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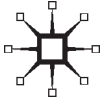
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BECOMING AN ENGINEER IN PUBLIC
UNIVERSITIES

PATHWAYS FOR WOMEN AND MINORITIES

EDITED BY
KATHRYN M. BORMAN, WILL TYSON, AND
RHODA H. HALPERIN

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BECOMING AN ENGINEER IN PUBLIC UNIVERSITIES

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Softcover reprint of the hardcover 1st edition 2010 978-0-230-61935-7

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Cover Image by Gyroscopic Studios

First published in 2010 by

PALGRAVE MACMILLAN®

in the United States—a division of St. Martin's Press LLC,
175 Fifth Avenue, New York, NY 10010.

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Basingstoke, Hampshire RG21 6XS.

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ISBN 978-1-349-38207-1 ISBN 978-0-230-10682-6 (eBook)

DOI 10.1057/9780230106826

Library of Congress Cataloging-in-Publication Data is available from the
Library of Congress.

A catalogue record of the book is available from the British Library.

Design by Newgen Imaging Systems (P) Ltd., Chennai, India.

First edition: May 2010

10 9 8 7 6 5 4 3 2 1

As we applied the finishing touches to this volume, we lost one of our coeditors. Rhoda Halperin passed away April 10, 2009. Rhoda was not only a coeditor, she was a colleague and friend who will be deeply missed. Rhoda believed strongly in the importance of this research and supported our team, particularly through her mentoring of graduate students. We regret that she did not get to see this work in print.

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ACKNOWLEDGMENTS

The NSF-sponsored study, “The Effects of College Degree Program Culture on Female and Minority Science, Technology, Engineering and Mathematics (STEM) Participation,” would not have been possible without the support and guidance of colleagues and friends over the last several years. We would first like to thank the institutions who participated in this research: University of South Florida, University of Florida, Florida A&M, Florida State University, Florida International University, University of Central Florida, Florida Atlantic University, Florida Institute of Technology, Embry Riddle Aeronautical University, St. Petersburg College, Hillsborough Community College, Santa Fe Community College, Tallahassee Community College, Miami-Dade Community College, and Broward Community College. Their continuous support of our project enabled us to conduct our research with considerable ease, and we look forward to any opportunity to collaborate in the future. Our heartfelt gratitude goes to the over 2,300 research participants in our study. They not only provided the data allowing us to complete our study but also, more importantly, provided insight into the daily lives of engineering majors and shared impressions of faculty, administrators and staff in engineering departments. We would also like to thank the members of our Advisory Board who provided valuable insight during the formative stages of our research and throughout the research process. Thank you to Cheri Ostroff, Melanie Cooper, Roger Seals, Michael Gaines, Jeylan T. Mortimer, and Mark Lewine. Thank you, Cheri, for conducting the evaluation of our project.

In addition to the authors of this book, the efforts of many people contributed directly to this research. We would like to thank the following for their dedication to this project: Mary Ann Hanson, Heather Ureksoy, Eva Fernandez, Ted Micceri, Melissa Rivera, Caroline Peterson, Cynthia A. Grace, Sam Arcangeli, Elaine Mueninghoff, Julia Fraser, Jaime Davis, Tasha-Neisha Wilson, Diane Cotsirilos, Anna Tolentino, Jennifer Hunsecker, Ashley Nixon, Sandra Gonzales, and Ana Torres.

The authors acknowledge the generous support of the National Science Foundation through NSF Grant # 0525408: “The Effects of College Degree Program Culture on Female and Minority Science, Technology, Engineering and Mathematics (STEM) Participation.” We also appreciate Susan Hixson’s guidance and support throughout our work. Any opinions,

XII / ACKNOWLEDGMENTS

findings, and conclusions or recommendations expressed in this volume are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Finally, the authors would like to thank the Palgrave Macmillan team including, Samantha Hasey, Assistant Editor, and Alan Sodovnik, Series Editor.

SERIES EDITORS' FOREWORD

*... Well, I listened to my mother and I joined a typing pool
Listened to my lover and I put him through his school
If I listen to the boss, I'm just a bloody fool
And an underpaid engineer
I been a sucker ever since I was a baby
As a daughter, as a mother, as a lover, as a dear
But I'll fight them as a woman, not a lady
I'll fight them as an engineer!*

—Peggy Seeger, “I’m gonna be an engineer,” 1970, Stormking Music

Forty years after Peggy Seeger, the sister of folk singer Pete Seeger, lamented in lyric the obstacles facing women, both as prospective engineers and engineers, the paucity of women and minority engineers remains a critical problem. *Becoming an Engineer: Pathways for Women and Minorities* summarizes the results of a three-year National Science Foundation (NSF)–sponsored investigation on limits and possibilities of higher education programs in increasing access for women and minorities into the STEM professions in science, technology, engineering, and mathematics. Through an examination of the ways in which the culture and organizational conditions of higher education may or may not result in the successful completion of undergraduate engineering degrees for those traditionally underrepresented in engineering careers, the book provides essential sociological evidence for providing increased access, opportunity, and results. Borman and her colleagues examined programs at two- and four-year public institutions of higher education in the State of Florida, the results of which they argue may be applied nationally. These institutions vary by size and scope of available undergraduate programs and also in their relative success in graduating women and minority students and indeed all groups of students in science, technology, engineering, and mathematics (STEM) majors.

Using a mixed-methods design, including qualitative methods, such as observations, interviews, and focus groups and quantitative methods, primarily surveys, this book contributes to the knowledge base concerning education and STEM careers, but also more broadly to the literature on organizational culture and the ways in which it affects important higher education outcomes. It provides significant insights about school

climate as it is reflected in university, college, and departmental policies and goals as well as in the administrative and academic supports provided to engineering undergraduate students. It examines factors that influence engineering undergraduate students' experiences as they seek to "fit" in and accomplish their academic goals, student preparation and curriculum issues that challenge both engineering undergraduate students and faculty responsible for preparing students for careers in civil and electrical engineering. The authors examine the community colleges as pathways to STEM programs at four-year colleges and universities and how student experiences affect their success as they transfer into four-year institutions. In addition, they explore the factors that result in persistence or attrition from these programs. Finally, the book provides policy implications for universities engaged in educating future engineers and research based best practices to increase the number of minority and women engineers.

This book illustrates the value of social science research in identifying the remaining obstacles to increased participation and the best practices for increasing the number of women and minority engineers. Finally, it illustrates the importance of a sociological perspective that emphasizes organizational processes, culture, and climate rather than a cultural deficit model that emphasizes group limitations, in understanding the limits and possibilities of colleges and universities in providing pathways for success.

ALAN R. SADOVNIK
SUSAN F. SEMEL