



Completing the Puzzle for Student Success at UHD and SJCN

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Abstract

Through the funding provided by the NSF STEP Program, the University of Houston-Downtown (UHD) and San Jacinto College North (SJCN) has effectively established a joint program entitled: Expanding Pathways to Success in Science (EPSS) at the University of Houston-Downtown (UHD) and San Jacinto College North (SJCN). UHD is a primarily undergraduate urban institution with approximately 12,000 students, and SJCN is a two-year community college with approximately 6,500 students located a few miles east of UHD. Both of these public, commuter institutions are HSI's and MSI's. The objectives of this program are: (1) Enhance the undergraduate learning environment in science and technology; (2) Establish a bridge program to facilitate the transfer of students from SJCN to UHD; (3) Motivate students, especially women and underrepresented minorities, to complete associate and baccalaureate degrees in natural science and biotechnology and to further pursue careers and graduate degrees in science, natural sciences and biotechnology; (4) Promote both on-campus and off-campus student participation in research; (5) Foster the interdisciplinary nature of science and its application in society; and (6) Increase recruitment and retention of Science, Technology, Engineering, and Mathematics (STEM) students. The EPSS program is part of the larger Scholars Academy program, which has similar objectives and scope. This presentation briefly describes the programs and activities that have been instrumental in successfully achieving the objectives of the EPSS program.

S

Scholarship and Stipend Support

In order to successfully achieve the objective of increasing the recruitment and retention of students into STEM fields, the EPSS program through the NSF STEP has awarded 120 EPSS related scholarships. In total, the Scholars Academy has awarded over 690 individual scholarships; over half to underrepresented minorities and females.

Scholarships	EPSS	EPSS Matching	Total EPSS
All students	86	34	120
Minority	39	22	61
Female	55	23	78

Scholarships awarded by the EPSS program Fall 2004 – Spring 2008. Minority students are underrepresented minorities (African-American, Hispanic, Native American / Hawaiian). Matching grants were provided by UHD.



Scholars Academy (SA) Family Portrait Fall 2007: All students receive a SA scholarship via EPSS or other funding.

T

Tutors and Peer Mentors

Student mentors and tutors work with faculty to help assist and retain STEM students by creating a positive learning environment in STEM.

Activities include:

- Free tutoring in STEM courses
 - 8 science tutors / semester for 15 natural science courses, including all freshmen level courses
 - 20 math and computer science tutors / semester for all Computer and Mathematical Science courses
- Peer Led Team Learning in Biology and Math Courses
- Peer mentors, each assisting faculty mentors
- Social and networking activities



UHD student receiving free math tutoring funded by the EPSS program.



Undergraduate Faculty Mentors

Faculty mentors are instrumental in recruiting, retaining, and motivating our students to careers in sciences:

- All EPSS and Scholars Academy students are matched with a faculty mentor (~10 students/faculty mentor).
 - 8 Natural Science Faculty Mentors
 - 5 Computer and Mathematical Sciences Faculty mentors
 - 2 Engineering Technology Faculty mentors
- STEM Faculty mentor students year round as academic advisors and undergraduate research advisors.

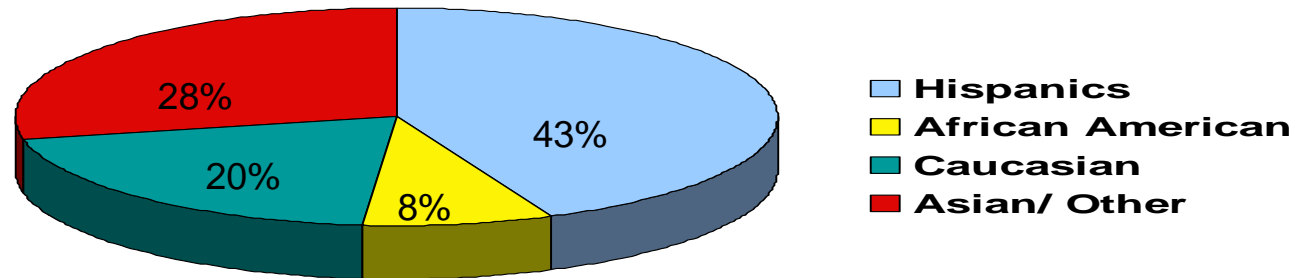


Scholars Academy freshmen being advised by Faculty within the Department of Computer and Mathematical Sciences at UHD.

D

Diversity

Located at the most culturally diverse liberal arts university in the western United States, the Scholars Academy is an academically competitive program whose primary mission is to increase the number of underrepresented minorities and females completing degrees in STEM fields.



Scholars Academy students ethnicity, 2007.



Scholars Academy students receiving Honors Corps award for their academic achievements.

E

Establishing a Bridge

The EPSS has recruited 45 students from its community college partner San Jacinto College North.

SJCN Students	Students
Applied	45
Accepted	34
Graduated	8

SJCN (San Jacinto College North) students applying to enter the EPSS program at the University of Houston-Downtown, 34 of the 45 were accepted, and 8 of the accepted students have graduated (2004 – 2007).



EPSS students from SJCN attending a research seminar at UHD.



SJCN Scholars Academy students and the Director visit UHD to begin their transfer process.

N


National Recognition

The EPSS program and the Scholars Academy received national recognition for its efforts to recruit, retain, graduate, and progress students toward STEM careers and graduate programs:



Texas Higher Education Star Award, 2004

Education and Human Resources



► Award-Winning Scholars Academy Expands Students' Pathways to Success: In an effort to increase the number of students receiving undergraduate degrees in the technical disciplines, NSF invests in the Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP). The initiative funds a small number of "Type 2" projects, which seek to understand why students do or do not stay to get their degree. But mostly it funds "Type 1" projects, which look for ways to draw students into the technical fields and then keep them there. One good example of a Type 1 STEP project is the University of Houston-Downtown (UHD) Scholars Academy, which gives undergraduate science and technology majors an opportunity to spend the summer working on research projects with faculty and advanced student mentors. The students come from both UHD and San Jacinto College North (SJCN), a public 2-year community college. In 2004 the Scholars Academy received the Texas Higher Education Star Award, established by the Texas Higher Education Coordinating Board to recognize exemplary contributions toward closing educational gaps in the state. And in November 2005, twelve academy students presented scientific research posters at the Sigma Xi Annual Meeting in Seattle, Washington, and were awarded either second or third place in their presentation categories. (DUE)

The twelve students (ten UHD and two SJCN students) who presented and were awarded either second or third place in their presentation categories at the Fall 2005 National Sigma Xi Conference in Seattle Washington. Credit: Drs. Phill Lyons (UHD biology faculty) and Eric Carson (SJCN geology faculty member).

The success of EPSS was acknowledged in the National Science Foundations' budget request to the President (fiscal year 2008).

T

Training in STEM Research

To achieve the objective of promoting undergraduate student research, the EPSS program and the Scholars Academy:

- Provides research stipends for students
- Progress students to off-campus research experiences
- Provides on-campus Student Research Conference for students to publicly present their research
- Funds student travel to present at peer-reviewed research conferences.

Year	Total STEM Research Students*	Funded by NSF STEP UHD	Funded by NSF STEP SJCN (sum)	Presentations at Major Conferences	Presentation Awards
2004	96	11	2	35	5
2005	117	28	6	47	16
2006	147	32	5	43	10
2007	171	55	2	39	6

UHD student research stipends 2004 - 2007. Total STEM research students funded by federal and private funds and matching UHD grants.

* On and off-campus research (approx. 12% avg. off-campus)



UHD student research conference.



UHD student research.

S

Service and Outreach

Scholars Academy students participate in service learning activities through the Scholars Academy.

Activities include:

- High school mentoring and STEM recruiting
- Science Engineering Fair of Houston volunteers and judges.
- Education Rainbow Challenge math contest judges and proctors.
- Teacher and K-12 workshops and science demonstrations.



UHD Scholars Academy student judges at the Education Rainbow Challenge math competition.

U

Use of STEM Seminars and Fieldtrips

Each year, the Scholars Academy provides a variety of STEM fieldtrips and seminars that helps connect their coursework to real-world situations. Seminars include research seminars in STEM fields as well as career and internship opportunities.



UHD Scholars Academy students on a fieldtrip in New York, NY visiting graduate schools and research institutions.



UHD Scholars Academy students at a seminar on summer research opportunities at Case Western School of Medicine.

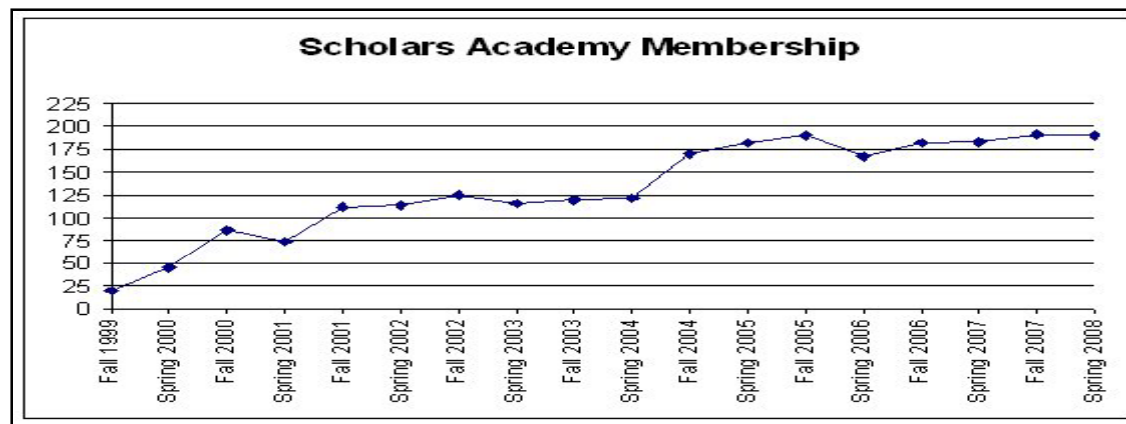
C

Community

The University of Houston-Downtown is a commuter university with over eleven thousand students. Through peer and faculty mentoring, personal advising, active participation in Academy activities and on-campus research, the Scholars Academy has been successful in creating a family community.



UHD Peer Mentors Retreat, August 2007.



Increasing UHD Scholars Academy student membership
Fall 1999 – Spring 2008.

C

Culture of Academia

Specialized Scholars Academy programs immerse students in an atmosphere of high expectations and academic excellence. Programs such as the Freshmen Student and Parent Orientation, the Pre-College Start Workshop and the College Success Program course have worked to recruit and retain first generation college students.



Incoming freshmen and their parents speak to Scholars Academy Peer Mentors at the Freshmen Student and Parent Orientation.



Freshmen in the College Success Program work in groups to solve inquiry-based problems.

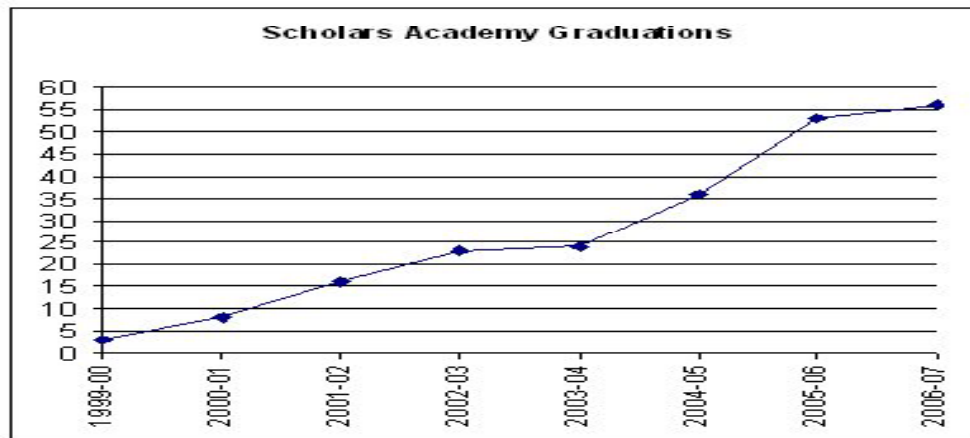
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Expanding the STEM Pipeline

The EPSS program has been successful in recruiting and retaining students within the STEM fields. Each year, Scholars Academy retains approximately 85% of the students and since the inception of the Scholars Academy, each year the number of STEM graduates continues to rise.



UHD Scholars Academy graduates, 2005.



Increasing UHD STEM graduates in the Scholars Academy Fall 1999 – Spring 2007.

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STEM Graduate School Preparation

The EPSS program works to motivate students to pursue careers and graduate degrees in science by providing curriculum enhancement activities. Activities such as the Graduate Record Exam Preparation Course has now been institutionalized as an elective course.

Activities Include:

- Resume and *Curriculum Vitae* Writing Workshops
- Visiting Scientists and Graduate Students
- GRE Preparation Course
- Graduate School and Internship Fair
- Visitation to graduate programs and research institutions.



UHD Scholars Academy Graduate School and Internship Fair, 2006.

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Successful Entrance into Graduate and Professional Schools

The EPSS and Scholars Academy has created an enriching environment that has resulted in the matriculation of students into graduate school and professional school within STEM-related fields.

Program	2000-2003	2004-2007
MS / PhD Program	12 / 1	10 / 14
Professional School	8	20
Working in the field	21	74

UHD Scholars Academy Graduates before (2000 – 2003)
and during the EPSS program (2004 – 2007).



UHD Scholars Academy Graduates,
Spring 2006.

From left to right: Karla Alvarez,
research assistant; Jennifer Abrams,
doctoral student in biomedical sciences;
and Vien Lam, medical student.

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Scholars Academy (SA) Family Portrait Fall 2007. The image shows a SA scholarship, EPSS or matching grant.

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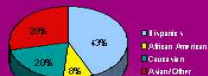
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Scholars Academy freshmen being advised by faculty within the Department of Computer and Mathematical Sciences at UHD.

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Scholars Academy students ethnicity, 2007.

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EPSS students from SJCN attending a research seminar at UHD.

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*On and off-campus research (12% avg. off-campus)



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• Science Engineering Fair of 100 volunteers and judges.

• International Rainbow Challenge math competition judges and proctors.

• Summer and K-12 workshops and demonstrations.



Scholars Academy student judges at the International Rainbow Challenge math competition.

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UHD Scholars Academy Graduate School Preparation (2000 – 2003) and during the EPSS program (2004 – 2007).



UHD Scholars Academy Graduate School Preparation, Spring 2008. From left to right: Kaiti Alkawas, research assistant; Jennifer Abrams, doctoral student in biomedical sciences; and Vera Lam, medical student.