included a change in the General University Requirements that eliminates the calculus requirement for programs where calculus was deemed non-essential, specifically business, design, fine arts, and humanities. The task force further encouraged a process to transform placement using multiple criteria, such as placement exams, high school courses, course grades, and SAT scores.

The recommended placement process precludes the possibility of placing students in a three semester remediation process before they begin the primary math requirement of their selected discipline. The task force proposed that students progress through not more than one three-credit preparatory intervention prior to beginning the required math for their discipline. This implies a transformation in the content of advising also. Students unable to reach the required entry level math for a technical discipline with only one preparatory course would be redirected to consider a program with less stringent math requirements.

An example of a revised approach to placement and remediation is an approach developed and implemented by the Computer Science department. In AY 2010-11, the Computer Science department piloted a new intro course in computer science, CS 100. It incorporates several pedagogical elements intended to improve the student success rate: use of a programmer-friendly, interpreted language (Python) with an interactive environment; a tightly-integrated lecture-and-practice classroom model; use of short video lectures on special topics and small-group projects based on these lectures.

This pilot resulted in a significant reduction in the WDF rate in the Fall 2010 semester among students who would previously have been placed in a slower-paced, two semester sequence (CS 110-111), equivalent in content and credit to the standard CS 113 intro course. Based on the positive experience with CS 100, this course has been made the standard first course in computing for all CCS students in Fall 2011. For CS students, CS 100 is an additional required course. The new course is a three credit course that can be used to satisfy the computing GUR. The remedial sequence has been retired.

This change in curriculum entails a corresponding change in the use of the CS placement exam. In the old model, the CS placement exam was used to place students with no previous programming experience in the two semester CS 110-111 sequence. In the new model, the placement exam is used to place students with prior programming experience in more intensive honors sections of CS 100.

The Task Force also encouraged other initiatives across the campus related to improving graduation. These included simplifying the GPA calculation and allowing students who change programs internally to share the same GPA benefits as students who transfer into the university from another school. Finally, based on an analysis of non-graduation and non-retained seniors, the Task Force proposed changes in advising intended to move students more rapidly toward degree completion. As with placement, what delays completion ultimately reduces graduation rates.

The NJIT Instructional Environment

NJIT hosts 140 programs of study, from bachelor to doctoral degrees and certificates. These programs were initiated in response to our rapidly changing technological world where NJIT has the resources and capacity to engage, educate, and prepare students to enter a global workforce upon completion of their degree. Curricula support the NJIT mission to prepare “students for productive careers and [amplify] their potential for lifelong personal and professional growth.” As the university continues to develop new academic programs in all of the colleges and schools, our most current concerted effort toward student engagement is the initiation of Community Connections, NJIT’s learning community pilot program, now in preparation for freshmen arriving in September 2011. This new student-centered program will promote cohort-based learning across the disciplines, involving faculty, students and staff in enhanced methods of student engagement, with the goals of improving academic performance and student satisfaction, thereby increasing student retention while also decreasing time to graduation. As such, the Task Force centered on two areas in the undergraduate curriculum: the emergence of learning communities and recent policy implications that impact students.

Summary of design and implementation of Community Connections: Learning Communities at NJIT

The Community Connections (CC) program will launch as a pilot in Fall 2011, placing approximately 250 regular admit, first-time students in discipline-based cohorts of 24-26 students for three semesters. Cohorts for freshmen are designated in NCE (CBPE, CE, EE, MIE), CCS (CS), SOM (BUS/IBUS), and CSLA (BIO/BIOC/CHEM/MATH/ PHYS), and one cohort in NCE (ECET) is designated for transfer students. Several existing cohorts at NJIT are provided a continuum of professional advising and enhanced academic support, resulting in higher than average retention and graduation rates. The CC pilot will broaden this opportunity for enhanced, structured support and academic engagement, and build on best practices demonstrated in the EOP, ADHC, Athletics, and APT programs, as well as in academic units such as CCS and CoAD.

The Task Force generated a model to predict the impact of retention increase on revenue and cost. According to this model, a retention increase of 10% will generate approximately \$3.1million, with a recruitment cost savings of \$63,000. The goal of the CC pilot model is to improve freshmen and sophomore year retention rates. Central to this effort is assurance of a relevant curriculum, documentation of academic success, and fostering of collaborative/active learning.

Congruent with the task force recommendations for all First-Year students, CC students will be placed in the curriculum that provides them access to timely and successful completion of the degree to which they have been admitted. That is, students will be placed in GUR courses (including math, humanities, chemistry, and computer science courses) as described in the course catalog for the degree, except where intervention is recommended based on placement criteria for these courses. For calculus-based courses, there will be no more than one intervention course for underprepared students. In order to ensure successful transition, students will be placed in a maximum of 16 credits for the first semester (defined criteria for credit load may allow for exceptions).

The CC pilot will serve as a platform for a uniform model of advisement at NJIT, providing a continuum of support, with initial focus on issues relevant to student transition to college life and academic demands of major. The NJIT uniform advising model is defined as one that is based in the following five activities, taken as complementary: (1) an individualized orientation focusing on the student as a unique individual with distinct abilities and desires; (2) a systems orientation focusing on retention, curricular sequence, time to gradation, employment, and graduate education; (3) a developmental orientation focusing on aligning student aspirations and abilities; (4) a prescriptive orientation focusing on the practicalities of student employment and course sequencing; (5) and a communicative orientation focusing on documentation of student progress, contact with administrators and instructors to anticipate barriers to retention and graduation and mediate appropriate intervention, and collaboration with advisors across campus to improve the model. Advisors across majors will provide a continuum of support in these five areas, and their message to students will be unbiased and consistent as students transition to NJIT and possibly seek transfer to a different major. Communication among advisors is critical in facilitating early transfer of students into more appropriate majors. In addition to out-of-class support, advisors will have contact with students during at least 5 weeks of the Freshman

Seminar (or equivalent course). Faculty involvement as mentors is most critical in activities (1), (2), and (5) associated with the uniform model. Students seek faculty guidance after they have transitioned to NJIT and as they orient toward research and/or co-operative educational experiences that prepare them for post-graduate education, careers in academia, or immediate placement in industry

Advising support will be augmented by peer mentor interactions with students in the Freshman Seminar, study groups, and several other team-building events involving faculty and representatives from Student Affairs. To address the changing needs of first-time students as they transition to their second and third semesters, the CC model also calls for the addition of a one-credit seminar experience in the second and third semester (with possible credit application to the social science GUR).

The CC pilot seeks to enhance student academic engagement in a clustered curricular format over three semesters. Student cohorts will be clustered in 2-4 courses, including a writing course, a major specific course (i.e. FED or CS 100), math or science, as well as a seminar experience. Team building within the classroom will be emphasized, with frequent peer and student-faculty interactions. Team building outside of the classroom will include facilitation of study groups, a community service project in at least one of the clustered courses during the first semester, and opportunities for service learning or research exposure in the second semester. The seminar experiences, and at least one other clustered course, should facilitate reflections on learning experiences (e.g., one-minute papers, EPortfolios, or journals).

Current best practices taken from academic units within NJIT inform the clustered curriculum format. For example, in the College of Architecture and Design all freshman students are grouped together in small design studios or lab courses. Architecture students spend 18 contact hours per week over two courses during each of their first two semesters. All labs and studios are open to these students 24 hours per day 7 days per week. This provides many opportunities for these cohorts to develop academic as well as social ties that contribute to high student satisfaction and success in their chosen majors.

The CC organizational structure includes curriculum and assessment subcommittees reporting to an advisory committee; all are structured such that they embrace shared governance. Implementation of the assessment plan will involve teaching faculty and advisors. Metrics will include improved pass rates, reduced W or I grades, increased proportion of major changes resolved by the end of the first year, increased involvement in club activities, research programs, and co-op. While economic and psycho-social factors impacting retention and graduation are more difficult to measure and have not been tracked systematically, the assessment strategy involves the collection of relevant data.

Recent Policies and Implications for Upper Class Students and Transfers

Recent policies approved by CAA may also positively impact retention and graduation rates given their impact on GPA. These include a repeat policy for upper division courses consistent with that for lower division courses (i.e., grade replacement upon retake). In addition, the new internal transfer policy is more consistent with that for external transfers: For students who change majors, grades below “C” will be excluded from the cumulative grade calculation earned in courses that are not applicable to students’ new majors, as determined by the new advisor.

The new recalculated GPA will be in effect at the end of the semester in which the student transfers.

Achievements and Recommendations for the Future

Over the term the Task Force met for eight sessions from March 3, 2011 through April 28, 2011 from 3:00 to 4:30 pm, and all NJIT constituencies that provide and support remediation, graduation, and instructional environments were represented. Discussions reflected the sections highlighted in this report: College Completion in the 21st Century; The NJIT First-Year Student; The NJIT Graduation Environment; and, The NJIT Instructional Environment. Members were diligent in their contributions. As a result, five motions were passed:

- Motion of March 3: Students have access to timely and successful completion of an NJIT degree.
- Motion of March 17: For both calculus-based and non-calculus based courses, there will be no more than one 3-credit intervention for underprepared students.
- Motion of March 17: Students will be placed through valid test scores and previous educational experience by mid-April (or when such information is available).
- Motion of March 31: NJIT will create a uniform model of advisement.
- Motion of April 14: All first year students will take at most 16 credits per semester, with 18 credits as the exception, not the rule.

Based on these motions and the supporting documentation, recommendations for the future are addressed in the ViSTA model below.

<u>RECOMMENDATION 1</u>	Adhering to <i>The Report on the Governor’s Task Force on Higher Education</i> , we recommend that NJIT examine and improve the placement rate of students into credit-bearing courses and develop an evidence-based plan to reduce substantially the remediation rate for first year students.
<ul style="list-style-type: none"> • VISION: The desired future for the recommendation 	Increase placement of incoming first-year students into credit-bearing courses that facilitate degree completion
<ul style="list-style-type: none"> • STRATEGY: The methodology recommended to achieve the vision 	Implement a unified placement model for writing, mathematics, chemistry, and computer science that includes valid test scores and summative high school course assessments.
<ul style="list-style-type: none"> • TACTIC: The specific action recommended to implement the strategy 	<p>Place admitted students into degree credit courses using the summer before they are admitted as a time for intervention in areas that may put the students at risk. The need for summer intervention will be based on a number of criteria that may include but will not be limited to high school performance, SAT, AP results, and placement tests.</p> <p>Track student progress empirically, using quantitatively and qualitatively based techniques, with intent of addressing possible relocation of the student placement by</p>

	<p>means of evidence of their performance.</p> <p>Examine and adopt alternative structures for ensuring student placement in degree credit courses, including increasing the degree credit of the course to cover pre-course material.</p>
<ul style="list-style-type: none"> • ASSESSMENT: The metric recommended to measure achievement of the vision 	<p>Use performance measures that are both locally-based and nationally informed to ensure a criterion base for performance that can be compared to benchmark institutions.</p>

<u>RECOMMENDATION 2</u>	<p>Informed by <i>Crossing the Finish Line: Completing College at America's Public Universities</i>, we recommend that NJIT create a unified, professional advisement system for undergraduate students.</p>
<ul style="list-style-type: none"> • VISION: The desired future for the recommendation 	<p>Create a uniform model of advisement system based on best practices.</p>
<ul style="list-style-type: none"> • STRATEGY: The methodology recommended to achieve the vision 	<p>Engage advisors and faculty in formative evaluations of student progress</p> <p>Provide improved advisement results based on best practices.</p> <p>Improve faculty-student interactions.</p> <p>Engage students in professional societies beginning in the freshman year.</p>
<ul style="list-style-type: none"> • TACTIC: The specific action recommended to implement the strategy 	<p>Advisors in learning communities fulfill the advising role as defined by the recommended uniform model of advisement.</p> <p>Track student progress quantitatively and qualitatively through early intervention where the advisor meets with instructors routinely and obtains performance data from Moodle.</p> <p>Develop and employ intervention strategies for course placement and major.</p>
<ul style="list-style-type: none"> • ASSESSMENT: The metric recommended to measure achievement of the vision 	<p>Document the strategies and tactics of the unified advisement system in order to identify which techniques result in decreased time to graduation.</p>

<u>RECOMMENDATION 3</u>	<p>Adhering to <i>The Report on the Governor’s Task Force on Higher Education</i>, we recommend that NJIT continue to contribute to the state’s economic competitiveness by producing professionals who will graduate in a timely fashion and contribute to workforce development.</p>
<ul style="list-style-type: none"> • VISION: The desired future for the recommendation 	<p>Ensure an organizational system for academic progression that supports timely and successful completion of an NJIT degree, while ensuring that graduated students have the workplace skills necessary to advance the state’s economic competitiveness.</p>
<ul style="list-style-type: none"> • STRATEGY: The methodology recommended to achieve the vision 	<p>Place students in a first-year curriculum that is commensurate with their development level</p> <p>Engage students in curricular activities relevant to the major</p> <p>Track student advancement and progression from high school through the undergraduate curriculum to create a continuum of care for all students.</p>
<ul style="list-style-type: none"> • TACTIC: The specific action recommended to implement the strategy 	<p>Place students in a first-semester curriculum of no more than 16 credits (exceptions follow well-defined criteria)</p> <p>Ensure that course prerequisites are met throughout the curriculum, including the calculus prerequisite for Physics. Students should be placed in Physics after successfully completing one semester of calculus.</p> <p>For key courses in the first year and for undergraduate majors, use full-time lecturers, tenure-track, and tenured faculty.</p> <p>Increase opportunities for project-based learning</p> <p>Increase opportunities for cooperative learning</p> <p>Increase exposure to research and professional development within program curricula</p> <p>Collect and analyze data on student performance as it relates to criteria applied in placement for courses and major.</p> <p>Collect and analyze data on student participation in academic experiences outside of the classroom including but not limited to cooperative education, internships, and research experiences.</p>

<ul style="list-style-type: none"> • ASSESSMENT: The metric recommended to measure achievement of the vision 	Document time to degree while ensuring, through performance assessment, that students have the skills to advance in the workplace.

<u>RECOMMENDATION 4</u>	Acknowledging our role as the state’s leader in science and technology education, we recommend that the university further strengthen the academic environment at NJIT as demonstrated through retention, improved student achievement, and graduation by permanently establishing a mechanism to examine issues related to retention and graduation under a shared governance structure.
<ul style="list-style-type: none"> • VISION: The desired future for the recommendation 	Build a cause-and-effect model based on the analysis and interpretation of outcomes associated with Recommendations 1-3.
<ul style="list-style-type: none"> • STRATEGY: The methodology recommended to achieve the vision 	Ensure an organizational system that builds empirical evidence to guide implementation of the strategies and tactics under Recommendations 1-3.
<ul style="list-style-type: none"> • TACTIC: The specific action recommended to implement the strategy 	<p>Benchmark recommended strategies and tactics against evidence-based strategies and tactics, and programmatically define</p> <ul style="list-style-type: none"> i) a qualified and prepared student ii) conditions for successful transition from High School iii) curricular innovation iv) effective advisement strategies
<ul style="list-style-type: none"> • ASSESSMENT: The metric recommended to measure achievement of the vision 	Document statistically significant measures of (1) Academic practices and processes that ensure successful transition from High School to NJIT (2) Student improvement as a function of the NJIT program (3) Innovative practices in instruction and curriculum advancement, and (4) Improved advisement strategies to facilitate timely and successful completion of an NJIT degree.