

**AC 2010-1907: A PARTNERSHIP OF NON-TRADITIONAL ACCESS INTO
ENGINEERING VIA NUPRIME AND THE UJIMA SCHOLARS PROGRAM**

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A Partnership of Non-Traditional Access into Engineering via NUPRIME and The Ujima Scholars Program

Background:

There are social and cognitive factors which may hinder the academic achievement of under-represented minority (URM) students in science and engineering which need to be taken into consideration. Some scholars and educators have predicted that the barriers that discourage under-represented minorities from achieving success in science and engineering, pointed to such factors as:

- inadequate academic preparation
- substandard educational resources
- mismatched social and academic expectations
- lack of encouragement
- psychological intimidation
- unstable familial and financial circumstances
- inadequate peer support
- lack of role modeling/mentoring
- low expectations by science and engineering faculty
- poor/uninspired instruction and advising by science/engineering faculty
- racism

(Reichert & Absher, 1997)¹

In recognizing the aforementioned social and cognitive factors which may negatively impact URM students in their pursuit of science and engineering, the Northeastern University Program in Multicultural Engineering (NUPRIME) has been committed, for the past thirty-six years, to counteracting these factors while cultivating and supporting diversity and academic excellence in the study of engineering at Northeastern University.

The NUPRIME Program helps provide an access point, for historically under-represented minority students, into the engineering education pipeline in an effort to diversify the pool both in the field and in academia.

The NUPRIME Program recognizes that talent and opportunity alone are not sufficient to support these students in their quest for a college education and/or professional aspirations.

A long term commitment to recruiting, mentoring and financial support along with increased academic opportunities is required. In support of this ongoing effort, the NUPRIME program, established in 1974, has collaborated with the Ujima Scholars Program, which was founded in 1972 at the African American Institute at Northeastern University.

The program takes its name from the Swahili word “Ujima” meaning “collective work and responsibility”, which represents a guiding principle for the Ujima Scholars Program. It is a one-year program that recruits into the University, 40 students with academic potential who do not meet traditional criteria for admission into their intended majors.

The primary goal of the Ujima Scholars program is to prepare students for college-level academic performance. The ultimate goal of the program is to retain students through their first year, prepared to be accepted into the major of their choice as sophomores. The long-term goal of both NUPRIME and Ujima Scholars programs is to provide academic and cultural support beyond that pivotal first year to insure that students are first, able to gain access into the College of Engineering and second, earn their undergraduate degrees in engineering.

Presented in this paper is an overview of the programmatic transfer, retention and undergraduate engineering success of Ujima Scholars over the past ten-plus years that have come into the College of Engineering through the support of the NUPRIME Program.

Origin and Purpose of the Ujima Scholars Program²

On May 3, 1968, following the assassination of Rev. Dr. Martin Luther King, Jr., the African American Institute's founders were successful in getting the University to acknowledge the anxieties of approximately 66% of Northeastern University Black students, who were members of the student organization of the Afro American Association. This resulted in a group of five Black students, representing the Afro American Association, presenting a list of thirteen demands to then President Asa Knowles who went on record in support of the thirteen demands. The first demand was a demand for 50 new academic scholarships for Black Students by September of 1968; and by 1971, a demand that at least 10 percent of the incoming freshman class be black and to establish a Program such as Project Ujima to aid in the recruitment, retention, support, and academic/career/personal/cultural development of Black students. Shortly thereafter, in February 1969, the Black students submitted a proposal for an Afro-American Institute (AAI) and a Black Studies Department, which the Board of Trustees granted permission for the use of a building referred to as the Forsyth Annex to serve as the first AAI home.

The Ujima Scholars Program, formerly known as Project Ujima, grew out of the establishment of the African-American Institute to assist the University in increasing the Black student population on campus. Founded in 1972 and introduced to Northeastern by then Institute Director, Greg Ricks, Project Ujima was modeled after Hampton University's Project Promise Program. The Ujima Program was designed to give a selected group of student's of African origin (who do not qualify for regular admissions as evidenced by test scores and grades, but who show promise for success in college) an opportunity to attend Northeastern. Beginning in 2005, the program enrolls students of all racial, ethnic and cultural identities. Newly appointed Institute Director, Lula Petty-Edwards, renamed Project Ujima to the Ujima Scholars Program in 1993 to reinforce in students the belief that they can engage in serious scholarship and achieve academic excellence.

The Ujima Scholars Program is committed to the success of its participants. The goal of the Program is to retain at least 85% of Ujima Scholars each year. Below is a comparative analysis of the student's retention rates, SAT averages, freshmen average GPA, and acceptance into majors percentages for entering classes of 1994, 1995, 1996, 1997, 1998, and 1999 based on records maintained by the Ujima Scholars Program, the University, and Professor Frank

Naarendorp's Statistical Report³. Graduation percentages are given for classes entering in 1994, 1995, and 1996.

1994	1995	1996	1997	1998	1999
Enrollment Numbers:					
70	66	86	40	52	54
Retention Rates:					
81%	73%	60%	77%	79%	70%
SAT Averages:					
710	744	848	843	881	904
Freshman Average GPA:					
2.1	2.2	2.1	2.6	2.6	2.3
Accepted into Major Percentages:					
28%	52%	47%	57%	75%	62%

The retention percentages reveal that the Ujima Scholars Program demonstrates significant success overall in exceeding the expected 65-70 percent retention rate for the identified entering classes. The average combined SAT score (math & verbal) is shown to have increased by 34 or more points since 1994, with the highest average being 904 in 1999. However, the low SAT averages in 1994 and 1995 appear not to have had a negative impact on either the retention or performance of students.

The SAT average increased to 744 in 1995, which is considered low. However, there does not appear to be a strong correlation between this low SAT score and performance, particularly when the SAT average increased to 848 in 1996, but the freshman average GPA for year was 2.1 and 2.2 in 1995. The SAT average in 1999 increased to 904, but the GPA average for the same year was only 2.3. The percentage of Ujima Scholars getting accepted into their desired majors in 1995 improved to 52%, but declined by 5% in 1996, although the SAT average was higher in 1996. The percentage of students getting accepted into their majors rose again in 1999 to 62%. While there is no information provided requiring statistical significance or the lack thereof, the above data suggests that there is no apparent relationship between SAT scores and performance, which supports the Ujima Scholars Program philosophy that SAT scores are not accurate determinants of a student's ability to succeed in college. Our experience supports the theory that financial aid is the leading factor in student attrition at the University as suggested by Reichert & Absher.

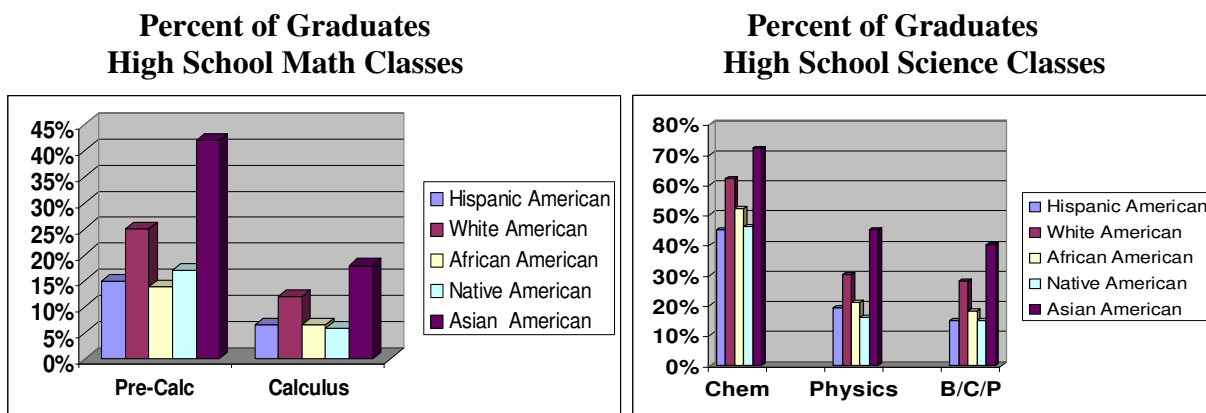
As far back as 1974, the average SAT scores for entering classes was about 299 Verbal and 313 Math. The overall GPA was about 1.9-2.0. Beginning in 1985, the average combined SAT score was between 650 and 700. The typical Ujima student came from a socioeconomic background which was/is below that of most Northeastern University students. However, the selection committee looked for students whose record showed the “qualities of responsibility and leadership, which were sometimes demonstrated through attendance records, extracurricular activities, and recommendations by school officials.”

In the mid 1990’s the Ujima Program was impacted by the University’s emphasis on “smaller and better” campus recruitment and the overall size of the student body. As a result, the criteria for admissions was modified for the Ujima Scholars Program by the Admissions Office in 2000 in direct response to the University’s call for Colleges to raise the SAT threshold. The minimum SAT was increased from 750-800. Students with SATs between 750 and 800 with a strong high school GPA were considered. Also students with a GPA below 2.0 and a SAT score of 950 or higher would receive consideration if extenuating circumstances could be substantiated. The Ujima Scholars enrollment pattern remained steady until 1996, then it showed a significant decline in 1997. Ujima enrollment then continued to decrease when it dropped from 86 in 1996 to 40 in 1997, due mainly to financial reasons as confirmed through telephone surveys with students. As a result, Ujima Scholars received enhanced financial aid awards beginning in 1999, including a \$7,500 Ujima Grant for five years for each Scholar if “enrollment circumstances remain constant.” For the past three years, 32 Ujima Scholars were awarded a full-tuition grant based on need. However, there are students accepted into the Ujima Scholars Program who do not meet the need-based criteria and as a result do not receive any Ujima Scholars Grant, but may gain admission based on the academic threshold that falls below the University accepted student profile.

Historical Perspective:

Based on institutional historical information, the number of Engineering Technology transfers have out-numbered the number of Engineering transfers from the Ujima Scholars Program into the College of Engineering . This was/is due to how more closely aligned the Engineering Technology major had been to certain students’ math/science skills or academic background and their interest in receiving a more hands-on approach to learning the technical side of Engineering. However, it should be noted that a few Engineering Tech students did initially express an interest in Engineering and were allowed to take Engineering Tech pre-calculus and chemistry courses to prepare them for the Engineering curriculum.

Mathematics and science are the primary languages of science, technology, engineering and mathematics. Students with inadequate grounding in mathematics and science, as seen in the graphs from the US Dept. of Education, are not well prepared for future academic and/or career opportunities, resulting in some colleges and universities experiencing difficulties in their recruitment efforts for under-represented minority (URM) students. In addition, they may find an even greater burden to not just recruit but to retain underrepresented students in their engineering program(s)⁴. It is precisely because of this high school academic disparity, the Ujima Scholars Program and NUPRIME work to address collectively.



(US Dept. of Education)

The Ujima Scholars Program established an agreement with the College of Engineering, by way of the NUPRIME program, that allows potential Engineering students who successfully completed Engineering Tech prep courses to be put on contract for one additional semester to continue taking Engineering first-year courses before they could be officially accepted into Engineering after earning an overall 2.8GPA, with no deficiencies and no grade less than a C+ in the major. Those students who did not fulfill this contractual arrangement were provided with the opportunity of transferring into the Engineering Technology program as an alternative engineering-related pathway.

Strategic Outlook:

The number of students expressing an interest in Engineering and qualifying for acceptance at the end of freshman year are improving due to a number of reasons. One key reason is that students are entering the university with a stronger background in math and science and with a greater knowledge of what Engineering is about in terms of what it offers and how it compares to their interest, skills, abilities, and career aspirations.

Additionally, most of these students enter with some level of exposure to the area of engineering they want to focus on, which has contributed a great deal to their ability to identify a specific area of engineering interest, which helps to enhance their confidence, motivation, and determination to succeed.

Last, we have found that our meetings with potential Engineering students during Ujima orientations, such as the “Meet-the-Major” Information Session in the fall, and the “Petition-to-Major” Process in the spring combined with the assistance they receive from the Institute/Ujima Scholars Program and the NUPrime program throughout the year, have helped to inform students early and on an on-going basis about Engineering requirements and what they must do to achieve success and official acceptance into College of Engineering at the end of freshman year.

This combined involvement has helped to motivate students to stay focused and to link them to available resources offered through the College of Engineering, leading to a successful undergraduate engineering experience.

Selection Process:

Admissions identifies Ujima Applicant Pool and invites approximately 120 potential candidates for in-person campus interviews. The in-person campus interview consists of an overview of the Ujima Scholars Program along with a math and reading assessment.

The Ujima Scholars Selection Committee is made up of Admissions, Administrators and Ujima Staff.

Ujima Scholars Academic Criteria:

Average GPA 2.85 (2.7~3.0)

Average SAT Combined Score 1025

Letters of Recommendation from teachers and guidance counselors

Strong Personal Qualities

Ujima Scholars Program Requirements

Students sign a contract agreeing to comply with Ujima program policies. According to the terms of that contract, students must participate in the following services:

- **Academic Achievement Efforts:** Students are expected to achieve and sustain good academic standing.

Scholars must successfully complete four college courses per semester based on selected major:

<i>Fall Semester</i>	<i>Semester Hours</i>	<i>Spring Semester</i>	<i>Semester Hours</i>
<i>Research & Writing</i>	<i>4.0</i>	<i>Research & Writing</i>	<i>4.0</i>
<i>Math</i>	<i>4.0</i>	<i>College Writing</i>	<i>4.0</i>
<i>Core/Elective</i>	<i>4.0</i>	<i>Math or Elective</i>	<i>4.0</i>
<i>Core/Elective</i>	<i>4.0</i>	<i>Elective</i>	<i>4.0</i>

- **Research & Writing 1 & 2 Course:** A required full credit two-semester course which provides writing focused on crafting strong essays, research writing and writing about literature, oratory with emphasis on developing effective oral communication and presentation skills, and research concentrated on academic research, scholarly inquiry, analysis of current events and the diverse topics and texts of the African Diaspora.
- **Assisted Study Program:** Students must participate in two (2) hour group study sessions each week. This program builds study habits; strengthens preparation for classroom participation, tests, and quizzes; and gives students a chance to get help with their assignments.
- **Tutorial Assistance:** Students who want help in a specific subject area can take advantage of free tutoring services at the John D. O'Bryant African American Institute. From the second week of classes to final exams, graduate students provide tutorial assistance in most subjects including biology, business, chemistry, economics, English, math, and physics.
- **Counseling Services:** Each Ujima Scholar is assigned a counselor/advisor who provides academic, career, and personal counseling. In addition, through the Peer Mentoring

Program, upperclass students, faculty, and staff assist and support freshmen as they make their adjustment to college. Ujima Alumni help prepare students for collegiate and career success. Referrals are made to University and external sources when appropriate.

- **Weekly Meetings:** Students are required to meet with a Ujima counselor/advisor on a weekly basis to insure their awareness and connection to available resources, and to receive course advising, encouragement, and support.
- **Group Meetings:** Ujima Scholars must attend biweekly meetings that offer strategies for dealing with various aspects of the academic experience at Northeastern. Topics covered include choosing and declaring a major, financial aid, understanding the cooperative education program, building assertiveness skills, learning about African-American history and culture, recognizing students academic achievement, and petitioning to a major.
- **Class Attendance:** Students are required to attend all classes to insure their academic success.
- **Community Service:** Ujima Scholars must complete twenty (20) hours of community service to enhance their involvement in the community and educational, career, cultural, social, and personal development.
- **Sports:** Students must refrain from competing in intercollegiate sports for entire freshman year..
- **Events:** Ujima Scholars are expected to attend several events sponsored by the John D. O'Bryant African-American Institute and the broader University community to further enhance their educational, career, cultural, social, and personal development.
- **Conduct:** Students are expected to maintain respectful behavior and a positive attitude towards their fellow peers, staff, faculty, and others.
- **Petition to Major:** Ujima Scholars petition to gain admission into their selected major in the spring semester of their freshman year. Students are eligible to transfer into the major of their choice if their performance during freshman year meets the criteria for selection into that major.

2007/2008 Academic Year Statistical Data⁵

The Ujima Scholars Demographics:

54% African American, 9% African, 2% Cape Verdian, 33% Hispanic/Latino, 4% White/Caucasian.

63% Females, 37% males

65% from Boston/New England region, and 35% from other regions of the United States

Boston/New England High Schools Represented:

Boston Latin Academy, Boston Day and Evening Academy, Cambridge Rindge and Latin School, John D. O'Bryant School of Mathematics and Science, Fenway High School, Northfield Mount Hermon School, The Winsor School, St. Sebastian's School, Wellesley High School, Brighton High School, Classical High School, Dexter High School, Health Careers Academy, Lincoln-Sudbury Regional High School, Lowell High School, Madison Park Technical Vocational High School, Muriel S. Snowden International School, New Mission High School, Newton North High School, Revere High School, and others

Other Regional High Schools Outside Boston/New England Represented:

David Starr Jordan High School, Georgetown Day School, Ossining High School, Western High School, William P. Clements High School, Walton High School, Storm King School, Teaneck High School

Academic Performance and Retention Data:**Fall 2007 (46 students enrolled)**

GPA	# of students	# of semester hours
3.0 – 4.0	9 (19%)	12-16
2.0 – 2.99	19 (41%)	8-18
Below 2.0	18 (39%)	8-17

Total GPA Average for Fall 2007 = 2.20 (C grade equivalent)

Total Semester Hours Average for Fall 2007 = 13.19 (normal semester hours total= 16, maximum semester hours without overload = 19, and 20 semester hours and above are due to transfer credit)

Spring 2008 (41 students enrolled – 5 of 46 withdrew spring semester)

GPA	# of students	# of semester hours
3.0 – 3.99	13 (32%)	8-18
2.0 – 2.99	20 (49%)	8-17
Below 2.0	7 (17%)	8-17

Total GPA Average for Spring 2008 = 2.53 (C+ grade equivalent)

Total Semester Hours Average for Spring 2008 = 13.78 (normal semester hours total = 16, maximum semester hours without overload = 19)

Total Fall & Spring 2007/2008 GPA Average = 2.4

Total Fall & Spring 2007/2008 semester hours Average = 26.97 (32 semester hours are required for freshmen year)

10 scholars or 24% of scholars took summer 2008 classes

Total GPA Average after summer 2008 classes = 2.4

Total Semester Hours Average after summer 2008 classes = 29.24

Total Number of students returned Fall 2008 = 36 or 78% (4 students returned spring 2009/Fall 2009 raising the total number of students that entered in Fall 2008 returning to 40 or 87%.

Petition to Major Statistical Outcome

87% of Ujima Scholars achieved direct acceptance and/or provisional acceptance into their majors for fall 2008 in spite of the academic and personal challenges many of them encountered during the 2007/2008 academic year. Approximately nine students who were assigned provisional status as of fall 2008 met the requirements to get accepted into their majors in spring 2008 semester. Below is a breakdown of transfer to major acceptance rate for fall 2007 entering class:

College of Arts and Sciences = 33 or 72%

College of Business = 5 or 11%

College of Criminal Justice = 2 or 4%

2008/2009 Academic Year Statistical Data⁶

The Ujima Scholars Class and Demographics:

56% African American, African, Black; 2% Asian American; 29% Hispanic, Latino; 2% Native American; 2% Puerto Rican; and 7% White/Caucasian

63% Females, 37% males

88% from Boston/New England region, and 12% from other regions of the United States

Boston/New England High Schools Represented:

Boston Latin Academy, Brighton High School, Brook Farm Business and Service Career Academy, Central Catholic High School, Classical High School, Dexter High School, Fenway High School, Health Careers Academy, John D. O'Bryant School of Mathematics and Science, Landmark High School, Lexington Christian Academy, Lincoln-Sudbury Regional High School, Lowell High School, Madison Park Technical Vocational High School, Muriel S. Snowden International School, New Mission High School, Newton North High School, Odyssey High School, Revere High School, Saint Mary's Jr/Sr High School, Stoughton High School, The Match Charter Public High School, The Wheeler School, Weston High School, Westwood High School.

Other Regional High Schools Outside Boston/New England Represented:

Benjamin Cardozo High School, Bronx Academy of Letters, Cardinal Hayes High School, Frederick Douglass Academy II, Friends Academy, White Plains High School

Academic Performance and Retention Data:

Fall 2008 (41 students enrolled)

GPA	# of students	# of semester hours
3.0 – 4.0	18 (44%)	12-21
2.0 – 2.99	20 (49%)	12-22
Below 2.0	3 (7%)	12-18

Total GPA Average for Fall 2008 = 2.85 (B- grade equivalent)

Total Semester Hours Average for Fall 2008 = 15.75 (normal semester hours total= 16, maximum semester hours without overload = 19, and 20 semester hours and above are due to transfer credit)

Special Note: One student achieved a 4.0 grade point average for Fall 2008

Spring 2009 (39 students enrolled – 2 withdrew for health reasons)

GPA	# of students	# of semester hours
3.0 – 3.99	15 (38%)	8-19
2.0 – 2.99	19 (49%)	13-19
Below 2.0	5 (13%)	12-16

Total GPA Average for Spring 2009 = 2.92 (B- grade equivalent)

Total Semester Hours Average for Spring 2009 = 15.94 (normal semester hours total = 16, maximum semester hours without overload = 19)
 Total Fall & Spring 2008/2009 GPA Average = 2.88
 Total Fall & Spring 2008/2009 semester hours Average = 31.69 (32 semester hours are required for freshmen year)
 21 scholars or 51% of scholars took summer 2009 classes
 Total GPA Average after summer 2009 classes = 2.81
 Total Semester Hours after summer 2009 classes = 33.12
 Total Number of students returned Fall 2009 = 40 or 97% (2 withdrew, 1 returned)

Petition to Major Statistical Outcome

Overall a highly motivated, academically prepared, and self-disciplined fall 2008 entering class. 59% of scholars achieved acceptance into their majors for Fall 2009:

College of Arts and Sciences Direct Acceptance = 37%
 College of Arts and Sciences Provisional Acceptance & Provisional Internal Transfer Program Acceptance = 36%
 College of Business Direct Acceptance = 10%
 College of Criminal Justice Direct Acceptance = 2%
 College of Engineering Direct Acceptance = 10%
 Repeating freshman status = 5%; expected to achieve eligibility to transition into their majors in Spring 2010.

The following information is the compiled data on a number of Ujima students who have transferred into and graduated from the College of Engineering and the School of Engineering Technology from 1997 to 2008.

Entering Class of 1997

I. B.	Mechanical Engineering	Graduated	2.672
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Entering Class of 1998

R. E.	Engineering Technology	Graduated	2.578
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Entering Class of 1999

M. A.	Engineering Technology	Graduated	2.099
I. A.	Electrical Engineering	Graduated	2.761
A. B.	Engineering Technology	Graduated	2.545
N. J.	Engineering Technology	Graduated	2.564

Entering Class of 2000

H. Z.	Engineering Technology	Graduated	2.284
M. B.	Computer Technology	Graduated	2.527
F. D.	Computer Technology	Graduated	N/A
E. M.	Computer Technology	Graduated	3.308
J. S.	Computer Technology	Graduated	2.360

Entering Class of 2001

L. A.	Computer Technology	Graduated	2.567
Z. M.	Electrical Engineering	Graduated	2.783
R. T.	Electrical Engineering	Graduated	N/A

Entering Class of 2002

O. E.	Mechanical Engineering Tech	Graduated	2.140
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Entering Class of 2003

J. H.	Mechanical Engineering Tech	Graduated	2.906
L. F.	Electrical Engineering	Graduated	2.848
S. W.	Computer Engineering Tech	Graduated	2.351

Entering Class of 2004

J. B.	Electrical Engineering Tech	Graduated	2.357
S. C.	Electrical Engineering	Graduated	2.473
T. G.	Computer Engineering	Graduated	2.954
M. M.	Mechanical Engineering Tech	Graduated	2.069

Entering Class of 2005

R. M.	Mechanical Engineering	(Still Here)	3.045
C. T.	Mechanical Engineering Tech	(Still Here)	2.714

Entering Class of 2006 (No transfers into engineering due to no interest)**Entering Class of 2007 (No transfers into engineering due to no interest)****Entering Class of 2008**

O. A.	Mechanical Engineering	Sophomore	2.805
A. J.	Electrical Engineering	Sophomore	2.905
T. M.	Civil Engineering	Sophomore	2.872
G. O.	Computer & Electrical Eng.	Sophomore	2.810

Entering Class of 2009**

A. A.	Electrical Engineering	Freshman	2.000
D. C.	Mechanical Engineering	Freshman	2.370
J. N.	Electrical Engineering	Freshman	2.555
E. L.	Civil Engineering	Freshman	3.259
J. A.		Freshman	3.741

**Students in the entering class of 2009 are currently in the petition process to transfer into their majors of interest.

2009 SAT Average – 1009

2009 GPA Average – 3.12

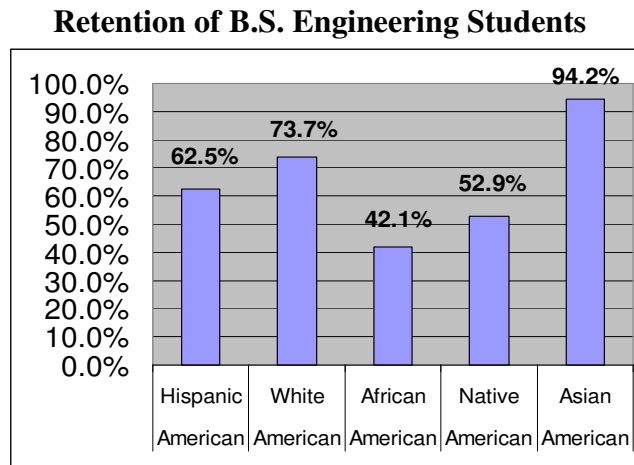
Entering Class of 2010

2010 SAT Average – 1088

2010 GPA Average – 3.05

Conclusion:

In summary, as of August 27, 2009, a total of 28 students who entered Northeastern University through the Ujima Scholars Program from 1997 to 2008 successfully transferred into the College of Engineering and/or School of Engineering Technology where they have outperformed the statistical rate of retention for under-represented. However, this challenge of retention is significantly greater for under-represented minority students than their counterparts, as seen by the NSF/EWC Retention of B.S. Engineering Students Graph.



(NSF/EWC, 2002)

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