Achieving Broader Impacts at 2-year Hispanic Serving Institutions with Strategic STEM Planning and Faculty Professional Development

NABI 2019 Summit: Exploring Broader Impacts through Connectedness

Theme: Connectedness Through Intentional, Strategic Design

Cynthia Pickering, Process Architect, ASU Research
May 1, 2019

Funding for the Hispanic Serving Community College (HSCC) KickStarter Program is provided by National Science Foundation (HRD#1450661)
Outline

Description of the Need
KickStarter Overview
KickStarter’s Broader Impacts
Broader Impacts from 2-year HSIs in KickStarter
Q&A
Description of the Need
Hispanics are the fastest growing segment

- By 2060, Hispanics will reach 30% of the U.S. population and the youngest group under 18 years (33.5%).
  - *U.S. Census Bureau, 2016*

- Between 2010 and 2020, 74% of people entering the workforce will be Hispanic.
Latinx Students in STEM

- Increasing demand for STEM workers far exceeds number of STEM degrees attained
  - *Richard Tapia Center for Excellence and Equity, 2013*
- Latinx Students enrolling in STEM majors but not completing STEM degrees at par with other groups
  - *Pew Research Center, 2014*
- Only 15% of Latinx earn a Bachelor's degree or higher
  - *Pew Research Center, 2014*
- 61% of Latinx STEM Bachelor’s degree holders attended community College; 18% earned Associates degree prior to their Bachelors
  - *New Directions in Institutional Research, 2010*
- HSIs “have the potential to increase the number of STEM degrees awarded to Hispanic students.”
  - *Crisp and Nora, 2014*
HSI Definition

Hispanic Serving Institutions (HSIs) are 2-year or 4-year institutions of higher education where Hispanic students make up at least 25% of the full-time-equivalent total enrollment.

- United States Department of Education
523 Hispanic Serving Institutions enroll

- 66% of the 3.5 million Hispanics in higher ed
- 39% of all Asian American & Pacific Islanders
- 21% of all African Americans
- 18% of all Native Americans
- 68% of all minority students

- Excelencia in Education, 2019
HSI Growth

- 47% of HSIs of the 523 HSIs are 2-year colleges
- HSIs have more than doubled since 2000
- Over 30 new HSIs added annually
- HSIs receive one-third less federal funding (on a per student basis) than the rest of higher education.

- *Excelencia in Education*, 2019
- *Hispanic Alliance of Colleges and Universities (HACU)*, 2018
Poll – Raise your hand if the item is TRUE

1. To be an HSI, Hispanic students must make up at least 25% of the full-time-equivalent total enrollment
2. HSIs have more than doubled since 2000
3. Over 30 new HSIs are added annually
4. 523 Hispanic Serving Institutions enroll over 68% of all minority students
KickStarter Overview
Kick Starter Program

- NSF-funded Pilot program (Grant #1450661) to learn from community college Hispanic Serving Institutions (2-year HSIs)

- Assist HSIs with strategic STEM planning, concept development, proposal preparation and submission

- Desired outcomes:
  - More 2-year HSIs compete successfully on NSF projects
  - 2-year HSIs strengthen their STEM infrastructure
  - Key partnerships are established that improve 2-year HSIs’ competitiveness
  - Kick Starter process is sustainable
Goals and Impacts for KickStarter Participants

1. Improve HSI’s STEM Pathway strategies and ability to provide evidence of effectiveness in future proposals (capacity to identify, collect, and analyze information)

2. Establish key partnerships that lead to more Hispanic students in the STEM Pathways pipeline

3. Develop a minimum of two proposals to NSF

4. Develop and implement funded projects, conceive new projects, and find new partners to further expand their STEM-based initiatives
Kick Starter Process

Recruit / Select
- Readiness Assessment

Startup
- DC Workshop & Visit to NSF

STEM Planning
- Research Study Approach
- Competitive Proposals

Write Proposals
- "Red Team" Merit Review

Implement / Sustain
- Community of Practice

- STEM Pathways Assessment
- STEM Pathways Plan
Discussion - 5 minutes

Discuss with the person next to you how something like the KickStarter Program could benefit each other’s organization, even if you are not an HSI.

Any volunteers willing to share a quick recap of your discussion?
KickStarter’s Broader Impacts
KickStarter’s Broader Impacts (from NSF award abstract)

This project will increase the numbers of 2-year HSIs that successfully pursue federal grants, particularly from the National Science Foundation, ultimately increasing recruitment and retention in STEM through enhancements to these institutions' STEM curricula, strengthening ties to industry and community partners, and developing robust articulation pathways to four-year STEM programs.

This project has the potential to become a technical assistance model for other minority-serving community colleges, such as two-year Historically Black Colleges and Tribal Colleges.
KickStarter 2-year HSI Participants

August 2015 - April 2019
24 HSI 2-year colleges in 6 states
$5.5 M in NSF grants awarded
44% proposal success rate
Cohort Status within KickStarter Process

- Recruit/Select
  - Readiness Assessment

- Startup
  - DC Workshop & Visit to NSF
  - STEM Pathways Assessment

- STEM Planning
  - Research Study Approach
  - STEM Pathways Plan

- Write Proposals
  - Competitive Proposals

- Implement/Sustain
  - Cohorts 2,3
    - "Red Team" Merit Review
  - Cohorts 1,2
    - Community of Innovation
KickStarter Impacts: 2-year HSI Proposals

A. Up to 5 years before Kick Starter without Tech Assistance
B. First 2 Proposals with Kick Starter Tech Assistance
C. Self-Service KS Alumni, After Learning KS Process
D. Total Kick Starter
Broader Impacts through Connectedness

278 4-yr. HSIs
245 2-yr. HSIs

Kick Starter

KS Monthly All Cohort Meetings

Proposal Awards 11

Partners

Students 1017
Educators 341
Biz 35
Public 3

21 K-12
21 4-Yr
5 2-Yr
Broader Impacts from 2-year HSIs assisted by Kickstarter
KickStarter Case Study

Dr. Par Mohammadian
Life Sciences Faculty & PI
Introduction

- Located in Sylmar, CA
- One of nine colleges within Los Angeles Community College District
Stackable Certificate and Degree Programs in Biotechnology

Support to offer the programs

NSF grant

KickStarter

Short-term certificates -> employment - Continue with education

(NSF ATE award # 1700152)
Advantages of being part of Cohort #1:

- Trip to Washington DC to learn about different NSF programs
- Campus visit to identify the current resources and gaps
- Assistance in identifying the type of NSF grants we should apply to
- Assistance in the grant writing process
- Introduction to other PIs who later served as mentors

(NSF ATE award # 1700152)
Outcomes of being part of KickStarter Cohort #1:

- Increasing the Student Biotech Pipeline (NSF ATE award # 1700152) (May 01, 2017 – April 30, 2020)
- Biotech students placed in top 10 NSF Community College 2018 Innovation projects in 2018
- An Intervention to Improve Success of Biology Majors in Mathematics (NSF HSI award #1832348) (Oct 1, 2018 - Sep 30, 2023)
LA Mission College Biotechnology Students

(NSF ATE award # 1700152)
KickStarter Case Study: STEM CURE

Integrating Research, Mentoring, and Industry Collaborations to Improve STEM Recruitment and Retention - NSF #1832543 Jan 1, 2019 - Dec 31, 2023

Dr. Robin Cotter, Life Sciences, Biology Faculty & PI
Dr. Elena Ortiz, Life Sciences, Biology Faculty & co-PI
Dr. Anna Marti-Subirana, Life Sciences, Biology Faculty & co-PI
Phoenix College serves our diverse community with student-centered teaching and learning experiences that inspire the lifelong pursuit of educational, professional, and personal goals.

- 17,000 students
- 5,840 FTE students
- 54.3% Hispanic enrollment
- 10 2-year colleges in the district, > 200K students
- 5 HSIs
Phoenix College, AZ / Elena Ortiz

1. How can we re-interpret others’ cultural context norms as strengths?

2. How can we redesign our teaching to engage the cultural strengths our students bring?
Open Discussion with Audience

How do these examples resonate?

Does anyone in the audience wish to share a related experience?

Any Questions?
Questions and Answers
Acknowledgements

Dr. Par Mohammadian, Life Sciences Faculty & PI

Dr. Elena Ortiz, Life Sciences Faculty & co-PI

Caroline VanIngen-Dunn, KickStarter PI, Director SFAz Center for STEM
Anna Tanguma-Gallegos, KickStarter Program Officer
Anita Grierson, KickStarter Program Officer
Thank You