Preface

The Handbook of Research on Human Cognition and Assistive Technology: Design, Accessibility and Transdisciplinary Perspectives marks a critical milestone in the history of implementation and practice of assistive technology in this country. We have come a long way since the term universal design was coined in the 1970s and linear perspectives and technology were at the forefront of assisting those with disabilities.

Over the years, numerous studies have been conducted on assistive technology from a special education perspective. With the unprecedented advancements in computing power coupled with the societal movement towards inclusive settings, there is no better time than today to strive for assistive technology equity in terms of universal implementation within a transdisciplinary perspective.

This edited book is borne from this opportunity and attempts to consolidate the relationships among human cognition and assistive technology. The intent of this book is to assist researchers, practitioners, and the users of assistive technology to augment the accessibility of assistive technology by implementing human cognition into its design and practice. Consequently, this book presents assistive technology as an intervention for people with disabilities from a transdisciplinary perspective.

This book is composed of 27 chapters prepared into six sections. Section 1 serves as the scaffolding for the remainder of the book, by laying the theoretical foundation of human cognition and its direct applicability to the design of assistive technology. The chapters in this part are intended to align assistive technology with the study of how the human mind works, discussing the importance of cognitive load and knowing when to avoid it, how to managing it, and in some cases, promote it. The chapters also delve into the understanding of empirically supported instructional principles that can be leveraged to assist those with special needs. The use of simulation-based instruction is also introduced as a precursor to Section 2 of this book, presenting the significant contributions simulation technology has towards assisting those with learning disabilities.

Section 2 focuses specifically on the Internet, media, and continues the line of thinking behind the management of cognitive load. The benefits of simulation-based instruction are expounded upon and the utilization of 3D virtual environments is presented. There has been a surge of popularity with such environments given the potentially limitless possibilities beyond that of entertainment. The chapters in this part discuss how such environments may hold significant opportunities to assist those who are challenged by traditional classroom instruction and interaction.

Section 3 looks at software and devices as tools to benefit interventions for individuals with disabilities. The chapters in this part discuss the role of assistive technology practice in the field as it aligns with research. That is, practice triggers motivation to conduct formative and experimental design research to enhance the quality life of individuals with disabilities.

Section 4 emphasizes the changing culture of evaluation and assessment in the area of assistive technology. In particular, the use of ecological evaluations and multi-model assessments reflect the
trend toward transdisciplinary perspectives. The chapters in this part present evidence-based systematic research in the field.

Section 5 stresses the practice of assistive technology as a strategy for teaching and learning. The chapters in this Section initiate the development of formative instructional strategies using assistive technology to achieve effective learning outcomes.

Finally, Section 6 summaries and describes what assistive technology looked like in the past, how it looks now, and how it might look in the future. This includes a review of the history of assistive technology-related legislation, research, and practice from traditional to modernist theories, from Helen Keller to Steven Hawking. It also addresses the “digital divide” and equity as major issues in the history of assistive technology.

There are many books providing insights into assistive technology. What sets this book apart from other edited books is that this book has been forged from a transdisciplinary perspective. The editors and contributing authors come from a number of disciples to include computer science, instructional design, curriculum and special education, and psychology, to name only a few. This book is a collaboration between researchers and practitioners alike and we hope that you enjoy reading it as much as we enjoyed the delightful journey it was in getting it published.

Soonhwa Seok
University of Wisconsin-Whitewater, USA

Edward L. Meyen
Kansas University, USA

Boaventura DaCosta
Soler Research Group, USA