Engineering Justice: Transforming Engineering Education and Practice
by Jon A. Leydens and Juan C. Lucena
Foreword by Donna M. Riley
Review by Marybeth Lima

This book, part of the IEEE PCS Professional Engineering Communication Series, is a thoughtful examination of the role of social justice in engineering education and practice. The authors begin this relatively short work (274 pages) with an overview of engineering for social justice (E4SJ), defined by the authors “…as engineering practices that strive to enhance human capabilities (ends) through an equitable distribution of opportunities and resources while reducing imposed risks and harms (means) among agentic citizens of a specific community or communities” (p. 15). The authors also introduce the criteria that define E4SJ:

- “Listening contextually (to develop trust and empathy)
- Identifying structural conditions
- Acknowledging political agency/mobilizing power
- Increasing opportunities and resources
- Reducing imposed risks and harms
- Enhancing human capabilities” (p. 21)

The first chapter details the reasons why social justice in the engineering profession tends to be invisible at best and discouraged at worst, and examines the reasons, both historical and current, for this situation. The next three chapters detail current work by scholars who have integrated E4SJ concepts into engineering curricula through design1 (Chapter 2), engineering science (Chapter 3), and Humanities and Social Sciences (HSS) courses (Chapter 4). In Chapter 5, the authors provide recommendations and guidelines for how to integrate E4SJ criteria into curricular and co-curricular engineering education and in the profession, and offer a vision of what the engineering profession could look like when transformed by the visible practice of E4SJ principles. The last chapter invites engineering educators and professionals into a community of practice through a set of reflective questions; potential future research directions are also shared.

As a long-term practitioner of community engagement in engineering, I read this book with interest. I found it accessibly written and I applaud its format, which contains concise, contextual summaries of theory and research that are effectively translated and described through case studies and examples. Appendices at the end of each chapter detail assignments or prompts, which give engineering educators concrete tools and methods for implementing E4SJ principles in their classrooms, curriculums, research, and practice. Additionally, readers are encouraged to ask and answer reflective questions throughout the book; this invitation involves the reader in a welcoming, non-judgmental manner while encouraging the reader to ponder important questions, such as “…how did I become so well-adjusted to injustice?”2 (p. 197).

1 In the interests of full disclosure, I am one of the scholars whose work is presented in Chapter 2.
2 The authors are quoting Cornel West in this passage.
I was impressed by the nuances raised in this book that made me deepen my understanding of E4SJ and its implications in my own work. I found the following passages (and resulting discussions, too long to include here) especially poignant:

- “To encourage students to “do good” or “be ethical” is not the same as providing questions that help unveil important structural conditions (p. 92).”
- “If we do not make a clear distinction between compassion (and its associated behavior, helping) and social justice, we run the risk of not changing the circumstances for those affected by the systemic causes of social injustice, or, even worse, of exacerbating social injustices (p. 245).”
- “…it is most vital that SJ not become equated with some vague notion of “doing good” or enacting “humanitarian” work that loses sight of the E4SJ criteria, such as listening contextually to a variety of perspectives, including those traditionally ignored due to race, class, or other characteristics (p. 246).”

By providing the historical context of E4SJ, an overview of the theories and research involved in this area, and by providing easy to implement ideas based on multiple case studies of E4SJ examples, engineering educators and practitioners are encouraged put into action a central theme of this book: “…transformation needs to occur not just outside the engineering curriculum, but particularly within it—in design and HSS, and especially, in the sacred cow, the engineering sciences (p. 208).” In so doing, the authors hope that we “…begin carving at the boundary between the technical and the social. While this boundary might not be completely obliterated, if we poke enough holes in it, sufficient opportunities will emerge so committed faculty and students can bring SJ into engineering curricula (p. 208).”

The authors quote philosopher Martha Nussbaum and the 10 human capabilities she has defined that will serve “as a benchmark for a minimally decent life” (p. 85). Jon Leydens and Juan Lucena have shared a vision for social justice that can transform engineering into a benchmark for a maximally decent profession. This book is a must for any engineering educator or practitioner who is interested in E4SJ, and should be in the library of every engineer.