Rehabilitation Research
Design & Disability

University of Wisconsin–Milwaukee

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R₂D₂ Accessibility & Universal Design Community Design Solutions (CDS)

Annual Report

May 2010-June 2011

Community Design Solutions (CDS) aims to improve the quality of life in Wisconsin by designing or changing environments toward increased accessibility and refining decision making processes effecting the environment. CDS is involved in numerous projects including working with UWM's Rehabilitation Research Design and Disability (R₂D₂) Center on the Milwaukee Idea Home, the ACCESS-ed and ACCESS Main Street Websites, UD ITEACH Project, Design and Disability Instruction, and the Housing Plus Project. Additional information and progress can be found at the following websites:

- CDS Website: www.uwm.edu/MilwaukeeIdea/CDS/
- R₂D₂ Center Website: www.r2d2.uwm.edu/
- ACCESS-ed Website: access-ed.r2d2.uwm.edu/
- ACCESS Main Street Website: access-mainstreet.r2d2.uwm.edu/
- UD ITEACH Website: uditeach.r2d2.uwm.edu/

I. Executive Summary

The Universal Design (UD) team, based in UWM's R_2D_2 Center and a component of CDS, successfully continued work on several projects. Following is a list of the highlights from May 2010 – June 2011:

- Two of our graduate students completed M.S. research theses related to universal design in the built environment.
- Four graduate students and one doctoral student received funding from the UWM College of Health Sciences to fund their research involving different aspects of universal design.
- R_2D_2 staff continued a third year of teaching the highly inter-disciplinary Design & Disability course, in the Fall of 2010.
- Product review meetings were held to discuss usability and product design improvements for two pototypes in development in the community including a bed and modified exercise bike.
- The Housing Plus program completed 16 home assessments from ten thriving neighborhoods throughout Milwaukee County, as well as updated protocols, procedures, and assessment tools. Google Calendar was used as a key communication hub.
- Five undergraduate students received a total of six Support for Undergraduate Reseach Fellows (SURF) awards. This resulted in three additional national poster presentations and nine local poster presentations.
- One graduate student received an Advanced Opportunity Program (AOP) Fellowship and two other students received AOP Fellowship continuations awarded based on acheivements possible due to working at the R_2D_2 Center and experiences provided there.
- Our teams proposed eleven grants for acitivites promoting Assistive Technology and Universal Design in Education and in the community.

- Five grant projects were awarded, including TechSpec, two subawards on the RERC for children with orthopedic disabilities (Tech4POD), Access Rating for Buildings, and Pathways to Independence IV.

- The ACCESS-ed and Access Main Street websites continue to promote UD with new dissemination strategies, collected resources from many external sources and new internally created UD resources.

- The UD ITEACH Project continued grant activities to develop a Student Campus Accessibility Needs Inventory (SCAN IT), reinforce universal design in education (UDE) dissemination and training, create learning technology analysis and technical reports, and implement campus-wide UDE interventions.

- At the 2010 International Association of Higher Education and Disability (AHEAD) Conference, three staff members from the R_2D_2 Center coordinated and co-sponsored a 2-day UDE pre-conference symposium, and presented a concurrent session and a poster presentation on the UD ITEACH Project.

- R_2D_2 staff and students attended and presented at the June 2010 Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) conference in Las Vegas, NV.

- R_2D_2 staff presented at the ACRM-ASNR Joint annual conference in Montreal Canada in October 2010.

- The 2010 Present's Summit on Excellence in Teaching and Learning had three workshops from R_2D_2 staff and students regarding UD.

- R_2D_2 staff and students led two platform presentations, five posters, one pre-conference instructional course, and two full paper platform presentations at four of the conferences at the 2011 Festival of International Conferences on Caregiving, Disability, Aging and Technology (FICCDAT). The pre-conference instructional course on measurement of accessibility and UD was the only course that attracted enough participants to run the course.

- Presentations were delivered by R_2D_2 staff at the AOTA and at WI AHEAD Conferences.

This year's activities continued to follow the theme of incorporating universal design (UD) into physical, instructional, service and informational environments to promote cutting edge campuses and communities that shift from accommodating and adapting for individuals to infusing universal design and accessibility from the beginning. Overall, the past year's activities have generated increased interest in the topics of universal design and accessibility in communities and campuses nationally and internationally. We look forward to the upcoming year of activity.

II. The Universal Access Team

- Roger O. Smith, Ph.D.,Professor, Occupational Science & Technology Director, Rehabilitation Research Design & Disability (R$_2$D$_2$) Center
- Dave Edyburn, Ph.D., Professor, Exceptional Education
- Aura Hirschman, MS, CRC, Universal Design Outreach Coordinator
- Melissa Lemke, MS, Biomedical Engineer
- Dennis Tomashek, MS Researcher
- Keith Edyburn, BS, Engineer
- Tereza Snyder, BFA, Programmer
- Cheryl Locher, MS, Operations Manager

Graduate and undergraduate students:

- Rochelle Mendonca Ph.D
- Goeran Fiedler, MS
- Alison Fernandez MS
- Steven Verville, BS
- Meenu Sagar, BS
- Wolfgang Zweimuller, BS
- Lindsey Fletcher, MS
- Carrie Jennerjohn, BS
- Kristen Lueck, MS
- Amy Erfurth, MS
- Minsoo Park, MS
- Thomas Dembski,
- Autumn Milanowski, BS
- Kati Liegl, BS
- Stacey Goulet
- Amanda Rayeske
- Traci Dolski
- Lauren Below
- Rachael Baumann

III. 2010-2011 Project Achievements

1. Websites

R_2D_2 Center staff members continue to collaborate to provide technical assistance and support for the creation, edits, and launching of various accessible R_2D_2 websites such as ACCESS-ed and Main Street. The R_2D_2 websites continue to grow with newly updated resources including links and videos and descriptions of ongoing projects.

The ACCESS-ed website promotes universal design in education (UDE), including instruction, services, information media, and the physical environments of higher education campuses nation-wide. The development of this website has been supported in part by the U.S. Department of Education's Office of Post-secondary Education and maintains a collaborative partnership with CDS. The ACCESS-ed website includes resources, tools, strategies, and products for the measurement of accessibility, and to infuse UD knowledge and use in post-secondary education. The ACCESS-ed website can be accessed at: access-ed.r2d2.uwm.edu/

The ACCESS Main Street website promotes universal design in the community. The development of this website has been supported in part by Office of Independence and Employment (Pathways Projects), Wisconsin Department of Health Services, Division of Long Term Care, Bureau of Aging and Disability. The ACCESS Main Street website can be accessed at:

accessmainstreet.r2d2.uwm.edu/

2. Design and Disability Instruction

The Design and Disability (OCCTHPY 625) course brings together current and future professionals from different backgrounds and disciplines to teach the concepts and application of universal design. This course was first taught as an elective in the fall of 2007 to students in the occupational therapy and architectural graduate programs among others. Now, this course is a requirement

for the Assistive Technology and Accessible Design Certificate. With more widespread advertisement, more students have enrolled to take it as an elective.

The Design and Disability course ultimately esposes students to a new way of thinking and creatively applying the techniques of UD in various settings and professions. The Assistive Technology and Accessible Design Certificate, mentioned above, is a fifteen credit graduate program focusing on the knowledge and application of assistive technology and universal design principles to prepare students for work in different areas of clinical practice. Support and collaboration for interdisciplinary students as well as involvement in student research has been provided throughout the past year of both SARUP and CHS graduate students. Thesis and dissertation instruction and advising continues to be provided for students within the R_2D_2 Center (Refer to Appendix A for Bibliography).

3. Milwaukee Idea Home (MIH)

The MIH is a project of CDS that was designed and built for accessibility which is currently being used by Independence*First* as a transitional housing facility. The project is also being utilized for instructional purposes such as class demonstrations and field trips. It provides students an incredible opportunity to experience and learn about accessibiliy and universal design first hand.

MIH Website: www.uwm.edu/MilwaukeeIdea/CDS/

4. Housing Plus

Housing Plus is a community-based project in which occupational therapy students from UWM collaborate with Rebuilding Together Greater Milwaukee (RTGM) and ten thriving neighborhoods in Milwaukee County to provide home assessments, recommended environmental modifications and adaptive equipment, and to implement repairs to improve safety, function, and independence to promote aging in place for senior homeowners living in Milwaukee County. The home assessment is conducted with one community-

based occupational therapist, one contractor and two occupational therapy assessors. The contractor and an occupational therapy assessor interview and evaluate the home with a family member of the homeowner while the community-based occupational therapist and occupational therapy assessor conduct a home assessment with the homeowner focusing on safety and functionality of the adult in his or her home. After the assessments, the team meets to discuss recommendations and changes that need to be made to the home. After a consenses is made, the occupational therapy assessors compile resources for the homeowner and locate devices needed to meet recommendations. With the approval of the homeowner, the purchase and installation of the adaptive equipment and implementation of the repairs and modifications of the home environment are completed.

The UWM student coordinator work with the RTGM coordinator. The two coordinators communicate through Google Calendar and email for all scheduling and document exchange. Additional improvements from previous years include the update of assessment tools and assessment protocol, and increasing efficiency in documentation.

5. **UWM Campus Implementation of Physical Facility Design**

With the input of numerous colleagues, AUDITs have been created to assess the design, usability, and accessibility of the campus. These audits have been used by professionals and students to evaluate different areas throughout the university and have been submitted to the campus implementation teams.

6. **UD ITEACH Project**

A demonstration project to ensure that students with disabilities receive a quality higher education, the UD ITEACH Project began project activities. The UD ITEACH Project, funded by the US Department of Education, develops a Student Campus Accessibility Needs Inventory (SCAN IT), reinforces universal design in education (UDE) dissemination and training through the ACCESS-ed website

and on-campus Departmental Accessibility Resource Coordinators (DARCs), creates learning technology analysis and technical reports to determine and promote accessibility, and implements campus-wide UDE policy and other interventions.

7. TechSpec Project

This Technology Specialization Program (TechSpec) will provide intensive interdisciplinary training in rehabilitation technology for 24 students who are recruited from the public, targeting specifically practicing vocational rehabilitation counselors. Program graduates will be able to provide competent assistive technology and accessible design case management and practice as well as provide leadership to advance the field. The curriculum is based on the Assistive Technology and Accessible Design graduate certificate.

To kick off the program in 2011, eight participants nationwide were recruited. A two day kickoff and orientation was held in Menomonee, Wisconsin. Participants took one course each semester and have so far completed Introduction to Assistive Technology and are completing Assessment in Assistive Technology and Accessible Design over the summer semester.

8. Access Rating for Buildings

This project will utilize handheld device applications to provide building accessibility information to users. The information will include general accessibility information, information specific to disability types, and information specific to an individual user based on a personal profile.

9. Rehabilitation Engineering Research Center on Technologies for Pediatric Orthopedic Disabilities: Tech4POD

Tech4POD is developing a national center with a focus on advanced engineering, research, and development projects based on innovative technologies to address the needs of children with orthopedic disabilities.

Current work within the R_2D_2 Center focuses on training and dissemination activities. A resource website for the RERC is also being developed.

IV.Planned Activities

Community Design Solutions allows us to continue working in a range of ways in the area of universal design and accessibility. As always, a set of new and continuing activities, including both community-based, and campus-based projects are anticipated for the current and coming year. Although we know the long list of activities that are desired can not all be accomplished in a short time, it is our hopes to continue with our current projects and expand our support for future projects. Planned activities include:

1. **Milwaukee Idea Home**
   - Continuation of home tours as part of instructional courses.

2. **Instruction**
   - Fall Design and Disability course to graduate students across schools and colleges (CEAS, CHS, and SARUP).
   - Continuation of the Assistive Technology and Accessible Design Certificate to both undergraduate and graduate students for continued education.
   - Ongoing interdisciplinary support and collaboration to graduate students across colleges related to universal design.

3. **Housing Plus**
   - Incorporating the knowledge, experience and skill of students into coursework and work related tasks.

4. **UWM Campus Implementation of Physical Facility Design**
   - Coordination with Physical Plant about accessible design.
   - Support to the UWM library for remodeling.
   - Involvement in 20 year UWM Campus Master Plan.
   - AUDITs of the campus environment for accessibility.
   - Establishing campus committee for remodeling and new campus projects.

- Dr. Smith will continue as a Member of:
  - UWM UITS Mobile Computing Task Force, 2010-ongoing, and
  - UWM Campus Sunray Computer Kiosk Design and Installation Committee, 2007-
  - Chair, UWM Commencement Stage Redesign Task Force, 2011
  - Graduate School Research Strategic Planning Sub-Committee on Partnerships with Other Institutions, Businesses, Non-profits and Government Agencies, 2010-11
  - School of Public Health Infrastructure Committee 2010
  - Project GOALS Task Force – Web Accessibility, 2009-2011

5. **Website Design**
   - Updating and editing of the R_2D_2 Center websites and improving the accessibility as an example to the public.
   - An upgrade to the ACCESS-ed website will include a new set of search strategies; a social networking component for professional and consumer input; and many new resources, both those developed as part of the UD ITEACH grant, and external resources.

6. **Proposals and Projects**
   - Propose to submit additional SURF applications regarding universal design
   - Plan to submit RERC on low vision and blindness.
   - Proposed undergraduate student research projects to assist with grant projects

7. **UD ITEACH**
   - Through the UD ITEACH Project, the ACCESS-ed website continues to make accessible products and resources available as an example for other websites, developers, etc. As indicated above, an upgrade to the Websites will include a new set of search strategies, including a social networking component for professional and consumer input.

- Continued work on the activities of "UD ITEACH, a Demonstration Project to Ensure that Students with Disabilities Receive a Quality Higher Education" includes new resources and also includes the new UD ITEACH website. uditeach.r2d2.uwm.edu/

8. **TechSpec**
   - Continue recruitment for next cohort and support of current TechSpec scholars. techspec.r2d2.uwm.edu/

9. **Tech4POD**
   - Future activities will include research and new tools that are being developed to improve the treatment of children with cerebral palsy, clubfoot, spina bifida, spinal cord injury, brittle bone disease and other orthopaedic conditions and research

10. **Access Rating for Buildings**
    - Continuing work on creating appropriate interfaces based on feedback from potential users
    - Increasing information included in the database

11. **Theses**
    - Manuscript preparation of thesis work to be published by graduate students in the R_2D_2 Center.
    - Three graduate students in the R_2D_2 Center continuing thesis work and two students continuing dissertation work.

12. **Collaboration and Community Outreach**
    - R_2D_2 director and staff continue involvement in the UW System Presidents Advisory Committee for Disability Issues (PACDI).
    - R_2D_2 staff members continue to be actively involved in the UWM Chancellor's ADA Advisory Center (ADAAC).
    - UD ITEACH collaborates with other UW system campuses to implement UDE on their campuses.

V. Appendices

Appendix A – Theses conducted in the R$_2$D$_2$ Center

Park, M. (2011). Preliminary validation of the Restaurant Accessibility and Task Evaluation Information Tool (RATE-IT): Content and construct validity. Unpublished master's thesis, University of Wisconsin-Milwaukee.

Erfurth, A. (2011). Measurement of restaurant accessibility by people with disabilities: Preliminary consequential and construct validity of a restaurant universal design assessment. Unpublished master's thesis, University of Wisconsin-Milwaukee.

Appendix B - Presentations 2010-2011

Hirschman, A., Mendonca, R., Lemke, M., (2010, April 29-May 1). Interdisciplinary Courses to Teach Inclusive Design for People with Disabilities. Presented at the University of Wisconsin System 2010 President's Summit on Excellence in Teaching and Learning.

Fernandes, A., Smith, R.O., (2010, April 29- May 2) SCAN-IT: The Student Campus Accessibility Needs Inventory Tool. Presented at the American Occupational Therapy Association (AOTA) Conference, Orlando, FL.

Mendonca, R., Smith, R.O., Lemke, M., (2010, April 29- May 2) Accessibility Web Site Resources: Access-ed and Access Main Street. Presented at the American Occupational Therapy Association (AOTA) Conference, Orlando, FL.

Hirschman, A., Lemke, M. R., & Smith, R. O. (2011). Faculty two-minute interventions and an incremental approach to implementing universal design. UW System President's Summit on Excellence in Teaching and Learning, Madison, WI.

Liegl, K. P., Lemke, M. R., Park, M., Erfurth, A., & Smith, R. O. (2011). Differences between architecture and occupational therapy student perceptions of restaurant accessibility using the RATE-IT evaluation tool. Poster presentation at the National Conference on Undergraduate Research 2011, Ithaca, NY.

Dembski, T., & Smith, R. O. (2011). Teaching module of the portrayal of disability through assistive technology in film. Poster presentation at the National Conference on Undergraduate Research 2011, Ithaca, NY.

Milanowski, A., Tomashek, D., & Smith, R. O. (2011). Role of multifocal lens glasses on walking balance. Poster presentation at the National Conference on Undergraduate Research 2011, Ithaca, NY.

Dembski, T., & Smith, R. O. (2011). Teaching module of the portrayal of disability through assistive technology in film. Poster presentation at the 11th Annual UW System Symposium for Undergraduate Research and Creative Activity, Parkside, WI.

Milanowski, A., Tomashek, D., & Smith, R. O. (2011). Role of multifocal lens glasses on walking balance. Poster presentation at the 11th Annual UW System Symposium for Undergraduate Research and Creative Activity, Parkside, WI.

Liegl, K. P., & Lemke, M. R. (2011). Student perceptions of the RATE-IT evaluation tool and usefulness of RATE-IT scores for people with disabilities. Poster presentation at the 11th Annual UW System Symposium for Undergraduate Research and Creative Activity, Parkside, WI.

Dembski, T., & Smith, R. O. (2011). Teaching module of the portrayal of disability through assistive technology in film. Poster presentation at the University of Wisconsin Milwaukee College of Health Sciences Spring Research Symposium Milwaukee, WI.

Milanowski, A., Tomashek, D., & Smith, R. O. (2011). Role of multifocal lens glasses on walking balance. Poster presentation at the University of Wisconsin Milwaukee College of Health Sciences Spring Research Symposium Milwaukee, WI.

Liegl, K. P., & Lemke, M. R. (2011). Student perceptions of the RATE-IT evaluation tool and usefulness of RATE-IT scores for people with disabilities. Poster presentation at the University of Wisconsin Milwaukee College of Health Sciences Spring Research Symposium Milwaukee, WI.

Dembski, T., & Smith, R. O. (2011). Teaching module of the portrayal of disability through assistive technology in film. Poster presentation at the University of Wisconsin Milwaukee Spring Undergraduate Research Symposium, Milwaukee, WI.

Milanowski, A., Tomashek, D., & Smith, R. O. (2011). Role of multifocal lens glasses on walking balance. Poster presentation at the University of Wisconsin Milwaukee Spring Undergraduate Research Symposium, Milwaukee, WI.

Liegl, K. P., & Lemke, M. R. (2011). Student perceptions of the RATE-IT evaluation tool and usefulness of RATE-IT scores for people with disabilities. Poster presentation at the University of Wisconsin Milwaukee Spring Undergraduate Research Symposium, Milwaukee, WI.

Lemke, M. R., Smith, R. O., & Anson, D. (2011). Full day course. Evaluating accessibility in the world around you: Measurement tools and assessment approaches for public spaces, home residences, products, information sources, and educational materials. RESNA Conference, FICCDAT Conference, Toronto, Canada.

Park, M., Liegl, K. P., & Smith, R. O. (2011, April). Preliminary validation of the Restaurant Accessibility and Task Evaluation Information Tool (RATE-IT). AOTA 91st Annual Conference, Philadelphia, PA.

Fernandes, A., & Smith, R. O. (2011, April). Obstacles and facilitators of inclusive post-secondary education for students with disabilities: An instructor perspective. AOTA 91st Annual Conference, Philadelphia, PA.

Hirschman, A., Smith, R. O., & Anson, D. K. (2011, April). Universal design instructional tools UDITS: Measuring accessibility. 91st Annual American Occupational Therapy Association 2011 Conference and Expo, Philadelphia, PA.

Mendonca, R. J., & Smith, R. O. (2011, April). Trace Usability Screening Kit (TUSK) for accessibility evaluation of products and environments. 91st

Annual American Occupational Therapy Association 2011 Conference and Expo, Philadelphia, PA.

Smith, R. O., Edyburn, D., & Hirschman, A. (2010, July). UD ITEACH – Universal design infusion of technology and evaluation for accessible campuses of higher education. 33rd annual AHEAD/PEPNet Conference, Denver CO.

Anson, D., & Smith, R. O. (2010, May). Making accessibility accessible: Environmental assessment for ADA and universal design compliance using a combination of high and low technology tools. AOTA 90th Annual Conference, Orlando, FL.

Smith, R. O. (2011, May). Measuring universal and individual accessibility: UD or not UD? Keynote Speaker. Advanced Rehabilitation Research Training, Marquette University, Milwaukee, WI.

Smith, R. O. (2011, May). Better design of the world: The role of Occupational Science & Technology in the advancement of scientific discovery. Keynote Speaker. 10th Annual Occupational Therapy Research Symposium, Colorado State University, Fort Collins, CO.

Proposals submitted:

- iSOCKET R01 NIH Yiorgos 20101.6.5

- Med AUDIT 2 2010.9.22

- Inga Wang R21 NIH 2010.10.16

- NIDRR FI wMCW BIFOCAL 2011.2.4

- NIH R01 Subaward Brooke 2011.2.5

Not Funded

- WI Partnership Program 2010.8.20

- RGIs 2010.10.4 Brooke, Roger

- CTSI 2010.10.29

- RWJ Foundation 2010.12.14

- NSF Iqbal 2010.12.17

- NIH R01 Resubmit 2011.3.5

Planned grants? Next year?

- RERC Low Vision 2011.8.22

- NIH R21 Healthy Independent Living w Iqbal 2011.9.19

- RGIs 2011.10.3 (Brooke and Inga?)