



Girls' Experiences in the Classroom: Information Sheet



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Mr. Parker, Melanie's fifth-grade science teacher, found her to be an ideal student. Melanie showed great aptitude in her studies and, like many of her female classmates, was mature and well-behaved in the classroom. Because the girls behaved so well, Mr. Parker concentrated his efforts on controlling some of the more unruly boys in class by involving them in discussion and activities. As a result, the boys were given much more attention than Melanie and other girls. To keep the boys interested and attuned, Mr. Parker chose science examples that appealed to the boys (i.e., examining bugs under a microscope, building a battery) and tried to use a lot of examples of boys who grew up to become famous scientists. Melanie would sometimes raise her hand to ask questions but Mr. Parker often ignored her hand and responded most quickly to the boys who answered without raising their hands.

This real-world example illustrates how teachers treat boys and girls differently in the classroom, whether in science or not. Melanie is not getting Mr. Parker's instruction, attention, and encouragement to the same extent as her male peers. While Mr. Parker may appreciate her maturity in class, he does her a disservice by focusing on the male students. It may not be surprising, then, that as she exits the fifth grade, Melanie begins to believe that "science is for boys" and her interests shift to other academic domains where she is a central and included participant in the classroom.

Girls and women earn comparative if not higher grades in coursework throughout their schooling. Although there are impressive increases in the number of women achieving bachelor and advanced degrees, there continues to be a shortage of female students trained in STEM fields (Herzig, 2004) and careers (U.S. Bureau of Labor Statistics, 2008). Women make up less than 40% of students in STEM graduate programs (NSF, 2004). One possible explanation for the gender gap in STEM-related fields is the divergent experiences that male and female students have in the classroom, which manifest as the following:

Interest Levels:

- STEM-classes may discourage interest levels in girls more than boys because of the pedagogical style (i.e., less interactive, more hierarchical; Gerber & Cheung, 2008).
- Women report that they are more likely to switch from STEM to non-STEM majors because of intrinsic interests and a desire to pursue careers that are more humanitarian in nature (Seymour, 1995; Mau, 2003).

Confidence Levels:

- Men have higher levels of STEM-related self-efficacy than do women (American Association of University Women [AAUW], 1991; Betz & Hackett, 1983; Pajares & Miller, 1994; Schunk & Pajares, 2002).
- When preparation and confidence levels are controlled, gender differences in math achievement disappear (Lapan, Boggs, & Morrill, 1989).

Peer Interactions:

- Peers play an important role in shaping students' educational aspirations (Buchmann & Dalton, 2002).
- Students tend to segregate themselves by gender and this effect may influence and reinforce gender differences in STEM-related aspirations and achievement (Maccoby, 2002).
- Male students may marginalize their female counterparts, by interacting with them in terms of sexual interests, not including them in study groups, and believing that women cannot succeed in STEM fields (Seymour, 1995).

Teacher Interactions:

- Teachers call on and allow male students to respond to questions more frequently, and interrupt male students less frequently than female students (Bailey, 1993; Hall & Sandler, 1982).
- Teachers interact with, reprimand, and critique male students more than female students. Teachers may be "protecting" female students by not challenging their ideas or critiquing their work, leaving female students less-prepared for course exams or demanding assignments (Jones & Dindia, 2004).
- Teachers are generally more accepting of male dominance than female dominance in the classroom (Jones & Dindia, 2004).

Performance and Perseverance:

- Throughout their academic careers, female students tend to receive equal or better grades than do male students; yet, women pursue STEM graduate study and careers at lower rates than do men (AAUW, 1998; Gallagher & Kaufman, 2005).
- High-stakes tests (SAT, ACT) are among the most important determinants of future success; however, they display the largest gender differences of any assessment tool (AAUW, 1998).
- Women are less likely than men to choose STEM-related careers, which has been linked to stereotype threat and disidentification processes (see Davies & Spencer, 2005).

We have identified the following remediation tactics for educators at the individual and organizational levels.

- Teachers, parents, and other role models must hold equal expectations for girls and boys. Some of the most profound social psychological research shows that differing expectations for students affects their achievement levels (Rosenthal & Jacobson, 1968; Jones & Dindia, 2004).

- Teachers and other role models should prepare and encourage more girls, in particular, to enroll in honors and AP level STEM courses – especially in physics, engineering, and computer science, where the gender gap is especially large (AAUW, 1998; Buchmann, DiPrete, & McDaniel, 2008).
- Educators must correct the unfair practices they may be employing in their classrooms. One way to do this is to provide teachers with gender equity training, especially before they begin teaching (AAUW, 1998).
- Educators should implement identity-safe environments that decrease the vulnerability that female students feel when facing stereotypes, stereotype threat concerning their STEM-related performances, and potential failures (Seymour, 1995; Spencer, Steele, & Quinn, 1999).
- Educators should emphasize aspects of STEM majors and careers that are particularly appealing to women (i.e., ability to help others; Miller, Blessing, & Schwartz, 2006; Seymour, 1995).
- Researchers should continue to evaluate assessment procedures to determine the fairest testing practices and those that most accurately reflect students' knowledge (AAUW, 1998).
- Researchers should disaggregate, or separate, data whenever possible to show data by gender, socioeconomic status (SES), race, and ethnicity. (AAUW, 1998; Buchmann et al., 2008).

In sum, female students have the aptitude to succeed in STEM fields, but their experiences in the classroom may be discouraging them from pursuing STEM studies and careers. Although female students take classes that prepare them for work in STEM-related fields and perform as well in their coursework as their male peers, they do not participate in STEM-related careers at the same rates as do male students. Thus, it is critically important that educators foster an interest in and a sense of identity with STEM fields for female students.

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I. Citations

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