Creating Passages for Young Minority Girls

Bradley Scott, Ph.D.

The gender gap – what is it? After all these years of gender equity in schools, does the gap still exist? Can it be closed? The answers to these questions are both simple and complex.

For instance, there are still gender gaps between girls and boys in various aspects of achievement and other performance outcomes in schools. In some areas, girls once performed consistently lower than boys on standardized math and science tests, while recently that is no longer the case.

But, in middle and high school, when science, math and computer courses are elective courses, girls tend to take fewer of them than do boys (National Science Foundation, 2003). Such courses as science, technology, engineering, and mathematics have commonly become labeled as "STEM."

The gap not only persists, it is changing. M.K. Gavin found that there is a new gender gap in technology (Gavin, 2000). Although the gender gap in advanced placement technology and computer science test performance has narrowed significantly, the percentage of women taking the exam is consistently low.

Yet, the Association of Medical Colleges found that for the first time ever, women made up the majority of medical school applicants in 2003, while there has been a sharp decline in males applying to medical schools (NEA, 2004).

So the gap is closing in some areas but still exists in others. There is an explanation offered in some circles for why this is so.

The Congressional Commission on Women and Minorities in Sciences, Engineering and Technological Development has noted that images of female scientists and engineers are still rare. Women make up only 19 percent of workers in science, engineering, and technology. The 10 fastest-growing occupations are in these very areas where women are under-represented.

S. Rosser and J. Montgomery's research found: "The continuing low numbers of women in many science, engineering, and mathematics fields provide other particular challenges and opportunities… These low numbers mean that a woman often serves as the first or one of few women… Women may have no senior women colleagues to act as role models, serve as mentors for them, and provide them access to networks of necessary professional information" (2000).

S. Malcolm is of a similar opinion regarding girls, in general, and minority girls, in particular. Minority girls are doubly challenged to be represented in STEM. As an African American scientist, she noted: "I came to understand that concern for social justice [where girls, particularly minority girls are concerned] could be expressed by mentoring freshman women, reassuring them that is was OK to do something nontraditional, by refusing to settle for anything less than excellence so as not to reinforce low expectations, and by confronting bigotry and narrow-mindedness from those who saw deficiency in difference" (Malcolm, 2000).

A growing number of people believe that the gender gap can be eliminated. The National Association of Elementary School Principals has commented that the achievement gap can be eliminated with the right supports, resources and efforts on the part of all education stakeholders. It goes on to state, "Educators must bring the same attention to girls' achievement in sciences, engineering, and technology that they successfully brought to math" (NAESP, 1999).

Gavin suggests that schools also invite, involve and educate parents as a way of supporting girls in math. For those that support parents, he recommends assisting them to do the following (Gavin, 2000).

- Create at-home activities that involve hands-on problem solving.
- Engage in daily math routines, such as grocery shopping and balancing check books.
- Collaborate with teachers in flexible and creative ways to make sure girls are challenged and energized about mathematics.
- Visit museums of science and explore the contribution of mathematics to the sciences and other disciplines.
- Encourage girls to participate in math clubs and competitions.
- Explore varied careers in mathematics fields.
- Provide female role models.

Darke and Clewell noted from their research that girls and boys show marked differences in levels of participation in extracurricular science activities. Boys participate more often in activities like science projects and hobbies. The researchers state, "This lack of informal science experience may negatively affect future learning outcomes in science for girls" (Darke and Clewell, 2000).

They recommend the use of innovative settings – like museums and parks, health care facilities, research facilities, laboratories, industrial and commercial sites, community centers, and online communities – to attract and engage girls in STEM.

Interventions such as mentoring and role modeling, summer science camps, internships, and cyberspace support also can be used to draw girls to STEM.

The Intercultural Development Research Association found in its work that minority girls express a powerful need to see and interact with minority female role models (Scott, 2001; Suda et al., 2000). The IDRA South Central Collaborative for Equity used this information to create a supplemental middle school science curriculum *Minority Women in Science: Forging the Way*. The curriculum uses the stories of minority female scientists as a basis for teachers and students to examine the personal and systemic challenges these women had to face to become scientists, mathematicians and engineers.

Following the guidance on what works from research, the curriculum provides students with hands-on in-classroom and outside of classroom experiences in the STEM disciplines represented by the women in the curriculum.

The goal of the curriculum is to create STEM passages for minority girls and other students while addressing a critical issue raised by the National Science Foundation: "Socially projected stereotypes about who should be scientists and engineers pose artificial limits on the participation of talented students. Gender is only one of the characteristics that shape

personal and group identity. Other characteristics such as race, ethnicity, economic status, religion, and disability also bear on whether students are encouraged, neglected, or discouraged from developing certain skills and ambitions. Our educational system must seek to develop talent and interest in science, mathematics, and technology in all children" (2003).

The real challenge to be faced on every front is to build STEM passages to prepare all learners to step up to the growing demands of these hyper-growth disciplines and professions. Research, training, professional development, focused application of resources, and thoughtful collaborative interaction among the critical stakeholders will be the vehicles to deliver us to the goal.

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Bradley Scott, Ph.D., is a senior education associate in the IDRA Division of Professional Development and director of the IDRA South Central Collaborative for Equity. Comments and questions may be directed to him via e-mail at feedback@idra.org .