

Executive Summary

Why kids of color are not entering STEM?

- Minority students' math achievement. Compared to their White counterparts, minority students are found to perform significantly worse on mathematics in high school, which affects their entrance to STEM majors (Riegle-Crumb, Moore, & Ramos-Wada, 2010).
- Parents' educational attainment. The percentages of Black, Hispanic, American Indian Children who had parent with a bachelor's degree or higher are among the lowest. For example, the percentage for Black children is only 20% compared to Asian, 59%, and White, 44% (NCES, 2012).
- Family STEM influence. Children who have parents working in STEM fields are more likely to take a STEM major in college (Chute, 2009). The percentages of Black, Hispanic, American Indian Children who had parent working in STEM fields are much lower than Asian and White children (Wang, 2012)
- Math/science teacher influence including the race and gender of the math/science teacher. The percentages of Black and Hispanic math and science teachers are much lower than that of White teachers (National Science Foundation, 2011).
- Racial/Ethnic concentration and school context (The National Academies, 2011; NCES, 2012). For example, in 2010-11, 46% of Black students attended predominantly Black schools which have relatively lower quality compared to predominately White schools (NCES, 2012).
- High school guidance counseling. In 2009, only 445 of Black students had counselors who reported that the primary counseling program goal was helping students plan and prepare for postsecondary education (NCES, 2012).

Citations

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Why women of color are not entering STEM careers?

- The lack of women of color role models in STEM careers for minority women (Gayles, & Ampaw, 2011)
- Minority females' aspiration for STEM is limited by their low levels of academic preparation at an early time point in school (Riegle-Crumb, Moore, & Ramos-Wada, 2010).
- College experiences. Women of color are most likely to be steered away from STEM fields under the pressure of institutional selectivity as well as an inhospitable academic climate (Espinosa, 2011)
- The lack of support for women especially for women of color in the traditional STEM environment (AAUW, 2010; Fletcher, 2004).

- Stereotype threat. Negative stereotypes toward women especially women of color, regarding their talent in and aptitude toward STEM majors and careers as lower than white counterparts (AAUW, 2010; Denner, 2011; Viadero, 2009).
- Fewer access to STEM courses in high school and fewer opportunity of exposure to new technology (Margolis, Estrella, Goode, Holme, & Nao, 2008).
- Males and females' different responses to incentives in STEM education and STEM employment (U.S. Dept. of Commerce, Economics and Statistics Administration, 2011).

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What practices seem to be effective for encouraging more students of color to enter STEM

- Teacher impact. Training math and science teachers from minority groups is positive in encouraging minority kids to enter STEM; and the mentoring from minority faculty members has an important role in the development of students of color pursue STEM careers (Griffin, Perez, Holmes, & Mayo, 2010).
- Culturally relevant practices which place much attention to both minority students' social and academic needs, such as the Scholars Programs (SP) by Central State University, a historically Black university (Kendricks & Arment, 2011). The SP incorporated supportive family environment, caring teachers, high expectations, academic rigor, and dynamic classroom strategies to overcome the barriers of minority students to enter STEM.
- Family involvement including exposing kids to STEM-related activities at an early age and build a supportive and encouraging network for kids with the help from the community or other organizations (The Computer Science Collaboration Project, 2012).
- Afterschool STEM programs/activities with a focus on minority groups such as After-School MathPlus with a focus on Asian- and African-Americans (Education Equity

Center at AED, 2007) and CSTEM with a focus on African and Hispanic students (Velez, 2011).

Citations

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What practices seem to be effective for encouraging women of color to enter STEM

- Effective encouragement. Encouragement from teachers or mentors requires no additional resources but needs attention to what women students performed and to be personal to increase the recipient's self-efficacy (National Center for Women & Information Technology, 2011).
- Role models for women of color. Exposing girls and women to successful role models to counter negative stereotypes and to encourage them to pursue a career in STEM (The American Association of University Women, 2010).

- Address peer culture in educational settings which has an important impact on women students' experiences at college and further influence their choice of entering STEM jobs (AAUW, 2010; Shapiro & Sax, 2011).
- Informal education programs using cultural responsive strategies and aimed particularly at girls of color, such as Girl Game Company (Denner, Werner, & Campe, 2005), digital mirror (Blair, Dietel-McLaughlin, & Graupner, 2010) and COMPUGIRLS (Scott, Clark, Hayes, Mruczek, & Sheridan, 2010).

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