Exemplary Practices for Engaging Underrepresented Minority Youth in STEM Includes List of Examples

These Exemplary Practices build on research and evidence-based practice in K-12 programs and have been adapted from the NSF-funded Computer Science Collaboration Project. The examples are designed to facilitate the implementation of the practices.

1. **Offer Culturally Targeted Recruitment and Programming**
   a. Use recruitment strategies designed to make youth feel welcome and valued
   - Target and personally invite youth and their friends.
   - Work with trusted organizations, schools, and community leaders to promote programs.
   - Include snacks, dinner, music, warm up activities (e.g., Loteria), or raffles (and highlight these on fliers) to add an element of fun, culture, and informality to the event.
   - Have staff that reflect and/or are familiar with the community you are trying to reach be the ones to promote programs directly with students through school/club visits, booths at community events, and other school events (e.g., sporting activities, assemblies).
   - Include a program name that indicates the program is designed with them in mind (e.g., SciGirls en Familia, Black Girls Code, Latinas in Computing).
   - If students are bilingual, provide materials in their native language.
   b. Incorporate cultural values, strengths, and celebrations into activities and curricula
   - Have students do projects that require them to incorporate information about their own lives.
   - Have students design products that benefit their families, homes, friends or community.
   c. Include activities to strengthen ethnic identity
   - Do group cohesion activities that allow students to share cultural traditions in their family.
   - Encourage students to design projects and to speak in their native language.
   d. Provide access to role models and/or mentors that share their cultural background
   - Bring in and/or develop materials that profile role models that share their cultural background; draw on local industry and college students.
   - Watch or listen to role model profiles (online, video, in person) as a group and discuss.
   - Have staff with similar backgrounds share their own stories about their path to college/career.
   e. Help youth navigate competing expectations across their home, peers, school and community
   - Build relationships with youth; learn about their interests, families, and dreams as well as their home-life, study habits, grades and goals.
   - If possible, meet their parents and communicate the importance of their support in their child's academic life.
   - Provide emotional support (e.g., encouragement and positive feedback on their abilities or work) as well as instrumental support (explain college requirements, get them access to computers, a quiet study area, or a safe and positive place to spend their free time).
   - Schedule programs to avoid potential scheduling conflicts (e.g., sports, work, or at-home responsibilities).
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f. Build on what students are interested in
- Allow time for free exploration to foster curiosity and buy-in.
- Link activities to real-world issues.
- Encourage and support pair programming by showing examples of effective and ineffective pairs, and rewarding students who work well together.
- Have slightly older peers help teach or assist in the classes.
- Create or use an online/anytime, secure social networking site to build a community of support.

g. Include strategies that build on the resources of bilingual and English language learners
- Assess English language proficiency at the beginning of your program; have Spanish-language resources available to complement curriculum.
- Have participants work in groups which comprise multiple levels of English language proficiency so that they can work together and use individual strengths to complete activities.
- Call on Spanish-speakers regularly to participate in discussions. Interpret for group if needed.

2. Foster Family Involvement
   a. Meaningfully engage families to increase their buy-in, and build their knowledge and social networks
   - Invite families to a kick-off event to learn what students will be doing and why it is important (to achieving college access, inspiring an interest in learning, a career, meeting the needs of future workforce – learn what is important to parents and speak to that).
   - Set up field trips and/or celebration events (e.g., end of school) and invite parents. Allow students to showcase their projects at events.

   b. Educate family members and other key adults to build youth’s network of support and encouragement
   - Assess topics that parents want to learn more about (e.g., cybersafety, building a webpage, college requirements) and hold workshops on these topics.
   - Connect with teachers, professors, administrators, counselors, parents, etc., to talk about your program and its benefits.
   - Learn about individual students’ demonstrated interests, strengths and needs and bring these up in conversation with other adults. Ask about resources that might address these students’ needs and connect them directly to the students if possible.

   c. Provide culturally competent staff to connect with and get regular input from family members
   - Make sure staff members can communicate effectively with parents and students by building trust and requesting feedback regularly via discussions, phone calls, short feedback forms and/or questionnaires at events, etc.
   - Explain why it is important for the program to hear from them – and mean it. Follow up on comments and why or why not changes were or were not implemented.
   - Ensure that staff members are aware of possible challenges to participation such as conflicting work schedules for parents, family obligations for students, and that they address these with changes in program schedule, follow up phone calls, home-visits, etc.
3. Carefully Select and Train Staff Members
   a. Use program volunteers and staff with first-hand experience of the youth in their community
      • Connect with organizations that are leading successful programs in targeted communities to post job announcements and volunteer opportunities.
      • Utilize the skills and resources of the family members—ask them to volunteer.
   b. Require regular training of program volunteers and staff on how to maintain a culturally competent program
      • Develop an embedded staff training program which allows new staff to observe current staff or volunteers for a period of time before leading any activities on their own.
   c. Use social science research to inform staff training
      • Research and implement strategies on how to reduce Stereotype Threat (http://reducingstereotypethreat.org) and on how to avoid reinforcing a Fixed Mindset (http://learningandtheadolescentmind.org/people_01.html).

4. Additional Practices to Engage Underrepresented Youth in STEM Programs
   a. Foster curiosity and exploration
   b. Link activities to real-world issues
   c. Have students work in pairs
   d. Use near-peer role models
   e. Increase computer access
   f. Offer classes beyond typing
   g. Create an online/anytime network of support
   h. Work with mentors that can offer meaningful guidance
   i. Work with local colleges and universities to ensure programs prepare students for college-level science
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References for Exemplary Practices

1. **Offer Culturally Targeted Recruitment and Programming** (Denner, Bean, & Martinez, 2009; Fuller & García Coll. 2010; Gándara & Contreras, 2009; Hobbs & Sawer, 2009; Oyserman, Brickman, & Rhodes, 2007; Rodríguez, Baumann & Schwartz, 2011)
   a. (Simard, Stephenson, & Kosajaru, 2010)
   b. (Franklin, Conrad, Aldana, & Hough, 2011)
   e. (Gasbarra & Johnson, 2008)
   f. (Cooper, 2011; Denner & Martinez, 2010)

2. **Foster Family Involvement** (Bandy & Moore, 2011; Behnke, Piercy, & Diversi, 2004; Denner, 2009; Denner & Rivera, 2011; Hobbs & Sawer, 2009; Kiyama, 2011; Zarate & Gallimore, 2005)
   a. (Behnke, Gonzalez, & Cox, 2010)
   b. (Engelman, McKlin, & Guzdial, 2011)

3. **Carefully Select and Train Staff Members** (Hobbs & Sawer, 2009)
   a. (Goode, 2008)
   b. (Goode, 2008)
   c. (Gonzalez, Blanton, & Williams, 2002)
   d. (Goode, 2007)
   e. (Goode, 2007)
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Complete List of References


### Additional Resources

Hispanic-White Achievement Gap Publications

White House Initiative on Educational Excellence for Hispanics
[http://ed.gov/about/inits/list/hispanic-initiative/index.html](http://ed.gov/about/inits/list/hispanic-initiative/index.html)


Latinas in Computing [http://anitaborg.org/initiatives/systers/lic](http://anitaborg.org/initiatives/systers/lic)