UHD SCHOLARS ACADEMY FACULTY & PEER MENTORING ORGANIZATION: DEVELOPING MENTORS TO MAKE THE SUCCESS DIFFERENCE

DR. MARY JO PARKER

Celebrating its 15th year of success, the University of Houston-Downtown's (UHD) Scholars Academy (SA) has generated over 700 graduates in science, technology, engineering, and mathematics (STEM), of which 91% remain in STEM graduate programs and/or the workforce. The basis of success lies in the use of small learning communities, called peer and faculty mentor groups, each of which is based on disciplines; support of freshmen and transfer students through lower and upper division STEM course work, and semester-long activities which form bonds among individuals, create support networks, are enriching and broadening, provide service to community, and offer immediate and ongoing connections to Ph.D. faculty. In turn, participating faculty members are exposed to energetic, competent, and enthusiastic undergraduates, and many first-generation students like themselves, enabling them to share their own success stories and paths to their doctorate degree with each member of the small group. Selection of peer mentor leaders and Ph.D. faculty mentors, and training of peer mentors through an off-campus retreat setting offer many minority-serving and Hispanic-serving institutions a model for inclusive success for their own diverse STEM populations. Fifteen years of longitudinal data will frame the evolution of the organization and its continuing completion and post-baccalaureate successes. This paper also focuses upon training of both peer undergraduates and Ph.D. faculty throughout a single year's timeframe juxtaposed to the entirety of the 15-year-old organization. The extensive influence of peer-led team leadership will provide insight into the training processes.

Background

The University of Houston-Downtown (UHD) is a four-year, urban university celebrating its 40th year. A federally designated Hispanic-serving and Minority-serving institution, UHD currently has one of the lowest tuition rates in Texas. Offering over 44 bachelor degrees, more than 1,000 STEM majors add to the 14,000-plus student population (Fact Book, 2013). Physically, UHD currently is made up of three buildings (see images below). A new science and technology building is anticipated with the upcoming Texas legislative session

Main Street Bldg.	Commerce Street Bldg.	Shea Bldg.

The Scholars Academy (SA) began in 1999 with a cohort of 20 STEM undergraduates. Its mission then and now is to increase the number of students graduating with STEM degrees. The SA, an academic unit within the College of Sciences and Technology, provides competitive scholarships, mentoring, and high impact experiences in the form of mentored research, community service and service learning to a student population of between 160-175 (see Figure 1).
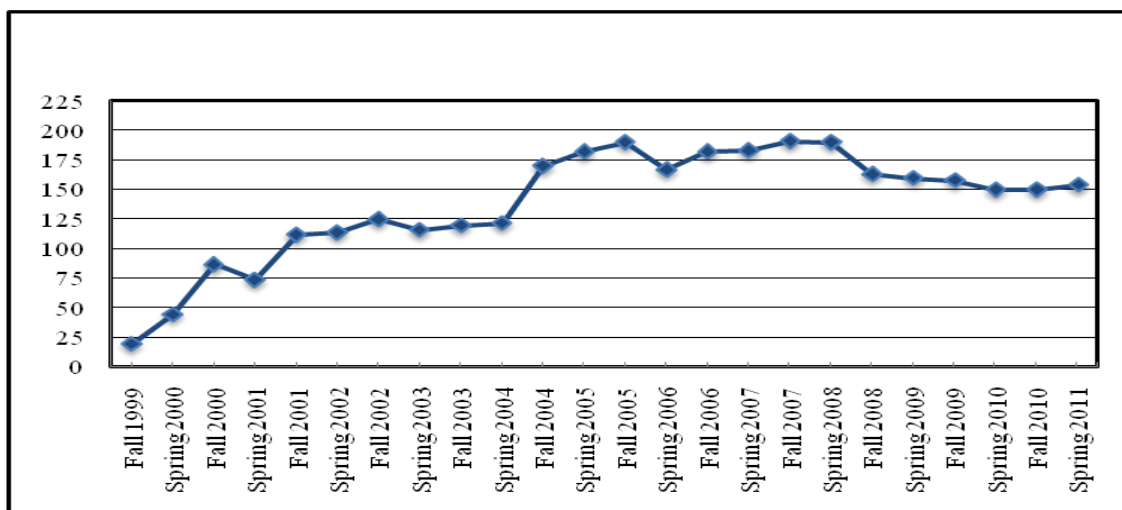

Figure 1. Scholars Academy membership growth 1999-2011

SA enrollment represents 15% of the larger division population while departmentally, SA members represent approximately 67% of the Natural Science majors, 27% of the computer and mathematical science majors, and 6-8% of the Engineering Technology majors. Demographically, there are almost double the number of Asians and almost half the number of African Americans in SA compared to the general UHD population. These data represent membership in Spring 2013, while UHD demographic data represent Fall 2012. Gender data reflects the greater university which is important since both UHD and SA have almost 60% females (considered an underrepresented population in STEM majors). All of SA members receive scholarship support, ranging from 61% to 100%.

The Scholars Academy is established as a five-point model:

Point one: Scholarship support to maintain full-time undergraduate status. Academic scholarships eliminate one of the major barriers hindering most underrepresented participants. Maintaining full-time status ensures scholars' annual progress in credit hours toward graduation.

Point two: Mentoring support provides upper division undergraduates and faculty members the mechanism to directly connect with freshmen and transfer students, new to the university, especially when they need guidance and prior to their asking for assistance. Mentoring is also provided through the Freshman and Transfer Seminar courses, mandatory for SA members. Peer-led Team-Learning (PLTL) is used in the freshman seminar course, which is run in a workshop format. The transfer seminar is moving to a similar system.

Point three: Broadening Career Activities are made possible through scholarly field trips and seminars which are offered each semester in an effort to allow students to hear from industry and graduate program experts with a broad discipline-based approach. As first-generation undergraduates (76% within the SA), broadening experiences are critical to refinement of career choices by the membership.

Point four: Graduate School Preparation is offered each semester. Visiting PhD professors are hired to offer verbal, math, and writing GRE workshops which are free of charge to all SA and UHD undergraduates.

Point five: Scholarly Research and Internships are high impact activities that provide SA members with realistic experiences of what future careers would involve. By providing these experiences and coupling them with support for conference posters, papers, and oral presentations in-house and external to the university, SA members gain invaluable experiences informing their future careers, and often, they gain an extra step into the career.

Leadership development begins with the SA mentoring system (See Figure 2). Peer mentor groupings are established by discipline. Peer mentors are generally junior/senior status, selected through a nomination and selection process. Faculty mentors also are selected by discipline, thereby connecting incoming and current freshmen and transfer students to STEM leaders through undergraduates and faculty dedicated to the SA mission. Guiding leaders are essential to the growth and graduation of all SA members. This is especially true when the SA vision, to support 100% matriculation into graduate programs, professional programs, and STEM industry careers, is targeted for realization.

SA's mentoring history is a lengthy one and offers a model for others. Briefly, beginning with two peer mentors and volunteer faculty mentors in 2000, SA saw the need to establish a Peer Mentor Coordinator position as peer and faculty mentors were brought on board. With this position came the inclusion of peer-led team leadership. PLTL became an investment in undergraduates' ability to learn leadership, transfer this leadership to other undergraduates through the modeling workshop. Utilizing PLTL within the SA demonstrated how such an investment by the organization could empower underrepresented students through training and trust in their abilities to grow as individuals and as SA members and as UHD students. By 2003, the SA incorporated its first Senior Peer Mentor to lead the eight (8) peer mentors. Currently, fifteen (15) peer mentor groups led by PhD faculty mentors and junior/senior peer mentors, representing the disciplines of natural sciences, computer and engineering technology, and mathematics and statistics, comprise the current SA organization.

Fall 2011 UHD Scholars Academy Roster

SA Executive Committee
Akif Uzman, CST Dean
Kenneth Oberhoff, CST Assoc. Dean
Richard Alo, CCSDS Exec. Director
Larry Spears, UCSS Director
Dennis Rodriguez, CMS Chair
Edward Sheinberg, ET Chair
Lisa Morano, NS Chair

Scholars Academy Director
Mary Jo Parker, Ed.D.

Program Manager
Rene Garcia, B.S.

Admin. Assistant II
TBA

Peer Mentor Coordinator
Mitsue Nakamura, M.S.

Senior Peer Mentor
Christine Varghese MBIO

Natural Sciences (NS)

Peer Mentor Jackie Nguyen BIOL	Peer Mentor Lisa Matsell BPS	Peer Mentor Matthew Ojeda MBIO	Peer Mentor Alex Weston MBIO	Peer Mentor Adolfo Lara BIOL	Peer Mentor Marlyn Davila BIOL	Peer Mentor Nameera Baig CHEM	Peer Mentor Dayna Spencer CHE	Peer Mentor Basit Jawad BIOL
Bria Anderson F-Biol	Latarsha Emerson BPS	Kevin Abate MBio	Karla Castro Biol	Winford Becton Biol	Santosh Adhikari BioT	Rebecca Barbosa Chem	Abisoye Adejumo Che	Miriam Amah Che
Itzel Campos Biol	William Hasbargen BPS	Frances Acevedo Biol	Diana Chakkramakkil BioT	Asad Durrani Biol	Lilian Antunes BioT	Brandy Bell-Lee Chem	Daniel Alvarez Che	Cassandra Flores Biol
Carolina Chavez F-Biol	Gerin John Biol	Kolawole Akindoju MBio	Marco Mondragon Biol	Valerie Jordan Biol	Raymond Cherian Biol	Rogelio Camacho Che	Joanna Castaneda Che	Kimberlyn Garcia Biol
Shanna Daniel F-Biol	Maryam Ogunkoya Biol	Caroline Barbosa MBio	Christian Escobar Biol	Asad Durrani Biol	Kul Gaudel BioT	Jennifer Carmichael Chem	Darlen Galicia F-Che	Ashley Harkey Che
Reihana Elsayed Biol	Janeth Pereira F-Biol	Jesus Barron MBio	Jimmy Ngo Biol	Amanda Kidd Biol	Bonnie Guinn BioT	Fatoumata Diallo CHE	Dulce Guevara Che	Pallawi KC Biol
Whitney Nwaogwugwu Biol	Wendy Ramirez Biol	Tonya Bauch MBio	Karla Rios Biol	Sheba Mathew BPS	Srijan KC BioT	Rosario Garcia F-Che	Escat Jimenez Che	Suzette Khan Biol
Isaac Omuhambe Biol	Angela Rosales BPS	Lee Anne Bay MBio	Natalie Rodriguez BPS	Kyla McKay BPS	Binh Le Biol	A'Tondra Gilstrap Che	Milena Lobaina Che	Hakeem Ogunkoya Biol
Itam Otu Biol	Alba Rubi Biol	Anna Garcia MBio	Massiel Rubio Biol	Jesse Morka F-Biol	Fersen Leiva F-Biol	Aisha Mehmood Chem	Ricardo Oropeza Che	Karishma Patel Che
Maria Preza F-Biol	John Waller Biol	Najah Khan F-Biol	Sara Taghikhani Biol	Lassana Samarakoon BioT	Andrew Mark BioT	Julie Nash Che	Eber Quiroga F-Che	Ceraira Snerling Simmons Biol
Nigar Safarova Biol	Alexis Woodard Biol	Linda Onyirimba F-MBio	Tuan Tran Che	Reyna Valdez BPS	Duc-Trung Nguyen BioT	Elsy Rivera F-Che	Jessica Rhone Che	Jose Ventura Biol
Ana Silva-Obando Biol	Tiffany Zedlidz F-Biol	Tracey Thomas F-Biol	Tanu Uppal MBio	Rosa Villagomez Biol	Deepak Pandey BioT	Israel Sierra Che	Dat Truong Che	Christian Walker F-Biol
Ana Uruena Biol			Briana Villarreal F-Biol				Claudia Turcios Che	
Faculty Mentor Dr. McCullough	**Faculty Mentor** Dr. Aoki	**Faculty Mentor** Dr. Sadana	**Faculty Mentor** Dr. Gulati	**Faculty Mentor** Dr. Hoge	**Faculty Mentor** Dr. Sullender	**Faculty Mentor** Dr. Benavides	**Faculty Mentor** Dr. Jiang	**Faculty Mentor** Dr. Jose

Computer & Mathematical Sciences (CMS) — **Engineering Technology (ET)**

Peer Mentor Melissa Greenlee MATH/CS	Peer Mentor Sarah Jennisca CS	Peer Mentor Sara Wilder MATH	Peer Mentor Brian Holtkamp CS	Peer Mentor Maxwell Goedjen CS	Peer Mentor Amy Flower SFET
Amie Albanese Math	Marisol Maciel Math	Ann Marie Alaniz Math	Greysi Chao CS	Nabil Bani CS	Juan Castillo SAD
Jungsook Larson Math	Paola Martinez Math	David Amos Math	Lucino Flores CS	Kaleigh Ceaser CS	Arturo Garcia SAD
Danielle Picklesimer Math	Athena Pasuelo Math	Jason Argueta Math	Kareem Harris CS	Jesus Fernandez CS	Taylor Luckett F-SAD
Ranjan Poudel Math	Pablo Rivera Math	Rnady Davila Math	Joseph Johnson CS	LaToya Green CS	Roberto Manzano F-SAD
Mayra Sanchez Math	Ilian Rojas Math	Amairani Hernandez F-Math	Tom Oguntuga CS	Nicolas Ramirez F-CS	Biliulfo Martinez F-SAD
Evelyn Saravia Math	Isaac Valdez Math	Yesenia Salazar Math	Daniel Stewart CS	Timothy Sullivan CS	Alejandro Mendez F-SAD
Jerome Stephens Math		Jose Trejo Math	Jermaine Thomas CS	Zaida Tinoco F-CS	Jibri Pimento F-SAD
			Antoine Williams-Baisy CS	Hugo Tobias F-CS	Santa Vasquez CIET
					Sudeep Wosti CIET
					Clemente Zamirrapa SAD
Faculty Mentor Dr. Yoon	**Faculty Mentor** Dr. Hrynkiv	**Faculty Mentor** Dr. Jegdic	**Faculty Mentor** Dr. Chen	**Faculty Mentor** Dr. Lin	**Faculty Mentor** Dr. Feng

Legend

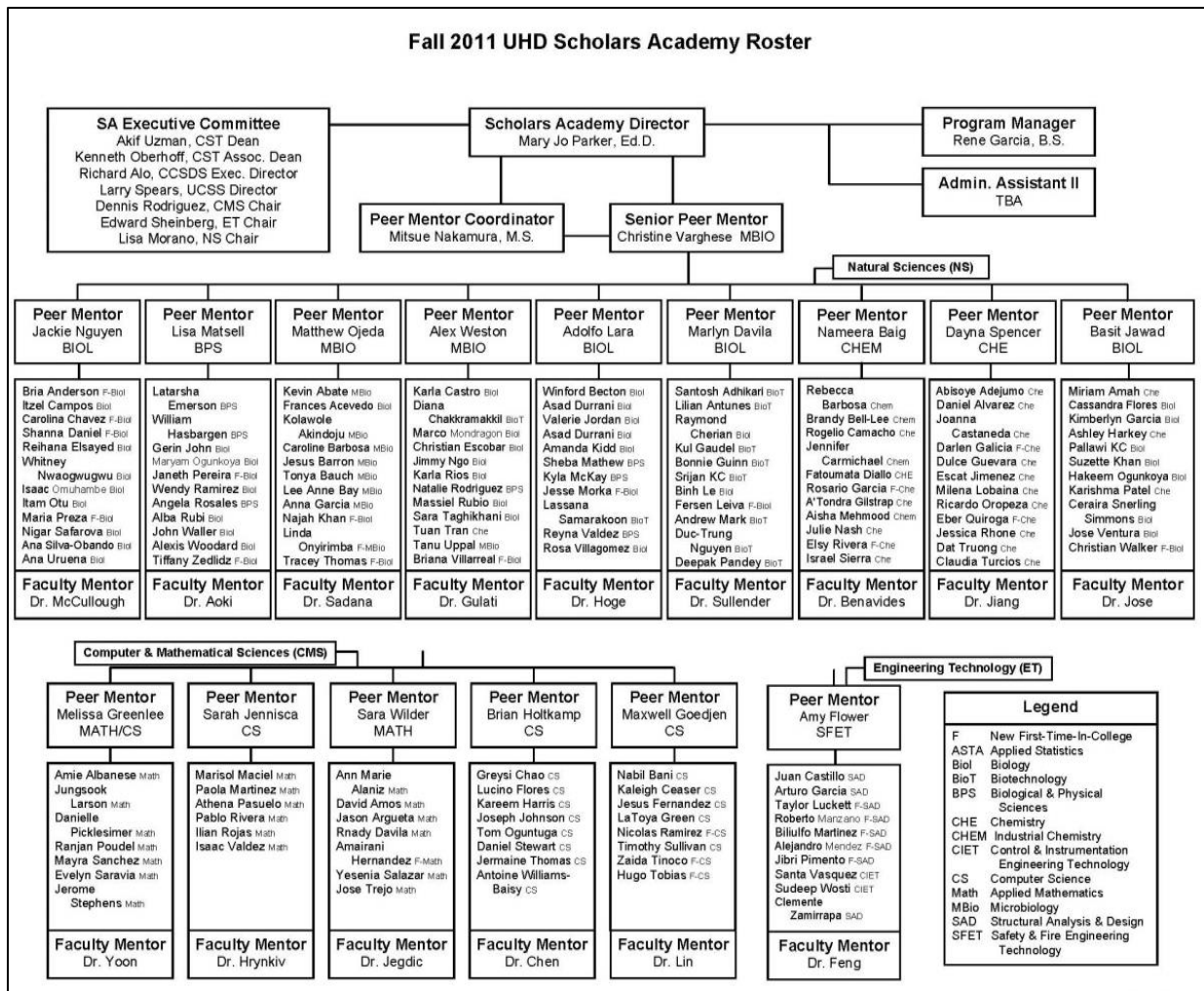|	
F	New First-Time-In-College
ASTA	Applied Statistics
Biol	Biology
BioT	Biotechnology
BPS	Biological & Physical Sciences
CHE	Chemistry
CHEM	Industrial Chemistry
CIET	Control & Instrumentation Engineering Technology
CS	Computer Science
Math	Applied Mathematics
MBio	Microbiology
SAD	Structural Analysis & Design
SFET	Safety & Fire Engineering Technology

Figure 2. Example of the SA organizational chart depicting peer mentor groupings by discipline.

Faculty Mentors

Early in the establishment of faculty mentors, SA found it necessary to ask for volunteers from the professoriate ranks due to limited funding sources. As the organization's student membership grew, based on grant-awarded scholarship funding, so too did the number of faculty mentors. Currently, small annual stipends are provided to faculty mentors and as a result obligatory actions accompany their activities as mentors. These obligatory actions include 1) attending and running a bi-annual orientation session at the beginning of each full semester; 2) participating in peer mentor led networking sessions throughout the semester; 3) meeting with each undergraduate within their peer mentor group to review, discuss, provide feedback, and approve an updating of a curriculum vitae (fall semester) and a personal statement (spring semester); 4) provide written feedback in the form of a report on the peer mentor and mentee status for each semester (this allows identification of issues, problems, and outstanding behaviors for future SA status in the way or probation, renewal, or movement into leadership positions); 5) scheduling a seminar and field trip each semester within their discipline networks external to the UHD community; and finally, 6) attendance of a pre-semester and post-semester meeting with the SA

Administrative arm to decide on new initiatives, provide feedback on issues perceived by the faculty mentors, and to provide a "thank you" for service to the organization and as mechanism of training new, incoming faculty mentors as to the expectations for the position.

Peer Mentors

Undergraduate juniors/seniors make up the SA peer mentors. Most have entered as freshmen (approximately 70%), however, some are recruited from the transfer ranks (approximately 30%). Recruitment of peer mentors in this manner provides a range of maturity levels and an expanse of entrance perspectives, thus each peer mentor is able to provide communication and proactive actions in guiding their group. Since the inception, the peer mentor role has included duties directly impacting the peers assigned to their group. The goal of the peer mentor is to establish lines of trusted communication with each mentee. This line of communication is seen as critical to retention of freshmen especially, but of transfers also. Creating a connectedness with significant faculty (faculty mentors) and peers within the same discipline (peer mentors), stands as a hallmark of the success the SA organization's membership continues to experience.

Networking meetings stimulate the lines of communication by affording face-to-face meetings, even in this digital age. Of course, text messages and emails are exchanged as well; however, networking meetings three times a semester are critical to the connection process. Networking meetings include topics such as 1) use of BlackBoard Learn Scholars Academy virtual organization environment (UHD BBL, 2013); 2) uploading and downloading required documents, such as the curriculum vitae, seminar attendance forms, and searching the links to scholarships and summer research experiences and/or employment postings; and 3) discussions of midterm status, tutoring options, establishing study groups within the peer mentor group, and other topics that form the basis of the general networking meetings. A specialized meeting involving a group service project rounds out the semester's peer mentor group activities. Generally, the service project is developed through consensus and targets the discipline area of the group. The service may run from four hours or more, must be external to the UHD community, and must be with an approved service agency. Another action each peer mentor must perform is to conduct an individual "interview" of each of their group members. These are submitted as a final report and offer insight into the level of participation and contribution from each member to the peer group. Finally, all networking meetings are run through the PLTL workshop method in an effort to lead by example, asking questions which will give group members the opportunity to develop their leadership skills and refine team-building dialogue and actions.

Peer mentors are rigorously and thoroughly screened and selected. Qualities and attributes necessary for effective mentorship by peers are key to the selection of peer mentors. These qualities include 1) demonstrated leadership; 2) a nurturing potential; 3) strong academics; 4) exhibited role model qualities; 5) strong GPA and consistently good standing in SA; and finally 6) verbal and active demonstration of an understanding of the SA environment and expectations of its members and of the organization as a whole. All selected peer mentors earn an annual stipend distributed per semester. To ensure these qualities are supported and grown in those undergraduates selected, the SA Administration subsidizes an off-site retreat, generally in a location that is considered non-urban, thus putting everyone in a situation where gaining comfort (similar to the new freshman entering university life) and bonding

with others is critical to individual and group successes. In this manner the SA models for the peer mentors the behaviors and actions necessary for them to utilize when dealing with their own groups upon the start of each semester.

<u>Development of Peer Mentors</u>

The process of developing leadership within academically capable undergraduates would seem an easy venture. However, this is not necessarily the case with STEM undergraduates, who for the most part are keenly intelligent and who do not generally work well in groups as a result of their individual academic success. This is one of the primary reasons necessitating the challenges put to the groups formed as part of the retreat process. Additionally, the retreat is run utilizing the format of a PLTL workshop with the Senior Peer mentor (a current senior undergraduate) as the leader and SA Administration acting only behind the scenes. With almost 50% of peer mentors trained in PLTL the retreat workshop becomes an effective model of learning leadership for all peer mentors.

Activities during the retreat are well-planned and purposeful. All timeframes in the camp are filled and there is no "down time."   Daily meetings and debriefings are scheduled by the SA Administration, but led by the Senior Peer Mentor and/or the Peer Mentor Coordinator. The purpose of the activities is to challenge the students' "urban comfort" with activities they might not otherwise have engaged in as urbanites (low ropes course obstacles as team-building exercises). Another purpose is to offer individual goal-setting through individual challenges, such as high ropes challenges and archery (See Figure 3). To encourage learning about new people peer mentors are paired (the SA Administration thoughtfully

Figure 3. Examples of off-site retreat activities for peer mentor training and development.

generates the pairings) and do all activities, including eating, recreating together. In so doing the paired individuals are charged to learn all they can about each other. This activity allows them to find commonalities with another individual.   To encourage the group as a whole toward improving consensus building several activities are provided. One such activity is to develop a skit which will be performed during the upcoming semester orientation to the entire SA organization. No other limits are placed on this "performance," only that all must agree, practice, and perform that which is developed. Finally, on the final evening of the retreat a game of "Newlyweds" is played with pairs separated. This allows all participants to see who truly communicated the best and most honestly. There is no prize, except that of the peer mentors understanding the value of learning about their mentees once they have the charge of nurturing and supporting them upon their return to campus.

Growing peer mentors continues after the retreat process through attendance at monthly meetings led by the Senior Peer Mentor and Peer Mentor Coordinator. A hallmark of the mentoring system SA has put into place is constant communications and support of mentees. When issues develop which the peer mentor might determine he/she is not equipped to handle, nor should handle, these are given to the Peer Mentor Coordinator. Thus, leadership development is a modeled phenomenon carefully sculpted and molded with PLTL principles as the foundation (PLTL, 2012) .

Mentoring Yields Successes

Over its fifteen-year history, the SA organization has maintained an Access database of all of its members. As a result of the database, longitudinal views of success metrics are available, disaggregated for only SA membership. When freshmen are evaluated by six-year graduation rates, SA reveals a current 57.1% (1999-2007 cohorts) with a retention rate of 68.4%. Likewise, when an examination of mentors growing mentees is reviewed, SA demonstrates individual entrance into graduate or professional schools at 44.9% for undergraduates classified as first-time-in-college (FTIC). When all SA member data (including FTIC and transfers) are examined, a rate of entrance into graduate and other post-baccalaureate education schools is 40.6%. Currently, over 700 SA alumni are realized with over 91% remaining in STEM positions through workforce employment and/or through continuance into graduate or professional schools. Institutionally, when the SA calculates a value-added determinant, we see the SA adding up to 1.73% to the UHD six-year graduation rates. Leaving little doubt, SA continues to contribute to the growth of undergraduate STEM leadership through mentoring, PLTL activities, and increases in the number of underrepresented STEM undergraduates successfully matriculating university STEM degree programs and remaining in STEM!

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