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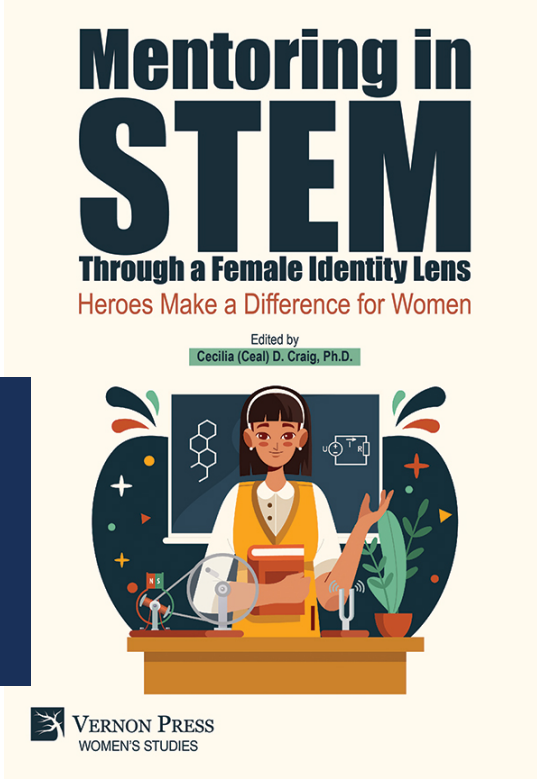

Edited by Cecilia (Ceal) D. Craig

Mentoring in STEM Through a Female Identity Lens

Heroes Make a Difference for Women

WOMEN'S STUDIES

About the editor

Cecilia (Ceal) D. Craig, PhD, a technology executive in high-tech for over 35 years, now a researcher and Science, Engineering, Technology, and Mathematics (STEM) robotics education advocate, is a Society of Women Engineers Fellow and in 2018 was recognized with a Distinguished Alumni Award for Career Achievement by The Ohio State University College of Engineering and received the SWE Distinguished Service Award in 2024.

Craig earned a Ph.D. in Education from Walden University, an M.S.E (mechanical engineering) from California State University at Fullerton, and a B.S.M.E. (mechanical engineering) from The Ohio State University. Dr. Craig held senior technical executive roles in manufacturing and program management for large and small high-tech and aerospace companies. She took a sabbatical from high-tech to teach high-school math and then worked with young people for several years before re-entering high-tech until retiring in 2011 to finish her Ph.D.

In 2002, a sixth-grade student in Dr. Craig's first Johns Hopkins University's Center for Talented Youth (CTY) science and engineering class asked if she would include robotics in the curriculum. Using student-made wall-hugging mouse robots for several CTY summers, her passion for STEM education and robotics was born. She and her engineer husband mentored a high-school robotics team, and she has helped bring robotics education and competitions to young people in the Northern California Bay area since 2004. Craig's dissertation study explored how the For Inspiration and Recognition of Science and Technology (FIRST) Robotics Competition influenced young women's career decisions.

Dr. Craig is a current BOD officer or volunteer in not-for-profit organizations: Society of Women Engineers (local, regional, and national levels), San Francisco Bay Wildlife Society, Western Region Robotics Forum, Silicon Valley Engineering Council, and the American Educational Research Association Mentoring and Mentorship Practices Special Interest Group. She continues to assess and publicize mentoring programs for women in STEM as a peer reviewer for several mentor-related journals.

Summary

With the stagnant low percentages of women in STEM careers, identifying practices to satisfy the growing need for professionals in those fields is critical to improve recruitment and retention. Supportive relationships, like mentors and sponsors, have been shown to both inspire women to pursue those careers and to help them succeed in them. This book explores how developing supportive connections helps students, faculty, and teachers see STEM professions as being a place for women to grow and succeed. Early chapters provide essential mentor characteristics and explore engineering education gender inequity from a teacher's perspective of stereotypes, stereotype threat, and bias, offering culturally relevant teacher mentoring approaches to promote equitable pre-college engineering education. Middle chapters describe K-12 mentoring programs: mentorship initiatives empowering young South African Women and girls to advance to mathematical-related careers; programs, methods and activities to achieve the desired goal of making young students aspire to become scientists; and engagement year-round in grades 9-12 combined with 40 years of iterative evaluation created a finely-honed enrichment program for low-income Black women in urban public high schools. A longitudinal undergraduate mentoring program for mentoring early college students in Louisiana provides further insights in that section.

The final four-chapter section describes mentoring programs for professors and teachers: reciprocal mentor relationships and role shifting within an informal peer mentoring group; differences between mentoring relationships and sponsoring relationships within academia; the impact of culturally responsive mentorship (CRM) on the development and expression of a pre-service teacher's woman of science identity; and a program that aims to recruit and retain STEM pre-service teachers and STEM teachers of color. With several longitudinal mentoring programs, several programs for women of color, this book fills a gap to help grow the numbers of women in STEM.

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SUBJECTS Sociology, Gender Studies, Philosophy

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