

STARSS: Scholarships to Aid Rio Hondo STEM Students

Dr. Vann Priest, Rio Hondo College

Vann Priest is Interim Dean of Mathematics and Sciences. He earned his Ph.D. in condensed matter physics from the University of Missouri-Columbia. After arriving at Rio Hondo College in 2000, Dr. Priest reformed the physics curriculum to include the results of physics education research. He has incorporated aspects of the inquiry-based curricula Workshop Physics and RealTime Physics. Due to generous funding from two grants from the Department of Defense and its Instrumentation Program for Hispanic Serving Institutions, the physics labs are state-of-the-art. Dr. Priest served as Principal Investigator (PI) on one proposal and Co-PI on the other.

Dr. Gisela Spieler-Persad, Rio Hondo College

Mr. Ryan Taylor Bronkar, Rio Hondo College

STARSS: Scholarships To Aid Rio Hondo STEM Students

Introduction

Twenty or so students each year receive both financial and academic support through the Scholarships To Aid Rio Hondo STEM Students (STARSS) program. With financial support, students find their financial pressures lessened, and they are actively encouraged to reduce the hours of off-campus employment, so that they may attend full time. The students are urged to participate in the college's nationally recognized¹ Math Engineering Science Achievement (MESA) program and the affiliated program, TRiO/SSS STEM funded by the U.S. Department of Education and are paired with a faculty mentor in their major field.

The goal of the STARSS program, funded by a National Science Foundation (NSF) award, is to motivate, retain, and help students succeed in STEM fields. Their success is integral to the mission and institutional goals of Rio Hondo College.

Rio Hondo College

Rio Hondo College in Whittier, California, is a part of the California Community College System. It was established in 1960. The one-college district includes the cities of Whittier, El Monte, South El Monte, Santa Fe Springs, and Pico Rivera, and draws heavily from the other neighboring cities of Montebello, Downey, La Puente, Norwalk, City of Industry, and eastern Los Angeles. It is a federally designated Hispanic Serving Institution (HSI).

The total enrollment (unduplicated annual headcount) is approximately 27,000. As its district is more than two-thirds Hispanic, the students reflect the demographic; 67.7% of the students identify as Hispanic. Among first-time students, 76% state that an academic degree or transfer to a four-year institution is their educational goal; however, 98% of them assess into a basic skills mathematics course.² The college is ranked 24th nationally for the number of Associate degrees awarded to Hispanic students.³

STARSS Objectives

The purpose of STARSS is to support academically talented, financially needy STEM students, so that the talent pool expands and the number of STEM majors and graduates increases. To that end, program staff seek students who have the ability and potential to succeed, yet need extra assistance to realize their goals.

The college institutional objectives include raising the success, retention and persistence rates in STEM major preparation courses, decrease the time required to transfer, and increase the number of Associate degrees and transfers for underrepresented groups. For the individual student, the program aims to reduce financial distress and the number of hours spent in off-campus employment, as well as enable them to be full-time students. With their involvement in MESA, the program hopes to inspire students to become self-motivated learners who can make the best use of the resources that are available at the college and their transfer institution.

STARSS Elements

Except for the transfer scholarship, the amount of each scholarship is determined by the number of courses that a student enrolls during the academic year. Awards are made in four tiers:

- Tier 1: \$4,000 for two consecutive semesters enrolled in two transfer level STEM courses each semester during one academic year.
- Tier 2: \$5,000 for two consecutive semesters enrolled in three transfer level STEM courses in one semester and two during the other semester of one academic year.
- Tier 3: \$6,000 for two consecutive semesters enrolled in three transfer level STEM courses each semester during one academic year.
- Tier 4: \$6,000 for students who complete their major preparation at Rio Hondo College and transfer as a STEM major to a four-year university or college.

The NSF award is for a total of \$599,988. This enables the college to present more than twenty scholarships a year for five years.

Eligibility is determined by the following criteria: U.S. residency, full-time enrollment in a STEM major (biological sciences, physics, chemistry, astronomy, materials science, mathematical sciences, computer and information science, and engineering) as shown by a comprehensive educational plan, financial need, motivation and professionalism (as described in an essay), and academic merit.

Grade point average and successful completion of certain prerequisite courses determine academic merit. Students are to have a 2.7 GPA (on a 4.0 scale) in their mathematics and science courses. This GPA was set there to encourage applications from students who would not qualify for highly competitive academic scholarships. Program staff chose to focus on those students who have the ability and potential to succeed, but who have faced obstacles in their lives. Students may show academic potential by being eligible to enroll in pre-calculus or the first semester of general chemistry.

In the application, students write an essay in which they describe their professional goals, their transfer STEM major, special interests, participation in other programs and clubs, and achievements. They are prompted to relate any obstacles they have faced. Many students describe family situations that have seriously impeded their academic career. They are also expected to explain how the scholarship will help financially. If they have an off-campus job, they are to show that the scholarship will reduce their workload. In an informal survey of MESA students, the Director found that many students typically work 20 hours per week for approximately \$10/hour.

The call for applications goes out in April. Information is provided to the students through the STARSS website, the MESA/TRiO SSS STEM programs, and announcements by STEM faculty in classes. Students are to arrange for a letter of recommendation for a STEM faculty member by mid-May. The application and the recommendation letter are due mid-June.

Support staff screens all applications for eligibility, checks them for completeness and accuracy, and compiles files for the scholarship committee. The committee scores the applications according to a rubric. Students are notified in July, and after the Financial Aid Office confirms

the students' financial aid eligibility, the money is disbursed in two installments, usually two weeks before the beginning of each semester.

For the second disbursement, students must make acceptable progress. Acceptable progress is defined to be successfully completing all math and science courses, maintaining full-time status, and keeping a 2.7 GPA in mathematics and sciences. Students are expected to show improvement in their grades. Students are also required to submit a midterm report that includes their participation in STARSS related activities. Program staff meet with each student to discuss their students' progress. A final report is required at the end of the academic year.

To maximize the effect of the STARSS program, students are urged to apply for every year in which they are eligible. Students may be supported for up to three years at Rio Hondo College and the first year at their transfer university. Students applying for renewals or the transfer award must meet the requirements as described above. For the transfer scholarship, students must have taken advantage of the available support services and have established a record of academic improvement.

Money alone is not an effective tool to effect change in student success. A support system must be in place. Rio Hondo College is fortunate to have its MESA/TRiO SSS STEM programs that can provide the support that the students need. Every STARSS student is eligible to join the larger cohort of MESA/TRiO students and indeed, required to participate in the programs' services and activities. MESA/TRiO SSS STEM activities emphasize study skills, time management, educational planning, financial literacy, and community support, all of which are shown to be effective in increasing academic success.⁵

Services include:

- MESA Center – an academically-based community center where a student can study alone in an enclosed office or in a conference room with larger groups. Students may use the center's computers, printers and copiers.
- MESA Director and Education Advisor – assures regular contact.
- MESA Counselor – enables each student to create a well thought out educational plan. An educational plan outlines all courses needed to transfer to the students preferred school. The plan is reviewed every semester by the counselor and student to evaluate the progress made and to revise it when necessary.
- Priority enrollment – allows students to register before open registration begins. This facilitates the formation of cohorts and peer support. It also allows student with few units to enroll in impacted sections.
- Financial Literacy Education and FAFSA assistance
- Early Alert – allows faculty to notify the MESA Director if academic intervention is needed.
- Application Support – helps in completing applications for transfer, scholarships, internships, and research fellowships.

Activities include:

- Academic Excellence Workshops (AEWs) – sessions designed to enhance the regular course work in math, physics, and chemistry. Each AEW is led by peer facilitators.

- Conferences, Internships, and Fellowships – STARSS students are expected to apply for these opportunities that include attendance at the annual conferences of the Society for the Advancement of Chicanos and Native Americans in Science (SANCNAS), the Society of Toxicology, and the Southern California Conference of Undergraduate Research (SCCUR). Students are strongly counseled to apply for NSF Research Experiences for Undergraduates (REU) programs.
- Weekly MESA hour – a series of seminars that focus on study skills, time management, the transfer process, financial education, and talks from STEM professionals.

MESA/TRiO SSS STEM have dramatically improved student performance in STEM courses. For students in the cohorts, those who participated in AEWs have a success rate in their math courses (trigonometry through linear algebra) of 76% as compared to 60% for non-program students. For Hispanic students in the cohorts, the success rate was 77%. In physics and chemistry, success rates were 80% for cohort students, 61% for others. Hispanic students in the programs succeeded at 78%.⁶

An important aspect of STARSS is the faculty mentor. This relationship between student and professor may be “the most important college experience impacting academic performance.”⁷ Each STARSS student is matched with a faculty mentor. The mentor/mentee connection will develop motivation and self-efficacy, assist students in taking advantage of college support services, and help them develop closer professional relationships with their instructors.

Early each semester, students, their families, mentors, and college officials are invited to the STARSS Scholarship Reception. This is the first step in building a mentor/mentee relationship; students and the faculty meet in social setting over breakfast or lunch. The reception also allows program staff to show the pride we feel in our students and to emphasize to family members the rigors and requirements of pursuing a science or mathematics degree.

Accomplishments

In its first four years, STARSS has awarded approximately \$440,000 in 93 scholarships.

Academic Year	# of Applications	Tier 1-3 Awards	Transfer Awards
2012-2013	37	18	5
2013-2014	36	20	5
2014-2015	47	16	5
2015-2016	35	13	9

STARSS recipients are succeeding and in most cases, outperforming their classmates.

	Asian/Pacific Islander	Hispanic	Other	White/Non-Hispanic	Non-Hispanic	Unknown
STARSS	87%	91%	83%	100%	–	–
MESA/TRiO	87%	71%	75%	81%	–	–
Non-program	67%	54%	62%	55%	69%	62%

Thirty-four students have graduated with Associates degrees, and thirty have transferred as STEM majors to institutions like Cal State Long Beach, University of California - Los Angeles, University of California - Berkeley, and the University of Southern California. Seven have been accepted to NSF-sponsored REUs, three have been named as Rio Hondo College Outstanding Students, and one was selected as the Jet Propulsion Laboratory Undergraduate Scholar and went on to accept a research fellowship at JPL.

Student Anecdotes

In the students' final reports, they are asked to comment on the impact that the scholarship has had on them. A few of these comments follow:

- Mentoring was beneficial because it allowed me to be more open about my personal goals with a professor. From my experience when I have a professor, I only see him in class and lecture and might go to his office hours on occasions but it's rare for me to talk about anything that is not related to schoolwork. Having a mentor assigned to me, made me it easier to see the professor more as a personal friend than a teacher. When I would go in to see my mentor I would have the confidence to tell him about my plans and career goals. After seeing the benefits of having a mentor, I started to visit other of my previous professors to try and develop similar connections and listen.
- Sitting down with the mentor outside of the office and just getting to know one another. It was a more relaxed environment and did not feel like a Teacher - Student meeting like in an office but more as a personal meeting.
- If it were not for the scholarship, I would have been forced to keep working at a 35 hour a week job which would have put my chances of passing these classes in jeopardy.
- The scholarship has allowed me to go to school full time. Without the scholarship I would have to work and go to school part time. It would certainly take me longer to transfer without the scholarship. ... [T]his scholarship is bringing me one step closer to transferring out sooner rather than later.
- After receiving the scholarship, I quit my job and for the first time, felt what it was to be just college student.
- I believe the STARSS helped me focus more on the academic portion of my education by cutting out the worry of working every day.
- The STARSS Scholarship has been essential to my success at Cal Poly Pomona. Time is very important and managing time when you have multiple responsibilities such as school, work, significant other, family, etc. The STARSS scholarship has given me the opportunity to take control of my time by allowing me to cut out a very significant part of my time which is work.

Acknowledgements

This work is supported by the National Science Foundation Scholarships in Science, Technology, Engineering, and Mathematics Program (S-STEM) through Award No. 1154093.

References

1. Excelencia in Education, *What Works For Latino Students in Higher Education*, 2013, retrieved from <http://www.edexcelencia.org/research/what-works-series>
2. Rio Hondo College, *Application for Reaffirmation of Accreditation: Self-Evaluation*, 2014, retrieved from <http://www.riohondo.edu/accreditation/wp-content/uploads/sites/28/2014/07/RHC-Self-Evaluation-2014-Report-Final.pdf>
3. Community College Week, *Associate Degree and Certificate Producers*, 2015, retrieved from <http://ccweek.com/articles.sec-17-1-top-100-charts.html>
4. See <http://www.riohondo.edu/mathematics-and-sciences/mathematics-and-sciences-homepage/starss/>
5. Strayhorn, T. L., *A hierarchical analysis predicting sense of belonging among Latino students*, *Journal of Hispanic Higher Education*, 7(4), 301-320, 2010.
6. Spieler-Persad, G., *Progress Report Form*, California Community College Chancellor's Office, Academic Affairs Division, 2016.
7. Cole, D and Espinoza, A., *Examining the academic success of Latino students in STEM majors*, *Project MUSE*, 49(4), 298-299, 2008.