Developing Competitive NSF Proposals: Science Foundation Arizona’s KickStarter Technical Assistance Program for Community College HSIs

AHSIE Best Practices Conference
March 21-22, 2016
by
Caroline VanIngen-Dunn, Director (SFAz)
Stephanie Vasquez, Grant Writer (PAC)

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Workshop Objectives

- Introduce KickStarter technical assistance program
- Introduce the SFAz STEM Pathways Model and STEM Planning process
- Engage in STEM planning self assessment example
- Share effective preparation strategies and resources for NSF proposal opportunities
- Identify common challenges faced by Community College HSIs
- Announce KickStarter Cohort 2 Call for Applications
Introduction
Science Foundation Arizona

- **Modeled after NSF** – Grant-making organization, Competitive selection and Peer Review process, Grant oversight

- **Partner and Mentor** - Provide Mentoring, Technical Assistance, Change Implementation Strategies, Program Leadership, Impact Measures

- **Arizona STEM Network (stem.sfaz.org)** - Connect and foster collaborations among researchers, businesses and educators

- **STEM Guides** - Identify, fund, support and disseminate Best Practices
COMMUNITY COLLEGE
STEM PATHWAYS
LED BY SCIENCE FOUNDATION ARIZONA

Outreach and Career Exploration

Knowledge and Skills

Transferable Degrees and Certifications

STEM Career

Outreach and Career Exploration

Knowledge and Skills

Transferable Degrees and Certifications

STEM Career
Vision

Increase the quantity and quality of STEM students who utilize the Community College system as part of their pathway to achieve certificates, Associate’s, Bachelor’s and advanced degrees.
KickStarter Program
What is the KickStarter Program?

**NSF-funded Pilot program** of comprehensive technical assistance (Grant #1450661)

- Prepare and position Community College **Hispanic Serving Institutions (HSIs)** to compete successfully for federal funds
- Focus on student recruitment and retention in STEM fields.

**Technical Assistance Team** provides support to:

- Use STEM Pathways Model and Resource Guide
- Assist community colleges in their STEM strategies to increase recruitment and retention of students
- Focus on technical career pathway programs to meet local workforce needs
- Develop and submit competitive proposals to NSF
Kick Starter Hypothesis

1. Proposals to NSF that are built upon college-wide STEM Plans designed to improve student recruitment and retention are more likely to show greater potential for sustainability, suggesting a wiser investment of NSF funding, and therefore are more competitive and likely to be funded.

2. Impose a “mini-competitive” process that reflects NSF principles within a collaborative environment to guide and support college participants on their path to developing competitive proposals to NSF.
KickStarter Cohort #1 Status

- Competitive application process using independent reviewers was completed last summer for eligible community college HSIs
- Kick-off Meeting held last September
- Initial Site Visits have been completed
- Colleges are in the process of developing S-STEM, ATE and other NSF proposal concepts
Cohort #1 at NSF
KickStarter Technical Assistance
KickStarter Technical Assistance

College Readiness Framework
- Administrative Support
- Proposal Preparation
- Infrastructure
- College Strategic Plan
- STEM Learning Best Practices
- Administration of other federal grants

STEM Planning Process
- STEM Planning Guide
- Self Assessment & Gap Analysis
- Academic / CTE and Broad Definition of STEM
- Identify top STEM Pathways
- Involve Industry

Effective Proposal Preparation
- Identify STEM Priorities
- Develop plans to fill critical gaps
- Priorities and needs matched to NSF programs
- KickStarter Red Team Review Process
STEM Pathways Model and STEM Planning Guide
STEM Pathways Model

- Offers multiple opportunities to explore, prepare for and pursue STEM degrees and careers
- Expands the notion that the only pathway to success is through university.
- Builds collaboration between K-12 & higher education, CTE & academics.
- Deeply integrates industry-based partnerships.
- Enhances student recruitment and retention.
STEM Planning Guide

• Online **Self-Assessment** Tool
• An **easy-to-use** community college roadmap for researching, planning and implementing STEM Pathway programs.
• Includes pathway descriptors, attributes, and over 30 **examples**

http://stem.sfaz.org
## STEM PATHWAYS MODEL
Science Foundation Arizona - The Arizona STEM Network

### PATHWAY COMPONENTS

<table>
<thead>
<tr>
<th><strong>A. STEM EDUCATION OUTREACH AND CAREER EXPLORATION (Recruitment)</strong> - Community college-led activities and events that generate enthusiasm and engage student interest in STEM career fields prior to college.</th>
<th><strong>B. FOUNDATIONAL KNOWLEDGE AND SKILLS (Retention)</strong> - Education programs and strategies that improve college students' foundational STEM knowledge and skills.</th>
<th><strong>C. TRANSFERABLE CERTIFICATIONS AND DEGREES (Workforce)</strong> – Job experiences and competency-based programs at industry with assessments that align to industry-recognized credentials.</th>
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<td>A1. Student-success strategies are incorporated in outreach activities and events that promote STEM career exploration.</td>
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<td>A2. Industry plays a supporting role in outreach activities, tours and events, capturing student interest in real-world STEM opportunities.</td>
<td>B2. Industry contributes to program development and mentors students in real-world experiences.</td>
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<td><strong>3. TECHNOLOGY-Integrated across the Pathway to provide better access to education resources, virtual tours, internships and mentorship.</strong></td>
<td>A3. College outreach activities have access to technology labs and technical equipment that generate student interest and awareness of STEM careers.</td>
<td>B3. Technology programs offer students hands-on learning experiences; technology is utilized to access instruction and student learning opportunities between institutions.</td>
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<td>A4. College Outreach activities and events inform parents and students about curricular alignment to STEM career programs.</td>
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http://stem.sfaz.org
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Foundational Knowledge and Skills | Industry Engagement

Industry contributes to program development and mentors students in real-world experiences.

B2. Attributes: Community Colleges-

B2a: collaborate with an established outside industry advisory board with which to connect and garner advice from local businesses/industry.
B2b: offer Industry assistance with developing ideas for classroom projects.
B2c: promote and support Industry knowledge of college programs that relate to STEM careers.
B2d: engage Industry representatives to serve as advisors/mentors to faculty.

Example Programs

- Assistance with developing ideas for Classroom Projects based throughout Early College Academy
- Industry Advisory Board Participation
- Industry give Community College faculty input to keep Course Curriculum Current

Quick Links

STEM Pathways Matrix
STEM Education Outreach and Career Exploration
  - Student Support Strategies
  - Industry Engagement
  - Technology Integration
  - Curricular Alignment

Foundational Knowledge and Skills
  - Student Support Strategies
  - Industry Engagement
  - Technology Integration
  - Curricular Alignment

Transferable Certifications and Degrees
  - Student Support Strategies
  - Industry Engagement
  - Technology Integration
  - Curricular Alignment
INDUSTRY GIVES COMMUNITY COLLEGE FACULTY INPUT TO KEEP COURSE CURRICULUM CURRENT

What is it?

Education and local industry collaborators work together to help students to successfully prepare for their future.

How is it done?

- Invite college Engineering and Technology faculty members, industry partners, and college administration to quarterly luncheon meetings reviewing curriculum changes, industry future needs, and is an opportunity for everyone to meet each other (Budget $600 per meeting)
- Include faculty members on curriculum decisions made by the college and suggested by the partners
- Organized by the Deans of Technology and Engineering and the Industry Coordinator. The event is funded through a grant from NSF.
- Agendas are made by the college and industry partners and faculty are notified of the luncheon IAB meeting by email/phone

What are the results?

- College faculty actively participate in opportunities to share information and seek feedback from industry partners
- Industry partners appreciate the faculty presence and recommendations; dialogue
- When industry changes are initiated, the college has an opportunity to react making sure that curriculum is current. This makes students more employable and the college course more relevant to the industry needs. An example: DOD required anyone working on a federal contract to have security certification. The college revised curriculum and provided additional training for students making them eligible for employment.
- New degree plans have been initiated by the college. An example: Industry partners needed students to have specific requirements for future industry needs. The college and industry partners met as a sub-group, initiated a survey, reviewed the industry needs, and are developing an Engineering Technology degree that meets industry needs and college requirements.

What have we learned?

- It is imperative to have a healthy relationship with faculty and industry partners
- Both the College and its industry partners are learning a lot about each other
- There is a continuous need to review job requirements for employment and inform faculty and administration of changes
- Industry partners and the college have employee changes and it is good practice to maintain updated lists and meet new employees
- It is best to meet with everyone at one time to avoid duplication
- It is best to meet at lunch based on attendance and scheduling available times
- Formal meetings two times a year are good for keeping communication open while optimizing everyone’s time.
# Palo Alto College – Student Outreach

## A. Outreach and Career Exploration

**A1a:** Provide content-specific available opportunities for both teachers and students to engage in Math/Science content and/or pedagogy.

*Angela* San-Demi: STEM faculty to STEM conferences (David, CTE) PAC DAY and OPEN HOUSES *(Thomas) Corporate and Community Education? Career & Technical Education? STEM? *(Stephanie) Perhaps on DEC/CITE side, but not as clear how this happens across academic programs.* *(Mike) 1.) Discover PAC 2.) CORE4STEM *(All) Professional development for faculty.*

**A1b:** Provide student intervention programs that lead students to be aware of resources and support.

*Stephanie:* We have a personal counselor available for all PAC students to provide emotional support *(VG) Tutoring, Faculty Mentors.*

**A1c:** Provide summer learning opportunities for students in the form of STEM camps, STEM clubs or STEM focused learning modules.

*Angela* Summer STEM Experience—Summer PAC Students are exposed to research in Chemistry, Biology, Engineering *(David) Library has a STEM camp for 3rd-4th graders *(David, CTE) SUMMER CAMP *(Thomas) Summer bridge program supported by CAARE STEM Grant. Other programs? *(Stephanie) STEM summer workshops, Library summer workshops. Not sure about club or learning modules CTE: STEM Day, Interactive high school and middle school tours *(Mike) 1.) STEM Summer Experience Program *(VG) Biology Club, Computer Science Club, Viva Verde.*

**A1d:** Offer programs that promote the field of engineering, which can include Engineering with local professionals, engineering contests & competitions, or STEM career exploration events.

*Angela* Smith: Academy of Science (VG) Students can participate in NASA's CCAS program which is an Engineering Competition at NASA during the Spring semester *(Stephanie) Limited area. Looking to expand with UNI MARKED at high risk area.*

## B. Foundational Knowledge and Skills

**B1a:** Strategies that encourage student exploration of STEM careers?

*(Thomas) ASTEM inside. *(Mike) 1.) Interactive workshops on H.S. tours/ visits 2.) STEM presentation at all NODA 3.) Create STEM KIT *(Stephanie) Discover PAC, Middle School program from Pleasantville hands-on, interactive tour. CTE has open houses, UTSA has 4-5 week prep for their Engineering program.*

**B1b:** Provide student intervention programs that lead students to be aware of resources and support.

*Stephanie:* We have the Math and Science Learning Centers on campus *(VG) Math and science tutoring. *(Angela) We also have online tutoring support (Mathbanking, Tutel.com, Brainwave). *(Thomas) There are 2 Science Learning Centers and 1 Math Learning Center. *(Stephanie) Science Tutoring Centers.*

**B1c:** Provide specific information about Transferable Certifications and Degrees through Transfer Guides for industry-recognized credentials and credits that transfer to other institutions.

*(Angela) We have many 2+2 plans with 4-year universities in Texas *(Angela) PAC’s website has links to these plans at the 4-year institutions.* *(Angela) We used to host this information on PAC’s website and it was much easier to use.* *(Angela) This information is also available through the Advising Centers.* *(Stevie, CTE) 2 PLUS 2 FOR CS, OIL, AND GAS, BUSINESS (Thomas) Done by Advisors? *(Stephanie) Yes *(Mike) 1.) Yes, Various transfer guides and 2+2 plans with Local/universities.*

**B1d:** Student success management with strategies for being successful student (e.g. time mgmt., study skills, goal setting).

*Angela* Advisors from the STEAM Advising Center have students through their case management system *(Angela) We have a personal counselor available for all PAC students to provide emotional support *(VG) Tutoring, Faculty Mentors.*

**B1e:** Other programs or seminars that provide students with strategies for being successful student (e.g. time mgmt., study skills, goal setting).

*Angela* SDAY courses provide this to all PAC students *(Angela) The Coaching Workshops have also provided this through the Math and Science Learning Centers but attendance has been low.* *(Thomas) The Science and Math-Learning Centers have offered E36/115 classes and to students. Attendance has been low.* *(Stephanie) Tutoring offers extensive workshop, but not sure about study skill components.* *(Mike) 1.) Though Academic Advising & Tutoring *(Dr. Joseph) Not only STEM related.*

**B1f:** Do the Student-support strategies at your Community College help students optimize course selection and credits earned toward a stackable credential or degree?

*(Angela) Addressed in the Advising Model? *(Stephanie) Needs attention, Longitudinal review.* *(Mike) 1) Yes, Currently offered in the Computer Science Areas and Vet Tech. Not too sure if it should include Agriculture.*

## C. Transferable Certifications and Degrees

**C1a:** Industry-recognized credentials and credits that transfer to other institutions.

*(Angela) Yes *(Mike) 1.) Yes, Various transfer guides and 2+2 plans with Local/universities.*

**C1b:** Strategic programming and partnerships with Local/universities.

*(Angela) Yes *(Mike) 1.) Yes, Various transfer guides and 2+2 plans with Local/universities.*

**C1c:** Student success management with strategies for being successful student (e.g. time mgmt., study skills, goal setting).

*(Angela) Yes *(Mike) 1.) Yes, Various transfer guides and 2+2 plans with Local/universities.*

**C1d:** Other programs or seminars that provide students with strategies for being successful student (e.g. time mgmt., study skills, goal setting).

*(Angela) Yes *(Mike) 1.) Yes, Various transfer guides and 2+2 plans with Local/universities.*

## Notes

**A. Outreach and Career Exploration**

- **Student Support Strategies**
  - Resources, processes and strategies that encourage student success.
  - **STUDENT SUPPORT STRATEGIES**
    - **ACCE Grant Outreach**
      - College incorporate strategies in your outreach activities and methods that encourage student exploration of STEM careers?
    - **Student Support**
      - **1. Student Support**
        - **STRATEGIES**
          - **Palo Alto College – Student Outreach**
        - **A1:** other events and activities that promote career exploration and ties to the workforce.
        - **A2:** Provide content-specific available opportunities for both teachers and students to engage in Math/Science content and/or pedagogy.
        - **A3:** Provide summer learning opportunities for students in the form of STEM camps, STEM clubs or STEM focused learning modules.
        - **A4:** other programs that promote the field of engineering, which can include Engineering with local professionals, engineering contests & competitions, or STEM career exploration events.

**B. Foundational Knowledge and Skills**

- **Education programs and strategies that encourage student success.**
  - **STRATEGIES**
    - **B1:** strategies that encourage student exploration of STEM careers?
    - **B2:** Provide student intervention programs that lead students to be aware of resources and support.
    - **B3:** Provide student intervention programs that lead students to be aware of resources and support.
    - **B4:** Provide student intervention programs that lead students to be aware of resources and support.
    - **B5:** Provide student intervention programs that lead students to be aware of resources and support.

**C. Transferable Certifications and Degrees**

- **Job experiences and competency-based programs with industry-recognized credentials and credits that transfer to other institutions.**
  - **STRATEGIES**
    - **C1:** Industry-recognized credentials and credits that transfer to other institutions.
    - **C2:** Strategic programming and partnerships with Local/universities.
    - **C3:** Student success management with strategies for being successful student (e.g. time mgmt., study skills, goal setting).
    - **C4:** Other programs or seminars that provide students with strategies for being successful student (e.g. time mgmt., study skills, goal setting).
# Palo Alto College – Industry Engagement

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<th>3. Transferable Certifications and Degrees</th>
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<th>NOTES</th>
<th>5. Foundational Knowledge and Skills</th>
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<tbody>
<tr>
<td>2a. Use Industry partners/sponsors to create internships and/or industry mentorship opportunities for students</td>
<td>Expand CE in College, Industry, Mentorship (Faculty)</td>
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<td>2c. Collaborate with industry partners to develop and implement industry-related courses, internships, and/or job placement opportunities</td>
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**Notes:**
- 2a: (TBD) YES, INDUSTRIAL REALITIES
- 2b: YES, THROUGH INDUSTRIAL REALITIES (Military) YES, THROUGH INDUSTRIAL REALITIES
- 2c: YES, THROUGH INDUSTRIAL REALITIES
- 2d: YES, THROUGH INDUSTRIAL REALITIES
- 2e: YES, THROUGH INDUSTRIAL REALITIES
- 2f: YES, THROUGH INDUSTRIAL REALITIES

**Industry Engagement:**
- 2a: Use Industry partners/sponsors to create internships and/or industry mentorship opportunities for students
- 2b: Develop a holistic approach to industry partnerships through industry advisory committees and/or industry partnerships
- 2c: Collaborate with industry partners to develop and implement industry-related courses, internships, and/or job placement opportunities
- 2d: Engage local professionals in the classroom and/or as mentors
- 2e: Engage local professionals as speakers for industry and/or STEM competitions
- 2f: Engage local professionals as mentors for students and/or promote STEM careers
### Outreach and Career Exploration
- Programs, events and activities that generate student interest and interest in STEM degrees and careers

### Notes
- How are programs delivered (e.g., online, in-person)?
- What are the course requirements? What is the final exam? What is the course format? What is the final exam? What is the course format?
- How are programs advertised? On what platforms? To what audiences?

### Educational Programs and Strategies that Increase Student Success and Career Awareness in Math and Other STEM Areas

### Notes
- How are programs delivered (e.g., online, in-person)?
- What are the course requirements? What is the final exam? What is the course format? What is the final exam? What is the course format?
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### Technology Certification and Degree Programs
- Experiences and competencies-based programs with assessment that aligns to industry-based certifications and assessments

### Notes
- How are programs delivered (e.g., online, in-person)?
- What are the course requirements? What is the final exam? What is the course format? What is the final exam? What is the course format?
- How are programs advertised? On what platforms? To what audiences?
# Palo Alto College – Curricular Alignment

## A. Outreach and Career Exploration Programs
- **Missions:**
  - Provide outreach to high schools and key industries to generate interest in STEM degrees and careers.

### Outreach Activities
- **Schools:**
  - Palo Alto High School
  - Mountain View High School
  - Mission College Prep High School

### Outreach Results
- **Numbers:**
  - Number of students interested in STEM programs

## B. Foundational Knowledge and Skills
- **Education programs and strategies that improve students' foundational and expected knowledge in math and other STEM core fundamentals.

### Foundational Knowledge and Skills
- **Topics:**
  - Math
  - Science

## C. Transitioning Certifications and Degrees
- **Diploma and Transitions from College and community college programs that align to industry-relevant credentials and degrees, transitioning toward college degrees.

### Transitioning Certifications
- **Programs:**
  - Associate of Science in Engineering Technology
  - Bachelor of Science in Engineering

## Notes
- **Key Notes:**
  - Participation in state and national programs
  - Collaboration with local businesses and industries
  - Continual evaluation and improvement of programs
Example

Palo Alto College
STEM Planning Experience

Stephanie Vasquez
Grant Writer
Palo Alto College (PAC)

• San Antonio, TX
• Over 8,600 students
• 75% Hispanic
• 61% Female
• 83% Part Time
• 42% Economically Disadvantaged
• 67% Require Remediation
Approach to STEM Planning

• Cross-college team supported by administration
• Planning facilitation led by Resource Development & STEM Project Director
Approach to STEM Planning

Principal Investigator
Dr. Beatriz Joseph

STEM Faculty
Dr. Jerrod Butcher

Academic Support
Thomas Murguia

Advising Support
Michael Ximenez

STEM Programs
Angela Menke

Resource Development
Stephanie Vasquez

Career & Technical
David Rutkoski

Early College HS STEM
Anthony Perez
Approach to STEM Planning

- Each area conducted self-assessment
- Team convened to develop consensus response
- Responses reflected expertise of representatives
Approach to STEM Planning

- STEM Strategic Planning (2013)
- HSI STEM Grant External Evaluator (2015)
- Kickstarter Initiative (2015)
Outcomes of STEM Planning

• Functional units well-represented
• Information shared with executive team, college leadership, STEM committee, presentations
• Identified positive activities that need to be implemented college-wide
Outcomes of STEM Planning, cont.

• Faculty and staff engaged, willing to own and develop STEM programming overall, including proposal development
Outcomes of STEM Planning, cont.

- STEM Planning Process Defined
- Ties directly to strategic plan and Palo Alto’s “College Action Plans”
- Planning Process and STEM functions to be owned by STEM faculty/staff
Outcomes of STEM Planning

PALO ALTO COLLEGE
STEM PLANNING PROCESS
Created 2016

PAC Strategic Plan

Pathways Model
Pathways Assessment
Outreach & Career Exploration

Progress Status
Periodic review and update

STEM Action Plans

Foundational Knowledge & Skills

College Action Plans

Transferable Certification & Degrees
Recommendations

• Consider including external partners in assessment process
• Allow assessment to include a “middle” response
• Would like to adapt tool for facilitating planning in other areas to help identify gaps and priorities
<table>
<thead>
<tr>
<th>Pathway Components</th>
<th>STEM Outreach and Career Exploration</th>
<th>Foundational Knowledge and Skills</th>
<th>Transferable Certifications and Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer these questions first:</td>
<td>Great! Answer the questions below.</td>
<td>Great! Answer the questions below.</td>
<td>Great! Answer the questions below.</td>
</tr>
<tr>
<td><strong>1. STUDENT SUPPORT STRATEGIES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources, processes and strategies that encourage student success.</td>
<td>Good Work</td>
<td>Good Work</td>
<td>Good Work</td>
</tr>
<tr>
<td><strong>2. INDUSTRY ENGAGEMENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vital to keeping schools current, providing teachers with resources, and capturing student interest in STEM careers.</td>
<td>A2: Industry plays a supporting role outreach activities, tours and events, capturing student interest in real-world STEM opportunities. <a href="#">Learn more about the attributes and see examples.</a></td>
<td>B2: Industry contributes to program development and mentors students in real-world experiences. <a href="#">Learn more about the attributes and see examples.</a></td>
<td>C2: Industry offers internships, apprenticeships, and job-shadowing experiences that guide students to earning industry-recognized certifications and degrees. <a href="#">Learn more about the attributes and see examples.</a></td>
</tr>
<tr>
<td><strong>3. TECHNOLOGY</strong></td>
<td></td>
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</tr>
<tr>
<td>Integrated across the Pathway to provide better access to education resources, virtual tours, internships and mentorship.</td>
<td>A3: College outreach activities with access to technology labs and technical equipment that generate student interest and awareness of STEM careers. <a href="#">Learn more about the attributes and see examples.</a></td>
<td>Good Work</td>
<td>C3: Technology equipment is available at industry for students to gain the appropriate experience and prepare for competency-based testing and certifications. <a href="#">Learn more about the attributes and see examples.</a></td>
</tr>
<tr>
<td><strong>4. CURRICULAR ALIGNMENT</strong></td>
<td></td>
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<tr>
<td>Ensures that all course credits count toward a credential.</td>
<td>Good Work</td>
<td>Good Work</td>
<td>C4: Colleges and industry align curriculum to meet industry-recognized certifications with credits that transfer toward stackable degree programs. <a href="#">Learn more about the attributes and see examples.</a></td>
</tr>
</tbody>
</table>

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Palo Alto College - Next Steps

• **Student Support** – Expanding Engineering Programs, Tracking student achievement and offering PD to local educators CTE to College

• **Industry Partners** – Expand CTE to College, Expand Professional and Industry Mentors, Add Internships and Job Shadowing

• **Technology** – Need to improve access to technology labs as a community outreach opportunity, Offer Virtual field trips

• **Curricular Alignment** – Enhance IR Tracking
Self Assessment Activity
## 2. Industry Engagement

Vital to keeping schools current, providing teachers with resources, and capturing student interest in STEM careers.

### A. Outreach and Career Exploration

Programs, events and activities that generate student’s interest in STEM degrees and careers.

| A1a: | Have a designated staff person to coordinate industry relationships. | [ ] | [ ] | [ ] |
| A1b: | Offer outreach events with local company employees. | [ ] | [ ] | [ ] |
| A1c: | Engage local professionals into the classroom guest speakers | [ ] | [ ] | [ ] |
| A1d: | Engage local professionals as coaches for Robotics teams or other STEM competitions | [ ] | [ ] | [ ] |
| A1e: | Engage local professionals in mentor and/or coaching roles for out of the classroom projects and events. | [ ] | [ ] | [ ] |

### B. Foundational Knowledge and Skills

Education programs and strategies that improve student’s foundational and expanded knowledge in math and other STEM-based fundamentals.

| B2a: | Do industry partners contribute to your Community College STEM program development and mentor students in real world experiences? | [ ] | [ ] | [ ] |
| B2b: | collaborate with an established outside industry advisory board with which to connect and garner advice from local businesses/industry. | [ ] | [ ] | [ ] |
| B2c: | Offer industry assistance with developing ideas for classroom projects. | [ ] | [ ] | [ ] |
| B2d: | Promote and support industry knowledge of college programs that relate to STEM careers. | [ ] | [ ] | [ ] |
| B2e: | Engage industry representatives to serve as advisors/mentors to faculty. | [ ] | [ ] | [ ] |
### 2. INDUSTRY ENGAGEMENT

Vital to keeping schools current, providing teachers with resources, and capturing student interest in STEM careers.

#### C. Transferable Certifications and Degrees

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2: Does your Community College partner with industry to offer internships, apprenticeships, &amp; job-shadowing experiences that guide students to earning industry-recognized certifications &amp; degrees?</td>
<td></td>
</tr>
</tbody>
</table>

#### C2a: collaborate with local industry to help students successfully prepare for their future.

#### C2b: engage local professionals with students in on-site field trips for both career exploration and job shadowing opportunities.

#### C2c: partner with industry to provide student apprenticeships, internships, and job shadowing experiences.
Desired STEM Planning Outcomes

• Conduct College-wide STEM Self-Assessment
• Develop STEM-level Strategic Plan
• Identify STEM priorities
• Conduct Gap Analysis
NSF Proposal Preparation Processes
Next Step - Proposal Preparation

- Use STEM Planning outcomes to develop, test and measure approaches that will enhance recruitment and/or retention of STEM students
- Develop proposal concepts
- Priorities and needs are matched to NSF programs
- Discuss ideas with NSF Program Officer
- KS Red Team Review Process
Logic Model

1. Resources/Inputs
2. Activities
3. Outputs
4. Outcomes
5. Impact

Your Planned Work

Your Intended Results
NSF Grants Process

**Phase I**
1. Opportunity Announced
2. Proposal Submitted
3. Proposal Received

**Phase II**
4. Reviewers Selected
5. Peer Review
6. Program Officer Recommendation
7. Division Director Review

**Phase III**
8. Business Review
9. Award Finalized
Merit Review Criteria

When evaluating NSF proposals, reviewers should consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits would accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers are asked to evaluate all proposals against two criteria:

• **Intellectual Merit**: The intellectual Merit criterion encompasses the potential to advance knowledge; and

• **Broader Impacts**: The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.
Intellectual Merit

The potential to advance knowledge

• A concise statement about the original contributions of the proposed research
• Originality, creativity, ability to transform
• Reference relevant literature in the field
Broader Impact

• This is often harder for proposal writers
• To broaden the impact of your work:
  – Outreach to K-12
  – Outreach to under-served populations
  – Contribution to Community
• How the research can have a broader impact on human resources
NSF Resources

• NSF Grant Proposal Guide
  – Guide lists NSF specific requirements
  – If you don’t meet the requirements, your proposal will not be reviewed.

• NSF Webinars - stored on program websites

• NSF program officers available
EvaluATE

- [http://www.evalu-ate.org/](http://www.evalu-ate.org/)

- The evaluation resource center for the NSF’s ATE programs

- Provide webinars, resource materials, newsletters, workshops, and opportunities for ATE community members to engage around issues related to evaluation in the pursuit of excellence in technical education.
NSF Peer Review

• Independent team of reviewers
  – Chosen by Program Officer from a pool of applicants
  – Need more reviewers with CC experience

• Review is based on 2 Categories:
  – Intellectual Merit
  – Broader Impact
Red Team Review

The SFAz KickStarter Team will increase a college’s likelihood of being funded through a series of planned proposal reviews by a “Red Team” comprised of experienced Principal Investigators:

- Red Team reviewers are selected for their NSF program and/or Review Team experience (e.g., S-STEM, ATE, IUSE).
- Red Team reviews will be similar to the NSF review system, focusing on Intellectual Merit and Broader Impact.

- **Preliminary**: 3-5 page outline, including details as to how specific NSF solicitation requirements will be met; 3-6 months in advance of due date.
- **Formal Review**: Full project description, bios, budget, evaluation plan that is aligned with the goals but may or may not include supplemental materials; 6 weeks in advance.
- **Post-Award**: Decisions, feedback between Red Team and proposal team.
NSF Funding Insights

• First gate = NSF program officer review
• Significant efforts and attention paid towards broadening participation
• Average proposals funded: ~22%
• Expectation is that a first time proposal will not win. Multiple attempts are expected and encouraged.
NSF Programs Most Relevant to Community Colleges

- S-STEM Scholarships and Student Support Services (due May 16)
- ATE - Advanced Technological Education (due Oct 6)
- IUSE - Improving Undergraduate STEM Education (due Nov 2)
- ADVANCE - Increasing the Participation & Advancement of Women in Academia (due Nov)
- ITEST - Innovative Technology Experiences for Students and Teachers (due Aug 10)
NSF Programs Most Relevant to Community Colleges

- ECR - Engineering Core Research (due Sep 8)
- LSAMP - Louise Stokes Alliances for Minority Participation (due Oct 14/ Nov 4)
- EAGER - Early Concept Grants for Exploratory Research (due May 31)
- REU - Research Experiences for Undergraduates (due Aug 24)
- NSF Broadening Participation Portfolio
Emerging Themes
Common NSF Funding Challenges

- Perception that the purpose of the Community College does not match with the Mission of NSF

- General community college policies differ from 4-year universities, and may be negatively perceived by reviewers:
  - Lack of faculty release time restricts their participation in PI roles
  - Significant amount of instruction (and student support) is conducted by part-time, adjunct faculty
  - Significant percentage of students are part-time and come with unique challenges
  - STEM faculty shortage is a real problem for program support and expansion
  - Many faculty do not have Ph.Ds
Common Declinations Comments

1. Evaluation plans often fall short of expectations
   • Involve an external evaluator at the start of the proposal
   • This is a critical program piece, not an afterthought

2. Proposed program must match NSF program objectives
   • Discuss program with NSF PO early in the proposal process
   • Good ideas won’t be funded if they are in the wrong program grouping
Common Declinations Comments

3. CCs do not always put their best foot forward
   • Know your strengths and weaknesses
   • Showcase your strengths and unique characteristics

4. Explain how programmatic choices are related to the specific needs of your college and student population
   • How are you adapting best practices to meet the needs of your students and your community?
   • Just having needy students isn’t enough – use data to demonstrate how you are meeting their needs
Grant Development Advice

Beyond the STEM Strategic Planning Process described earlier:

• Be aware of and understand previously funded NSF programs in your area

• Understand the relevant literature and best practices

• Use NSF-funded centers and program PIs for reference

• Contact the Program officer in advance
Grant Development Advice, Cont.

- First time ATE awards have highest win rate
- Start small
- Start the proposal process with an evaluator on board
- Intellectual Merit can include taking work done in another setting and researching how it applies in your setting
- Identify best practices to address your population demographics and set of challenges
Kickstarter Cohort #2
Cohort #2

- 6-7 Community College HSIs will be added to the KickStarter Technical Assistance Program
- Call for Applications release - April 4th
- Letter of Intent due June 2nd
- Full proposal due June 23rd
Applicant Eligibility – Who can Apply?

- Designated HSI with at least 25% Hispanic student enrollment within California, Arizona, New Mexico, Texas, or Florida.

- Must be a Community College.

- Must have active or recent (within last 5 years) Title-V funding and the awarded Title V project must be focused on:
  1. recruiting and retaining students in STEM,
  2. updating and streamlining STEM courses and degree/certification attainment
  3. expanding federal funding competitiveness.

- Must have previously submitted proposal(s) in the last 5 years to NSF, or another federal agency, and been declined.

- Institutions are NOT ELIGIBLE to apply if they are, or have been, the lead institution of an NSF grant within the past 5 years.
KickStarter Goals

1. Submit a minimum of two proposals to NSF or other appropriate Federal agency within 3-year period with at least one funded proposal.

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

3. Establish key partnerships that lead to more Hispanic students in the STEM Pathways pipeline; and

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

Caroline VanIngen-Dunn  
Director, Community College STEM Pathways  
Science Foundation Arizona  
cvaningen-dunn@sfaz.org  
602-682-2882

Stephanie Vasquez  
Grant Writer, Palo Alto College  
svasquez117@alamo.edu  
210-486-3941
NSF Programs – S-STEM

S-STEM Scholarship Program

• Due May 16, 2016
• 40%-60% Split between student support programs and scholarships
• To increase the success of low-income academically talented students with demonstrated financial need who are pursuing associate, baccalaureate, or graduate degrees in STEM
• Award rate ~20%
Advanced Technological Education

- Due October 6, 2016
- Emphasis on 2-year colleges, focuses on education of technicians for high technology fields that drive our nation’s economy
- Must involve industry
- First time ATE – highest award rate (up to 70%)
NSF Programs - IUSE

Improving Undergraduate STEM Education

• Due dates: Nov 2, 2016 and Jan 11, 2017

• NSF invites proposals that address immediate challenges and opportunities that are facing undergraduate STEM education, as well as those that anticipate new structures and new functions of the undergraduate learning and teaching enterprise.

• Two tracks: Engaged student learning and Institutional & Community transformation

• Two tiers in each track: Exploration & Design and Development & Implementation
Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers

- Next due dates aren’t posted but should be Nov 16/Jan 17
- Develop systemic approaches to increase the representation and advancement of women in academic STEM careers
- Develop innovative and sustainable ways to promote gender equity in STEM academic workforce
- Contribute to the development of a more diverse science and engineering workforce
NSF Programs - ITEST

Innovative Technology Experiences for Students and Teachers

• Due date: August 10, 2016

• Aimed at PreK-12 student interests and capacities to participate in STEM and information communications technology (ICT) workforce.
  – Awareness, motivation, content and skills
  – http://stelar.edc.org/ to see previous projects
NSF Programs - ECR

Engineering Core Research

• Due date: Sept. 8, 2016
• Fundamental research in STEM education: STEM learning, STEM learning environments, STEM workforce development, and broadening participation in STEM
Louis Stokes Alliances for Minority Participation (LSAMP)

• Due dates:
  – Bridge to Doctorate: Oct 14, 2016
  – Pre-alliance planning: Oct 14, 2016
  – LSAMP alliance: Nov 4, 2016

• Increase the number of students in STEM in order to diversify the STEM workforce
NSF Programs - EAGER

Early Concept Grants for Exploratory Research

• Due date: May 31, 2016
• Dear Colleague Letter – NSF 15-078
• Proposals that address effective approaches in undergraduate STEM education for students at two-year HSIs
• Encourages research on broadening participation and STEM education
NSF Programs - REUs

Research Experience for Undergraduates

• Supports active research participation by undergraduate students in any of the areas of research funded by NSF.

• Institutional due date: 4th Wednesday in August

• BUT – individual students should apply NOW for summer research positions
NSF Broadening Participation Portfolio

The portfolio represented is divided into three categories:

• Programs that are primarily focused on broadening participation (15 programs)
• Programs that have broadening participation as one of several emphases (11 programs)
• Dear Colleague Letters expressing interest in specific aspects of broadening participation (21 programs).