RERC Research:
Needs and Barriers to Universal Design as a Workplace Accommodation

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Universal Design

The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

- Equitable Use
- Flexibility in Use
- Simple and Intuitive Use
- Perceptible Information

- Tolerance for Error
- Low Physical Effort
- Size and Space for Approach and Use
Background

• Few published studies have described types of accommodations or examined their effectiveness.

• The degree to which a common set of accommodations is used to address similar problems across individuals is dependent on the expertise and experience of individuals in the field.

• As a result, field has been driven by practice-based evidence, rather than the other way around.

• Leads to an unnecessary amount of “reinventing the wheel” or one-of-a-kind accommodations that may not meet all of users’ needs.
User Needs Studies

1. Describe types of accommodations made and for whom.
2. Understand use of and effectiveness of accommodations.
Study 1. National Survey of Employees with Disabilities

- Demographics - age, gender, income, education;
- Functional limitations – impact on employment;
- Types of Accommodations received or not received by functional limitation – impact on employment.
Sample (N = 510)

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18-54</td>
<td>55-64</td>
<td>65+</td>
</tr>
<tr>
<td><strong>Motor Limitations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintaining Body Position - Sitting</td>
<td>45%</td>
<td>35%</td>
<td>45%</td>
</tr>
<tr>
<td>Maintaining Body Position - Standing</td>
<td>37%</td>
<td>38%</td>
<td>45%</td>
</tr>
<tr>
<td>Changing Position</td>
<td>39%</td>
<td>47%</td>
<td>33%</td>
</tr>
<tr>
<td>Moving Around (the Environment)</td>
<td>39%</td>
<td>37%</td>
<td>29%</td>
</tr>
<tr>
<td>Manipulating Objects</td>
<td>28%</td>
<td>28%</td>
<td>16%</td>
</tr>
<tr>
<td>Coordinating Movements</td>
<td>26%</td>
<td>20%</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Mental Limitations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceiving Space and Time</td>
<td>*20%</td>
<td>15%</td>
<td>8%</td>
</tr>
<tr>
<td>Attending to Task</td>
<td>22%</td>
<td>19%</td>
<td>18%</td>
</tr>
<tr>
<td>Remembering</td>
<td>19%</td>
<td>14%</td>
<td>12%</td>
</tr>
<tr>
<td>Processing Information</td>
<td>9%</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Sensory Limitations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual Impairment</td>
<td>35%</td>
<td>46%</td>
<td><strong>57%</strong></td>
</tr>
<tr>
<td>Hearing Impairment</td>
<td>7%</td>
<td>11%</td>
<td>14%</td>
</tr>
</tbody>
</table>
## Mobility Accommodations: Basic Access

<table>
<thead>
<tr>
<th>Groups</th>
<th>Accessible Transportation</th>
<th>Accessible Parking</th>
<th>Modification to Restroom</th>
<th>Flexible Schedule</th>
<th>Ramps</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 54</td>
<td>15%</td>
<td>10%</td>
<td>11%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>55 - 64</td>
<td>13%</td>
<td>10%</td>
<td>9%</td>
<td>13%</td>
<td>6%</td>
</tr>
<tr>
<td>65+</td>
<td>11%</td>
<td>14%</td>
<td>7%</td>
<td>2%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Other identified accommodations: elevator, automatic door, emergency call button, handrails, stair lift

**Principles:** Equitable Use, Low Physical Effort, Size and Space for Approach and Use
Positioning Accommodations: Workstations

<table>
<thead>
<tr>
<th>Groups</th>
<th>Modify Workstation</th>
<th>Ergonomic Chairs</th>
<th>Steps or Lifts</th>
<th>None Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 54</td>
<td>24%</td>
<td>20%</td>
<td>13%</td>
<td>43%</td>
</tr>
<tr>
<td>55 - 64</td>
<td>25%</td>
<td>25%</td>
<td>5%</td>
<td>45%</td>
</tr>
<tr>
<td>65+</td>
<td>14%</td>
<td>29%</td>
<td>21%</td>
<td>36%</td>
</tr>
</tbody>
</table>

Principles: Flexibility in Use, Low Physical Effort, Size and Space for Approach and Use
Vision Accommodations: Visual Technologies

<table>
<thead>
<tr>
<th></th>
<th>Accessible Documents (OCR)</th>
<th>Reading Guides / Aids</th>
<th>Braille Display</th>
<th>None Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 54</td>
<td>10%</td>
<td>14%</td>
<td>7%</td>
<td>12%</td>
</tr>
<tr>
<td>55 - 64</td>
<td>7%</td>
<td>7%</td>
<td>4%</td>
<td>17%</td>
</tr>
<tr>
<td>65+</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Other Accommodations: electronic media, magnifier, enlarged print, Braille, CCTV, anti-glare devices, new display

Principles: Perceptible Information
No Accommodations

![Bar chart showing percentage of individuals in different age ranges with various accommodations issues.](chart.png)

- **Vision**
- **Hearing**
- **Moving**
- **Coordination**
- **Remembering**

**Age Range**

- 18-54
- 55-64
- >64

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Implications for Universal Design

• **Mobility (Moving, Positioning, Coordinating)**
  – Basic access to common areas and workstations
  – Equitable Use, Low Effort, Size and Space

• **Dexterity (Manipulating Objects)**
  – Adapted workstations and computer hardware
  – Flexibility in Use, Tolerance for Error, Low Effort

• **Sensory (Visual and Auditory)**
  – Adapted computer hardware
  – Perceptible Information, Tolerance for Error

• **Cognition (Perception, Attention, Memory)**
  – Memory aids
  – Simple/Intuitive, Tol. for Error
Study 2. Follow-up Telephone Survey with GA VR Clients (N = 54)

- Satisfaction with Accommodations
- Longevity of Accommodation Use
- Utility of Accommodations in new jobs
Sample

- Age: mean = 38.48 years (range 19 - 57 years)
- Gender: 60.4% female, 39.6% male
- Race: 74.4% white, 25.6% black
- Education level
  - Some high school or graduated: 45.2%
  - Some college or graduated with Bachelors: 45.2%
  - Education beyond 4 year college: 9.5%
- Most frequently reported primary conditions
  - Spinal cord injury: 21.2%
  - Visual impairment: 21.2%
  - Traumatic brain injury: 13.5%
  - Cerebral Palsy: 7.7%
Longevity of Use

- 38% never used or discontinued use within 1 yr
- 66% discontinued use within 5 yrs
Utility of Accommodations Across Jobs

44% of accommodations not taken to subsequent jobs

- 40% Not appropriate for new job
- 30% Returned to school or use at home
- 26% Discarded as became obsolete
- 4% Lost job
Conclusions

- Despite 80% being satisfied with accommodations, often did not work well.
- Over half of these people moved on to subsequent jobs, but took only part of their accommodations with them.
- Most common reasons for disuse was obsolete technology, failure or incompatibility of accommodations, lack of training, and left job.
Key Practice Issues: Benefits of UD as an Accommodation

• Can reduce need/$ for individualized accommodations
• Can reduce amount of time to start or return to work (i.e., minimal individualization)
• Less need to go with individual across jobs
• Can facilitate group work & social inclusion (linked to positive impacts on work satisfaction and productivity)
• Has benefits to multiple workers w/ and w/o disabilities
Key Barriers to UD as an Accommodation

• Accommodations based on an individual employee performing essential functions of a job as determined by employer (i.e., inclusion is not an essential job task)

• Benefit to multiple employees
  – May not qualify as an accommodation
  – Can > initial cost, even though < life cycle cost
Key Policy Questions

• What are the paradigm and metrics of positive employment outcomes?
  – Performance of work tasks (i.e., activity) (ADA notion that inclusion follows function)
  – Performance of Activity and Participation in the Workplace (ICF* constructs that inclusion and function are equal and independent)

Thank you

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