

# Chapter 10

## The Role of Mentoring on the Retention of Women From Diverse Backgrounds in STEM

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### ABSTRACT

*Women continue to be underrepresented in the science, technology, engineering, and math (STEM) fields. This is concerning because STEM is a key driver of innovation and global competitiveness. STEM jobs in the United States are growing at a faster rate than other occupations, but there remains a shortage of qualified applicants. Women from diverse racial and ethnic groups represent an underutilized resource. However, they face multiple challenges as they enter the field, develop a STEM identity, progress in their education, and pursue and persist in STEM occupations. This chapter summarizes the key reasons for why there continues to be an underrepresentation of women (especially women of color) within STEM. It then discusses the role and impact of mentoring as well as the competencies required for effective mentoring. Finally, it presents recommendations for advancing mentorship efforts for women from diverse backgrounds within STEM.*

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## INTRODUCTION

The purpose of this chapter is to discuss the key issues related to women's underrepresentation within the science, technology, engineering, and math (STEM) professions. It also aims to examine the role of mentoring as an intervention that could enhance STEM interest, STEM identity and STEM retention among women, especially women from diverse racial and ethnic backgrounds. The chapter ends with recommendations for furthering research and mentorship efforts for women within STEM.

The authors begin with a story about an experience illustrative of some of the many challenges ahead for broadening participation in the STEM arena. In 2015, the second author was asked to volunteer as a judge for a science fair serving high schools located in the Northeast. This was what she observed:

*As a part of my work over the last several years with a Science Foundation who focused on high school students, I had the opportunity to meet many young students, many of whom are females who developed projects related to their interests in the sciences. Serving as a science fair judge to evaluate junior and senior level high school STEM projects opened a door to understanding one tool for pre-college science research education. Students are evaluated based upon an agreed set of criteria: creativity, scientific thought, thoroughness, and clarity of presentation. In this respect the projects involved cross-curricular requirements and emphasized the importance of a wide range of skills that are needed to successfully develop and conduct scientific inquiry while keeping in mind the end user.*

*As a part of this experience I had the good fortune to see the early work of young females and males from diverse backgrounds. The experience afforded the opportunity to engage in discussions about STEM content and to explore student attitudes and perceptions about the scientific process and their relationship to the requirements of inquiry. One of the factors that became apparent was the difference between levels of self-confidence of the female and male students even though their intellectual abilities seemed comparable. A second quality appearing to distinguish between the genders was the amount of mentoring time by their teachers directed toward these projects. It appeared that females did not receive as much attention as males. This was not necessarily a result of intended neglect but more frequently a case of the females not asking for assistance, reporting that they were shy to do so. Interestingly, the projects of the female students generally were of a higher caliber in that they were meticulously organized, demonstrated a strong grasp of key concepts, and included detailed notes regarding their processes as well as extra background readings. These meticulous students frequently reported that their parents were interested in what*

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