What educators need to know about . . .

Encouraging Talented Girls in Mathematics

M. Katherine Gavin

If a girl who is extraordinarily gifted in math decides against math, the loss may be great indeed. She may have been the one to discover a new theorem; she may have been the one who found a way to understand gravity; or the cell she may have had the happiness of doing the work for which she is uniquely suited.

Barbara Kerr, Smart Girls Two (1994, p. 205)

The National Research Center on the Gifted and Talented

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### Accommodating Learning Styles

Teachers should recognize a variety of learning styles and adapt their teaching methods accordingly. This can be achieved by incorporating cooperative learning strategies, which have been shown to enhance student engagement and learning outcomes. Cooperative learning involves students working together in small groups to achieve a common goal, thereby promoting critical thinking, problem-solving, and social skills. Effective group dynamics require clear communication, mutual respect, and support among group members. Teachers can facilitate this process by ensuring that group compositions are diverse and by providing regular feedback to groups to help them improve their collaborative skills.

### High Expectations and Beliefs

Achieving high expectations and beliefs in mathematics education is crucial for girls. Teachers should set high standards for their female students and encourage them to believe in their abilities. This can be achieved by providing them with challenging problems, recognizing their achievements, and promoting a growth mindset. Teachers must also be aware of and address gender stereotypes and biases that may influence their expectations for female students. By doing so, they can help girls develop confidence and competence in mathematics, which is essential for their future academic and career success.

### Making Connections

Making connections between mathematical concepts and real-world applications is essential for engaging girls in mathematics. Teachers can integrate STEM (science, technology, engineering, and mathematics) projects that are relevant to girls' interests and experiences. For example, a project that explores the mathematics of fashion design or the engineering of a sustainable city can be particularly appealing. By connecting abstract mathematical concepts to real-world problems, teachers can help girls see the relevance and practical applications of mathematics in their daily lives.

### Female Role Models

Promoting female role models in mathematics education is crucial for encouraging girls to pursue careers in the field. Teachers can highlight the achievements of female mathematicians and scientists, both past and present, to inspire and motivate their female students. This can be done through guest lectures, school visits, and educational resources that feature female mathematicians. By seeing that mathematics is not only a viable career option for girls but also a field where women have achieved significant success, girls are more likely to consider a career in mathematics.

### Cooperative Versus Competitive Settings

Research has found that cooperative learning environments are more effective for girls in mathematics than competitive settings. In cooperative settings, girls are encouraged to work together, share ideas, and support each other's learning. This can lead to increased motivation, higher self-esteem, and better academic outcomes. In contrast, competitive environments may create anxiety and feelings of inadequacy, particularly for girls who are not as confident in their mathematical abilities.

### Accommodating for Differences

It is important for teachers to recognize and accommodate for differences in learning styles and abilities among female students. This can be achieved by using a variety of teaching methods and materials that cater to different learning preferences. For example, visual learners may benefit from diagrams and graphs, while auditory learners may prefer lectures and discussions. By providing a range of learning opportunities, teachers can help ensure that all girls have the chance to succeed in mathematics.

### Research and Evidence

Recent research has shown that girls are more likely to participate in and enjoy mathematics when they are taught by female teachers who are confident in their mathematical abilities. This suggests that female role models in the classroom can have a significant impact on girls' attitudes and achievement in mathematics. Additionally, integrating STEM projects that are relevant to girls' interests and experiences can help engage them in mathematics and support their long-term educational and career goals.