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About the Editor

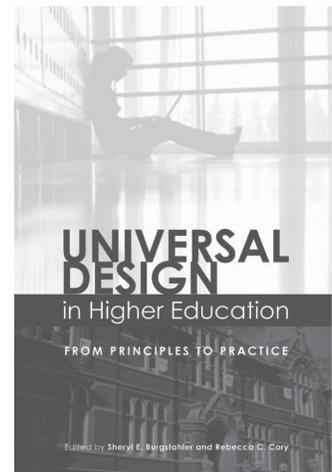


Dr. Sheryl Burgstahler founded and now directs the DO-IT (Disabilities, Opportunities, Internetworking, and Technology) Center at the University of Washington (UW). DO-IT promotes the success of students with disabilities in postsecondary education and careers, employing technology as an empowering tool. DO-IT sponsors programs that increase the use of assistive technology and promote the development of accessible facilities, computer labs, electronic resources in libraries, web pages, educational multimedia, and Internet-based distance learning programs.

Dr. Burgstahler has published dozens of articles and book chapters and delivered presentations at national and international conferences that focus on universal design of distance learning, websites, computer labs, instruction, student services, and other applications in education, and the management of electronic communities, work-based learning activities, and transition programs for youth with disabilities. She is the author or co-author of eight books on using the Internet with pre-college students and directing e-mentoring and transition programs.

She is the lead editor and author of the book *Universal Design in Higher Education: From Principles to Practice*. Information about purchasing this book can be found at <http://www.uw.edu/doit/UDHE/>.

Dr. Burgstahler is an Affiliate Associate Professor in the College of Education at the UW. More about Dr. Burgstahler can be found on her website at <http://staff.washington.edu/sherylb/>.





About the Contributors



Many people worked together to create these instructional materials so that others can learn from DO-IT's efforts to make science, mathematics, and technology courses accessible to students with disabilities. The development team that helped create the 2003, 2006, and 2009 editions included Tarrah Carson, Dan Comden, Marvin Crippen, Andrea Doyle, Rebecca Drury, Imke Durre, Natalie Hansuvadha, Carole Isakson, Tracy Jirikowic, Richard Ladner, Sara Lopez, Kathy Medcalf-Flaker, Mick Moore, Steven Nourse, Rebekah Peterson, Amy Olson, Jeanne Portelance, Alan Roth, Laura Roy, Deborah Schmitt, Cheryl Smith, Heather Stoehr, Sherry Studley, Valerie Sundby, and Linda Tofle. Much of the content is duplicated in other publications, training materials, and web pages published by DO-IT; most can be found within the comprehensive website at <http://www.uw.edu/doit/>.

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Advancements in technology and increased job specialization have resulted in career opportunities in fields that were once considered unattainable for individuals who have disabilities. Many of these careers require knowledge and skills obtained through postsecondary education. Although the number of individuals with disabilities seeking postsecondary education continues to increase, these students experience lower success rates than their non-disabled peers. Individuals with disabilities continue to be underrepresented in many challenging academic and career fields.

Federal legislation mandates that academic accommodations be made to ensure that qualified postsecondary students with disabilities have educational opportunities that are equivalent to others. Faculty and staff members who are familiar with disabilities, accommodation strategies, and resources are better prepared to make arrangements that will ensure that students with disabilities have equal opportunities to participate in their programs.

Since 1992, DO-IT has promoted the success of individuals with disabilities in postsecondary education and employment through direct work with students who have disabilities, and through professional development for educators, service providers, and employers. DO-IT has been recognized for its efforts through many awards, including the 1995 National Information Infrastructure Award in Education; the 1997 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring; the 1999 Golden Apple Award for excellence in education; the 2001 exemplary program award from the Association on Higher Education

and Disability (AHEAD); a 2001 Bright Ideas Award from the Professional and Organizational Development Network; the 2004 Sloan Consortium Award; the 2004 BizTech Accessibility Award; several Achievement Awards from the Washington Association for Postsecondary Education and Disabilities; the 2006 Trace Research and Development Center's Catalyst Award; and the 2007 Greenberg Award for Innovation from Career Opportunities for Students with Disabilities.

Educators who are familiar with universal design principles and accommodation strategies are better prepared to make arrangements that will ensure that students with disabilities have equal opportunities to participate in their programs. The purpose of this training binder is to increase awareness of

- the rights, potential contributions, and needs of students with disabilities;
- educators' responsibilities for ensuring equal educational opportunities for all students in their programs; and
- strategies for accommodating students who have disabilities in science and mathematics classes.

I hope that you find these materials useful in your efforts to ensure that all students have equal opportunities to learn, explore interests, and express ideas.

Sheryl Burgstahler, Ph.D.
Director, DO-IT





The purpose of the materials in this binder is to help science, mathematics, technology, and special education educators effectively teach students with disabilities. The goal is for all students to be fully included in courses and programs and, as a result, experience success in STEM academic and career options.

Part I includes an overview of key issues, how to make physical adaptations to classrooms and labs for general access and safety, information on assistive technology, how to design accessible electronic resources, sample *Student Abilities Profiles*, and resources. Part II includes materials to deliver training to pre-service and in-service teachers at all academic levels.

Part I: Making Instruction Accessible

Access Issues and Strategies

Pages 3-70

This section covers issues related to access to education for individuals with disabilities, including legal and attitudinal issues and general teaching strategies. It shares principles of universal design and suggestions for making educational activities accessible to all students, including those who have disabilities.

Access to Technology

Pages 71-100

This section covers the three areas that must be addressed in order to provide full access to computing resources—computer lab access, provision of adaptive technology, and universal design of electronic resources.

Resources

Pages 101-134

This section covers resources relevant to technology, science, and mathematics instruction. Additional information can be found at DO-IT's *AccessSTEM* website at <http://www.uw.edu/doit/Stem/>. An electronic copy of this binder is available at <http://www.uw.edu/doit/MathSci/>.

Part II: Teaching Pre-service and In-service Teachers

Presentation Tips

Pages 137-144

This section provides suggestions for making engaging and informative presentations to educators, administrators, and staff.

Presentations

Pages 145-234

This section outlines several presentation options:

- 20-30 minute presentations to introduce participants to accessibility issues and give them a conceptual understanding of assistive technology and how it helps people with disabilities access the Internet.
- 45-minute presentation on creating accessible websites, includes tips and best practices.
- 1-hour presentation on increasing the accessibility of science and math classrooms by utilizing universal design techniques.
- 2-hour presentation with a focus on computer lab access, assistive technology, and accessible web page



design provides participants with tools to begin making the school's or department's computer lab and web pages accessible to everyone.

- Full-day session that offers science, mathematics, and special education teachers the opportunity to explore how science and math classes can be made accessible to students with disabilities.

For each presentation option, a sample script is included to minimize the preparation that might otherwise be required. The presenter may use the script verbatim or extract ideas to customize a presentation.

The videos included in this notebook can be used in specific presentations or broadcast on public television. Handout and overhead projection templates are provided in the *Presentation Tools* section for easy duplication and use.

A web-based resource option is also available for faculty and administrators. To access these resources, visit the *Faculty Room* at <http://www.uw.edu/doi/Faculty/>.

Presentation Tools

Pages 235-284

This section includes ready-to-use tools for presenters.

- **Final Evaluation Tools**
One of two evaluations can be selected for use with participants at the end of the session.
- **Projected Visual Templates**
Templates that can be developed into presentation slides are included for use in the presentations. Many templates are included to optimize custom

presentations. In addition, slides are freely online at <http://www.uw.edu/doi/MathSci/>.

- **Handouts**

Reproducible, camera-ready handouts for presentations are included in the plastic pouch in the back of this binder and are also available freely online at <http://www.uw.edu/doi/Brochures/publist.html>.

- **Video**

Videos referenced throughout this handbook are collected on eight DVDs (located in the back of this binder) and are also freely available online at <http://www.uw.edu/doi/Video/Search/>. Their titles follow.

CAREERS 1

- *Learn and Earn: Tips for Teens*. Students with disabilities show how they benefit from work-based learning. (13 minutes)
- *Learn and Earn: Supporting Teens*. Learn how parents, teachers, and mentors can encourage teens to participate in work-based learning. (13 minutes)
- *It's Your Career*. College students with disabilities tell about the value of work-based learning. (13 minutes)
- *Access to the Future: Preparing Students with Disabilities for Careers*. Learn how to make career services accessible to students with disabilities. (14 minutes)

COLLEGE 1

- *Working Together: Faculty and Students with Disabilities*. Successful students with disabilities tell about techniques and accommodations that contributed



to their success, emphasizing the importance of the faculty-student relationship. (9 minutes)

- *Building the Team: Faculty, Staff, and Students Working Together.* Learn how to create an inclusive postsecondary environment. (16 minutes)
- *Equal Access: Universal Design of Instruction.* Learn to make instruction in a classroom or tutoring center accessible to all students. (13 minutes)
- *Equal Access: Student Services.* Learn how to apply universal design principles to make postsecondary student services accessible to all students. (15 minutes)



- *Opening Doors: Mentoring on the Internet.* Mentors help students with disabilities achieve success in college studies and careers. (14 minutes)

PROGRAMS 1

- *DO-IT Pals: An Internet Community.* Peers and mentors with disabilities support each other in an online community. (9 minutes)
- *DO-IT Scholars.* High school students with disabilities prepare for college and careers. (11 minutes)
- *Snapshots: The DO-IT Scholars.* DO-IT participants tell about their experiences. (28 minutes)
- *Finding Gold: Hiring the Best and the Brightest.* Employers in work-based learning programs show how to fully include participants with disabilities. (7 minutes)

PROGRAMS 2

- *How DO-IT Does It.* Successful practices employed by DO-IT programs to increase the success of young people with college and careers. (34 minutes)

STEM 1

- *Working Together: Science Teachers and Students with Disabilities.* Successful science students with disabilities suggest ways to make science activities accessible. (13 minutes)
- *Equal Access: Science and Students with Sensory Impairments.* Students and employees with sensory impairments share strategies for success. (14 minutes)
- *The Winning Equation: Access + Attitude = Success in Math and Science.* Science and math teachers share strategies for making these subjects accessible to students with disabilities. (15 minutes)
- *STEM: Science, Technology, Engineering, Mathematics and the University of Washington.* Students and faculty highlight STEM programs offered to a diverse student body at the UW. (10 minutes)



TECHNOLOGY 1

- *Working Together: People with Disabilities and Computer Technology.* Individuals with disabilities demonstrate adaptive technology for people with mobility impairments, blindness, low vision, hearing or speech impairments, and learning disabilities. (14 minutes)
- *Working Together: Computers and People with Mobility Impairments.* People with mobility impairments demonstrate computer access technology. (14 minutes)
- *Working Together: Computers and People with Sensory Impairments.* People with visual and hearing impairments demonstrate computer technology for school and work. (10 minutes)
- *Working Together: Computers and People with Learning Disabilities.* Students and workers with learning disabilities demonstrate computer-based tools and strategies. (12 minutes)
- *Computer Access: In Our Own Words.* Students with disabilities demonstrate adaptive technology and computer applications. (10 minutes)

TECHNOLOGY 2

- *Equal Access: Universal Design of Computer Labs.* Learn how computer labs can be designed to be accessible to students with disabilities. (11 minutes)
- *World Wide Access: Accessible Web Design.* People with disabilities describe roadblocks they encounter and examples of accessible web design. (14 minutes)

- *Real Connections: Making Distance Learning Accessible to Everyone.* Learn issues to consider when designing courses to fully include students with disabilities. (12 minutes)
- *Access to Technology in the Workplace: In Our Own Words.* Employees show how to make technology accessible. (13 minutes)
- *Camp: Beyond Summer.* Learn how to add Internet experiences to summer camp programs for children and youth with disabilities. (10 minutes)

TRANSITION 1

- *College: You Can DO-IT!* College students with disabilities and staff share advice for success in college. (14 minutes)
- *Moving On: The Two-Four Step.* How to successfully transition from two- to four-year postsecondary institutions. (11 minutes)
- *Taking Charge 1: Three Stories of Success and Self-Determination.* Successful young people with disabilities share strategies for living self-determined adult lives. (17 minutes)

Permission is granted to reproduce any of these materials for noncommercial, educational purposes as long as the source is acknowledged. Much of the content is duplicated in other publications, training materials, and web pages published by the DO-IT Center; most can be found within the comprehensive website at <http://www.uw.edu/doi/>.