

Employment of People with Disabilities: Twenty-Five Years Back and Ahead

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**VOLUME XXV COMMEMORATIVE SYMPOSIUM LAW AND INEQUALITY: THE NEXT 25 YEARS:
ARTICLE: Employment of People with Disabilities: Twenty-Five Years Back and Ahead**

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SUMMARY:

... BBI researchers trained in computer engineering, information management, and law are conducting interdisciplinary analyses to identify business and organizational management software applications, engineered for people with disabilities who may require accommodations. ... BBI will be documenting knowledge about the status of media technology accessibility and developing best training, hiring, and employment practices for the media and communications industry, as well as higher education. ... Similarly, BBI's Disability and Business Technical Assistance Center - Southeast ADA Center ("DBTAC") uses collaborative tools to promote research activities and disseminate results within its eight state region of service. ... The current literature of disability discrimination research largely includes surveys on employers' attitudes toward job applicants and employees with disabilities, as well as analog studies manipulating applicant disability status and examining how employment-related decisions are affected by such status. ... The ethical considerations to be balanced in field research are the same as those that occur in academic settings, though a heightened duty to protect participants' rights is incumbent on the researcher. ... As we investigate opportunities for developing accessible open-source software applications that have practical business uses, we encourage setting new standards for software applications to anticipate the needs of the user (e.g., employee) without requiring their use of assistive technology.

HIGHLIGHT: By most accounts, Americans with disabilities today have significantly lower rates of employment than their non-disabled peers. Prior studies generally have relied on a "supply-side" approach, focusing on personal characteristics and limitations to predict employment and earnings. These models have not sufficiently analyzed variables related to social context (i.e., interaction of employer demand/supply, the environment, civil rights, and corporate culture) as predictors of employment outcomes for people with disabilities. This Article reviews past research, driven by a medical model approach, and recent research driven by a social-civil rights paradigm. We envision future research that guided by a comprehensive social-civil rights-techno model approach. We describe research efforts to help identify and evaluate future employment models. We end with a blueprint for research and policy challenges and opportunities to be addressed over the coming 25 years, with suggested benchmarks to gauge improvement in the employment rate of per-

sons with disabilities.

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Introduction

Since the passage of the Americans with Disabilities Act ("ADA") of 1990, multiple indicators demonstrate improvements in the social inclusion and participation of people with varying disabilities throughout the United States.ⁿ¹ Thousands of people with disabilities, who previously received essential and life sustaining services while housed in state institutions, today live and flourish in highly integrated communities of their choice.ⁿ² New commercial construction - office buildings, restaurants, airports, and sports stadiums - in the last fifteen years has been subject to the ADA Accessibility Guidelines mandating such standards as accessible entrances, telephones, seating, restrooms, directions, and parking.ⁿ³

Title I of the ADA introduced revolutionary employment provisions that have proven a "model for anti-discrimination protections for people with disabilities all over the world."ⁿ⁴ It requires employers to provide accommodations for a qualified employee with a disability when the accommodations are requested, reasonable, [*325] and needed to perform essential job functions.ⁿ⁵ Employers and employees engage in an interactive dialogue to identify and implement appropriate accommodations.ⁿ⁶ Moreover, there is increased understanding and public support for individuals with disabilities to succeed in the workforce, gain independence from welfare programs, and own homes.ⁿ⁷ As a result, employment rates have increased among people with severe functional limitations.ⁿ⁸

People with disabilities, however, continue to receive less appropriate health care and education when compared to those without disabilities and are more pessimistic about their futures.ⁿ⁹ Similarly, individuals with disabilities experience disparities in access to transportation and technology due to inaccessible designs, are less active politically, and are three times more likely to live in poverty than people without disabilities.ⁿ¹⁰ Overall employment rates of people with disabilities remain significantly lower, and unemployment three times higher, than those of people without disabilities, with notable declines in employment rates for people with physical, sensory, self-care, and mental disabilities.ⁿ¹¹

First, reviewing previous research efforts, this article sets out a blueprint for the role of research, policy, and law in advancing [*326] the "civic, economic and social participation of persons with disabilities in a global society."ⁿ¹² Part I reviews past public policy efforts and research findings regarding workers with disabilities. Part II discusses current and future research initiatives on the cutting edge of promoting successful employment outcomes for people with disabilities. Part III presents promising research methodologies in multidisciplinary field disability and employment research. Finally, Part IV presents challenges and opportunities for research, policy, and legal initiatives, framing a blueprint for the next quarter century.

I. Past Research on Employment and People with Disabilities

Successful employment outcomes for people with disabilities are more the norm today - after a century of shifting attitudes, beliefs, and public policy initiatives. A civil rights framework for understanding societal barriers that "disable" people and that supports equal education, economic, and employment opportunities is now part of the American fabric. Research continues to inform improvements in policy and practice, though recently the emphasis of research is shifting from solely preparing people with disabilities for employment - a supply-side approach - to also preparing employers and industries for hiring and accommodating workers with disabilities - a demand-side approach - in the new global economy.

A. The Medical and Civil Rights Models of Disability

Early federal initiatives addressing the needs of individuals with disabilities date back to the aftermath of the American Civil War. Congress implemented a pension program for Union Army veterans with disabilities - the first social insurance plan in the world of such scale and support - which at times consumed nearly fifty percent of federal revenue.ⁿ¹³ Pension eligibility was based on a medically diagnosed "incapacity to perform manual labor."ⁿ¹⁴ This medical model viewed disability as an infirmity precluding equal opportunity and participation in society.ⁿ¹⁵ Through the pension scheme's broad reach, the medical model became the standard [*327] conception of disability for over a century.ⁿ¹⁶

Social Security entitlement programs benefiting people living in poverty or with disabilities perpetuated the medical model well into the 1960s.ⁿ¹⁷ People with disabilities continued to play a subordinate role to the medical system and

to social expectations to adjust to a physical and social environment structured for the convenience of people without disabilities.ⁿ¹⁸ Viewing people with disabilities as deficient in some mental or physical capacity, the medical model did not recognize the disabling impact of the environment as constructed, nor its role in producing unnecessary segregation and poverty.ⁿ¹⁹ Focusing on medical needs rather than individual rights, the medical model created a legacy of federal and state policies providing assistance under the guise of welfare and charity.ⁿ²⁰

In the 1970s, national policies began to address the rights of people with disabilities.ⁿ²¹ The Rehabilitation Act of 1973 recognized that people with disabilities compose an insular minority, who are entitled to civil rights protections similar to those fought for by women and African Americans.ⁿ²² People with disabilities began to challenge stereotypes and assert their right for equal opportunities in education, health care, employment, housing, and transportation.ⁿ²³

A civil rights framework built on equal rights, economic independence, inclusion, and empowerment led to passage of other federal laws addressing equal opportunity and accessibility in education, housing, and air travel, and culminated with the ADA.ⁿ²⁴ [*328] Today, the federal government plays a significant role in eliminating the physical, social, and limit equal involvement in society for people with disabilities.ⁿ²⁵

B. The Supply and Demand Sides of Employment for People with Disabilities

Successful employment plays a central role in eliminating social and economic barriers faced by people with disabilities. Employment opens the door to social inclusion, skill and career advancement, asset accumulation and home ownership, and increased economic and civic involvement.ⁿ²⁶ In 2004, the National Organization on Disability, in conjunction with Harris Interactive, found that workplace discrimination on the basis of disability significantly declined between 2000 and 2004.ⁿ²⁷ The proportion of qualified job seekers with disabilities not offered a position matching their skill set declined from 51% to 31%.ⁿ²⁸ Furthermore, those individuals reporting the denial of reasonable accommodations by employers fell from 40% to 21%.ⁿ²⁹ Nonetheless, employment rates in the U.S. remained consistently lower for people with disabilities compared to people without disabilities.ⁿ³⁰

Successful employment begins with a match of labor supply and demand. Most employment and disability research since the passage of the ADA has targeted the supply side, including "exploring how employment and earnings may be depressed by personal characteristics (e.g., educational gaps, time and energy constraints) or ... disincentives created by disability income programs."ⁿ³¹ Job placement services frequently emphasize assisting qualified workers with disabilities to develop skills sets, accessing the job market, and understanding work culture.ⁿ³²

[*329] Indicators of labor supply, such as educational attainment, work experience, and "labor market tightness as measured by the unemployment rate," have been primary tools for economic analysis predicting employment outcomes.ⁿ³³ Demand side characteristics have not been studied sufficiently under the supply side model.ⁿ³⁴ Part II illustrates new research protocols focused on "Employer Demand" characteristics.

II. Present Research on Employment and People with Disabilities

The Burton Blatt Institute ("BBI") is at the forefront of disability and employment research, policy development, and promoting best practices for advancing the successful employment of people with disabilities. BBI's five-year "Demand Side Employment Placement Models" projects engage a team of more than twenty-five leading researchers, including scholars of disability law, economics, statistics, and psychology, located at seven national universities across the United States.ⁿ³⁵ The purpose of the research is to develop a knowledge base for employers and to build effective tools for their use to promote the hiring of highly qualified workers with and without disabilities.ⁿ³⁶ This part discusses two comprehensive initiatives: (a) the Demand Side Employment Placement Models ("Employer Demand") Project, and (b) the related role of present and emerging technologies in training and accommodating employees with disabilities.

A. Employer Demand

Researchers need to understand employer demand for workers, skill sets, and changing work requirements over time.ⁿ³⁷ Similarly, we need to better understand the role of employer policies, practices, and attitudes in the successful or unsuccessful employment of people with varying disabilities. Researchers at BBI, and their national partners, are undertaking a rigorous research [*330] agenda - the Employer Demand Project - to address demand side factors and translate findings into practical tools and information for employers.ⁿ³⁸

Recent work leading to the Employer Demand Project addressed systemic attitudes about, and practices toward, employees with disabilities in different corporate contexts or "cultures." Uncertainty toward workers with disabilities is commonplace, arising in part from a lack of prior experience or contact with people having disabilities.ⁿ³⁹ Stereotypes

and stigma, communication difficulties, attitudes, and policies marginalize employees with disabilities and "deny them jobs with substantial responsibility, income, and benefits."ⁿ⁴⁰ Negative forces become self-fulfilling prophecies by impacting job evaluations, performance expectations, and co-worker acceptance and support.ⁿ⁴¹

Other aspects of corporate culture include principles of equity and independence,ⁿ⁴² which may give reason for an employer to provide accommodations to an employee with a disability. Equity and personal independence are often inconsistent with accommodations, when these accommodations are perceived as advantages that employees without disabilities do not receive.ⁿ⁴³ Yet, studies find supportive corporate cultures, such as those that promote employee networks and flexible work arrangements, benefit employees with and without disabilities as well as the larger organization.ⁿ⁴⁴ Further, studies indicate that for many employers, the benefits of providing workplace accommodations to disabled employees easily exceed any associated costs.ⁿ⁴⁵

The Employer Demand Project is taking our knowledge-base and the tools at the employer's disposal to the next level of integration. Our partners at the Disability Research Institute are developing an "Employer-Based Hiring & Retention" tool.ⁿ⁴⁶ This unprecedented [*331] and comprehensive employer resource, "drawn from an extensive collection of job skill and job analyses sources,"ⁿ⁴⁷ will support informed employment matches by assisting placement professionals and people with disabilities to "more accurately identify[] specific tasks associated with real jobs (i.e., essential job functions) for which accommodations will be required."ⁿ⁴⁸

BBI partners at the Disability Statistics Center are developing a new baseline measure for predicting employer demand over the coming decade in light of variables including disability type and severity, industry, location, occupation, physical and mental requirements, available benefits, competition, and macroeconomic conditions.ⁿ⁴⁹ These data will encourage necessary internal changes in employment policies and practices, thus attracting qualified workers with and without disabilities.ⁿ⁵⁰ They will also have the added benefit of teaching job training specialists as how people with varying abilities and disabilities may prepare themselves for a changing workforce.ⁿ⁵¹ Similarly, our partners at the Rutgers University Program for Disability Research are developing new baselines to predict future employer demand for workers with and without disabilities: (a) who have specific job skill sets,ⁿ⁵² (b) during times of layoff and downsizing,ⁿ⁵³ and (c) who use alternative, part-time, or home-based work arrangements.ⁿ⁵⁴

Our partners at the Job Accommodation Network ("JAN"), with access to a large, emerging dataset collected from employers who have sought assistance or information to accommodate employees with disabilities, are advancing knowledge of best practices when requesting and implementing accommodations.ⁿ⁵⁵ [*332] These findings and emerging tools, in addition to others discussed below, are helping to improve employment opportunities for people with disabilities in the 21st century.

B. Technology: Updating the Social-Civil Rights Model

Rapid and extensive innovations in technology over the past decade have created new opportunities for people with disabilities by facilitating their independence and empowerment.ⁿ⁵⁶ Technology plays an important role in promoting the civil rights of people with disabilities by creating and modifying applications, devices, and systems that adapt physical environments, workplace supports, educational outlets, and computer and information systems to the needs of people with disabilities.ⁿ⁵⁷ Technology supports the civil rights model of disability by eliminating programmatic and environmental barriers that disable people with mobility, learning, and other differences.ⁿ⁵⁸ Technology is critical in expanding employment opportunities for people with disabilities, especially in technology-dependent fields such as the information and communications technology and media industries, which largely have been inaccessible to them.ⁿ⁵⁹ BBI's research agenda facilitates the application of accessible technologies in real world situations through training and dissemination activities.ⁿ⁶⁰

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1. IT Works

The IT (Information Technology) Works project aims to advance the employment opportunities available for people with disabilities in the computer and Information Technology ("IT") professions through multiple research activities.ⁿ⁶¹ As computer-related industries are among the fastest growing, the demand for skilled workers continues to exceed the number available.ⁿ⁶² People with disabilities routinely experience high rates of unemployment and are underrepresented in IT-related occupations.ⁿ⁶³ Given this shortfall, it is beneficial to increase placement of people with disabilities in these positions.

The IT Works project activities target employers at IT firms and other firms that use IT, individuals with disabilities seeking employment in IT jobs, and entrepreneurs with and without disabilities in IT fields or other fields that use IT.ⁿ⁶⁴ Increasing the successful employment of people with disabilities in IT jobs requires job training and increasing workplace accommodations.ⁿ⁶⁵ The demand for IT in the twenty-first century involves not only computer engineering and IT firms, but also database management, management and computer support services, and website development, which are all important parts of most industries and occupational activities.ⁿ⁶⁶ Ongoing BBI projects targeting these industries are described next.

a. Accessible Open Source Software for Business

IT firms and software engineers design and implement software applications to meet the diverse needs of businesses and non-profit organizations across U.S. industries. IT professionals use proprietaryⁿ⁶⁷ and open source software applicationsⁿ⁶⁸ and customize [*334] them to client need.ⁿ⁶⁹ Open source applications are popular among designers because they are free, abundant, and adaptable for specific purposes.ⁿ⁷⁰ These applications give users free access to the materials and framework used in creating the product, such as the source code, which enables users to modify the end product to match target goals and needs.ⁿ⁷¹ Developing accessible open source applications for use by people with varying impairments will increasingly allow programmers and designers to have free access to applications built for standard business purposes, easily tailored to meet specific employee needs.

BBI researchers trained in computer engineering, information management, and law are conducting interdisciplinary analyses to identify business and organizational management software applications, engineered for people with disabilities who may require accommodations. A part of this analysis identifies markup features with capabilities to permit or enhance accessibility, such as Dynamic Hypertext Markup Language ("DHTML"), and applications presenting a Voluntary Product Accessibility Template ("VPAT"). Researchers also aim to evaluate the accessibility of open source applications using Section 508 accessibility standardsⁿ⁷² and universal design principles,ⁿ⁷³ as well as the legal obligations [*335] on designers to ensure accessibility in their business products and services.

Additionally, the research team is building a prototype module for open source applications to accommodate employees with disabilities in varying fields. Findings and products will target people with disabilities, stakeholders in the IT and software engineering fields, and educators in business, IT, and engineering through such means as webcasts, audioconferences, and the electronic dissemination of law and policy briefs.

b. Technical Support Jobs

Technical support services are required in an increasing number of industries.ⁿ⁷⁴ Demand for skilled employees to provide these services remains significantly ahead of supply.ⁿ⁷⁵ Technical support centers routinely train their employees in hard and soft skills to efficiently assist consumers based on project and client (e.g., business, company, etc.) requirements,ⁿ⁷⁶ and use varying methods to conduct these trainings.ⁿ⁷⁷ People with disabilities provide a pool of job seekers who may be trained - or better trained - to perform these tasks.

One step toward increasing the employment of people with disabilities in technical support jobs requires understanding of technical support and training needs of potential trainees with disabilities. Companies that train in-house and training specific firms use different methods to present their curricula, such as computer-based training, a mixture of lab and classroom settings, and teacher-conducted classroom sessions.ⁿ⁷⁸ BBI researchers are [*336] identifying both technical support needs across industries and the types of training programs available to meet those needs. The next step is to evaluate the accessibility and needed modifications of training programs and materials to ensure equal opportunity for people with disabilities.

c. Proposed Initiatives

Modern media and communications integrate information and communications technology ("I & CT") in daily operations.ⁿ⁷⁹ There is an increasing awareness internationally about the potential of accessible I & CT to advance the inclusion and empowerment of people with disabilities.ⁿ⁸⁰ BBI will be documenting knowledge about the status of media technology accessibility and developing best training, hiring, and employment practices for the media and communications industry, as well as higher education. These institutions will be equipped to train and accommodate people with disabilities, advancing their equal opportunities for successful media and communication careers.

2. Technology for Independence

BBI's Technology for Independence: Community Based Resource Center ("CBRC") project is helping to advance research and generate knowledge on assistive technology ("AT") and environmental access for persons with disabilities.ⁿ⁸¹ This project brings BBI together with a number of partners across the spectrum of disability research and advocacy, including community-based organizations and members of the disability community.ⁿ⁸² CBRC encompasses a range of activities aimed at facilitating the capabilities of community-based and consumer-directed disability organizations in designing and implementing research promoting [*337] consumer empowerment and access to, and use, of technology.ⁿ⁸³

CBRC offers training programs to promote an understanding of research methods, design, questions, and assumptions through on-site symposia and on-line training sessions, thus efficiently using the Internet to provide people at remote distances with the opportunities to participate in trainings.ⁿ⁸⁴ Trainings introduce research concepts and methodologies in participatory action research ("PAR") through online modules that enable community based organizations without research backgrounds to engage in scientifically rigorous research activities.ⁿ⁸⁵ BBI research partners disseminate resources and research findings through accessible outlets and offer technical support to stakeholders.ⁿ⁸⁶

3. Technology Enhanced Learning Communities

BBI increasingly incorporates interactive web-based applications in its research methods to facilitate enhanced partnerships through collaborative laboratories, or in other words, "collaboratories," or "centers without walls," with partners across the United States and around the globe.ⁿ⁸⁷ BBI projects implement strategies to build collaboratories using web-conferencing and open-source web development applications.ⁿ⁸⁸ These projects, including the Employer Demand project, facilitate coordinated research, training, and dissemination activities by researchers located at multiple universities.ⁿ⁸⁹ The collaboratory brings together an accomplished team of researchers to share research findings and expertise and deliberate on research proceedings in real time.ⁿ⁹⁰

Similarly, BBI's Disability and Business Technical Assistance Center - Southeast ADA Center ("DBTAC") uses collaboratory tools to promote research activities and disseminate results within its eight state region of service.ⁿ⁹¹ The collaboratory is increasing [*338] knowledge sharing among partners and providing training programs, educational activities, and technical assistance to a range of audiences.ⁿ⁹²

III. Promising Methodological Paradigms for Disability Research

While we have highlighted aspects of the research agenda needed in the next twenty-five years, we also believe there is a need to push forward paradigmatically. Thus, we describe two different methodological approaches for research in the next twenty-five years: (1) increasing the use of PAR and (2) increasing the use of experimentalism in the field.

A. Participatory Action Research

Historically, scientifically relevant and rigorous research lacked the involvement of people with disabilities in the research process - whether participating as informants and developers of the design of studies, interpreting findings, or making recommendations based on findings.ⁿ⁹³ Some researchers argue that traditional research methods create an unequal relationship in which the researcher assumes the role of an expert and the person with a disability is treated as an isolated individual whose inadequacies and limitations are the root cause of their problems in daily life.ⁿ⁹⁴ When researchers view the individual as the locus of disability, they ignore environmental factors in the person-environment relationship, such as access to appropriate transportation, accessible housing, and differing AT needs.ⁿ⁹⁵ These environmental factors are not integrated into the design of the research, thus preventing an assessment of their impact. Similarly, questionnaires used in traditional research methods and national surveys frequently ask questions about disability in terms of the consumer's functional limitations, rather than as a social relationship between the individual and environmental resources or barriers.ⁿ⁹⁶

[*339] Due to this lack of meaningful involvement of people with disabilities in the design, implementation, and dissemination of research, there is a disjuncture between researchers interested in disability and community-based disability advocates.ⁿ⁹⁷ Points of disagreements include the design and provision of environmental access, health care programs, assistive technology, and job training.ⁿ⁹⁸ Moreover, the absence of individuals with disabilities in the design of AT has perpetuated stigma by viewing AT through the prism of the traditional medical model.ⁿ⁹⁹

More recently, research has been influenced by the values and principles of the civil rights and independent living movements described earlier, though it continues to pay insufficient attention to the creation and dissemination of research that has direct real-world applications and involves people with disabilities in the research process.ⁿ¹⁰⁰ Research-

ers who themselves live with disabilities have been at the forefront of calling for scientifically rigorous research that incorporates meaningful participation from the disability community.ⁿ¹⁰¹

The emergence of PAR is a response to the shortcomings of the previous research and the need for a dialogue between the disability community and researchers from multiple disciplines.ⁿ¹⁰² PAR addresses the gap between researchers and human subjects [*340] in traditional research settings and provides a platform for researchers and the disability community to play critical roles transferring their knowledge from multiple disciplines and perspectives to action.ⁿ¹⁰³

PAR is a collaborative research approach that involves active participation of members of communities under study who provide input at all levels - from initial decision making to the final presentation of results and discussion of implications.ⁿ¹⁰⁴ The PAR approach invites people with disabilities to participate in the basic phases of the action research process: "look, think and act," or in other words, gathering information, interpreting and explaining, and resolving issues.ⁿ¹⁰⁵ PAR enables people with disabilities to set the agenda by prioritizing issues important to them, reflecting on their experiences, and devising actions they perceive as being possible and meaningful within the context of their life experiences.ⁿ¹⁰⁶ PAR promotes co-learning, "reciprocal transfer of expertise," shared decision-making, and "mutual ownership of the processes and products of the research enterprise."ⁿ¹⁰⁷

A survey of the rehabilitation literature in 2000 revealed that over 500 articles and reports incorporated aspects of PAR, with the greatest increase in PAR-related publication occurring after 1993.ⁿ¹⁰⁸ Disability research using PAR has addressed disability accessibility,ⁿ¹⁰⁹ and has involved people with mental disabilities,ⁿ¹¹⁰ chronic illness,ⁿ¹¹¹ learning difficulties,ⁿ¹¹² hearing impairments,ⁿ¹¹³ [*341] and ethnic minorities,ⁿ¹¹⁴ among others. Multiple issues were addressed in these works including: the dynamics of power between community members and researchers,ⁿ¹¹⁵ methodological concerns,ⁿ¹¹⁶ the role of universities in a PAR model,ⁿ¹¹⁷ and conflict resolution during the research process.ⁿ¹¹⁸

A successful use of PAR is the Technology for Independence: A Community-Based Resource Center ("CBRC") project.ⁿ¹¹⁹ BBI researchers and colleagues conduct training sessions and symposia providing expertise in, and a forum for use of, PAR.ⁿ¹²⁰ These activities are designed to increase the capacity of community organizations to conduct scientifically rigorous research on AT.ⁿ¹²¹ CBRC assists consumer-run organizations to develop the capacity to collect, analyze, and disseminate findings regarding AT and environmental access that address the needs of people with disabilities as organization members and consumers.ⁿ¹²²

One CBRC project known as "CR4AT," carried out by the California Foundation for Independent Living Centers, identified roles for employers and consumers to increase their knowledge and effective use of AT in the workplace.ⁿ¹²³ Consumers, researchers, industry managers, engineers, employers and stakeholders collaborated to address questions deemed important by the disability [*342] community.ⁿ¹²⁴ CBRC offers nationwide training and technical assistance to funded PAR projects including distance learning, on-site methods training, and audio conference discussions.ⁿ¹²⁵ Started in 2003, CBRC continues using PAR to prepare the next generation of researchers from the disability community who will study the application of AT for advancing independence.

PAR aligns with the principles and values of the independent living philosophy by incorporating self-determination and consumer control and promoting access to meaningful, informed choice. PAR likely will increase in sophistication as researchers continue to research with, and be inspired by, people with disabilities because research efforts benefit from expanding the scientifically rigorous research designs and strategies from which it draws.

B. Experimental Research Efforts

Recognizing the involvement of the target audience in the research process is one key way to paradigmatically move disability research forward over the coming twenty-five years. A second critical way is to focus on programmatic research that approaches problems in substantively and methodologically balanced ways. Researchers are trained to conduct programmatic research that focuses on a substantive question and explore it thoroughly, drawing connections along the way to related findings described in the bodies of literature.ⁿ¹²⁶

The National Institute of Disability and Rehabilitation Research ("NDRR"), a key government funding source for disability-related research, encourages researchers to balance and achieve scientific "rigor" and practical "relevance" in their work.ⁿ¹²⁷ Researchers operationalize the term "rigor" as the internal validity of [*343] the research, or the control of variables that may account or provide alternative explanations for the findings.ⁿ¹²⁸ Similarly, researchers operationalize the term "relevance" as external validity, or the practicality, meaningfulness, applicability, and generalizability of findings in terms of populations, settings, tasks, and other characteristics.ⁿ¹²⁹

These two aspects of research are not mutually exclusive, but as one increases the other does decrease. As an example, consider what happens when addressing a research question using a rigorous scientific paradigm (e.g., an experiment): more variables need to be controlled through elimination or manipulation to prevent them from being alternative causal explanations for the study's findings. However, by controlling a multitude of variables associated in the real world, we create an artificial situation in which findings are completely dependent, and the artificial situation does not completely reflect reality. The limitations with such findings are of limited value because they may not be found under circumstances that increasingly approximate the settings of the real world.ⁿ¹³⁰ Similarly, as relevance increases by including more aspects of a real world setting, for example by reducing the control of multiple variables as in an experimental design, a multitude of causal factors will be present and may account for the findings. While relevance has increased, rigor has diminished. The solution is to strike a balance via programmatic research that involves multiple studies varying the ratio of rigor to relevance.ⁿ¹³¹

All applied researchers encounter this conundrum. They successfully navigate this dilemma by walking the line between rigor and relevance to achieve an appropriate balance.ⁿ¹³² Very rarely - in fact some say never - may a study perfectly balance the two. The prevailing paradigm of research is to take a "programmatic perspective" and to ask the same research question in multiple ways, employing multiple techniques to answer it.ⁿ¹³³ When the multiplicities of perspectives yield the same answer, one has [*344] "convergent evidence" providing greater confidence in the result.ⁿ¹³⁴ If the answer varies depending on how you ask the question, to whom you ask the question, or where you ask the question, and so forth, then the answers may not be supported universally, and thus have limited relevance.ⁿ¹³⁵

As an example, consider research on attitudes towards persons with disabilities. The current literature of disability discrimination research largely includes surveys on employers' attitudes toward job applicants and employees with disabilities,ⁿ¹³⁶ as well as analog studies manipulating applicant disability status and examining how employment-related decisions are affected by such status. These analog studies are experimental in design and approximate real-world circumstances, for example, by using undergraduate students instructed to sort through constructed resumes and make hiring decisions.ⁿ¹³⁷ When research is viewed as a continuum ranging from high-in-control/low-in-realism to low-in-control/high-in-realism, it is evident that the current evidence base has the ends of the continuum well covered. These survey and analog research paradigms have shown that persons with disabilities fair worse on a variety of employment related outcomes, such as hiring, salary, employee assessment and promotion decisions when compared to applicants without disabilities.ⁿ¹³⁸ Indeed, the reticence to hire a person with a disability appears to extend to [*345] applicants with only a potential for a future disability.ⁿ¹³⁹

While these studies have been informative, there are limitations in their design. Analog research inherently decreases the real-world generalizability of findings due to the artificial nature of the setting, task, and participants.ⁿ¹⁴⁰ While data collected via survey methods and examination of statistics of employment status corroborate the low and under-employment rates of people with disabilities,ⁿ¹⁴¹ these methods do not control for variables that may be driving the findings.ⁿ¹⁴² One of the issues is that attitude reports are subject to a variety of biases, including social desirability.ⁿ¹⁴³ The link between one's reported attitude and actual behavior is tenuous and dependent on other factors.ⁿ¹⁴⁴ Even when attitude surveys are designed to control for social desirability, self-reported attitudes against discrimination are not indicative of actual behaviors.ⁿ¹⁴⁵

These gaps need addressing to demonstrate that discrimination towards people with disabilities is a convergent, or robust, finding.ⁿ¹⁴⁶ Together, experimental and analog research methods may overcome these weaknesses by embedding manipulations not explicitly detected by participants related to variables that induce reporting biases.ⁿ¹⁴⁷ As an example of this approach, we return to prior descriptions of ongoing BBI research on employer demand,ⁿ¹⁴⁸ [*346] including a set of interrelated projects, each built from prior literature, to identify in multiple ways the variables impacting the employability of persons with disabilities.

C. Attitudes Toward Persons with Disabilities and Employment Discrimination: Field-Based, Experimental BBI Research

One BBI project builds on research identifying negative attitudes as a barrier to employing persons with disabilities.ⁿ¹⁴⁹ This project is designed to occur in the middle of the realism versus the control continuum described above. Since the ends of the continuum have been well-covered by prior survey and analog research, the study balances these ends by achieving control and realism. In this way, it builds the evidence base by testing alternative causal explanations for the finding that, all else being equal, people with disabilities are hired less often. Put more specifically, business owners may claim that people with disabilities who apply for jobs are under-qualified. These claims are similar to those made for years regarding gender and ethnic disparities in employment and compensation rates in certain job sectors.ⁿ¹⁵⁰ Simi-

larly, business owners may believe or claim that providing accommodations to employees with disabilities is costly, posing an undue burden on the employer, despite the fact that data establish accommodations are low-cost and provide tangible net benefits to the company.ⁿ¹⁵¹ We hypothesize that implicit negative employer attitudes toward applicants with disabilities do reduce the likelihood of applicants receiving a job offer. To examine whether negative employer attitudes are the driving force, and not some other factor such as the cost of accommodations, experimental research is necessary.

In our study of negative attitudes toward employing people with disabilities, we balance internal and external validity, control and realism, respectively, by conducting an experimental study in a field setting. First, we achieve rigor, or internal validity, through control of important variables.ⁿ¹⁵² Second, we achieve relevance, [*347] or realism, through use of participants who conduct the "study task at hand" in real life instead of labs.ⁿ¹⁵³ Thus, while it is possible, and indeed expected, that conclusions from this research will corroborate existing studies, this research adds a new paradigm not commonly used in the disability arena. This example demonstrates that by rounding out the paradigms addressing a substantive body of research, the methodological spectrum is appropriately covered, and we add to the state of the science.

BBI's current research on attitudes and disability discrimination is meant to push current paradigmatic boundaries. The findings from this research will help to close gaps in the literature and address a fundamental driving force behind the ADA: to give people with disabilities an equal opportunity for employment. This type of research has been demonstrated as successful in other substantive fields,ⁿ¹⁵⁴ and disability research now moves into this arena. Substantively, BBI is continuing to add to the evidence base by studying attitudes towards people with disabilities across settings. Developing collaborative research will address the stigma associated with having a disability, physical or mental, and how the media may be used as a vehicle for changing attitudes.ⁿ¹⁵⁵

IV. A Blueprint for the Next 25 Years

Over the next quarter century, among the issues likely to have impact on the lives of people with disabilities are: the scientific rigor and interpretation of disability research, the effective translation of disability research into policy and best practices,ⁿ¹⁵⁶ and the role of government and courts in clarifying disability law, and the ADA's mandates in particular. The direction of these areas may expand or retract the self-determination, equal opportunity, and societal inclusiveness of people with disabilities.

A. Research

Increasing use of experimentalism will not be without challenge. Perhaps the biggest challenge involves the navigation of [*348] ethical issues that face researchers who conduct research in the field. As discussed, experimental paradigms using behavioral measures overcome the weaknesses associated with self-report measures, including conscious and unconscious biased reporting, and control for possible alternative causal factors other than the one under investigation.ⁿ¹⁵⁷ However, to prevent other factors from influencing the behavior of participants in the study, whether consciously or unconsciously, as Professor Robert Rosenthal and others have shown, it is of importance that participants not know which factor is thought to be driving their behavior.ⁿ¹⁵⁸ Thus, a minimal level of deception is used, implicating heightened scrutiny by reviewers charged with safeguarding the rights of human research participants. Though this is a standard practice in experimental research, it poses new challenges in the field.

Participants in studies that occur in academic settings typically are aware they are participating in a study, though the exact purpose of the study is often kept from them.ⁿ¹⁵⁹ Participants in field-based settings may be kept unaware of their participation to prevent the participants from altering their behavior. The ethical considerations to be balanced in field research are the same as those that occur in academic settings, though a heightened duty to protect participants' rights is incumbent on the researcher.ⁿ¹⁶⁰

Primary among such considerations are: "Is the participant harmed in any way from their participation?," and "Do the benefits of this research outweigh the use of deception?"ⁿ¹⁶¹ It is important to evaluate the legal implications of participation as well. For example, research data may be subject to subpoena.ⁿ¹⁶² It is unacceptable [*349] to expose participants who are unaware of their participation to legal risks.ⁿ¹⁶³ Fortunately, the National Institutes of Health ("NIH") recognizes that such obstacles need not prevent necessary research from going forward. They offer a researcher, and not just those receiving NIH funding, the opportunity to apply for Certificates of Confidentiality, which include the right to refuse subpoena.ⁿ¹⁶⁴ This legal protection, coupled with carefully conducted ethics reviews by home institutions of the researcher, allow for new and important opportunities in research.

Much interview, survey, and observational work has occurred in field settings and much experimental, controlled research has occurred in academic settings. In the next 25 years, it will be important for researchers to test findings from the field in controlled paradigms, and to test findings from controlled paradigms in field settings. This balance will further the paradigmatic continuum and help identify convergent, replicable, and valid research findings. The accumulation of such findings across comparable studies then is possible, allowing for meta-analytic techniques to synthesize a body of research studies.ⁿ¹⁶⁵ This cumulated knowledge enables a more complete assessment of disability law and policy.

B. Policy

The recent and ongoing work of BBI researchers and colleagues in the development of collaboratories examines two fundamental questions: "To what degree may accessible cyberinfrastructure be developed in the disability community?" and "How may this cyberinfrastructure be used?"ⁿ¹⁶⁶ These questions are essential to ensuring people with disabilities are not isolated by a digital divide,ⁿ¹⁶⁷ in part, as "the tremendous potential" of cyberinfrastructure [*350] to enhance and make more efficient geographically distributed collaboration becomes widespread in science, industry, and policy making.ⁿ¹⁶⁸ Applying the principles of Universal Design ("UD") in the planning, development, and maintenance of collaboratory cyberinfrastructure, BBI researchers are finding ways to "improve access to information for people with varying disabilities, and may do so in the future without expensive and complex assistive technology."ⁿ¹⁶⁹

The next step is to translate findings from this initiative into effective policy and best practices that enhance opportunities for, and the inclusion of, people with disabilities in all aspects of life. Preliminary findings suggest the "flexibility to permit manipulating the code for greater accessibility are vital" when selecting software applications for commercial, business, research, and other purposes.ⁿ¹⁷⁰ As we investigate opportunities for developing accessible open-source software applications that have practical business uses,ⁿ¹⁷¹ we encourage setting new standards for software applications to anticipate the needs of the user (e.g., employee) without requiring their use of assistive technology.

Though we have yet to determine whether ADA Titles I and II employers and Title III businesses are accountable under the law for ensuring the software they use for everyday purposes is accessible, there is much we may do to encourage this development. As the World Wide Web Consortium ("W3C") endeavors drafting improved 508 standards,ⁿ¹⁷² we encourage applying UD principles as the baseline.ⁿ¹⁷³ This is a first step toward heightened standards of technological inclusiveness for people with disabilities will have broad implications for title II employers.ⁿ¹⁷⁴ Moreover, these standards may be revisited through the lens of UD to make adjustments for new research findings and technological innovations.

Finally, we encourage funding for empirical research that demands the development of products and services using UD principles. [*351] Ultimately, people with disabilities will benefit on the job, in their communities of choice, at home, and on the World Wide Web from field studies and controlled laboratory research analyzing the usability of technology by people with varying impairments and needs.ⁿ¹⁷⁵

C. Law

Businesses increasingly are developing an online presence with virtual storefronts in addition to their physical stores, or at times as their only marketplace.ⁿ¹⁷⁶ This trend is giving rise to policy and regulation challenges, even as it presents opportunities for people with disabilities to participate in activities ranging from shopping to educational activities. One concern is the applicability of the ADA to online stores and the need for such web sites to be accessible to people with varying disabilities.ⁿ¹⁷⁷ Legal challenges on the accessibility of business websites have resulted in differing court judgments, although a majority of courts addressing the issue conclude there must be a "nexus between the challenged lack of service and the place of public accommodation."ⁿ¹⁷⁸

In a recent lawsuit, the Plaintiffs alleged that Target.com was not accessible to people who were blind due to the inappropriate use of alternative text and navigation links, both of which are easy and economical to make accessible.ⁿ¹⁷⁹ Target argued that it had no legal obligation to create accessible websites, as the ADA applied only to "places" of public accommodations. The federal district court disagreed with this position stating that ADA Title III applied to all services provided by a public entity, when that web service has a "nexus" to the physical place of business.ⁿ¹⁸⁰ A contrasting judgment was delivered in a similar case filed against Southwest Airlines, wherein the court held that virtual ticket counters were not physical places and not covered by the ADA's definition of public accommodations.ⁿ¹⁸¹

[*352] Whether the ADA applies to the websites of public goods and service providers is an issue of ever-increasing importance as online services and the use of information technology in the actual trade of goods and services are growing at an extraordinary rate.ⁿ¹⁸² The absence of a mandate for website accessibility will widen the digital divide between people with and without disabilities as more commerce turns to the online marketplace. As proposed by

the National Council on Disability in 2004, an ADA Restoration Act may be necessary to clarify the Act's mandates for the courts and public alike.ⁿ¹⁸³

Policy revisions may incentivize built-in accessibility features for online stores and actively initiate desirable best practices to ensure that people with disabilities have equal opportunities in the global market. The certainty that online business will grow, perhaps exponentially, from their use today presents vast opportunities for researchers, businesses, website designers, and policy makers to identify best practices and create accessible global marketplaces from the ground up. With passage of the 2006 United Nations Convention on the Rights of Persons with Disabilities, we are at the watershed of social, educational, and economic advancement of people with disabilities the world over.ⁿ¹⁸⁴

Conclusion

In this new millennium, we also enter a new era in disability research, policy, and law. Strong evidence suggests attitudes lead to discrimination against people with disabilities. New research is moving towards understanding the operation of such attitudes in realistic settings and testing interventions to ameliorate their negative effects. Participatory action research is enabling researchers to design studies that include a focus on environmental and social factors impacting people with disabilities. Studies are clarifying ways that social and environmental factors - workplace accommodations, universal design, and technological advances - [*353] remove barriers to full social and economic inclusion of people with disabilities. Technological advances are creating new "places" for consumers and citizens that are designed to be inclusive and empowering. These advances may be used by policy-makers and courts, nationally and internationally, to further advance the civil and human rights of people with disabilities in the next twenty-five years.

Legal Topics:

For related research and practice materials, see the following legal topics:

Computer & Internet Law
Privacy & Security
Company Communications
Labor & Employment Law
Discrimination
Accommodation
Public Health & Welfare Law
Social Services
Disabled & Elderly Persons
Advocacy & Protection
Discrimination
Americans With Disabilities Act

FOOTNOTES:

n1. Peter Blanck, The Burton Blatt Institute: Centers of Innovation on Disability at Syracuse University, 56 Syracuse L. Rev. 201, 209 (2006).

n2. State and private institutional residential settings have seen a decrease in residents with intellectual and developmental disabilities from 125,340 in 1991 to 67,066 in 2005. Over the same period, this population has increased their in community settings of 1 to 6 persons from 108,479 to 291,142. K. Charlie Lakin et al., Changing Patterns in Size of Residential Settings for Persons with Intellectual and Developmental Disability, 1977-2005, 44 Mental Retardation 306, 309 fig.1 (2006); see also Am. Ass'n on Mental Retardation et al., "Community for All" Tool Kit: Resources for Supporting Community Living, at II.D.1-2 (2004), available at http://thehcp.syr.edu/toolkit/Community_for_All_Toolkit_Version1.1.pdf (discussing comparable changes in the residential settings of individuals with intellectual and development disabilities); U.S. Dep't of Justice, Delivering on the Promise: Self-Evaluation to Promote Community Living for People with Disabilities: Report to the President on Executive Order 13217, at II.A.1 (2002), available at <http://www.hhs.gov/newfreedom/final/pdf/doj.pdf> (discussing the role of the Department of Justice with respect to improving the housing conditions of disabled people).

n3. See generally 36 C.F.R. §1191 (2007) (prescribing accessibility guidelines for buildings and facilities covered by the ADA); Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (U.S. Access Bd. 2002), available at <http://www.access-board.gov/adaag/ADAAG.pdf> (providing guidelines for accessibility to buildings and facilities under the ADA).

n4. The Honorable Dick Thornburgh, Remarks at the Congressional Human Rights Caucus Briefing on International Disability Rights (Mar. 30, 2004), available at <http://www.nod.org/index.cfm?fuseaction=page.viewPage&pageID=1430&nodeID=1&FeatureID=1263&redirected=1&CFID=5578504&CFTOKEN=74939408>.

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n6. Id. at 248-51 (describing the process an employee must undergo in order to obtain a reasonable accommodation from her employer under the ADA).

n7. See Blanck, *supra* note 1, at 210.

n8. H. Stephen Kaye, Disability Statistics Ctr. Inst. for Health and Aging, Improved Employment Opportunities for People with Disabilities 1 (2003), available at http://dsc.ucsf.edu/view_pdf.php?pdf_id=27; Douglas Kruse & Lisa Schur, Employment of People with Disabilities Following the ADA, 42 Indus. Relations 31, 50-51 Tbls. 3 & 4. (2003).

n9. Harris Interactive Inc., 2004 Gaps Survey of Americans with Disabilities 5, 10-11 (2004), available at http://www.nod.org/Resources/harris2004/harris2004_data.pdf. The National Organization on Disability prepared a summary of the key indicators from this poll which is available at http://www.nod.org/Resources/harris2004/harris2004_summ.pdf.

n10. See Michael Waterstone, The Untold Story of the Rest of the Americans with Disabilities Act, 58 Vand. L. Rev. 1807, 1834 (2005) (noting that voter registration is lower for people with disabilities and that people with disabilities are more likely to feel politically marginalized); Jack McNeil, U.S. Census Bureau, Current Population Report: Americans with Disabilities: Household Economic Studies 1997 1 (U.S. Dep't of Commerce 2001), available at <http://www.census.gov/prod/2001pubs/p70-73.pdf> ("The poverty rate among the population 25 to 64 years old with no disability was 8.3 percent; it was 27.9 percent for those with a severe disability.").

n11. See Harris Interactive, *supra* note 9, at 7; Kris Maher, Disabled Face Scarcer Jobs, Data Show, Wall St. J., Oct. 5, 2005, at D2 ("The employment rate for Americans age 21 to 64 with sensory, physical, mental, or self-care disabilities fell to 38.3% in 2004, from 40.8% in 2001.").

n12. Burton Blatt Inst., <http://bbi.syr.edu/> (last visited Feb. 12, 2007).

n13. See Peter Blanck, Americans with Disabilities and Their Civil Rights: Past, Present, and Future, 66 U. Pitt. L. Rev. 687, 690-91 (2005).

n14. *Id.* at 690.

n15. *Id.*

n16. See *id.*

n17. *Id.* at 693.

n18. *Id.*

n19. *Id.*; see also Peter Blanck & Michael Millender, Before Disability Civil Rights: Civil War Pensions and the Politics of Disability in America, 52 Ala. L. Rev. 1, 2-3 (2000) (describing the negative effects of the medical model on disabled people).

n20. Blanck, *supra* note 13, at 693.

n21. Blanck et al., *supra* note 5, at 4.

n22. Cf. 29 U.S.C. §701(a)(5), (c)(1)-(2) (2000) (indicating that people with disabilities "continually encounter ... discrimination in such critical areas as employment, housing, public accommodations, education, transportation, communication, recreation, institutionalization, health services, voting, and public services," and that U.S. policy mandates "respect for individual dignity, ... self-determination, ... privacy, rights, and equal access" for Americans with disabilities).

n23. Joseph P. Shapiro, No Pity: People with Disabilities Forging a New Civil Rights Movement 64-70 (1993) (describing the activities of disability rights activists and the origins of disability protections in the Federal Rehabilitation Act).

n24. Blanck, *supra* note 13, at 693.

n25. *Id.* at 693-94.

n26. Lisa Schur, *The Difference a Job Makes: The Effects of Employment Among People with Disabilities*, 36 *J. Econ. Issues* 339, 342-46 (2002).

n27. Nat'l Org. on Disability, *Landmark Disability Survey Finds Pervasive Disadvantages* (June 25, 2004), <http://www.nod.org/index.cfm?fuseaction=page.viewPage&pageID=1430&nodeID=1&FeatureID=1422&redirected=1&CFID=5578504&CFTOKEN=74939408>.

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n30. Peter Blanck et al., *Demand Side Employment Placement Models*, National Institute for Disability and Rehabilitation Research Grant No. H133A060033, at 1 2005 (on file with authors) [hereinafter *Employer Demand*].

n31. *Id.*

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n34. *Id.* at xv.

n35. Burton Blatt Inst., *Projects*, <http://bbi.syr.edu/projects/> (last visited Feb. 7, 2007).

n36. See Burton Blatt Inst., *BBI Employment Demand Project: Project Overview*, <http://bbi-empdemand.syr.edu/Home/tabid/336/Default.aspx> (last visited Feb. 7, 2007).

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n38. Burton Blatt Inst., *supra* note 36.

n39. Lisa Schur et al., *Corporate Culture and the Employment of Persons with Disabilities*, 23 *Behav. Sci. & L.* 3, 10-11 (2005).

n40. Blanck, *supra* note 1, at 216.

n41. *Id.*

n42. Schur, *supra* note 39, at 12.

n43. *Id.* at 12-16.

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- n61. See Law, Health Pol'y & Disability Ctr., IT Works-Research Overview, <http://disability.law.uiowa.edu/itworks/overview/research.htm> (last visited Feb. 7, 2007) [hereinafter IT Works-Research Overview].
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n63. *Id.* at 639-40.

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n65. K. Schartz et. al., *supra* note 62, at 642, 645.

n66. *See id.* at 638.

n67. *See generally* Jonathan Zittrain, Normative Principles for Evaluating Free and Proprietary Software, 71 U. Chi. L. Rev. 265, 265-66 (2004) (explaining the basic characteristics of proprietary software).

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n69. *See* Bashar Nuseibeh & Steve Easterbrook, Requirements Engineering: A Roadmap, Proceedings of the Conference on the future of Software Engineering 37 (June 4-11, 2000), <http://www.doc.ic.ac.uk/~ban/pubs/sotar.re.pdf>.

n70. *See generally* Jason Williams et al., The Advantages of Adopting Open Source Software, in *Expanding Choice: Moving to Linux and Open Source with Novell Open Enterprise Server* (2005), available at <http://www.informit.com/articles/article.asp?p=376255&rl=1> (enumerating the positive attributes of open source software); James Bessen, Open Source Software: Free Provision of Complex Public Goods 19-21 (2005), <http://pascal.case.unibz.it/retrieve/3224/opensource.pdf>.

n71. Bessen, *supra* note 70, at 5-9.

n72. 29 U.S.C. §794d (2000). The Rehabilitation Act of 1973 was amended by the Workforce Investment Act of 1998 (P.L. 105-220) to include, in part, the section 508 standards promulgating specific standards for electronic and information technology accessibility. These standards have been codified in Title 29 of the United States Code.

n73. The Center for Universal Design at North Carolina State University in 1997 articulated seven core principles of Universal Design: (1) Equitable Use, (2) Flexibility in Use, (3) Simple, Intuitive Use, (4) Perceptible Information, (5) Tolerance for Error, (6) Low Physical Effort, and (7) Size and Space for Approach & Use. William N. Myhill, The Future for Universal Design in Improving Employment Outcomes for People with Disabilities, Policy Brief Prepared for NCD Employment Grant, Principal Investigator Dr. Douglas Kruse (2006) (on file with author). Federal law recognizes "universal design" as "a concept or philosophy for designing and delivering products and services that are usable by people with the widest possible range of functional capabilities, which include products and services that are directly accessible (without requiring assistive technologies) and products and services that are interoperable with assistive technologies." 29 U.S.C.A. §3002(19) (2006) (emphasis added).

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n85. *Id.* at 54, 57-59.

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n87. William N. Myhill et al., *supra* note 60; Gary M. Olson et. al., Collaboratories to Support Distributed Science: The Example of International HIV/AIDS Research 44 (2002).

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n90. *Id.*

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