



Strategies for Women's Success in STEM



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Introduction

The disparity between young women's science aptitude and STEM retention rates has been the focus of many studies. A variety of barriers prevent young women from either choosing STEM fields as a path of study in higher education, or continuing to work within the industry after graduation. Gender Bias, sexual harassment in school or in the workplace, and perceived incompetence are all noted barriers for young women looking to work in STEM fields. This poster focuses on the strategies that can be implemented to help encourage the success of young women in science, including strategies for schools and teachers, parents, and young women and men in social situations.

Background / Statistics

- 41% of PhD's in STEM fields, but make up only 28% of tenure-track faculty
- 57% of women participate in the workforce but only 26% of math and computer careers are filled by women.
- Young girls consistently do better than young men in STEM classes in elementary and middle school, though by college their participation in these fields has dwindled

I focused on finding strategies that support young women while they are in school in an effort to increase retention rates in STEM careers.

Barriers to Success

- Implicit bias** - Unconscious decisions about what a certain gender or group of people is good at, or how they should behave
- Explicit bias**: consciously held beliefs about a certain gender or group of people
- Influences from: Parents -> Peers -> Teachers
- Socially enforced gender roles
- Representation of women in STEM
- Sexual harassment as a barrier to STEM Careers

Strategies to Address Barriers to Success

<p>Parents</p> <p>Children's Choice -Clothing, activities, books, sports, toys, dress-up choices</p> <p>Gendered Language -Avoid gendered cliches as a way to demonstrate gender equality such as: boys don't cry, such a pretty girl, boys will be boys</p> <p>Equal Representation -Provide examples of women and men in various roles: stories that focus on girls as the protagonist in sports, science, or adventure stories as well as boys as artists and caregivers</p> <p>Validating Emotions -Recognize that children's emotions and reactions are very real to them and should not be ignored: avoid discouraging girls from being angry or bossy, or telling boys to toughen up when they are sad or scared</p>	<p>Peers</p> <p>Media Literacy -Help kids understand how what they see on TV and in the media perpetuates harmful stereotypes</p> <p>Tools for Success -Give young girls the tools to stand up for their choices with peers, especially regarding gender roles</p> <p>Gendered bullying -Have discussions about how teasing someone for their gender choices is wrong and how to avoid it and combat it when it is used against them.</p>	<p>Teachers</p> <p>Classroom Expectations -Model appropriate classroom behavior independent of gender where all students are held to the same community standards.</p> <p>Equal Access -Equal opportunities for girls and boys to join clubs, activities, and teams including exposure to these activities during normal classes and lessons. -Use examples of all genders in lessons and class activities:</p> <p>Gender Expectations -Avoid organizing activities based on gender roles. -Be conscious of the way you model gender roles in class and encourage these behaviors in students</p> <p>STEM as Required Core -To promote success and interest in STEM these classes should be included in the core curriculum for all students</p>
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High School

Retention
-By late middle school girl's confidence and interest in STEM is already in decline
-Girls who are talented or interested in STEM should be supported through mentorship and encouraged to pursue STEM in College

Sexual Harassment
-Young women can feel isolated in STEM fields especially when peers and mentors engage in harmful language or behaviors like sexual harassment or exclusion based on gender.
-Schools, labs, or STEM focused clubs should focus on zero tolerance policies that help support women feeling safe and included in male-dominated spaces



Career Success

Women Helping Women
-Women in STEM should work to mentor and support younger women colleagues to help them feel included and supported in the field.

Old Boys Clubs
-Similar to sexual harassment and gender-based exclusion, it can be difficult to be successful in a work environment that supports gender bias in networking situations

Retention & Promotion
-Employees who provide child support and maternity leave greatly increase women employee's retention rates. These considerations can allow women to remain in the work force, or more easily re-enter if they decide to have a family.

STEM Education Reform

- Next Generation Science Standards
 - College Board Science Standards for College Success
 - 21st Century Learning
- Examples of education frameworks that support STEM education as vital core subjects for all students. Supports STEM earlier in education as an important skill to compete in a globalized society.

Future Research

- Adolescent Girls**
-How parents talk to their girls and what activities they enroll them in from a young age affects girl's school performance and future interests.
- Looking at gender-neutral parenting / schooling as a strategy to avoid implicit biases
- Girls in School**
-Strategies of STEM clubs in US schools and their success with young girls
- How social climates between boys and girls influence girl's interest in STEM
- Higher Education and Career Success**
-Women's experiences with sexual harassment and gender based exclusion in classes or in the workplace
- Women's choices for leaving STEM majors or careers and understanding the cause of these choices

Conclusions

Women's retention rates in science fields are well below the workforce average, leading to a less diverse work force focused important national problems. A variety of social and institutional barriers affect how we perceive girl's science aptitude and their ability to compete in STEM fields. The absence of women in STEM leads to male-centric work forces that can be exclusionary and aggressive towards women in the field.

By focusing on early intervention that teaches both girls and boys the worth of women in science, more women can stay in STEM fields leading to a more diverse and advanced work force focused on today's pressing issues.

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