



The Experimental Program to Stimulate Competitive Research (EPSCoR)

Western Tri-State Diversity Innovation Working Group Meeting Report

Valles Caldera National Preserve
Science and Education Center

September 12-15, 2010

Facilitated by



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People. Ideas. Progress.

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Introduction

The **Western Tri-State Diversity Innovation Working Group** was convened by the EPSCoR representatives from Idaho, Nevada, and New Mexico on September 12-15, 2010 in Jemez Springs, New Mexico. The goal of the meeting was to develop a comprehensive strategic plan that can be implemented throughout the tri-state area to increase participation of and support for underrepresented minorities (URM) and women in EPSCoR scientific research and, more broadly, in science, technology, engineering, and math (STEM) disciplines.

Meeting Objectives

The working group had developed four objectives as a focus for the discussions and decisions of the group in attendance:

1. Increase efforts to **recruit** URM students and women in EPSCoR scientific research and, more broadly, in STEM disciplines.
2. Develop strategies to effectively **retain** URM students and women in EPSCoR scientific research and, more broadly, in STEM disciplines.
3. Provide **tools** needed by faculty to develop effective mentoring skills and foster a campus climate that will positively impact success of URM students and women in STEM disciplines.
4. Promote **institutional commitments** and develop **infrastructure** to enhance recruitment, retention, and advancement of URM students and women in STEM disciplines.

Meeting Participants

Both tri-state and national representatives active in EPSCoR programs, scientific research, or efforts to diversify scientific research and STEM programs attended the meeting.

Meeting Conveners

- Michele Casella, Nevada EPSCoR
- Mary Jo Daniel, New Mexico EPSCoR
- Sarah Penney, Idaho EPSCoR

Meeting Attendees

- Phyllis Baca, Santa Fe Community College
- Paul Buck, Nevada State College
- Janet Callahan, Boise State University
- Lorie Liebrock, New Mexico Tech
- Benita Litson, Diné College-Arizona
- Diana Marinez, Texas A&M University-Corpus Christi
- Jose Melendrez, University of Nevada-Las Vegas
- Patty Avila Porter, Truckee Meadows Community College
- Caiti Steele, New Mexico State University
- Frank Tuitt, University of Colorado-Denver

Meeting Facilitator

- Charlotte Pollard, New Mexico First

Meeting Process

During the meeting, working group members participated in several full group and small group sessions in which they generated initial ideas that would address each of the four meeting objectives and then came to consensus on six core strategies that would increase the participation of and support for URM students and women in EPSCoR scientific research and, more broadly, in STEM disciplines. The detailed report that follows outlines the six core strategies. The meeting agenda and initial ideas can be found in the appendix.

Working group members will find opportunities to share the core strategies with others in the tri-state area who are involved in EPSCoR scientific research and will reach out to other members of the scientific community to become involved in implementing the six strategies.

Strategy One: Engage Interest Early

Statement: Engage the interest of URM students and women in scientific research and, more broadly, in STEM disciplines early in their educational experiences by providing information that allows them to explore and prepare for a career in the field.

Timeframe: Short-term 2010-2011 and Long-term 2013

| Key Action Steps | Key Milestones* | Team Members |
|--|---|--|
| 1. Conduct an inventory of STEM programs in the tri-state area, which can ultimately be part of a Western Tri-State Consortium STEM Resource Center (refer to Strategy 6) | <ul style="list-style-type: none"> Complete inventory and website templates by Mar. 2011 | S. Penney M.J. Daniel M. Casella |
| 2. Create a STEM Pipeline website in Nevada and New Mexico modeled after the Idaho STEM Pipeline website | <ul style="list-style-type: none"> Launch website by May 2011 | Community Coordinators (TBD) |
| 3. Seek state partnerships and coordinate marketing plans to target URM and women students, insuring the use of active, face-to-face marketing methods in addition to passive, media-related methods | <ul style="list-style-type: none"> Launch first marketing campaign by Nov. 2011 | |
| 4. Build funding into next EPSCoR award to support future education outreach and diversity activities | <ul style="list-style-type: none"> To be determined by 2013 | |

*The key milestone dates are guidelines for possible start/end dates. Plans may be altered as the action steps are integrated into each team member's regular workload and new information is learned in the process.

Strategy Two: Early Research Experience

Statement: Enhance the retention and advancement of URM students and women in scientific research and, more broadly, in STEM disciplines by ensuring early research experience for STEM students, with a focus on URM and/or under-prepared students, utilizing a reward system for students and faculty based on an analysis of their needs.

Timeframe: Short-term 2010-2011

| Key Action Steps | Key Milestones* | Team Members |
|--|--|---|
| <p>1. Conduct general assessment:</p> <ul style="list-style-type: none"> ▪ Assess institutional support available for undergraduate researcher integration ▪ Conduct analysis of undergraduates in STEM research, including faculty and student demographics, student math levels, and other qualifications for student research (i.e., identify what is current) ▪ Assess faculty needs to enable support of undergraduate researchers ▪ Assess URM and/or under-prepared student needs for participation ▪ Assess research requirements for undergraduate students; get researchers to think out-of-the-box | <ul style="list-style-type: none"> ▪ Start by Jan. 2011 | <p>L. Liebrock D. Marinez (external advisor)</p> <p>Outreach to: M. Carroll M. Pullin C. Baxter</p> <p>Check with: J. Callahan for ID representative and NV institutions for representative</p> |
| <p>2. Complete analysis of assessed needs</p> | | |
| <p>3. Create recommendations for institutional support of undergraduate researcher integration. Consider the following:</p> <ul style="list-style-type: none"> ▪ Matching process (i.e., determine how to find all qualified students and match to research and perhaps develop introductory course to recruit students) ▪ Student research training (e.g., perhaps develop a one-credit course, including how to do research and provide presentation experience at a mini-conference) ▪ Mentoring program (e.g., faculty and/or peer mentoring) ▪ Student researcher teams ▪ Reward system for faculty researchers (e.g., travel funding for student to present research) | | |

| Key Action Steps | Key Milestones* | Team Members |
|---|---|--------------|
| 4. Look for support to expand or develop the recommended changes/additions: <ul style="list-style-type: none"> ▪ Identify funding source ▪ Identify Principal Investigators and team, plus collaborators (e.g., consider other departments, institutions, and tri-state opportunities) ▪ Prepare and submit proposal ▪ Start the work immediately | | |
| 5. Develop and implement the program, including collection of data to evaluate | | |
| 6. Assess the effectiveness and determine whether modifications are needed: <ul style="list-style-type: none"> ▪ Assess effectiveness (e.g., statistical analysis, focus group evaluations for faculty and students, etc.) ▪ Develop needed modifications ▪ Replicate program | | |
| 7. Publish model and evaluation of effectiveness | <ul style="list-style-type: none"> ▪ Complete by Dec. 2011 | |

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Strategy Three: Social Networking

Statement: Facilitate the recruitment, retention, and advancement of URM students and women in scientific research and, more broadly, in STEM disciplines by designing, developing, and maintaining a social networking system that provides academic and social support for these students.

Timeframe: Short-term 2010-2011

| Key Action Steps | Key Milestones* | Team Members |
|---|--|---|
| 1. Search for an existing Facebook site that closely matches our objective to use as a model | <ul style="list-style-type: none"> Complete by Oct. 2010 | M. Casella J. Melendrez S. Penney |
| 2. Identify key structures and components on existing Facebook pages | <ul style="list-style-type: none"> Complete by Oct. 2010 | M.J. Daniel N. Willoughby |
| 3. Verify policies that would govern EPSCoR generated Facebook pages, including NSF policies | <ul style="list-style-type: none"> Complete by Oct. 2010 | Get input from: C. Steele P. Avila Porter |
| 4. Each state EPSCoR creates similarly structured Facebook pages, linked to each other and linked to the tri-state STEM Pipeline websites (refer to Strategy One) | <ul style="list-style-type: none"> Complete by Dec. 2010 Link to state STEM Pipeline websites by May 2011 | Test with: undergraduate and graduate students |
| 5. Each state identifies local group websites to link to that will reach URM students | <ul style="list-style-type: none"> Complete by Jan. 2011 | |
| 6. Identify existing national group websites to link to as a fan or friend; our website would fan others | <ul style="list-style-type: none"> Complete by Jan. 2011 | |
| 7. Follow steps above for any other social networking opportunities/technologies | <ul style="list-style-type: none"> Complete by Jan. 2011 | |
| 8. Link all relevant independent websites to tri-state consortium Facebook pages | <ul style="list-style-type: none"> Complete by Jan. 2011 | |
| 9. Update content at least twice per week with a focus on engaging, interesting content and images and soliciting and using input from fans and friends | <ul style="list-style-type: none"> Goal is to have over 1000 fans and friends for each state Facebook page from targeted population within six months | |
| 10. Contact business schools to see if there are students who can develop social networking/marketing strategy as a class project. | | |

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Strategy Four: Mentoring

Statement: Develop the capacity of faculty members to be successful mentors for URM students and women interested in scientific research and, more broadly, in STEM disciplines by supporting professional development activities, such as seminars, workshops, conferences, resources, faculty-to-faculty mentorship programs, etc. and by sponsoring appropriate rewards to recognize faculty contributions.

Timeframe: Short-term 2010-2011

| Key Action Steps | Key Milestones* | Team Members |
|---|---|--|
| 1. Identify and recruit faculty who are already achieving results as instructors/mentors for URM students | <ul style="list-style-type: none"> Start by Jan. 2011 | C. Steele M.J. Daniel A. Smith M. Casella B. Litson |
| 2. Identify existing infrastructures for faculty training and adopt a model that works | | |
| 3. Define mentoring success by collecting baseline data on best practices; find an expert who has existing success metrics | | Contact J. Schopf and tri-state |
| 4. Develop criteria for successful mentorship partnership | | Principals |
| 5. Develop a culturally-relevant mentoring support structure: <ul style="list-style-type: none"> Teach students how to be effective mentorship partners Identify non-faculty community members to participate in the mentorship program (i.e., mentor clusters) Introduce mentor coordinator and/or potential mediator to manage the program or be an informal resource to call on for this task | | Investigators to review plan and provide seed monies for development |
| 6. Reward mentors for success in URM mentoring (e.g., funding/financial incentives for research assistants, materials, travel to professional meetings, etc.) | | |
| 7. Facilitate existing or newly developed model workshop with certificate of attendance and support letter to Dean; workshop should address issues identified in Key Action Steps 1-6; use success metrics to evaluate workshop | | |
| 8. Present plan to institutions (e.g., Tri-State EPSCoR meetings, Dean Council meetings, Board of Regent meetings, Faculty Senate meetings, Council of University Presidents meetings, higher education conferences, etc.) | <ul style="list-style-type: none"> Complete by Dec. 2011 | |

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Strategy Five: Best Practice Research

Statement: Demonstrate the importance of supporting the geographic, ethnic, cultural, and gender diversity in scientific research and STEM disciplines by systematically researching the effectiveness of approaches and best practices to mathematics placement and interventions for under-prepared STEM-interested students and using data-driven analysis to better understand potential barriers for STEM-interested students who are under-prepared for college level mathematics

Timeframe: Short-term 2010-2011

Note: This action plan outlines a process for research on diversity and implementation of integrated best practices. A specific example is used as a first proposal.

| Key Action Steps | Key Milestones* | Team Members |
|---|----------------------|--|
| 1. Establish a Google Group to coordinate efforts | ▪ Start by Oct. 2010 | L. Liebrock |
| 2. Post papers on what has been done for this STEM-wide problem and conduct institutional and technical research/analysis on literature | | L. Liebrock J. Callahan M.J. Daniel P. Baca J. Melendrez |
| 3. Write white paper on results of research | | J. Callahan (lead) |
| 4. Identify funding source | | Team |
| 5. Complete review by Institutional Review Boards | | Institutional leads |
| 6. Write "research center" proposal | | Institutional leads and team |
| 7. Hire staff with needed mathematical analysis skills at lead institutions | | Institutional leads |
| 8. Examine how to include community colleges in the analysis for transfer to STEM | | P. Baca and team |
| 9. Research best practices for identifying and analyzing barriers to graduation in STEM for under-prepared students (e.g., gaps in knowledge) | | Institutional staff |
| 10. Integrate barrier analysis with Boise State University method | | J. Callahan |
| 11. Analyze best practices for barriers and evaluate their integration to arrive at a set of barrier analyses | | Institutional staff and team |
| 12. Apply barrier analyses to other tri-state institutions | | Institutional leads |
| 13. Research best practices and approaches to mathematics placement | | Institutional staff |
| 14. Analyze best practices for mathematics placement and evaluate their integration | | Institutional staff and team |

| Key Action Steps | Key Milestones* | Team Members |
|---|---|-------------------------------|
| 15. Analyze barrier analyses results at tri-state institutions | | Institutional leads |
| 16. Research best practices and approaches to mathematics intervention | | Institutional staff |
| 17. Analyze best practices for mathematics intervention and evaluate their integration | | Institutional staff and team |
| 18. Pilot and test best practices in projects at Principal Investigator institutions and evaluate effectiveness | | Institutional leads and staff |
| 19. Scale program across a larger set of tri-state institutions and evaluate effectiveness | | Institutional leads |
| 20. Disseminate results and best practice analysis nationally | <ul style="list-style-type: none"> ▪ Complete by Dec. 2011 | Team |

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Strategy Six: Coordinated Efforts

Statement: Facilitate coordinated action in the recruitment, retention, and advancement of URM students and women in scientific research and, more broadly, in STEM disciplines in higher education through a state (then regional) hub and a series of outreach satellites independent of educational and governmental institutions.

Timeframe: Long-term 2010-2013

Note: This action plan outlines a process for developing a pilot program in the southern part of the State of Nevada. An alliance has already begun to take shape; therefore they are in the best position to explore the feasibility of this strategy. If successful, the pilot program can be expanded to serve the entire state and can be replicated in Idaho and New Mexico.

| Key Action Steps | Key Milestones* | Team Members |
|---|---|--|
| 1. Form a team from UNLV and its feeder schools to explore interest in designing the structure for a Southern Nevada STEM Resource Center. If successful, this pilot program could be expanded to serve the entire state of Nevada and replicated in Idaho and New Mexico to establish a Western Tri-State Consortium STEM Resource Center. | <ul style="list-style-type: none"> ▪ Gain institutional commitments by Dec. 2010 | M. Casella J. Melendrez Representatives from other organizations |
| 2. Determine the working parameters of the alliance: <ul style="list-style-type: none"> ▪ Identify key partnerships, for example: <ul style="list-style-type: none"> ▪ Higher education institutions ▪ K-12 schools ▪ Nonprofit organizations ▪ Government departments of education (K-20) ▪ Outline center goals and objectives, for example: <ul style="list-style-type: none"> ▪ Outreach ▪ Recruitment ▪ Retention ▪ Funding ▪ Agree on operating policies and procedures ▪ Identify personnel needs (short- and long-term) ▪ Develop role/responsibility descriptions ▪ Document memos of agreement among partnerships | <ul style="list-style-type: none"> ▪ Complete by May. 2011 | |
| 3. Secure funding | <ul style="list-style-type: none"> ▪ On-going | |

| Key Action Steps | Key Milestones* | Team Members |
|--|--|--------------|
| 4. Conduct an inventory of STEM resources and programs, initiatives, research, funding opportunities, etc. (refer to Strategy 1) | <ul style="list-style-type: none"> ▪ Complete inventory and website templates by Mar. 2011 | |
| 5. Create a STEM Pipeline website in Nevada modeled after the Idaho STEM Pipeline website (refer to Strategy 1) | <ul style="list-style-type: none"> ▪ Launch website by Mar. 2011 | |
| 6. Implement program in southern Nevada | <ul style="list-style-type: none"> ▪ Launch center by Sept. 2011 | |
| 7. Document process to facilitate expansion and replication: <ul style="list-style-type: none"> ▪ Project plan (along the way) ▪ Lessons learned ▪ Best practices | <ul style="list-style-type: none"> ▪ On-going | |
| 8. Communicate outcomes in tri-state meetings and conferences | <ul style="list-style-type: none"> ▪ On-going | |
| 9. Expand the program to include the entire state of Nevada and | <ul style="list-style-type: none"> ▪ Determine need and feasibility by Sept. 2011 ▪ Complete expansion by Sept. 2012 | |
| 10. Replicate In Idaho and New Mexico to form a Western Tri-State Consortium STEM Resource Center | <ul style="list-style-type: none"> ▪ Determine need and feasibility by Sept. 2011 ▪ Complete expansion by Sept. 2012 | |

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Appendix A: Meeting Agenda

Sunday, September 12, 2010

| Time | Topic |
|---------|---|
| 3:00 pm | Arrive |
| 6:30 pm | Dinner and Introductions: <ul style="list-style-type: none"> ▪ Name, Organization, Role ▪ Personal Success Story regarding your efforts to enhance geographic, ethnic, cultural, and gender diversity in STEM programs |

Monday, September 13, 2010

| Time | Topic |
|----------|--|
| 7:30 am | Breakfast |
| 8:15 am | Welcome and Overview <ul style="list-style-type: none"> ▪ Statement of Purpose/Goals ▪ Outcomes, Agenda, and Roles ▪ Ground Rules: What are the ground rules that will help our conversations go well? |
| 9:00 am | Large Group Discussion 1 <ul style="list-style-type: none"> ▪ What are strategies to effectively recruit URM students and women in EPSCoR scientific research and, more broadly, in STEM disciplines? |
| 11:30 am | Lunch |
| 12:15 pm | Large Group Discussion 2 <ul style="list-style-type: none"> ▪ What are strategies to effectively retain URM students and women in EPSCoR scientific research and, more broadly, in STEM disciplines? |
| 2:45 pm | Break |
| 3:00 pm | Small Group Discussion 3/Large Group Review <ul style="list-style-type: none"> ▪ What tools are needed by faculty to develop effective mentoring skills? ▪ What strategies are needed to foster a campus climate that will positively impact success of URM students and women in STEM disciplines? |
| 4:30 pm | Presentation: Overview of VCNP |
| 5:00 pm | Adjourn |
| 6:30 pm | Dinner and Presentation: Increasing Our Workforce—Retaining STEM Students in our Universities |

Tuesday, September 14, 2010

| Time | Topic |
|-------------|--|
| 6:30 am | Bird watching (optional) |
| 7:30 am | Breakfast |
| 8:30 am | Recap: Day 1 |
| 9:00 am | Small Group Discussion 4/Large Group Review <ul style="list-style-type: none">▪ What are ways to promote institutional commitments and develop the infrastructure that enhances recruitment, retention, and advancement of URM students and women in STEM disciplines?▪ How can we use social networking sites to help with this effort? |
| 11:30 am | Lunch |
| 12:15 pm | Initial Synthesis of Ideas <ul style="list-style-type: none">▪ Integrate Parking Lot issues and ideas from previous discussions▪ Synthesize ideas from Discussion 1-4▪ Determine work teams for action planning |
| 3:00 pm | Break |
| 4:00 pm | Tour: Magma to Magpies: A Guided Glimpse of the Caldera |
| 7:00 pm | Dinner |

Wednesday, September 15, 2010

| Time | Topic |
|-------------|---|
| 7:30 am | Breakfast |
| 8:00 am | Small Group Action Planning/Large Group Review |
| 11:30 am | Lunch |
| 12:15 pm | Small Group Action Planning/Large Group Review, Cont'd. |
| 1:45 pm | Next Steps <ul style="list-style-type: none">▪ Final decisions▪ Assignments |
| 2:00 pm | Meeting Evaluation |
| 2:30 pm | Depart |

Appendix B: Initial Ideas

Discussion One: Recruitment

Question: What are strategies to effectively recruit URM students and women in EPSCoR scientific research and, more broadly, in STEM disciplines?

Expansion of High Priority Ideas:

1. **Engage interest in STEM early on** by connecting with URM students and women and providing information about existing STEM programs on a state and tri-state level. Key actions are to create, market, maintain, and embed use of a website based on the Idaho Pipeline site which can be used by students, parents, faculty, and other stakeholders.
2. **Establish a one-stop STEM recruitment hub** entitled *Access to Your Future Center* on a regional (tri-state) or statewide basis. Key ideas include:
 - Establish Statewide Recruiter(s) for STEM disciplines that recruit students for STEM programs in any P-20 institution in the three, tri-state region.
 - Establish Diversity Ambassador(s) who market STEM disciplines in an authentic, cultural way with students, parents, community members and organizations, faculty, and industry/workforce leaders. The ambassador ties together the dual enrollment programs, preparation programs, transition programs from two-year to four-year institutions, STEM camp programs, scholarship foundations, career counseling programs, asset mapping programs, outreach programs, and other resource information. The ambassador markets the various programs and disseminates best practices. Core pipeline partnerships might include: industry, social/corporate responsibility groups, churches, community organizations, higher education departments, public education departments, and nonprofit organizations that focus on STEM disciplines. This idea will add cohesion to the system and would not be affiliated with any specific institution. A potential funding source would be a NSF grant to engage STEM faculty members and other stakeholders to develop the hub, create website support, and outline outreach strategies.
3. **Create a coordinated marketing approach** at all levels (e.g., K-12, Higher Education) that targets URM and women students and parents. The marketing plan would utilize all types of media to reach both urban and rural audiences in various languages (e.g., posters, postcards, newsletters, social networking sites, popular video sites, broadcast radio/TV, articles on interesting student research, national/regional publications, commercials at special events of interest to students like sports, etc.). Students would be engaged to craft a compelling message and identify the creative elements of the campaign. They would also be highlighted in the advertisements as STEM role models. The approach would build on existing media outlets of interest to undergraduate/graduate students and experts/professionals in the field. The marketing campaign would highlight STEM research opportunities. A potential funding source would be corporations from industries that rely on prepared STEM graduates.
4. **Use faculty, advisors, and counselors to recruit students with STEM discipline potential.** Key ideas include:
 - Develop a holistic education plan and model for college and high school STEM faculty, advisors, and counselors to prepare them to identify and support STEM students
 - Establish *Advising Centers* that relate to the STEM disciplines and train the advisors/counselors who work in these centers
 - Create partnerships between STEM faculty and advisors
 - Support peer mentoring/faculty mentoring and embed into specific courses

- Submit proposal to fund professional development
- Model sources to explore are the Denver Scholarship Foundation and Association for Counselor Education and Supervision

Overarching Idea:

1. Use the wheel, don't reinvent it—explore existing best practices

High Priority Ideas:

2. **Engage interest in STEM at a young age**
 - Teach STEM related subjects in a way that is relatable to middle school/high school youth experiences, for example teach principles of physics in skateboarding
 - Provide experiential learning and field experiences
 - Highlight interests of students
 - Connect STEM to community needs through service learning opportunities
 - Support STEM Camps for youth
 - Use undergraduate students/organizations to recruit others
3. **Identify Recruitment Coordinator to build the STEM pipeline through partnerships in communities**
 - Recruit for multiple STEM programs, for example K-12 and Higher Education, college/teacher/scholarship prep programs, and community partnerships
 - Support STEM programs for fundraising, funding, mentorships, etc.
 - Support dual enrollment programs, for example, high school to college and two-year to four-year colleges
 - Establish one-stop shopping centers for STEM information/resources
4. **Create cool marketing program that appeals to students**
 - Use videos on research, websites, articles about cool students
 - Educate parents of middle school/high school students regarding opportunities using a “trusted” approach like Tupperware parties
 - Communicate social/cultural relevance of STEM
5. **Use faculty, advisors, and counselors to spot potential**
 - Target to STEM students
 - Assign and meet with students and parents at orientation program
 - Get students into right classes
 - Allow undecided science/engineering designation

Medium Priority Ideas:

6. Identify Diversity Liaisons to connect students with research opportunities; rely on introductory classes faculty to identify potential students
7. Support first-year programs/learning communities
8. Support freshman researchers to present their research to high school students at their alma mater; college present research to other students
9. Educate students regarding how to apply for and keep financial aid
10. Train faculty on how to relate to others (i.e., the human element)
11. Train teachers to establish trust with students to allow expression and show support of ideas
12. Provide a virtual and continual Big Brother/Big Sister type mentoring program with industry members and with student peers as mentors

Low Priority Ideas:

13. Provide funding incentives or disincentives to faculty members linked to URM students

14. Redefine merit and how to assess potential
15. Require mandatory mentoring
16. Find funding for curriculum-based undergraduate research and link to four-year programs
17. Engage national labs and industry organizations to recruit students and show them STEM opportunities
18. Create opportunities to share research (e.g., posters, websites)
19. Support Science/Engineering fairs and competitions
20. Have administrators help faculty write proposals
21. Engage early with faculty to identify strengths and how want to best use
22. Create new inter-disciplinary programs

Discussion Two: Retention

Question: What are strategies to effectively retain URM students and women in EPSCoR scientific research and STEM disciplines?

Expansion of High Priority Ideas:

1. **Provide support networks (i.e., social and academic, including orientation).** Key ideas include:
 - Get institutional buy-in and identify good models in each department (i.e., SHPE, SWE, etc.)
 - Provide peer mentoring, financial resources, academic coaches, tutoring, and academic success centers
 - Become more prescriptive or mandatory, with quantitative evaluations, and dissemination of information regarding what makes an impact
 - Make applicable and customize to small institutions or “what fits” our institution
2. **Provide early research opportunities.** Key ideas include:
 - Offer an Introduction to Research course for undergraduates taught by faculty incorporating faculty members’ passion, provide funding to develop course as part of regular teaching assignment, and give credit for the course toward a degree
 - Have research faculty present projects (e.g., Research Carnival) to students who can sign up as a researcher
 - Develop mechanisms for non-research faculty (e.g., in community college) to partner with research faculty to provide more opportunities early on.
 - Build early research experience into EPSCoR and restrict to URM students and women working in pairs.
 - Have funds follow the student and connect to faculty reward system.
 - Support students to present their research
 - Have graduate students get preference for research experience
3. **Reward faculty by:**
 - Have EPSCoR create an award to recognize those who work with URM students and have student organizations, colleges, diversity centers, SHPE, NSBE make nominations for Mentor of the Year award
 - Have EPSCoR provide continuation award for faculty who take on an under-prepared in math student (e.g., \$1,000 travel grant for producing a publication in second year)
 - Have EPSCoR facilitate the national NSF and PECASE award
4. **Develop faculty by:**
 - Have EPSCoR develop a position statement regarding the importance of working with URM and women students
 - Create indicators that recognize a university’s stance on STEM retention, diversity, etc.
 - Develop seminars 1) where peers in a STEM discipline gives presentations or pairs with faculty members to give presentations; 2) encouraging Dean/Chair to attend; 3) incorporated into new faculty orientation and have EPSCoR sponsor a speaker each year

- Enhance new faculty orientation with content on URM issues, how to access resources, mentoring, misconceptions regarding URM students, how to get undergraduates integrated in research, best practices
- Provide research grant assistance (e.g., career awards, outreach)
- Use Centers for Teaching and Learning as a way to reach graduate students and other faculty
- Have EPSCoR partner with professional and organizational development in higher education

Overarching Idea:

1. Identify best practices

High Priority Ideas:

2. Provide **supportive networks**, both social (i.e. of students, faculty, professional staff, community partners) and academic (e.g., tutoring, especially for “last hurdle” courses)
3. Provide **early research** opportunities (i.e., as freshmen and sophomores)
 - Tie REU money to URM student for faculty support, travel, etc.
 - Provide funding to attend science conferences tied to undergraduate research
4. **Embed what you want faculty to do** into their tenure and promotion requirements
 - Recognize and reward faculty effort in working with URM students and women (e.g., Best Advisor award, something that contributes to their resume)
 - Provide faculty development around teaching, advising, and mentoring students

Medium Priority Ideas:

5. Provide orientation to freshman and students transitioning from two-year to four-year institutions regarding STEM opportunities and resources
6. Require mandatory one-credit science course as a freshman
7. Provide STEM orientation and teach students the “culture” of STEM and research; don’t assume they know what they need to be doing; provide intensive two-three week summer orientation (i.e., usually to high school seniors)
8. Encourage one-on-one relationships between student and faculty (i.e., less formal than mentoring, more personal)
9. Protect Year Zero or Year minus One program to get students ready
10. Support community-based participatory action research (i.e., service learning, civic engagement)
11. Build student cohorts/integrated learning communities to connect students to each other in an organized way around their academics
12. Identify barrier/gateway courses and address student needs
13. Establish early warning system to identify and recover at-risk students
14. Provide equal exposure/rewards for STEM as done for athletes
15. Engage with national and minority organizations and bring them to campus to highlight their professions and role models

Low Priority Ideas:

16. Require mandatory one-credit science in society course
17. Demonstrate relevance of research to community interests
18. Provide ongoing funding for scholarships and undergraduate internships
19. Establish faculty to faculty mentorship program
20. Provide more showcasing opportunities, competitions, symposiums, and seminar series
21. When hiring faculty, base selection on willingness to work with URM students and women

Discussion Three (A): Faculty Mentoring Tools

Question: What tools are needed by faculty to develop effective mentoring skills?

Ideas:

1. Provide “On Being a Mentor: A Guide for Higher Education Faculty” by W. Brad Johnson
2. Support faculty on faculty mentoring
3. Get institutional buy-in to ensure mentoring role is part of faculty job descriptions and performance evaluations
4. Provide mandatory professional development training on multi-levels for current and future faculty
5. Provide different mentors (i.e., mentor cluster) for different needs; include retirees, peers, etc.
6. Ensure quantitative evaluation to measure impact, disseminate information, and adapt plan when needed

Discussion Three (B): Positive Campus Climate

Question: What strategies are needed to foster a campus climate that will positively impact success of URM students and women in STEM disciplines?

Ideas:

1. Conduct annual evaluations that recognize faculty mentoring of URM and women in STEM fields.
2. Encourage Provost, President, Dean and Chair participate in URM events (e.g., McNair)
3. Create more opportunities to bring URM students and their families to campus
4. Ensure there are student evaluations that assess the learning climate (i.e., campus climate survey, classroom environment evaluation, specific discipline survey)
5. Recognize the critical importance of professional and classified staff in terms of creating a climate of success for students
6. Provide faculty development: 1) train faculty to establish “class norms” and “ground rules”; 2) provide tools to proactively deal with conflict management when it occurs in group work; 2) demonstrate importance of using diverse examples to illustrate points in class

Discussion Four (A): Institutional Commitments and Infrastructure

Question: What are ways to promote institutional commitments and develop the infrastructure that enhances recruitment, retention, and advancement of URM students and women in STEM disciplines?

Ideas:

1. **Develop guidelines for future research applications:** 1) offer workshops on how to identify and write competitive proposals that enhance diversity and pay attention to how to write and obtain letters of commitment and engage in research collaborations; 2) use STEM diversity scorecard to measure progress; 3) assist faculty and principal investigator in writing proposals to include diversity goals
2. **Seek funding for professional development program:** 1) explore funding from Alliance for Graduate Education and Professoriate, Council of Graduate Schools, and National Science Foundation for URM graduate students in PhD programs who may become faculty; 2) provide program for future URM faculty members; 3) sponsor a STEM Summer Institute for any faculty member interested in increasing STEM diversity
3. **Develop an online resource center:** 1) develop URM organization listserv to recruit more diverse faculty and post faculty administrative positions on pages accessed by URM faculty; 2) list best practices for increasing STEM diversity; 3) provide database of articles, programs, resources; 4) link to other websites like Facebook, sites used by URM students, sites that are used STEM students
4. **Provide administrative support:** 1) establish ongoing institutional collaborations to compliment diversity efforts; 2) establish STEM focused Diversity Centers

Discussion Four (B): Social Networking Sites

Question: How can we use social networking sites to help with this effort?

Recommendations:

1. **Plan how the site will be used:**
 - Determine the objectives of the site (e.g., building connections with other students or professionals, providing STEM information; establishing peer mentoring; recruiting students through “tweeting”; recruiting professionals in STEM fields; exploring research being done, etc.)
 - Develop a “hook” to draw them in once a week and keep engaged; appeal to interests and immediate application
 - Can’t really tell how many “hits” are made to site as there will be links from other sites that will impact the number of people using the site
 - Recognize that the institution can only manage their website somewhat, not entirely
 - Encourage use of the site and connections through marketing; recognize will not become a substitute for what students already use (i.e., Facebook, Twitter, etc.)
2. **Establish an institutional policy**
 - See example at www.tmcc.edu/web/policies/
 - Use best practices and policy statements that already exist regarding use by minors
 - Consider human subjects issues (i.e., should not be a problem with Institutional Review Board as long as site does not involve conducting research or publishing/presenting papers)
 - Have Ethics Committee review site
 - Consider Family Educational Rights and Privacy Act
 - Train students/faculty in the use of the site
 - Develop a very closed-site if necessary to communicate information specific to needs

3. **Provide committed resources:**

- Ensure a creative and professional look and feel for marketing purposes in the development of the site
- Use consultants that are innovators in education
- Use student ambassadors or internal site administrator to monitor and check public information

4. **Be aware of psychology of use:**

- Recognize that fads in technology change quickly
- Recognize that some people use social networking purely to revalidate their own egos
- Ensure whoever is on the Facebook page is passionate about STEM and scientific research