



**Presentation to: Department of Education
Office of English Language Acquisition**

***Public & Private Partnership Best Practices in Establishing
an Outreach Program for Majority English Learners***



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Co-Founder
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DREAM Background

Founded in 2007 to provide role models to underrepresented high school students

Mission:

To foster achievement through mentorship of underrepresented groups toward higher education in STEM fields

Design project used as mentoring catalyst

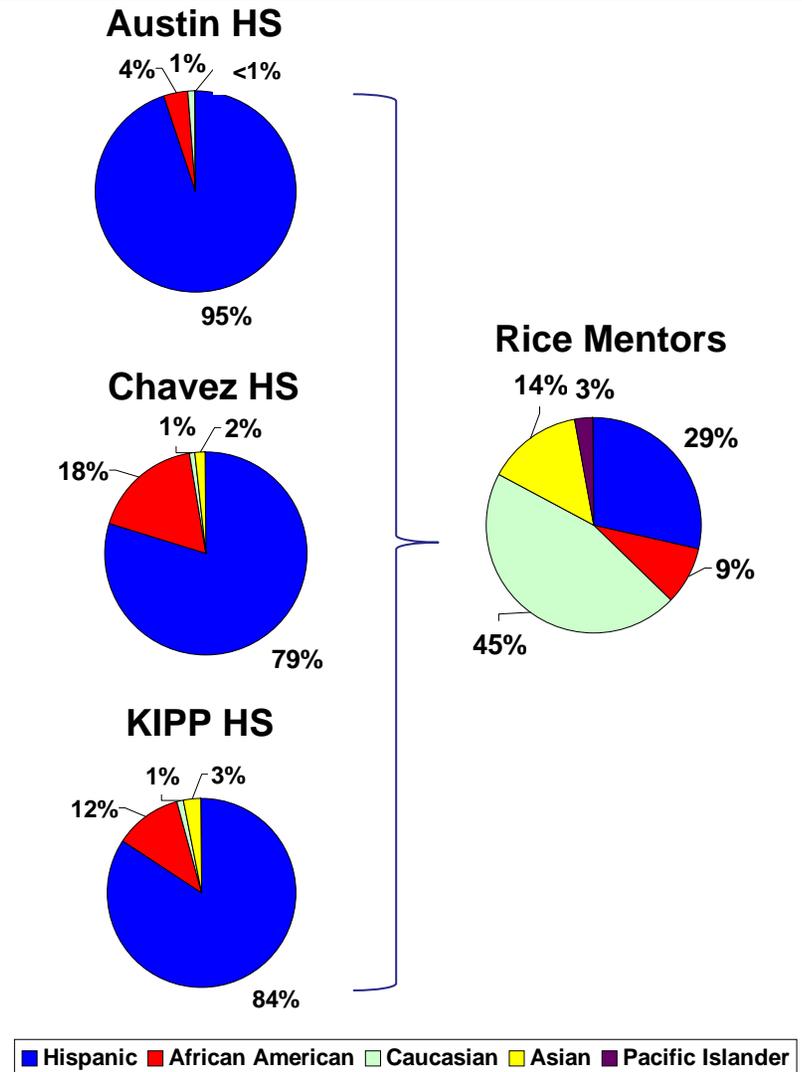
- Active learning via hands on design projects
- Physics concepts as basis of projects

60 volunteer university mentors from Rice

Expanded from 1 to 3 campuses in 2009

- Austin HS (AHS)
 - after school 1 hour five times a week
- Chavez HS (CHS)
 - during school for 50 minutes two times a week
- Knowledge is Power Program (KIPP) HS
 - Co-Curricular (CCO) sessions for 1 hour 2 times a wk

Collaboration between Rice, HISD, and private entities and organizations



DREAM Model – Academic Semester



Kick-off Meeting at High Schools



Prototype Build & Testing

Mentees use points earned to rebuild designs via cost structure

Test designs and make improvements until DREAM Day

DREAM College Admissions Summer Session (Introduced 2010)

Recruit University Mentors

Define Design Criteria

DREAM Mentoring Sessions (8-10 Weeks)

Students create groups of 3 with 1 Mentor

Physics Based Lecture each session ~10 min

Design building time ~50 min each session

Mentors provide feedback on efficient designs and engineering principles

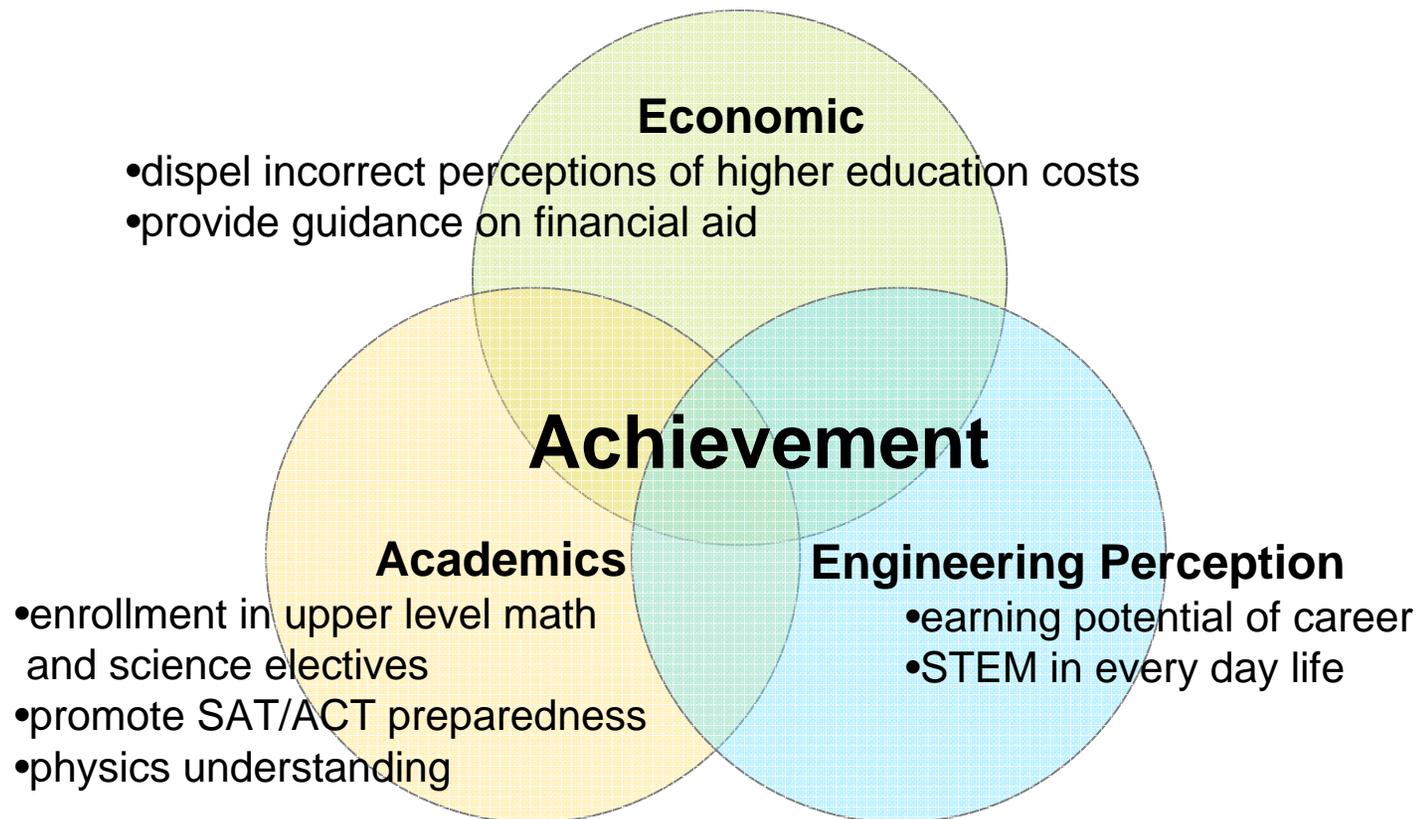
Fall Semester
Seniors College Application Mentoring

DREAM Day



DREAM Impact on Mentees

3 Strategic Areas to increase STEM awareness in ELs

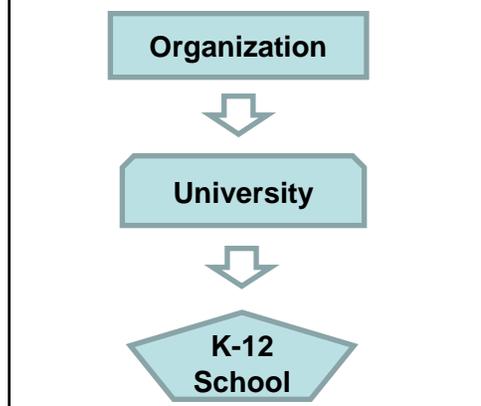


DREAM Partnership Model

Outreach

- Establish buy-in from local administrators, students, parents, and teachers
- Implement data driven research based best practices
- Increase number of mentors from underrepresented groups
- Expand to middle schools using high school mentors
- Invest in mentees throughout high school with scholarships
- Implement across university-K12 partner schools
- Focus on low-cost program high-yield STEM throughput

Partnership Structure



Research

- Maintain metrics for program effectiveness
- Develop DREAM curricula on pre-engineering concepts
- Demonstration of impact to STEM pipeline
- Establish replicable best practices
- Establish an advisory panel with
 - industry reps
 - education admin
 - researchers
 - teachers
- STEM Awareness in other cohorts
 - Parents/guardians
 - Teachers

DREAM

Achievement Through Mentorship

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Bank of America



RICE



ASME



DREAM - Achievement Through Mentorship

DREAM Publications

American Society for Engineering Education (ASEE)

Kienast, K. J., Oke, O. S., Kong, Z. C., Bautista-Chavez, A. M., Goza, A. J., Jackson, R. W., Castilleja, J. A., Jr., & Houchens, B. C. 2010 Implementation of physics mini-lectures and college prep in DREAM: Rigor in an informal, design-based high school mentoring project. abstracted submitted to the 2011 ASEE Annual Conference & Exposition.
(presented by Juan Castilleja Jr.)

Goza, A. J., Garland, D. C. & Houchens, B. C. 2010 Physics and mathematics learning outcomes of underserved and underrepresented DREAM mentees at three urban high schools. ASEE Paper AC 2010-296, Proceedings of the 2010 ASEE Annual Conference & Exposition, Louisville, KY.
(presented by Natalia G. Salies)

Castilleja, J. A., Jr., Jackson, R. W., Salies, N. G. & Houchens, B. C. 2010 Motivating minority high school students for futures in engineering through D.R.E.A.M. (Designing with Rice Engineers — Achievement through Mentorship). ASEE Paper AC 2010-1134, Proceedings of the 2010 ASEE Annual Conference & Exposition, Louisville, KY.
(presented by Juan Castilleja Jr.)

Campo, L. M., Rice, S. A., Rimer, D. B. & Houchens, B. C. 2009 Mentoring to impassion the study of engineering in underrepresented high school students via a design mechanism. ASEE Paper AC 2009-659, Proceedings of the 2009 ASEE Annual Conference & Exposition, Austin, TX.
(presented by Brent C. Houchens)

P-12 Engineering and Design Education Research Summit

Houchens, B. C., Bautista-Chavez, A. M., Castilleja, J. A., Jr., Jackson, R. W. & Goza, A. J. 2010 Learning outcomes and perceptions of underrepresented high school mentees targeted through engineering outreach. P-12 Engineering and Design Education Research Summit, Seaside, OR.
(presented by Brent C. Houchens)