

# PREFACE

Our goal in creating this book was to develop something unique—to fill a gap in the resources available to engineering faculty and engineering librarians. There is a singular absence of practical advice on how to apply information literacy concepts in the domain of engineering education. For a number of years, faculty in the Libraries and in the School of Engineering Education at Purdue University have been collaborating to help first-year engineering students make more informed design decisions—decisions based on wise use of available information sources. Both engineering educators and librarians understand that novice engineering students tend to make quick decisions about what approach to take to solve a problem, then spend a lot of time developing prototypes and finishing details, when they might have saved a lot of effort and created a superior outcome had they spent more time upfront attempting to understand the problem more fully and thinking more broadly about potential solutions before actually working to implement one.

Furthermore, many engineering students seem to believe that everything needs to be done from first principles. They waste an inordinate amount of time trying to redesign a widget that is already cheaply and readily available commercially, and often spend months designing a new device, only to find out that something remarkably similar had already been patented years ago. This well-intentioned but wasted effort can be mitigated by helping engineering students adopt a more informed approach to engineering design. To date there has not been a systematic effort to develop such a model that resonates with both engineers and librarians. This book was conceived to meet that need.

Librarians and engineering educators each hold a piece of the puzzle in developing an integrated, informed learning approach, and this book is written for both audiences, as a way to bridge the gaps in conceptualization and terminology between the two important disciplines. Librarians specialize in the organization and application of information, while

engineers understand not only the practice of engineering design, but also how students learn and what cognitive barriers they may have to adopting new concepts and ways of knowing. Over the past few years, the Colleges of Engineering and Technology at Purdue have, collaboratively with the engineering librarians, developed first-year courses that substantively integrate information literacy into their design activities. Our experiences in this integrated and synergistic approach are what we have endeavored to capture in this book.

We, the editors, developed and tested the central organizing principle of this book, the Information-Rich Engineering Design (I-RED) model, as the framework for integrating information literacy into a capstone design course, IDE 48500, Multidisciplinary Engineering, as part of the Multidisciplinary Engineering program at Purdue.

We approach the creation of this book as a design activity itself. A team of engineering educators, engineering librarians, and com-

munications experts was assembled and a first prototype of the book was created at a two-day workshop held at Purdue University in September 2012. This event afforded a unique opportunity for the contributors to make suggestions about their and each other's chapters and for clarifying what content should be located in which chapter. Over the course of the writing, we also had the chance to try out each other's techniques in the classroom, providing additional feedback on the effectiveness of different activities. The result, we hope, is that even though this work was written by a collection of individual authors, both engineers and librarians, it will read as a collective, integrated whole.

Truly, it has been a pleasure to work with all the talented writers and thinkers who devoted their time to this book. We had many excellent conversations, and we, the editors, know our teaching practice has improved greatly from the exchange of ideas over the course of the writing.