

Curriculum Partners Answer Questions

On March 31, 2009, the Educational Equity Center at AED hosted a webinar titled: *Great Science for Girls (GSG): Evidence-Based Curricula for Girls*. This webinar featured four GSG curriculum partners who talked about their programs and curriculum materials. Thank you to all those who participated. The recording of the webinar is available at the GSG website: www.edequity.org/gsg/about/webcasts.

The following are questions posed by participants. Click on the question to read the answers.

Contact information for the curriculum partners are provided here in the event you would like to follow up on any question/answer listed below.

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Questions

- Are there programs that help facilitate STEM learning experiences for girls and their dads/male role models?
- Do you know of any information developed for preschool age children regarding science focus for girls?
- Is there additional information about girls' learning styles, i.e. brain research?
- Was it difficult to get the girls to the programs, especially the 11-14 year olds? What did you do to get that age group?
- If we want to reach out to all girls, not just underserved, would you have programs for them? Such as for gifted & talented girls.
- Have these programs been implemented for week-long all-girl camps?
- Have any of these programs been implemented with boys and girls, and does that change outcomes?
- What are some challenges you've encountered with your different programs, and how did you work with them/get around them/modify your programs to accommodate them?

Are there programs that help facilitate STEM learning experiences for girls and their dads/male role models?

Dale McCreedy: GAC has been very effective in cultivating collaborative science learning for dad-daughter teams. Also see the new NAS publication for references (Section 7-10); Tenenbaum and various co-authors; Frome and Eccles.

Linda Kekelis: Christina Chhin, Martha Bleeker, and Janis Jacobs's article *Gender-Typed Occupational Choices: The Long-Term Impact of Parents' Beliefs and Expectations in Gender and Occupational Outcomes* (Eds. Helen Watt and Jacquelynne Eccles) addresses this topic. The authors found "that parents' gender-typed career expectations were strongly related to their adolescent children's career expectations 2 years later but that this relationship varied depending on the gender of both the parent and the adolescent... fathers' occupational expectations significantly predicted both daughters' and sons' gender-typed career choices at age 28, whereas mothers' occupational expectations only predicted daughters' career choices at age 28."

Maryann Stimmer: *More Dads Influence Daughters' Career Paths*

by Tara Parker-Pope --an interesting article about dads' influence on daughters' career selection for science careers: <http://well.blogs.nytimes.com/2009/02/23/more-dads-influence-daughters-career-path/?apage=2->

Linda Colón: See the online science magazine, Science Daily - *How Dads Influence Their Daughters' Interest in Math* which reports on the results of a study from the University of Michigan's Institute for Social Research. One of the study's findings indicated that fathers in particular have a major influence on whether their daughters develop an interest in math. It points out that fathers spend more time on math and science activities with their sons and buy them more math and science toys. The complete study can be downloaded at: www.sciencedaily.com/releases/2007/06/070624143002.htm

Do you know of any information developed for preschool age children regarding science focus for girls?

Maryann Stimmer: www.preschooleducation.com/art19.shtml -- At this site there's a nice piece titled: *Math, Science, and Girls: Can We Close the Gender Gap?* It makes the nature/nurture argument.

Linda Colón: Visit the *Science: It's a Girl Thing* facebook page developed by the Educational Equity Center at AED. Early childhood activities are downloadable and designed for parents and children to do together at home. There is also a guide for families and short videos to spark interest. [facebook.dj/scienceitsagirlthing](https://www.facebook.com/scienceitsagirlthing)

Is there additional information about girls' learning styles, i.e. brain research?

Linda Kekelis: See *Why Aren't More Women in Science? Top Researchers Debate the Evidence*. Ed. by Stephen Ceci and Wendy Williams -- a collection of 15 essays by top researchers on gender differences.

Was it difficult to get the girls to the programs, especially the 11-14 year olds? What did you do to get that age group?

Dale McCreedy: For GAC - a program targeting K-8th - we had some trouble getting older girls. Building this audience at this age without a history is a challenge. We ultimately had the greatest success by "growing our own" - that is, tapping into girls in late elementary and then encouraging them to stay as they moved into middle school. Because this was a child/adult partnership program, it was also an advantage to have influential adults encouraging sustained participation, which was easy once they had a history of benefits within the program.

The other approach we found successful was identifying a supportive teacher who had access to this age girl. In our case, we were reaching out to a Latino community, and found a teacher of technology at a K-8 school who took the lead in recruiting and encouraging participation ... and she participated herself. "Insiders" generally have more influence and knowledge about what will work within their community.

Linda Kekelis: When some girls hear about a science or technology program, they have all sorts of reasons not to join-sounds nerdy, they're not smart enough or good enough with computers, they don't know anyone in the program, etc. We found that it helps to talk with girls and show them the kinds of projects that they'll get to work on. We had telephone kits that girls absolutely loved and these were a great recruiting tool. The idea of meeting role models or going on field trips also was of appeal to girls in the 11-14 range. What we have found to be especially helpful is working with teachers who can personally invite a girl. At the start of each school year when we ask girls why they join Techbridge, many of them tell us that a

personal invitation from a teacher brought them to the program. We also get the word out to parents through newsletters and PTSA meetings. Sometimes parents will appreciate the educational benefits of a science or technology program and will encourage their daughters to sign up. It helps for parents to ask their daughters to give the program a chance and attend a session or two. Usually, by then, the girls find that they do enjoy the program and continue because they want to, not because they have to.

If we want to reach out to all girls, not just underserved, would you have programs for them? Such as for gifted & talented girls.

Dale McCreedy: I feel that ALL girls need opportunities, and certainly a program like GAC will work for all audiences - I have used it within my children's schools as a family workshop for the PTO for example - with 60-80 people in attendance. I think there are several points to address. First of all, that while not all children have common experiences, most of us would probably not argue that certain populations have more access than others. Often children of more affluent background have access to schools with better resources and have support structures that promote and support extracurricular activities that may support science learning. Therefore, experiences that can't flex a bit to reflect what people bring with them may not serve as broad an audience. However, that said, since "gifted and talented" is specifically listed, it is important to note that there are "gifted and talented" across demographics. A program like GAC, for example, which was developed with the notion that a shared experience is provided as grounding for a challenge or science scenario, with subsequent exploration and engagement activities are able to be shaped by participants and some facilitator support by building on individual questions and experiences in ways that are appropriate for people with different experiences, ages, histories.

Linda Kekelis: Our programs serve a wide range of girls-from the gifted and talented to girls in the middle, to those who are struggling academically and those in special education programs. We find that through teamwork and community building that the underserved and those with more advantages can work together and benefit. In fact, we hear from our girls that they enjoy and appreciate the opportunity to work with and get to know girls from different ages, backgrounds, and social classes. Having the chance to get beyond their friendship circles and comfort level takes some work on the part of staff and the girls, but it's worth the effort.

Linda Colón: Our approach to engaging and supporting girls (and all children) in science learning is to expect the best from each child. With that in mind, Afterschool Science PLUS is designed to build on what students bring to the activity. Working in small groups, students learn and teach each other. They make observations and guesses, conduct experiments, problem-solve and think creatively. Diversity of experiences, views, learning styles, abilities and disabilities are the "PLUS" that makes the science learning process in particular, work so well.

Have these programs been implemented for week-long all-girls camps?

Lisa Regalla: There have been several SciGirls all-girl summer camps. A great example is the SciGirls program in Tallahassee. They have two concurrent summer camps: one for new SciGirls campers, and one for returning girls. More information is available at: www.wfsu.org/kids/scigirls/index.php. There is also a blog about and for Tallahassee SciGirls at <http://scigirls.blogspot.com/>.

Dale McCreedy: GAC has been adapted to camp settings. Instead of girl/adult partnerships, older girls have worked with younger ones. I would be happy to discuss adaptation to camp further should someone be interested.

Linda Kekelis: Techbridge has offered 2-week summer programs where the girls have had the chance to work in depth on an exciting array of projects-from Cars and Engines, to Green Doll Houses, to Engineering Design. These programs give our staff an opportunity to develop new curriculum and test it out with a group of girls before we launch the projects with our after-school programs. We hosted a 4-year summer academy where we worked with the same group of girls and found that the impact was substantial in interesting the girls in studies and careers in engineering. This summer we are trying a series of one-day science projects and are looking forward to seeing how this works. The projects for this series include America's Top Robot, Mythbusters, and building an ROV.

Have any of these programs been implemented with boys and girls, and does that change outcomes?

Maryann Stimmer: AS+ has been used in all girl and co-ed settings.

Linda Colón: Pre- and post-evaluation results of AS+ indicated that boys' attitudes about girls who do science became more positive.

Dale McCreedy: Again - I have used GAC curriculum in a school setting - inviting families to come, preferably as partners (1:1 when possible) but have not specified gender in these settings.

What are some challenges you've encountered with your different programs, and how did you work with them/get around them/modify your programs to accommodate them?

Lisa Regalla: One challenge SciGirls has faced is trying to engage more girls from underrepresented communities in STEM. This year, we were able to get NSF funding to create new bilingual resources: SciGirls en Español DVDs, Activity Guides, and parent brochures. We are partnering with nine organizations across the country to implement bilingual SciGirls programs that serve predominantly middle school Latina girls. These organizations already have strong connections to Latino communities, bilingual educators, and experience with bilingual education programs. For SciGirls, these partnerships are key to reaching diverse audiences.

Dale McCreedy: GAC's original goal was multifaceted - promote science learning for underserved communities by offering programs ideal for girl/adult pairs. When we piloted the program, we had diverse sites, each with different challenges. For example, some sites very committed to serving particular communities that were underserved, and new to their museum, found that while GAC worked really well, participating partners were more often a mom and multiple children. They needed to adapt the program to meet these needs.

Linda Kekelis: This is a great question. One challenge that we had when we launched Techbridge was helping the interest that girls had for science and engineering, lead to a career goal. We heard from girls that they thoroughly enjoyed the hands-on projects we introduced, but considered the activities like hobbies. We expanded upon our program with role model visits to our after-school programs and also field trips to worksites. These have been very successful in expanding our girls' career interests and the girls will remember role models they met from years ago as pivotal in the academic and career choices.

Another lesson we learned in introducing role models and hosting field trips is that these experiences require considerable time to plan but they are worth the effort. We know that teachers and role models are busy and so our staff puts in the time to plan for the events as much as we can. It is important to discuss what makes for successful interactions with girls and to check in periodically to make sure that you and everyone involved in these outreach efforts are on the same page. Follow-up is also helpful for sharing lessons learned and also communicating to role models and partners the impact they have made on your girls.

(Note: *Get Involved...Make a Difference: A Guide for Classroom Visits and Field Trips for K-12 Students* - a resource developed by Techbridge for role models in encouraging girls in technology, science and engineering can be found at the GSG website: <http://edequity.org/gsg/files/Get-Involved-Make-a-Difference.pdf>)

Linda Colón: Every implementation provides an opportunity to address new challenges and share creative ideas for addressing them. One example is, when girls were asked to draw a scientist as part of the "Who Does Science" activity (in Afterschool Science PLUS) we found that they drew the basic stereotype (as did the boys) of the Einstein look-a-like scientist. One clever idea was to take a photo of them doing science and writing on it their name, e.g., "Lisa doing science." I think this really started helping students envision themselves as scientists and I believe, increased their interest in learning about contemporary scientists.