

**I.T. Works:
Barriers, Facilitators and Strategies for Promoting Quality and Successful Employment
and Advancement of Individuals with Disabilities in the Information Technology Industry**

A. Importance of the Problem

Need and Target Populations

The **I.T. Works** project's research, training, and dissemination activities will focus on five target populations: 1) employers at information technology (I.T.) and non-I.T. firms; 2) individuals with disabilities seeking employment in the I.T. industry; 3) entrepreneurs with and without disabilities in I.T. fields or non-I.T. fields; 4) trainers at I.T. training programs; and 5) project directors and staff at federally funded I.T. training projects. For purposes here, an I.T. firm is defined by the Information Technology Association of America (ITAA) as a company that creates and sells commercial I.T. solutions to customers. ITAA defines a non-I.T. firm as a firm that uses I.T. solutions to assist in business operations but is not developing such solutions for commercial sales.

According to the U.S. Department of Commerce (June, 1999), by 2006 almost half of U.S. workers will work in industries that either produce information technology products or use information technology (I.T.) products extensively. Of the 10 fastest growing occupations between the years 1998-2008, the top five are computer-related: the demand for computer engineers will increase by 108%; for computer support specialists by 102%; systems analysts by 94%; database administrators by 77%; and desktop publishing specialists by 73% (U.S. Department of Labor, *Occupational Outlook Handbook*, 2001). The Bureau of Labor Statistics projects a need for an additional 577,000 systems analysts and 439,000 computer support specialists by the year 2008 (U.S. Department of Labor, *Occupational Outlook Quarterly*, Winter 1999). Even though, due to a downswing in the overall US economy, earlier projections that the

need for an additional 1.6 million I.T. workers in 2000 and that 843,328 I.T. jobs would go unfilled (ITAA, 2000) overstated actual demand, ITAA President Harris N. Miller reports that a random sample of 685 I.T. managers, both inside and outside the I.T. industry, surveyed by telephone in January 2001 found that I.T. remains a top field for job seekers and that the talent gap remains large: hiring managers predict a shortfall of 425,000 skills workers in 2001 (ITAA, June/July 2001). That study also found that 1 in every 14 U.S. workers was involved in I.T. and 1 in every 12 I.T. jobs went unfilled for lack of an appropriate skilled applicant (ITAA, April 2001).

The ITAA study, **When Can You Start? Building Better Information Technology Skills and Careers Bridging the Gap** (ITAA, April 2001) confirmed earlier findings from its study, **Bridging the Gap: Information Technology Skills for a New Millennium** (ITAA, April 2000), that non-I.T. companies employ more I.T. workers than do I.T. firms, with non-I.T. firms currently employing about 9.5 million individuals. Non-I.T. companies also generate a greater demand than I.T. companies with over 640,000 openings and nearly 303,000 vacancies. Although non-I.T. companies have a greater aggregate demand for I.T. workers, the average I.T. firm has a greater number of jobs to fill: five times as many jobs for tech support representatives, six times as many for web developers, and 12 times as many for database developers (ITAA, April 2001). Both studies found that technical support people remain most in demand by I.T. and non-I.T. companies alike: technical support positions will make up one quarter of all new positions through April 2002—and 50 percent of all jobs are in the two positions that exist in almost every organization: technical support and network administration.

A similar acute employment-related need affects the majority of individuals with disabilities. Despite nearly a decade of Harris Polls citing the fact that more than two-thirds of

individuals with disabilities who are not employed say that they would prefer to be working, the 2000 Harris Poll commissioned by the National Organization on Disabilities found, once again, that only 32% of individuals with disabilities between the ages of 18-64 work full or part time compared to 81% of people without disabilities, a difference of 49%. Furthermore, despite years of sustained economic growth and increasingly low unemployment nationwide, people with disabilities are poorer than the rest of the population and continue to face overwhelming discrimination in the workplace (Schwochau and Blanck, 2000). Several different indicators may be used to demonstrate the economic distress of people with disabilities. Depending on age and definition of disability, the poverty rates of people with disabilities range from 50% to 300% higher than the general population. Furthermore, more than one third (34%) of people live on a “very low” household income of less than \$15,000 per year, compared to just 12% of people without disabilities (Harris, 1994, 1998). Poverty is directly related to the ability to work—while one in ten working-age adults with no work limitations live in poverty, the rate is three times greater for those with some work limitations, rising to 38.3% for working-age adults with a “severe disability.” Although part of this difference is due to the greater number of part-time and temporary workers in the disability population, the poverty rate among full-time, year-round workers with disabilities is still 60% higher than among their counterparts with no disabilities (Kaye and Longmore, 1997).

Significant income discrepancies exist between Americans with and without disabilities, regardless of gender and age (Baldwin, 2000). Those with disabilities who are employed earn only 72% on average of what workers without disabilities earn annually. Comparing full-time, year-round workers, average monthly earnings for males with disabilities are \$1,560 and for females are \$1,100, while males without disabilities average \$2,190 and females, \$1,470 (U.S.

Census Bureau, 1994-5). Two of every five Americans with disabilities say that their disability has prevented them from working (Harris, 1994, 1998). For a variety of reasons, people with disabilities have a much lower chance of finding and keeping fulfilling employment. Twenty-six percent of employed people with disabilities reported difficulty in getting the kind of job they wanted because of their disability. Furthermore, less than half (46%) of those employed full-time feel their job requires their full talents and abilities. The barriers people with disabilities face in finding satisfactory employment are numerous, the most significant being that the job “didn’t pay enough” (47%), that there was poor access to public facilities and transportation (27%), and that employers did not provide adequate health insurance (23%). Lack of money is considered the most serious by far of a list of potential problems; 68% of people with disabilities cite it as at least a minor problem, of which 39% feel it is the most serious problem they face. Approximately two-thirds (67%) of adults with disabilities report their disability has prevented them from “reaching their full abilities as a person” (Harris, 1994, 1998). People with disabilities who are employed often are forced to work fewer hours than their peers; well under a fifth (17%) work full-time, compared to the nearly two thirds (63%) of employed people without disabilities who have full-time jobs (U. S. Census Bureau, March 1999).

Activities Address Significant Need

The ongoing, robust demand for I.T. workers in I.T. and non-I.T. industries—as well as the difficult economic conditions affecting a majority of individuals with disabilities—would suggest that I.T. and non-I.T. firms would attract the attention of individuals with disabilities, as well as other populations underrepresented in the I.T. field. However, in this field, as in many others, people with disabilities are underrepresented. The National Science Foundation estimates

that the science and engineering labor force has only 5.8% individuals with disabilities, despite the fact that persons with disabilities make up at least 20% of the U.S. population.

In looking at factors that may affect the number of individuals with disabilities considering I.T. careers, the ITAA Task Force on Recruiting Underrepresented Groups identified barriers that may apply, but are not limited, to people with disabilities. For example, the I.T. field has an *image* that I.T. is the domain of the highly educated and technical elite. *Lack of encouragement* from teachers, school counselors, or parents, and a *lack of role models* other than white male “geeks” or “nerds,” may keep members of underrepresented groups (such as women and African Americans) from seeking the basic knowledge and skills required for post-secondary technical education. *Lack of opportunity and access* to accessible technology for individuals with disabilities as well as lack of opportunity and access to computers in general for members of groups with few economic resources may limit computer-related education. *Lack of appropriate skills* and *rapid technological change* are barriers to many people—even those already in the I.T. field. Finally, the ITAA Task Force looked at the *broader socioeconomic context*: students in under-resourced or rural areas have limited access to the educational resources that can prepare them for I.T. careers.

The I.T. field provides an untapped environment in which people with disabilities may most contribute fully, since this is an area in which a person’s intellectual capability tends to be valued above all other factors. Likewise, I.T. employment provides increased opportunities for people with intellectual and mental impairments (e.g., learning disabilities and episodic illnesses). It is an environment in which the use of innovative hardware and software applications is the norm, not the exception. Furthermore, a number of innovative national demonstration projects, both publicly and privately sponsored, have identified promising

practices that result in increased employment by “disadvantaged populations” including individuals with disabilities in the I.T. industry.

One study—**From Promising Practices to Promising Futures: Job Training In Information Technology for Disadvantaged Adults**—looked at 26 I.T. training programs in six high-technology regions. The 26 I.T. training programs surveyed for the study were selected on the basis of recommendations from 70 key informants (program directors, new media and I.T. professional associations, job training oversight agencies, and academics); and met the following criteria: the program 1) was free or low-cost; 2) served disadvantaged or unemployed adults; 3) focused on advanced computer training, in digital media, networking, and help desk support; and 4) focused on workforce developed rather than extended learning.

The study identified five factors the successful I.T. training programs had in common. Successful programs: 1) provide soft skills training (motivation, flexibility, and social interaction skills) in the form of both job search techniques and peer support groups; 2) place individuals in jobs related to their training; 3) target jobs with a career trajectory and make it possible for trainees to obtain additional skills while working; 4) pay careful attention to the quality of their teachers, particularly their links to the I.T. industry; and 5) reshape curriculum and maintain state-of-the-art equipment to keep up with the rapidly changing needs of the industry. The study identified, as one of its four principles of development for I.T. workforce training programs for disadvantaged adults, that the “creation of an incentive structure that encourages industry participation in the workforce development for I.T.” was key, as was “improvement of communication and partnering efforts among different stakeholders.”

I.T. Works has been designed to explore the interfaces among I.T. training programs, individuals with disabilities who have participated in such programs, and employers who have

hired individuals with disabilities in I.T. jobs. Guided by a Blue Ribbon Expert Panel comprised of representatives from the Education and Training Sector, Employers and I.T. Industry, Individuals with Disabilities who are working in IT, and representatives of federally funded I.T. training projects, **I.T. Works** will interview and survey employers who have hired individuals with disabilities who have graduated from I.T. training projects, collecting demographic information on these employers as well as information about the individuals they have hired.

B. Responsiveness to an Absolute or Competitive Priority

The priorities addressed in the project are:

- (1) Identify and evaluate I.T.-based training and employment recruitment, hiring, and placement strategies, including entrepreneurial opportunities, that promote successful employment for persons with disabilities in the I.T. industry;
- (2) Identify, develop, and evaluate strategies to assist with overcoming barriers that limit opportunities for advanced skill development and promotions in jobs requiring significant I.T. knowledge and skills (including training for individuals currently working in I.T. industry and those in jobs requiring significant expertise with I.T.);
- (3) Develop and evaluate training programs to inform employers, educators, and individuals with disabilities about effective strategies that will assist with overcoming barriers for I.T.-based training and improve I.T.-based employment opportunities; and
- (4) Develop and implement in the first year of the grant, in consultation with the NIDRR-funded National Center for the Dissemination of Disability Research (NCDDR), a plan to disseminate the project's research results to the appropriate audiences including, but not limited to, educators,

employers, manufacturers, persons with disabilities, disability organizations, technology service providers, businesses, public vocational rehabilitation agencies, and journals.

The table below lists the activities and designates responses to each priority. Details on each activity are found in the sections of the proposal on design of research activities, design of development activities, design of training activities, and design of dissemination activities.

Table: Priorities, Research, Training, and Dissemination Activities, and Year of Activity

Research, Training, and Dissemination Activities	Priority			
	One: Identify and Evaluate Employment Strategies	Two: Identify, Develop and Evaluate Strategies for Barrier Reduction	Three: Develop and Evaluate Training Programs	Four: Develop Dissemination Plan
Literature Review and Dissemination	Year 1	Year 1	Year 1-5	Year 1-5
Expert panel consultations	Year 1-5	Year 1-5	Year 2-5	Year 1-5
Large survey	Year 1	Year 1	Year 2-5	Year 1-5
Detailed Questionnaire	Year 2-5	Year 2-5	Year 2-5	Year 2-5
Webcasts			Year 3-5	Year 3-5
Audioconferences	Year 1-5	Year 1-5	Year 3-5	Year 3-5
Assistive Technology Class	Year 1-5	Year 1-5	Year 1-5	Year 1-5
Interactions with Individuals with Disabilities	Year 1-5	Year 1-5	Year 3-5	Year 4-5
Interactions with Employers	Year 1-5	Year 1-5	Year 2-5	Year 4-5
Interactions with Educators	Year 1-5	Year 1-5	Year 1-5	Year 4-5
Interactions with Entrepreneurs	Year 1-5	Year 1-5	Year 3-5	Year 4-5
Website Information Collection, Training, and Dissemination	Year 1-5	Year 1-5	Year 2-5	Year 3-5
I.T. Conferences	Year 1-5	Year 1-5	Year 2-5	Year 4-5
Disability-related Conferences	Year 1-5	Year 1-5	Year 2-5	Year 4-5
A.T. Evaluation and Education	Year 1-5	Year 1-5	Year 1-5	Year 4-5
Certification bodies and corporations	Year 1-2	Year 1-2	Year 3-5	Year 4-5
Interactions with I.T. Trainers	Year 1-5	Year 1-5	Year 2-5	Year 4-5

C. Design of Research Activities

This section describes the design of research activities. The research will inform the plan of development, the training activities, and the dissemination activities, and serve as an evaluative tool to measure change and impact over the five-year time period. Training, dissemination, development, and evaluation activities are described in their respective sections.

Research cited in the Needs section provides evidence for the demand for and shortage of information technology (I.T.) workers. According to a 1998 report by the U.S. Department of Commerce, Bureau of Labor Statistics indicate that the U.S. will need more than 1.3 million new I.T. employees by 1996. The Needs section cited research demonstrating the employment problems that individuals with disabilities face. As noted in NIDRR's request for proposals, the 2000 Harris poll, commissioned by the National Organization on Disabilities, found that only 32% of individuals with disabilities between the ages of 18-64 work full or part time compared to 81% of people without disabilities, a difference of 49%. Increasing the employment of individuals with disabilities in I.T.-related jobs would reduce the shortage for trained I.T. workers and increase the employment of individuals with disabilities.

An important area of study and intervention is the method by which information technology (I.T.) may help to dismantle barriers to the employment of individuals with disabilities. Barriers may be classified as technical, attitudinal, and environmental (Blanck, 1998, 2000; Roulstone, 1998). Technical barriers result from inaccessible technology in the workplace. An example of a technical barrier would be a person who is blind not being able to perform the essential functions of a job because he/or she cannot use (or does not have access to) the graphical user interface (GUI) to a particular software application used in the organization (National Council on Disability, 1996). In this example, the problem is that the GUI was not

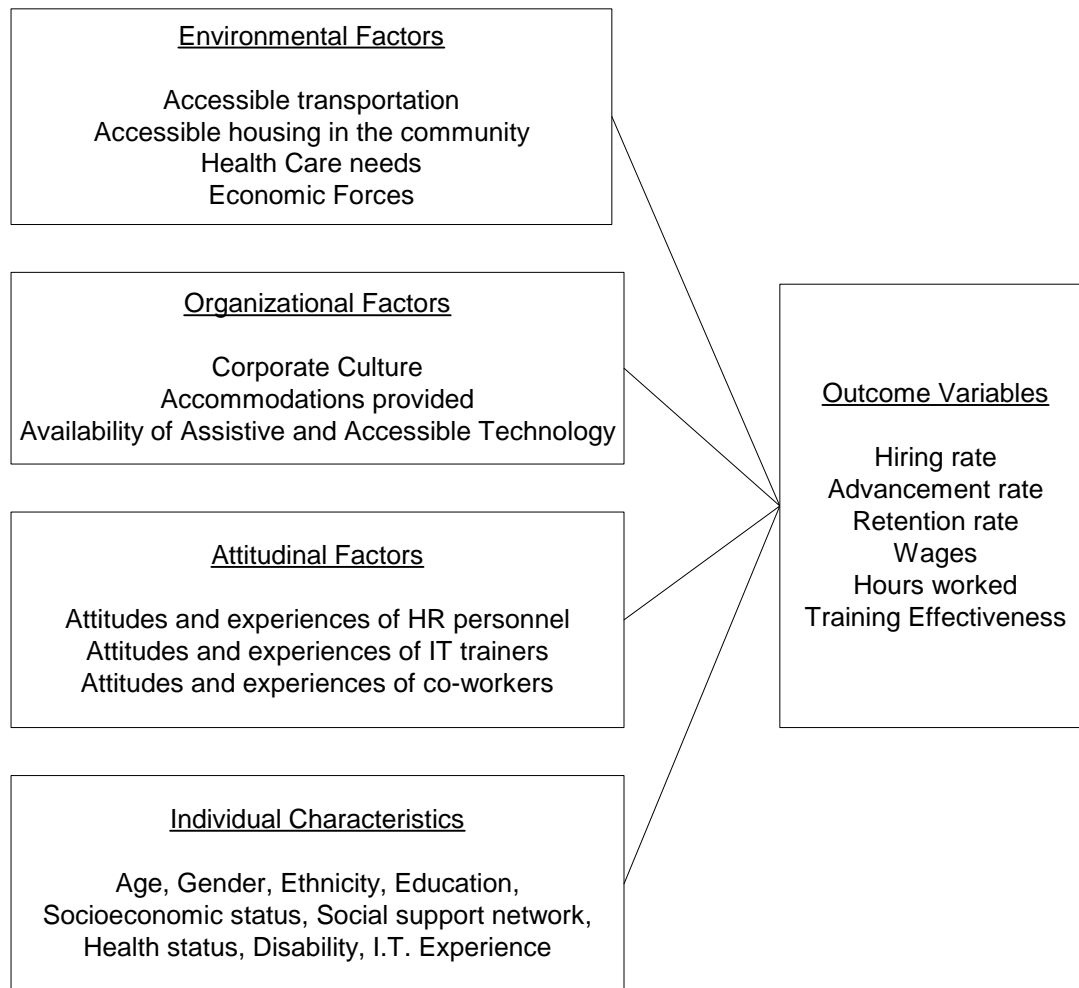
designed to be accessible; that is, capable of being used with some cost-effective accommodation by a person with a disability (Blanck, 1994, 1996; Blanck & Sandler, 2000). Attitudinal barriers result from the stereotypes and prejudices people have about individuals with disabilities (Marti & Blanck, 2000). An example of an attitudinal barrier is illustrated in the case of an individual with disabilities not being offered a job because of the attitudes and prejudices of the human resource manager for that organization. Environmental barriers result when the physical layout of the workplace makes it difficult or impossible for the to complete the tasks of the job. Environmental barriers include an individual with a disability being denied a job offer because the company's offices are located on the second floor of a building without an elevator, perhaps not in accordance with the Americans with Disabilities Act.

One goal of the proposed project is to determine how these types of barriers pose impediments to the hiring, advancement, and retention of individuals with disabilities in the I.T. workforce. We define the I.T. workforce to be employees working at, or potentially hired by, I.T. and non-I.T. organizations. Using definitions established by the Information Technology Association of America (ITAA), an I.T. organization is defined as an organization that creates and sells commercial I.T. solutions to customers (ITAA, 2000, 2001). Examples of large I.T. organizations are Cisco Systems, Novell, Gateway, Dell, Symantec, and Microsoft. The ITAA defines a non-I.T. organization as an organization that uses I.T. solutions to assist in business operations but is not developing such solutions for commercial sales (ITAA, 2000, 2001). Examples of large non-I.T. organizations are Merrill Lynch, State Farm Insurance, Ford Motor Company, General Motors, and Daimler Chrysler. The reason for identifying the significant barriers is to then be able to design training or other interventions to address and potentially overcome these barriers.

A second goal of the proposed project is to determine the enablers/facilitators to the hiring, advancing, and retaining of individuals with disabilities. Our approach to accomplishing this goal is to use interviews, surveys and questionnaires to determine the characteristics of organizations and of individuals that are either barriers or facilitators. The organizations of interest are: (1) the I.T. and non-I.T. organizations as defined above, (2) the Federally-funded I.T. training and employment projects (e.g., Department of Labor Employment and Training Administration (DOL-ETA) technology grantees), and (3) I.T. trainers (e.g., community- and four-year colleges, proprietary I.T. training and certification schools). The participants of interest are: (1) individuals with disabilities who are employees of I.T. and non-I.T. organizations, (2) individuals with disabilities who were served the by Federally-funded I.T. training and employment projects, and (3) individuals with disabilities who are entrepreneurs.

For this investigation, and based on our prior research, we use a theoretical model to guide the research hypotheses and study design. The theoretical model is presented in Figure 1 and discussed throughout this narrative.

Figure 1: Theoretical Model



In the research model, we develop four primary categories of predictor variables (e.g., independent measures) for the major outcome measures related to the hiring, advancement, training, and retention of individuals with disabilities in I.T. jobs. These predictor measures are derived, from among others areas, Professor Harlan Hahn's socio-political theory of the integration of individuals with disabilities into society (Hahn, 2000). Hahn postulates factors and forces in society and at the individual level contribute to the integration of persons with disabilities into society. These factors, in combination and alone, determine individuals with disabilities integration into society; for instance, organizational culture (internal to an

organization) and an individual's type and severity of impairment contribute to integration in work of that individuals with disabilities.

In accord, Figure 1 illustrates the types of factors we predict, a priori and based on our literature review, that influence the integration of individuals with disabilities in I.T. jobs.

Specifically, we propose that there are factors internal and external factors affecting individuals with disabilities and organizations that are predict or are correlated with the hiring, retention, advancement, and wages of individuals with disabilities in the I.T. workforce. Our conceptualization results in four classes of predictor factors:

1. environmental factors - factors external to the organization such as accessible transportation to work, health care provisions, possibility of telecommuting, micro- and macro-economic forces, labor supply/labor force demand, and market sector;
2. organizational factors - factors internal to the organization such as corporate culture, accommodations provided, and availability of assistive and accessible technology;
3. attitudinal issues - factors external to the worker/individuals with disabilities such as individual attitudes of managers, co-workers, and hiring staff; and
4. individual characteristics - factors internal to the individuals with disabilities such as nature, type, or severity of the disability; health status, age, gender, ethnicity; wealth, family supports, and education.

These categories of factors and other measures within each class will serve as predictor variables in our subsequent bivariate correlation and multivariate regression analyses. The criterion/outcome variables are the hiring rate, advancement rate, retention rate, wages, and number of hours worked for individuals with disabilities. One primary goal of the investigation is to determine the extent to which the predictor variables alone and in combination are related to the criterion variables. Thus, the types of research questions we address include the following:

1. Is the availability of assistive technology in an organization related to the advancement of individuals with disabilities within the organization?

2. Are organizations that are aware of issues related to the employment of individuals with disabilities more successful in hiring, retaining, and advancing individuals with disabilities?
3. Are organizations with senior management who individually are aware of the needs of individuals with disabilities more successful in hiring, retaining, and advancing individuals with disabilities? For example, if the CEO has a family member with a disability, will the company be more responsive to the needs of individuals with disabilities?
4. Are companies that provide and encourage the use of assistive and accessible technology and follow-up with appropriate training and evaluation more successful in hiring, retaining, and advancing individuals with disabilities?
5. Are organizations with larger budgets for assistive and accessible technology more successful in hiring, retaining, and advancing individuals with disabilities?
6. Are individual differences among individuals with disabilities a determining factor regarding the hiring, retaining, and advancing of individuals with disabilities? For example, are more educated individuals with disabilities more successful in the workplace than less educated individuals with disabilities?
7. Are organizations with mentoring/internship programs for individuals with disabilities more successful at hiring, advancing, and retaining individuals with disabilities? For example, do organizations with mentoring programs retain individuals with disabilities at higher rates than organizations with such mentoring programs?

Participants

There are five categories of participant groups in this study: the human resource managers, individuals with disabilities, managers of Federal training projects (e.g., Department of Labor Employment and Training Administration (DOL-ETA) technology grantees), I.T. trainers, and entrepreneurs. The human resource managers will be employees of I.T. and non-I.T. companies (using the ITAA definitions provided above) and will complete a survey and a questionnaire to assess the characteristics of the companies for which they work and to assess attitudes toward individuals with disabilities. The individuals with disabilities will be employees of the companies that are surveyed or will be participants in, or graduates of, one of the Federal

training programs in I.T.-based employment for people with disabilities. Some of the latter will be individuals who interviewed for a job but were not hired. The individuals with disabilities will be given a questionnaire to assess their experiences during training, hiring, and employment. The managers of Federal training projects will be surveyed to identify the issues that they encounter in their projects related to entrepreneurial activities, training successes and barriers, recruitment, and placement of individuals with disabilities that are served by the projects. The I.T. trainers will be given a questionnaire to assess the methods by which they incorporate AT and accessible software in their training programs, and how individuals with disabilities are accommodated in the training. The entrepreneurs will be given a questionnaire to assess their experiences as entrepreneurs with disabilities—particularly barriers they have encountered (Blanck, Sandler, Schmeling, & Scharz, 2000). All participants will be adults, 18 years of age and older. Individuals with disabilities may be represented in all groups because the focus of the project is to improve the employment opportunities for individuals with disabilities.

Informed Consent Procedures. All participants in this study will be provided with a project description and a consent form. This project description will include information on the purpose of the project, the participants anticipated involvement, any risks of participating, procedures being used to minimize risk, information on the confidentiality of their responses, termination procedures, and procedures to consent to participate. Respondents who choose to participate will return a signed consent form to the LHPDC. When the consent form is received, the participant will be sent an e-mail or letter, based on their preference, which contains a logon identification and password so that they can complete the survey or questionnaire online. The surveys and questionnaires will be administered from a secure website using a secure Internet connection that encrypts information passing between the website and the participant. When the

participant logs on for the online survey, the project will be described again, and participants will need to indicate that they are consenting to participate. See also, "Item 12/Protection of Human Subjects Attachment," above.

Alternative Formats for Surveys and Questionnaires. Alternative formats for the project descriptions, consent forms, surveys, and questionnaires will be provided (e.g., paper form, Braille).

Human Resource Managers. Human resource managers (or other top-level managers, but the term "HR manager" will be used throughout the document) employed at I.T. and non-I.T. companies will comprise a second group of participants. To provide sufficient sample size for statistical analysis of the survey (described in the Materials section below), twenty managers will be selected from employers associated with the approximately 25 Federal I.T. training and employment projects for people with disabilities, up to a total of 500 HR managers. To provide a more representative sample, an additional 500 HR managers will be selected from companies that are members of, or associated with, the Information Technology Association of America (ITAA). For the more-specific follow-up survey (described in Materials below), 25 HR managers will be selected from the survey responses of the companies in the original pool of approximately 500 companies working with the Federal training projects. Another 25 HR managers will be selected from survey responses of the companies in the original pool of 500 from the ITAA membership roster. To protect the privacy of the human resource managers, the project description will be sent to the participating companies by the Federal grantees and ITAA.

Individuals with Disabilities. The third group of participants will be individuals with disabilities. Individuals with disabilities who are employees of the same companies as the HR managers will comprise one subgroup of this group of participants. An attempt will be made to

sample two employees with disabilities from each of these companies for a total of 100 individuals with disabilities. Another subgroup of approximately 100 individuals with disabilities will be selected from the pool of people who were served through one of the Federal training programs in I.T.-based employment for people with disabilities and interviewed for a job but were not hired. Participating individuals with disabilities from both subgroups will be given a questionnaire (described in the Materials section below) to assess their employment experiences.

Companies working with the Federal grantees and companies who responded to the Human Resource Managers' survey will be asked to help recruit employees with disabilities to participate in this study. The companies will be provided with project descriptions and consent forms to give to their employees with disabilities. This project description will include information on the purpose of the project, their anticipated involvement, any risks to them of participating, procedures being used to minimize risk, information on the confidentiality of their responses, termination procedures and procedures to consent to participate. Employees who choose to participate will return a signed consent form to the LHPDC. When the consent form is received, the participant will be sent an e-mail or letter, based on their preference, which contains a logon identification and password so that they can complete the survey or questionnaire online. The investigators will attempt to fill all requests for alternative formats for the questionnaire (e.g., providing it in an electronic form, Braille). When the participant logs on for the online survey, the project will be described again, and participants will need to indicate that they are consenting to participate.

Directors of Federal training projects. This group will comprise the managers of the Federally-funded training I.T. training and employment projects (e.g., DOL-ETA) for individuals

with disabilities. Questionnaires, project descriptions, and consent forms will be distributed to all of the project directors to identify the issues that they encounter in their projects related to entrepreneurial activities, employment successes and barriers, including employers' recruitment and placement of individuals with disabilities who have graduated from the projects. Directors who choose to participate will return a signed consent form to the LHPDC.

I.T. Trainers. These participants will be from a group of geographically diverse organizations that train people in I.T., including individuals with disabilities, such as from community colleges (e.g., Austin Community College (Texas), the Community College of Denver (Colorado)), four-year institutions (e.g., the New Jersey Institute of Technology (Morristown, New Jersey)), and proprietary I.T. training and certification schools. Areas of interest are the methods by which they incorporate AT and accessible software in the training programs, and how individuals with disabilities are accommodated in the training, or how the needs of individuals with disabilities do or do not differ from than those of trainees without disabilities. The LHPDC will send project descriptions and consent forms to these training programs. Training programs which choose to participate will return a signed consent form to the LHPDC.

Entrepreneurs. This group will comprise entrepreneurs with disabilities working in the I.T. industry or entrepreneurs in I.T. businesses who have hired individuals with disabilities. They will be surveyed on training and entrepreneurial activities, including barriers they have encountered, difficulties they have had with training for themselves and/or their employees, and factors they believe have facilitated their success.

Member organizations of entrepreneurial or incubator organizations (e.g., Austin Technology Incubator at the University of Texas, the University of Iowa Technology Innovation

Center) who work with entrepreneurs and individuals involved in self-employment will assist in recruiting individuals with disabilities who are entrepreneurs. They will be provided with project descriptions and consent forms to give to distribute them to their constituents. Entrepreneurs who choose to participate will return a signed consent form to the LHPDC.

Materials

This proposed project will use a structured interview, surveys, and questionnaires. The structured interview will be given to the Expert Panel members who are assisting the researchers in the construction of the survey and questionnaires. This method ensures each Expert Panel member has meaningful input in every area of inquiry. Further development of the surveys and questionnaires will be conducted through open-ended conference call discussions. A survey will be sent to HR managers, and a follow-up questionnaire sent to a subset of the HR managers. A questionnaire will be given to individuals with disabilities who are employees of, or interviewed with, the information technology oriented companies. A questionnaire will be given to entrepreneurs. No specimens or records will be used. No existing data will be used. Because a major part of the Year 1 of the project is the development of the survey and questionnaires, detailed descriptions of the instruments and questions will be provided at a later time, should this project receive funding. However, the following sections describe general concepts that the investigators anticipate will be included in the survey and questionnaire instruments.

Structured Interview. Expert panelists will complete the structured interview to provide input and insight into types of questions to include in the surveys and questionnaires. Structured interviews consist of a series of predetermined questions that allow for open-ended responses. Each Expert Panel member will contribute to the development of the survey and questionnaire through quarterly conference calls in each year of development and revision, to further the external validity of the project.

Survey to HR Managers. This survey will consist of items to assess the organizations' knowledge of assistive-technology (AT) issues (e.g., what is your company's definition of AT). Other items will assess knowledge of the Americans with Disabilities Act, legislation related to AT, knowledge of technology for individuals with disabilities, and knowledge of job analysis and accommodations for individuals with disabilities. Additional questions will be related to hiring and advancement practices regarding individuals with disabilities, attitudes of key personnel regarding individuals with disabilities, and characteristics of the organization (e.g., total number of employees, number of employees with disabilities). There will be questions related to knowledge of ergonomics and injury prevention. For ease of responding and coding, responses for survey items will consist of ratings scales and closed-ended items (e.g., checkboxes).

Questionnaire for HR Managers. This questionnaire will be an in-depth follow-up to the HR Managers survey. It will cover some of the same topic areas as the survey, but in greater detail. Although the survey may include general questions regarding the knowledge of available technology for people with disabilities, the questionnaire would ask about knowledge of technology for specific disabilities (e.g., technology for visual, auditory, communication, cognitive, and mobility disabilities) and under what circumstances the knowledge was acquired (e.g., formal training, on-job training). The questionnaire also would ask about their experiences with providing different types of technology for specific disabilities (e.g., visual, auditory, physical). Other items might query if they know about organizations that can provide them with such information (e.g., Centers for Independent Living).

One section of the questionnaire will assess characteristics of the organization, including the number of employees, number of employees with disabilities, number of interviewees with

disabilities, budget for I.T., budget for AT, cost of accommodations made, and benefits of making the accommodations (e.g., increased productivity, hiring, retention). Another area will assess the organizations' hiring and advancement practices regarding individuals with disabilities, including the number of individuals with disabilities hired and number of individuals with disabilities promoted. Attitudes and personal experiences of key personnel regarding individuals with disabilities will be assessed (e.g., does the respondent personally know anyone with a disability?, does any member of management have a family member with a disability?). The HR managers will be asked to provide job descriptions for themselves and for the individuals with disabilities from their company that are also participating in our study, which will further aid in method triangulation and verification of data and findings.

Questionnaire for individuals with disabilities. This questionnaire will assess the characteristics of individuals with disabilities, including demographic information (age, gender), education (educational attainment, level of integration in education), and disability specific information (e.g., type of disability, severity of disability). Additional questions will assess their employment and work experiences, including availability of AT in their workplace, the particular AT with which they have experience, and accommodations requested/provided for their job. Items will be included to assess perceptions of the corporate culture regarding individuals with disabilities (e.g., the perceived attitude of management towards individuals with disabilities, and the perceived attitude of coworkers toward individuals with disabilities). There will be items to assess their experiences related to recruitment, advancement, and retention. Other employment questions such as number of hours worked per week, wages, and a job description will be asked.

Questionnaire for directors of Federally-funded I.T. training projects. Items on the questionnaire will be used to identify the issues that the managers encounter in their projects

related to entrepreneurial activities, training successes and barriers, employers' recruitment practices, and placement of individuals with disabilities that are served by the projects. An example of such an item would be an open-ended question asking the managers what barriers they perceive as existing in the placement of individuals with disabilities in the workplace.

Questionnaire for I.T. trainers. The questionnaire for the trainers will include items to assess the methods by which they incorporate AT and accessible software in the training programs and how individuals with disabilities are accommodated in the training they use. There will be items to identify the way the needs of individuals with disabilities differ or are the same as the needs of trainees without disabilities. In addition, they will be asked items regarding the accessibility of the products they train people to use.

Questionnaire for Entrepreneurs. The questionnaire for entrepreneurs will include items related to training and entrepreneurial activities. This will include items asking them what supports they received in starting their business, and which, if any, training programs they or their employees have used. Items will ask them to rate the effectiveness of these training programs. The questionnaire will include items to identify facilitators of and barriers to their success.

Design & Analysis

This investigation will yield information that illustrates relationships among various independent or predictor and dependent or outcome measures derived from the theoretical model. The analysis primarily involves a correlational research design. A correlational design allows researchers to discover relationships among variables. These discoveries may be used to make subsequent predictions (e.g., in regression analysis) and to formulate the design and hypotheses for subsequent studies (Bordons & Abbott, 1995).

In this correlational design, the predictor variables include the characteristics of the companies, the characteristics and attitudes of the HR managers, the characteristics and attitudes of the individuals with disabilities, the characteristics and attitudes of the directors of the Federally-funded training projects, and the characteristics and attitudes of the entrepreneurs. The criterion variables (dependent measures) include hiring rate, advancement rate, retention rate, wages, and number of hours worked for individuals with disabilities. One goal of the project is to determine which predictor variables (alone and in combination) are related to the criterion variables. To reach this goal, bivariate correlations will be computed between individual predictor and criterion variables. In addition, multivariate regression analyses will be performed on each of the criterion variables to assess the influences of combinations of variables.

There will be a longitudinal component to the study design. The questionnaires described above will be administered on a yearly basis. For the HR managers, the unit of analysis will be the position, not the person filling the position in Year 1, which could vary from year-to-year. The unit of analysis for the Federal training projects will be the position of project director, not the particular person who completed the questionnaire in Year 1. For the participant groups of individuals with disabilities, I.T. trainers, and entrepreneurs, the unit of analysis will be the particular person (i.e., we will attempt to track the individuals surveyed in Year 1 over time).

D. Procedure

This section will describe the year by year summary of the research activities. This information is presented in tabular form in a timeline in the section on Design of Development activities below.

Year 1. During the first year of the grant, selection of the Expert Panel will be completed. Currently, selection of the panel is partially complete, with letters of support from

members attached to this application. Additional members will be selected during the first quarter of the first year to fill the panel. The researchers will consult with the Expert Panel during the construction of the surveys and questionnaires via teleconferences and web conferences. Based on the meeting, the Expert Panel will generate questions for the survey and will critique questions generated by the researchers.

Prior to the distribution of the survey, it will be pilot tested with a small sample of approximately 25 respondents to ensure that the items and instructions are clear and understandable, and that the online presentation of the survey is reliable. The Expert Panel will provide input on the selection of representative companies to distribute the questionnaire based on the findings of the survey.

The survey will be primarily administered in an online format. To ensure controlled, secure access to the survey, each respondent will be required to provide a user identification number (userid) and a password to access the website. The userid, password, and instructions will be sent via postal mail and e-mail. The e-mail will provide a hyperlink to the online survey which will be accessed by a secure Internet connection (using among other safeguards the HTTPS protocols). The postal mail will include the URL for the secure website as well. Using an online format for the survey makes it possible to have the responses checked for errors (e.g., skipped questions or inappropriate multiple responses to a question) as the respondent completes the survey. The online format increases the speed and accuracy of the data coding. Having the data coded quickly increases the real-world relevance of the findings because the data may be analyzed and the findings disseminated in a timely fashion. The respondents will have the option of responding to the survey in alternative formats (see above) if they do not wish to complete the online version. Follow-up letters and e-mails will be sent to increase the response rate.

The questionnaires for the HR managers, individuals with disabilities, Federal training project directors, I.T. trainers, and entrepreneurs will be pilot-tested during Year 1. As with the survey, the questionnaires will be administered in an online format. To ensure controlled, secure access to the questionnaires, each respondent will be required to provide a userid and a password to access the website. The userid, password, and instructions will be sent via postal mail and e-mail. The e-mail will provide a hyperlink to the online survey which will be accessed by a secure Internet connection (using among other safeguards the HTTPS protocols). The postal mail will include the URL for the secure website as well. As with the survey, the respondents will have the option of responding to the questionnaires in an alternative format if they desire.

By the latter part of Year 1, the researchers should be analyzing the results of the survey. These results will be used to determine which companies will receive the follow-up questionnaires and to modify these questionnaires as necessary prior to administration.

Year 2. During the second year, the questionnaires for the HR managers, individuals with disabilities, Federal project managers, and entrepreneurs will be administered. The questionnaires for the HR managers will be administered to a subset of the sample used in the Year 1 survey (the consent and recruitment procedures for these participant groups is described in Participants above). Follow-up letters and e-mails will be sent to increase the response rates to the questionnaires. By the latter part of Year 2, the researchers will be analyzing the data collected from the questionnaires.

Year 3. The longitudinal components of the design will continue to be implemented. The questionnaires administered during Year 3 will be revised as necessary depending on the results from Year 2 and feedback from participants. These revised questionnaires will be administered using the same procedures as in Year 2. Follow-up letters and e-mails will be sent

to increase response rates. By the latter part of Year 3, the data from these questionnaires will be preliminarily analyzed.

Year 4. The longitudinal components of the design will continue. The questionnaires administered during Year 4 will be revised as necessary depending on the results from prior years. These revised questionnaires will be administered using the same procedures as in prior years. Follow-up letters and e-mails will be sent to increase response rates. By the latter part of Year 4, the data from these questionnaires will be analyzed.

Year 5. The longitudinal components of the design will be completed. The questionnaires administered during Year 5 will be revised as necessary depending on the results from prior years. These revised questionnaires will be administered using the same procedures as in prior years. Follow-up letters and e-mails will be sent to increase response rates. By the latter part of Year 5, the data from these questionnaires will be analyzed.

It is important to note that the longitudinal study will be part of the evaluation of impact of training and dissemination activities by measuring changes over time in the workplace. These change measures will include increased employment, changing attitudes, technological changes, environmental changes and other measures.

D. Design of Development Activities

I.T. Works will develop new programs, techniques, and strategies to increase the I.T. based employment of individuals with disabilities. The most effective and appropriate technology will be used to deliver each program, technique or strategy. Each item noted in the research design, the development of training activities, and the development of dissemination activities are noted and explained briefly below.

Literature Review and Dissemination

The literature review will be completed in the first quarter, and will be shared with to the Expert Panel in preparation prior to the first of the scheduled conference calls. This will serve to ensure a common knowledge base between the researchers and each member of the panel. Panel members will be asked to recommend additional sources for review. The literature review will be distributed in paper and electronic formats, with alternative formats as needed. An annotated bibliography may be the first product disseminated by **I.T. Works**.

Expert Panel consultations for development of research, training, and dissemination plans

The Expert Panel will be consulted in several ways: 1) Quarterly conference calls will be conducted, 2) an e-mail listserv will be used, and 3) structured interviews will be conducted with each panel member to assure that all points of view about a given research area are represented. The Expert Panel members will review each activity of the project and have the opportunity to comment on it to improve, expand, or otherwise guide the approaches taken by the core staff (with documentation of suggestions maintained in a database). The Expert Panel will be instrumental in recommending training and dissemination avenues that they are aware of or participating in through their professional activities.

Broad survey

The larger survey sent to the study participants will be constructed with the advice of the Expert Panel. The survey will be developed based on the existing literature on the topics of I.T. based employment, employment of people with disabilities, and other information that informs the research activities. Findings from the survey will inform construction of the detailed questionnaire, and will indicate training needs for typical respondents.

Detailed Questionnaire

The detailed questionnaire will be developed with the advice of the Expert Panel based on the same sources as the larger survey. Additionally, results of the larger survey will inform the development of the detailed questionnaire. In contrast to the larger survey, a more in-depth analysis of issues from the selected participants will be possible using the detailed questionnaire. The questionnaire will be revised annually as it becomes clear what areas need to be revised for clarity, more detail, or other factors. The questionnaire will detail successes and barriers and inform the needs for training and dissemination.

Webcasts

Webcasts will be developed to train targeted audiences and to disseminate findings of the research, strategies to increase employment and advancement, and information about I.T. based employment successes and barriers. Because LHPDC is developing webcasts for other funded projects, the technology will be in place to conduct webcasts for **I.T. Works** audiences. Currently the LHPDC contracts with a streaming video server provider to carry the video stream. The University of Iowa is in the development stages of implementing in-house web cast connection and broadcast facilities. Testing should begin in Fall 2001 and, assuming that the tests are positive and the service is in place, costs for the first webcasts in Year 3 will be significantly lower than the rates charged by commercial servers to carry the video streams. Webcasts will be marketed through other training opportunities, the listserv, and the **I.T. Works** website.

Audioconferences

Audioconferences targeted to specific populations (e.g., I.T. employers and HR managers, individuals with disabilities, entrepreneurs) will be conducted as part of the project's training and dissemination activities. Currently, the LHPDC uses University of Iowa

audioconferencing facilities. These provide services such as transcription of the calls, which will be important both as archives of the audioconferences and as an additional dissemination method (including posting these transcriptions on the project's website). Audioconferences will be marketed through other training opportunities, the listserv, and the **I.T. Works** website.

Assistive Technology and Accommodations Class, Training and Materials for Dissemination

Academic Assistive Technology Class

Dr. Dawson currently teaches an assistive technology class at the University of Iowa. The class reaches approximately 20 educators and rehabilitation counselors each semester and will be offered twice each year beginning in the 2002-2003 academic year. The class will form the basis for policy briefs, development of distance learning, conference and other training activities, and dissemination of information and strategies related to AT, I.T., and I.T.-related accommodations. The class offers a basic understanding of how assistive technology may be used in employment of individuals with disabilities, or to help them to reach their educational goals. The class is detailed here to show how it will inform other training and dissemination activities. It offers both theory and hands-on training and is divided into lecture, lab activities, and guest speakers. The lecture components expand on the students' reading of the week and offer current information and material. The labs allow the students to have hands on experience in using assistive technology. The guest speakers offer students first hand, expert views on the use of assistive technology. By the end of the class, students have a basic understanding of assistive technology, including how to find current information about assistive technology and strategies for funding. Course content will form the basis of the policy briefs and distance education on-line training modules targeted to specific audiences described below. Similarly, selected guest speakers will be video and audio taped for web-based presentation.

Non-academic credit assistive technology and accommodation training

Individuals who do not want or need academic credit will be able to take advantage of the same training offered in the in-residence class as it is developed into policy briefs, distance education and other formats. The training will take several forms. The goal is to create accessible information and training materials on assistive technology and work accommodations. The training will be developed with a variety of formats that allows for a diversity of learners' needs. Evaluation of the success of this training option will be based on industry-standard competencies to evaluate student progress. Training materials will be distributed by web pages, electronic bulletin board, web media (visual and audio), a virtual resource room, and printed media. Electronic materials will be in accessible formats, as specified by W3C's accessibility guidelines. Other alternative formats will be provided as requested.

Interactions with Individuals with Disabilities

Individuals with disabilities will be involved in each activity, as investigators of this project, as members of the Expert Panels, as survey or questionnaire participants, as entrepreneurs, or in other roles. In addition, training materials, conferences, classes, dissemination activities and other **I.T. Works** activities will be developed that focus on individuals with disabilities, including those who are self-employed or entrepreneurs, as a specific audience.

Interactions with Employers

Employers of people with disabilities will be instrumental in gathering information related to the employment practices, demographics, and other factors related to employment in I.T. and non-I.T. firms. The LHPDC has a history of working with employers in this capacity. In addition to serving as a key source of information collection, employers and HR managers in

I.T. and non-I.T. firms will be a target audience for the project's training, and dissemination activities, including conference sessions, webcasts, technical assistance and other means to ensure the widest participation in each stage of the project.

Interactions with Educators

Educators in rehabilitation programs, I.T. training programs, including Community Colleges, the University of Iowa, and specialized I.T. training are involved in several stages of the project. They will be surveyed, and given information related to, demographics related to employment and to I.T., successes and experiences with training, recruitment, placement, and disability specific I.T. training, including accessible software, hardware, and training facilities, and barriers and experiences with limits on training they have encountered.

Interactions with Individuals who are Entrepreneurs

Entrepreneurs will be engaged when they complete questionnaires, and they will be the focus of targeted training and dissemination activities, including information from a NIDRR-funded study of entrepreneurship of individuals with disabilities in Iowa (report published in 2000). Strategies for entrepreneurial activities will include information about I.T. business opportunities, accessible I.T., and factors which entrepreneurs face which differ from traditional employment.

Website Information Collection, Training, and Dissemination

The **I.T. Works** website will offer information on the project, serve as a central point for information collection, training activities, and dissemination activities. It will be designed and maintained conforming to accessible I.T. standards promulgated by the W3C Web Accessibility Initiative, and Section 508 of the Rehabilitation Act. The site will feature training activities which are cost effective and which can be replicated by industry and other training projects.

Project materials will be disseminated in multiple formats based on intended audience and accessibility of the information. The website will serve as the primary information collection site to facilitate the fastest data collection and analyses strategies. Alternative data collection formats will be offered to individuals who prefer not to use the website.

I.T. Conferences

I.T. Works staff from ITAA will present at regional and national conferences. They will assist in the identification of promising practices by communicating with conference participants. The training and dissemination activities will be carried out by ITAA at each conference they attend. In addition, 12 I.T. firms selected annually by the project's Expert Panel and representatives from ITAA's Board will make presentations on the promising strategies they employ that positively impact the recruitment, employment, advancement and retention of individuals with disabilities in the I.T. industry.

Disability-related Conferences

During each project year, Dr. Blanck, Dr. Scharz, and Dr. Dawson will present on the **I.T. Works** project and its findings at up to 12 national conferences to which they are invited each year. Their presentations will be based on the project research findings and developed in collaboration with the Expert Panel members. Dr. Blanck typically speaks at 6 to 8 conferences annually, while Dr. Dawson typically presents at three. Dr. Scharz will develop speaking opportunities as the project progresses, and will assist in the preparation of materials for presentation made by other core staff.

Certification bodies and corporations

The project will target training certification programs and providers with information that educates them on the topic of providing training environments accessible to individuals with

disabilities. Increasing the accessibility of I.T. training projects, including both programmatic and physical accessibility, is vital for individuals with disabilities to acquire, retain, and advance in employment. Certification bodies may implement recommendations or requirements based on project findings that I.T. trainers must meet as part of the certification process. Certification bodies that will be targeted by the project include Cisco Certified Network Engineer training programs, Microsoft Certified Software Engineer training programs, and other industry standards. If the certification training programs use accessible hardware and software standards for their I.T. trainers, individuals with disabilities will be more readily able to utilize the training courses. Standards bodies have a wider influence than individual training programs. Materials targeted towards them will highlight the potential market and employment pool of individuals with disabilities.

Interactions with I.T. Trainers

I.T. Trainers are used by employers for their employees, training projects for their clients, individuals, and entrepreneurs to acquire and upgrade their I.T. skills. Some trainers are certified by training certification bodies, while others are independent of certifying bodies. Materials will be targeted to these trainers that will inform them of the advantages of making their training programs accessible to individuals with disabilities, the means for making them accessible and inviting to individuals with disabilities, and the marketing opportunities such accessible training programs present in expanding their work with individuals, employers, and training projects.

I.T. WORKS - Project Timeline

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
YEAR 1	Identify remainder of Expert Panel.	Revise questionnaires, surveys, and methods as necessary.	Complete pilot testing.	Distribute survey to companies.
	Complete extensive literature review to focus on survey and questionnaires.	Review analysis with expert panel and NIDRR.	Analyze data from pilot testing.	Conduct follow-ups to increase response rates.
	Review revisions Expert Panel and NIDRR.	Begin pilot testing of the questionnaires, surveys, and methods.	Collect survey data online.	Analyze survey data.
	Meeting in DC between NIDRR, ITAA, and LHPDC to outline specific goals and tasks related to the project.	Visits to regional conferences to conduct interviews with IT employers and disseminate research findings.	Revise as necessary.	Review analysis with Expert Panel and NIDRR.
	Construct initial survey and questionnaire drafts based on final literature review to discuss with Expert Panel.	Communications with IT employers as part of data collection and identification of promising strategies.	Meeting in DC between ITAA and LHPDC to continue work on the project.	Select companies to send questionnaires based on survey analysis and review with Expert Panel and NIDRR.
	Distribute draft questionnaires, surveys, and literature review to expert panel and NIDRR.		Identify companies to distribute the survey to through ITAA, NBIA, and the federal IT projects.	Revise questionnaires based on survey responses if necessary.
	Convene first conference call with Expert Panel and NIDRR to review project, surveys, questionnaires, and proposed methodologies.		Develop website to collect survey responses from companies completing the survey online.	Develop website to collect questionnaire responses from all target groups.
	Communications with IT employers as part of data collection and identification of promising strategies.		Visits to regional conferences to conduct interviews with IT employers and disseminate research findings.	Visits to regional conferences to conduct interviews with IT employers and disseminate research findings.
			Communications with IT employers as part of data collection and identification of promising strategies.	Communications with IT employers as part of data collection and identification of promising strategies.

I.T. WORKS - Project Timeline

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
YEAR 2	Distribute questionnaires to: - companies selected from survey - employees of these companies - federal training projects - IT trainers - entrepreneurs	Collect questionnaire data online.	Complete analysis of questionnaire data.	Review development of training activities with Expert Panel and NIDRR.
	Conduct follow-ups to increase response rate.	Analyze questionnaire data.	Review analysis of data with Expert Panel and NIDRR.	Continue development of training activities.
	Meeting in DC between ITAA and LHPDC to develop activity schedule for Year 2.	Review preliminary analysis with Expert Panel and NIDRR.	Select order of targeted training with Expert Panel and NIDRR at partner meeting in DC (Expert Panel by conference call).	Pilot test of training activities with selected member of the Expert Panel and selected members of the target groups.
			Plan development of training activities in conjunction with DC meeting.	
			Begin development of training activities based on analysis of questionnaires and selected order of targeted training.	

I.T. WORKS - Project Timeline

Activities for Years 3, 4, and 5 will be similar to Years 1 and 2, with the addition of full project research, training, and dissemination activities underway.

YEAR 3	
	Distribute questionnaires to target audiences for longitudinal component of the study.
	Conduct follow-ups to increase response rates.
	Revise training activities after Year 2, Quarter 4 pilot testing.
	Deploy training activities.

YEAR 4	
	Dissemination activities begin as planned in coordination with NCDDR.
	Build website to present our findings.
	Prepare research reports to submit for publication.
	Distribute questionnaires to target audiences for longitudinal component of study.
	Conduct follow-ups to increase response rates.
	Develop strategies for assessing the effectiveness of the trainings.

YEAR 5	
	Dissemination activities as planned in coordination with NCDDR.
	Prepare research reports to submit for publication.
	Distribute questionnaires to target audiences for longitudinal component of the study.
	Conduct follow-ups to increase response rates.
	Revise strategies for assessing the effectiveness of the trainings.

E) Design of Training Activities

The NIDRR notice of funding priorities suggests training needs: “Increased knowledge and understanding of different disabilities as well as reasonable accommodations, including assistive technologies and access to I.T., are critical to the recruitment and ongoing support of individuals with disabilities in I.T.-based employment. In addition, expanded knowledge of employee rights and responsibilities, cost factors, legal issues, healthcare liabilities, and disability culture will have an impact on the development of strategies used by employers to successfully train and employ individuals with disabilities.”

A range of training activities will be developed and implemented beginning in Year 3 and continuing throughout Years 4 and 5. Because the specific content of the training activities—as well as the specific audiences to which the training will be targeted—will depend on the results of the research conducted in Years 1-5, this discussion of training activities and materials is general and the specific training will be developed, planned, and modified with input from NIDRR and the Expert Panel.

The proposed research activities will include multiple, extensive training opportunities targeted at a wide range of audiences and conducted via a variety of systematically designed strategies intended to meet the training needs and abilities of each group and its members. The targeted groups are expected include I.T. employers and human resource managers, I.T. training programs (including Federal demonstration projects as well as secondary and propriety schools), and individuals with disabilities and organizations that represent them. Strategies to be used in reaching each group are summarized in the Table below.

TABLE: TRAINING FROM SURVEY AND QUESTIONNAIRE RESULTS

Target Group	Training Areas
Employers	Corporate and employee demographics related to employment and to I.T. Successes and experiences with training, recruitment, hiring, placement Barriers and experiences with limits on advancement, training
Employees	Corporate and employee demographics related to employment and to I.T. Successes and experiences with training, recruitment, hiring, placement, and entrepreneurial opportunities Barriers and experiences with limits on advancement, training
Federal Training Projects	Demographics related to employment and to I.T. Successes and experiences with training, recruitment, placement, and entrepreneurial activities Barriers and experiences with limits on advancement, training
I.T. Trainers	Demographics related to employment and to I.T. Successes and experiences with training, recruitment, placement Disability specific I.T. training, including accessible software, hardware, and training facilities Barriers and experiences with limits on training
Entrepreneurs	Demographics related to entrepreneurial activities and to I.T. Successes and experiences with training Issues related to entrepreneurship that differ from employment Reasons for becoming entrepreneurs

Training Materials

All materials used in the training of target groups will be high-quality, fully accessible instruction with the clarity and variety to effectively reach a maximum audience. Instructional materials will be prepared in a variety of forums and formats for diverse learners (e.g. persons with a various learning or mental disabilities). Multiple approaches to distribution will ensure that information will be offered equally or equivalently to all learners. Training materials will be made available in alternative and accessible formats through the project's website, online resource room, electronic bulletin board, listserv, and published print and electronic media. The materials will be presented in a variety of audio and visual formats that allow access for different screen readers and other assistive technology.

Training in the findings and practices identified through the surveys and questionnaires described in Section C will be provided to each of the target groups. The areas of training will

parallel the research outcomes from the surveys and questionnaires. We will combine findings from all surveyed groups pertaining to each area, so that each group will benefit from information from outside their own group. Areas of training will be specific to the needs of each group, as shown in Table 1 above.

Training Methods

Print materials

Print materials will include information on policy, barriers, strategies, assistive technology and accommodations that may be used in I.T. employment. These materials will be developed as information briefs that offer the main points in these areas. As information is disseminated, it will be submitted for print publication as well as distributed on the Web.

Web Training

The Web can be a resource and a training tool. As a resource the website will offer information on assistive technology and job accommodation in multiple formats such as policy briefs, research reports, fact sheets, and other formats. In addition, the website will have articles and mini-case studies featuring I.T. and non-I.T. firms that have demonstrated promising practices in the areas of recruitment, hiring, accommodations, retention and promotion of individuals with disabilities. The site will offer profiles of individuals with disabilities working in the I.T. field as well as those who have become entrepreneurs. These documents will emphasize best practices.

As a training and evaluation tool, an optional evaluation of knowledge section will be available for use prior to accessing any of the “core” training materials—e.g., information about assistive technology or how to make accommodations in the I.T. industry. This evaluation tool may be used by the trainee as a learning event itself. Further, it will serve as a baseline measure

of what individuals using the site already know and can indicate what they have gained after using these materials. To measure knowledge gained through the training, the introduction will require the user to sign on with a unique identifying name (not tied to identifiable information) and complete a brief questionnaire (a pretest) to assess the user's knowledge of a given field (e.g., assistive technology). Then the user will read sections on assistive technology. At the end of each of these sections a questionnaire will ask the user some key points about the content of the section. After the user completes a questionnaire, an answer page will show the user the correct responses and allow the user access to the next section of the assistive technology information. The user's answers from each section will be compared to the answers on the introductory questionnaire to show knowledge gained. Showing knowledge gained can be motivational and instructional for the user and can provide evaluation information about the quality of the training to the project. An optional satisfaction survey can be filled out by trainees at the end of each training.

Fully accessible and usable design of the website will involve the following process:

1. Research AT issues related to content.
2. Acquire written materials.
3. Read and evaluate research and written materials.
4. Test and evaluate AT software.
5. Develop prototype Web pages for training in AT.
6. Present prototype to subject matter experts for feedback and comments.
7. Redesign prototype and develop graphics and necessary interactions.
8. Evaluate interactions (formative evaluation) and modify, if necessary.
9. Present revised training to and receive feedback from pilot users.
10. Modify training, if necessary.
11. Place material on Web for distribution.
12. Ongoing research on data collected from website.
13. Ongoing update of material as needed.

The Bulletin Board

An electronic bulletin board will be available for the peer support network on information about promising practices and effective strategies. Persons may make comments on topics of interest or pose questions. Similar strategies have been implemented by LHPDC in the distance learning project and technical assistance funded activities with the Department of Labor Work Incentive Grantees, and it is an additional method for knowledge transfer, dissemination, and utilization. This strategy also is being implemented by the LHPDC for use in a case study of a major I.T. corporation, and experience from these projects will be directly applicable to this strategy.

Web Distribution of Multimedia (visual and audio)

Individuals learn information in many forms. For some, visual and auditory information is the best method of learning. Where content is appropriate (such as working with different screen readers), some materials will be offered using video or audio to enhance the training, with captioning or scripts available for accessibility. As part of providing the latest information on AT and accommodations, webcasts of interviews with experts in the AT field will offer educational application information.

Virtual Resource Room

The virtual resource room will offer the latest downloadable software or links to the software for trial for work accommodation. The resource room will have comment features that allow persons to comment on the application of the software and to present any difficulties or solutions that they encounter.

Conferences and Workshops

Project training will be incorporated into numerous technology- and disability-related conferences, including the following:

- ITAA national and regional conferences;
- National Council on Rehabilitation Education;
- Closing the Gap;
- National Rehabilitation Association;
- American Counseling Association;
- Regional I.T. association forums;
- Society of Human Resource Managers conferences;
- Working groups organized for individual I.T. training certification bodies and corporations;
- State of Science National Conference; and
- Webcasts, audioconferences, and presentations customized for each target audience.

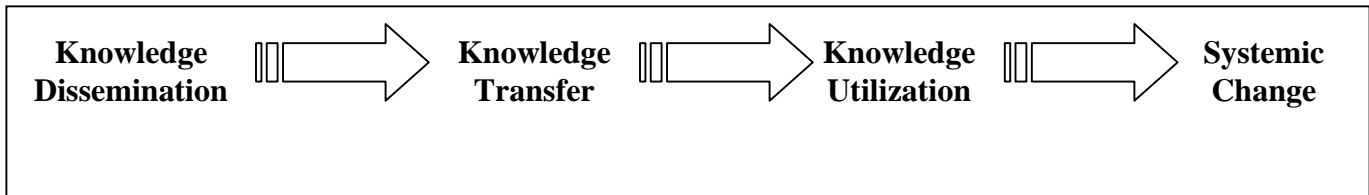
Webcasts and audioconferences will include captioning and will be archived online for access in different formats and for those who miss real-time participation. Such venues for learning will feature the key strategies identified in the study and offer interactive question-and-answer sessions.

Table 2: Summary of Training & Knowledge Transfer Strategies

Target Group	Strategies
I.T. Employers (500 or more employees)	Webcasts (2-hour panels plus interactive Q & A) Trade associations – ITAA national and regional conferences (2-hour breakout sessions) Online tip of the week with listserv Self-paced distance learning course online
I.T. Employers (less than 500 employees)	Webcasts Audioconference series CRITA – regional I.T. association forums Online listserv Self-paced distance learning course online
I.T. Training Certification Bodies and Corporations (COMTIA, Cisco, Microsoft, Carnegie)	Webcasts Working groups – individualized training per organization
Human Resource Managers (I.T. and non- I.T. companies)	SHRM conference breakout Webcasts featuring positive company examples
Community College/University Continuing Education Programs	Webcasts featuring education promising practices Distance education course online
Centers for Independent Living, Disability-Related Organizations	Conference presentations Webcasts featuring individual success stories

F) Design of Dissemination Activities

“The goal of all dissemination should be utilization” (NCDDR – Research Exchange, Volume 1, Number 4).



All materials used in dissemination activities will be prepared with scientific rigor and real-world relevance in mind for a diverse audience, and offered in numerous formats effectively

and accessibly to reach as many people as possible. Users with and without disabilities learn in different ways. Care has been taken to conduct a review of the literature and of various learning styles, accessibility issues, and user preferences to design materials of the utmost quality, clarity, and variety. This includes but not limited to style of writing, content, and multiple methods of presenting the information.

Information briefs, two to four pages on assistive technology, accommodations, and project research findings, will be prepared and published. Magazine articles identifying best practices and capturing success stories will be offered in I.T. trade publications such as ITAA and regional CRITA newsletters. When appropriate, findings from the questionnaires and surveys will be written for publication in peer-reviewed rehabilitation and business journals for educators and researchers. The project website will be regularly updated to contain project information, a calendar of current activities and events, and accessible archives of publications, findings, training materials, resources, and links to further information and training opportunities.

Findings will also be presented in numerous technology- and disability-related conferences, when possible, including the following:

- ITAA national and regional conferences;
- National Council on Rehabilitation Education;
- Closing the Gap;
- National Rehabilitation Association;
- American Counseling Association;
- Regional I.T. association forums;
- Society of Human Resource Managers conferences;
- Working groups organized for individual I.T. training certification bodies and corporations;
- State of Science National Conference; and
- Webcasts, audioconferences, and presentations customized for each target audience.

Also linked to the project website will be the online resource room, a virtual library that will offer the latest downloadable work accommodation software for trial, including an evaluation feature that allows users to comment on applications and any difficulties encountered. The electronic bulletin board will facilitate a peer support network on accommodation information, allowing participants to pose questions, offer suggestions, share success stories, and make comments on relevant topics of interest. The project listserv will facilitate timely announcements, updates, and user interaction.

In years 1 through 5 of the project, in cooperation with ITAA, the project will sponsor an Industry Awards Program. This program has two goals: 1) to stimulate interest in employing individuals with disabilities and 2) to give public recognition and reward to I.T. firms that have developed effective strategies that promote the employment and advancement of people with disabilities. There will be six categories of awards: recruiting, hiring, accommodations, retention, training, and career advancement. A total of 12 companies will be honored each year, with awards going to one small and one large I.T. firm in each category. Each award winner will be presented at ITAA's Annual Workforce Development Conference.

Nominations will be solicited through the ITAA membership via its website as well as from the project's Expert Panel, publicly and privately funded I.T. training and employment projects, and the public at large through the project's website and other points of dissemination. An Awards Committee consisting of representatives from the ITAA Board and the project's Expert Panel will establish selection criteria and select winners.

The evaluation of dissemination materials is important to assess and improve the quality of the materials and to evaluate their impact. For materials disseminated through conferences, webcasts, and other live activities, feedback will be obtained to evaluate quality of content and

delivery. Later activities will be modified to account for this feedback. Electronic and interactive dissemination activities will be evaluated according to a formative and summative evaluation process (see Section J, Evaluation, for a description of these processes). The process of developing these activities will generally include the following steps:

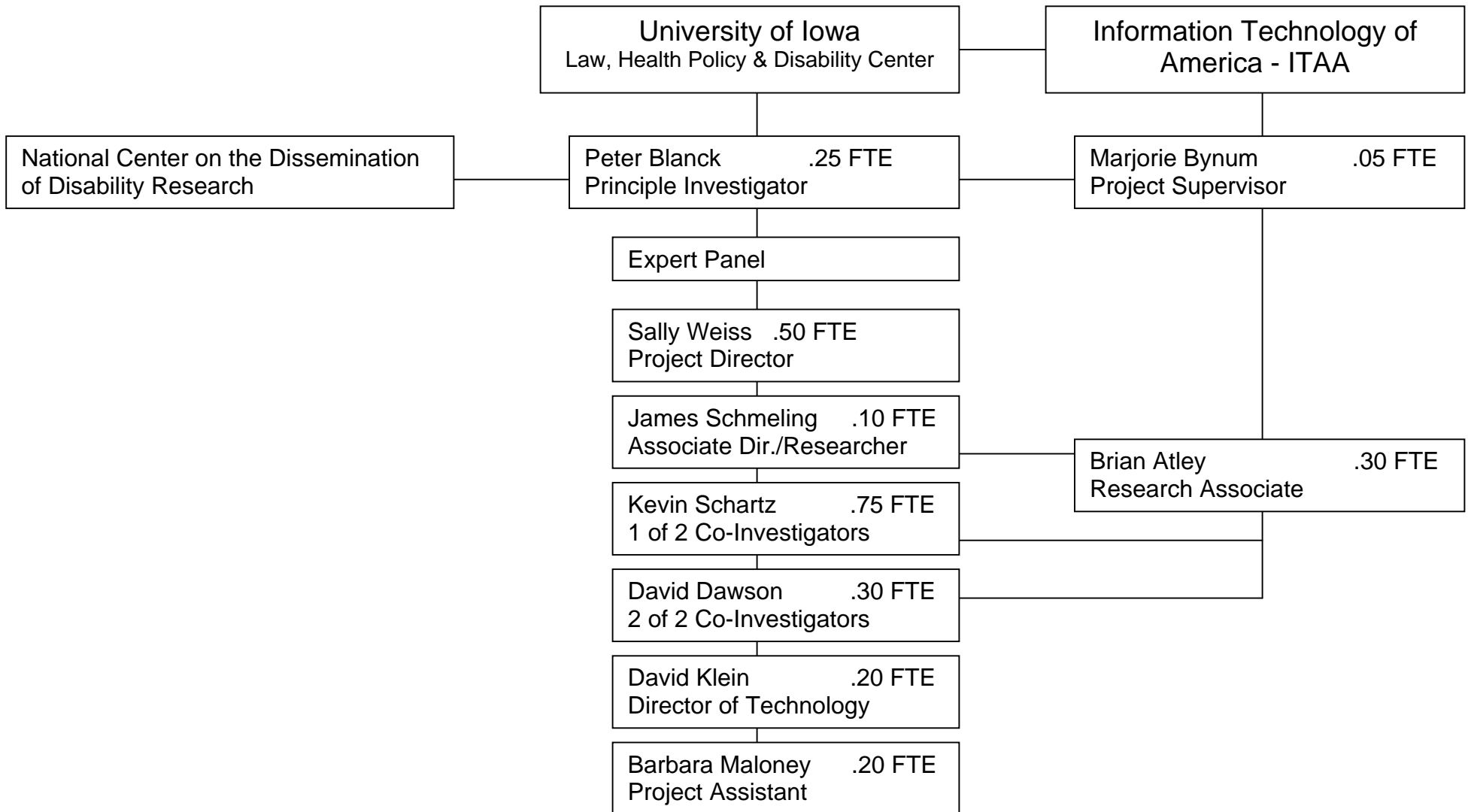
1. Research AT issues related to content.
2. Assemble research data and related publications.
3. Analyze data.
4. Develop prototype of dissemination materials, including user interactivity when possible and appropriate.
5. Present prototypes to subject matter experts for feedback and comments.
6. Revise prototypes based on feedback.
7. Present revised materials to and receive feedback from pilot users from targeted groups.
8. Modify materials, if necessary.
9. Place materials on Web for distribution.
10. Ongoing evaluation of data collected from website, including user satisfaction, usability, and accessibility.
11. Ongoing update of material as needed.

G. Plan of Operation

Project Organization

Collaborating partners in the proposed **I.T. Works** are the Law, Health, Policy and Disability Center at the University of Iowa and the Information Technology Association of America. The project's organization is shown in **Figure 1: I.T. Works Organizational Chart**. All project staff are cited on the chart, and their project-related time commitment is denoted. Resumes for all project staff appear in Appendix 2; brief descriptions of staff qualifications appear in Section K.

Figure 1: I.T. Works Organizational Chart



Law, Health Policy and Disability Center of the University of Iowa, College of Law. The Law, Health Policy & Disability Center (LHPDC) was formed by its Director, Professor Peter Blanck, as a policy research Center in 1993. The LHPDC has been conducting applied research and training, with policy research informing the service provided to clients. Projects requiring direct service include research components to assess effectiveness and understand barriers and facilitators to the service. The LHPDC's staff has expertise in law, psychology, instructional design, computer science, and other disciplines, all of which are complementary to the goals of this project.

The LHPDC has experience in carrying out training and research, and widely disseminating that knowledge to ensure its use in the widest variety of settings after the conclusion of the project. The LHPDC's experience in designing an accessible interactive web site includes a project for the Region VII CRP-RCEP. The LHPDC developed and implemented a Web-based distance education program for training employment specialists. The LHPDC continues to provide technical assistance and is involved in developing new courses for the CRP-RCEP. The program was revised based on feedback from the recipients of the training.

The LHPDC is involved in information dissemination on a national scope for a project in collaboration with The George Washington University. Funded by the Robert Wood Johnson Foundation, the LHPDC developed an accessible web site to disseminate information from states that have implemented Medicaid buy-in plans and other work incentive initiatives with states, advocates, legislators, and others who are considering, researching or using these initiatives.

The LHPDC provides technical assistance to businesses and individuals on implementing the ADA through a contract with the Region VII DBTAC. Technical assistance is provided on a

statewide basis, in cooperation with partners in Missouri, Nebraska, and Kansas, led by the DBTAC personnel at the University of Missouri.

The LHPDC, in its role as a partner in the Rehabilitation Research and Training Center on Workforce Investment and Employment Policy for People with Disabilities (RRTC), has been awarded a one-year contract from the Employment and Training Administration in the U.S. Department of Labor. The purpose of the contract is to assist the DOL central office, the regional Disability Coordinators/GOTRs, and the 23 Work Incentive Grantees funded during the fall of 2001, with information training, and technical assistance activities that improve the effective and meaningful participation of youth and working age adults with disabilities in the One-Stops and comprehensive workforce development system. The contract is renewable for up to two years. The Workforce Investment Act offers states and local communities an unprecedented opportunity to bring together public and private resources that respond to market needs for skilled labor and customer needs for employment and related support services. It is the intent of the RRTC to become a resource that facilitates policy and program development at a state and local systems level as part of a process of continued improvement of opportunities and employment results for youth and working age adults with disabilities. Through multiple activities, the RRTC will help 1) understand current policy development across federal agencies that are relevant to systems change and capacity building efforts; 2) exchange information on promising systems change activities and keep up-to-date on other grantee strategies and outcomes; and 3) identify barriers and problem solve policy and practice solutions that advance access and effective participation in the Workforce Development System at a local community level.

To the current project, the LHPDC contributes its experience carrying out research, dissemination and service projects. The LHPDC has access to assistive technology labs, educational consultants, technology to be used to develop training and interventions, instructional designers to review the training, researchers to evaluate its effectiveness, and writers to document and disseminate models. As is the LHPDC's goal with most of its research projects, it is committed to sharing the information and models developed through research with other researchers, policy makers, consumers and government agencies. Most of the projects undertaken by the LHPDC revolve around employment outcomes and benefits for people with disabilities. More information is available about other projects and research at the LHPDC's web site (<http://www.its.uiowa.edu/law>).

Information Technology Association of America, Workforce and Education Department

The Information Technology Association of America (ITAA) provides global public policy, business networking, and national leadership to promote the continued growth of the I.T. industry. ITAA consists of over 500 direct corporate members throughout the U.S., and a global network of 41 international I.T. associations. The association plays the leading role in issues of I.T. industry concern including information security, taxes and finance policy, digital intellectual property protection, telecommunications competition, immigration online privacy and consumer protection, government I.T. procurement, human resources and e-commerce policy. ITAA members range from the smallest I.T. start-ups to industry leaders in the Internet, software, I.T. services, ASP digital content, systems integration, telecommunications, and enterprise solution fields.

ITAA runs a leading Workforce and Education Department, directing workforce and educational initiatives designed to grow the I.T. workforce through partnerships and industry

leadership. Each year the department convenes the National I.T. Workforce Convocation to gauge progress and track best practices in dealing with the I.T. skills gap. The 2001 Convocation attracted over 350 leaders in industry, education and government. Featured speakers included Carlene Ellis from Intel, Congressman John Conyers and well-known Internet founder, Vint Cerf.

Through grants from the Department of Education and the National School to Work office, ITAA has implemented a nationwide program to engage employers in School-to-Career activities. ITAA has partnered with the Department of Labor to bring together high tech employers and Workforce Investment Boards to address critical training and retraining needs for today's workforce. Participation in the America Connects Consortium highlights the association's abilities to provide technical assistance to communities across the U.S. The ITAA Workforce and Education Development web site features I.T. career information, examples of innovative partnerships, leading research and valuable links for persons interested in I.T. workforce issues.

ITAA also has a history of activity with workforce issues that affect persons with disabilities. Section 508 of the Rehabilitation Act, as revised by the Rehabilitation Act Amendments of 1998, sets new rules for I.T. products acquired by the Federal government. The statute requires Federal agencies to develop and purchase I.T. products that are accessible to individuals with disabilities. This new rule will significantly alter the way in which the Federal government purchases I.T. products and services. The I.T. industry sees Section 508 as an important opportunity to bring technology to even more Americans who might otherwise not be using I.T., and enter new markets by providing these products. ITAA has taken a leading role in educating the producers of I.T. equipment and services on the requirements and implications of

the new statute, and is working with the General Services Administration to educate procurement officers within the government as well.

Project Staff

Principal Investigator, Peter Blanck, Ph.D., J.D. (.25 FTE) will provide oversight of the research design and methods. Dr. Blanck, LHPDC Director, is a professor of law, psychology, and occupational health. He is a member of the President's Committee on Employment of People with Disabilities. He is strongly committed to the disability community and efforts to promote employment of people with disabilities. Dr. Blanck is able to bring academic research in law, psychology, and occupational health to bear on real world projects and positively impact their outcomes, for instance, as evidenced by his testimony last year before Congress on the applicability of the ADA to the Internet. Dr. Blanck will develop the analysis and findings from multiple data sources. He will also lead all project evaluation activities.

Dr. Kevin Schartz (.75 FTE) will serve as one of the two Co-Principal Investigators. Dr. Schartz, an Assistant Research Scientist, is well versed in data collection and analysis. He holds a Ph.D. in psychology and masters of computer science, with a specialization in software engineering. Dr. Schartz, as Co-Principal Investigator, will be responsible for designing and implementing the surveys, and combining the content and the technology employed by the project, which will be used to convey the substantive information about I.T.-based employment and training to the target audience.

Dr. David Dawson (.30 FTE) will also serve as a Co-Principal Investigator. Dr. Dawson holds a Ph.D. in Counselor Education, Rehabilitation Counseling Program, and will be responsible for survey and interview design focused on practices related to assistive technology,

I.T., and accessible I.T. interfaces. He will assist in the development of training and evaluation activities related to the use of I.T. by individuals with disabilities.

The Project Director, Sally Weiss (.50 FTE) will be responsible for the day-to-day management of the project. Her responsibilities include program and financial oversight, including reviewing monthly written reports submitted by all project staff documenting critical findings and progress based on performance indicators. These reports will be reviewed by the Project Director to determine whether performance indicators and timelines are being met, identify unforeseen difficulties, and implement remedial activities as necessary. Ms. Weiss will also coordinate project activities among project staff and the Expert Panel. In addition, Ms. Weiss will assist in the development, editing and production of all training and dissemination materials and, beginning in Year One of the project, work with the National Center on the Dissemination of Disability Research to disseminate research findings to targeted audiences.

Assisting Ms. Weiss in the coordination and monitoring of project activities will be James Schmeling (.10 FTE) in his joint role as a project administrator and Senior Researcher. Mr. Schmeling, the LHPDC Associate Director, is a policy researcher and administrator for the LHPDC. He will coordinate the project administrative activities and provide substantive expertise in the ADA, assistive technology policy, government policy, and other areas. As a project administrator, Mr. Schmeling will meet with the Project Director every Monday morning by telephone to review project activities and staff accomplishments toward specific objectives. He will also coordinate administrative activities with the University of Iowa as needed. As Senior Researcher, Mr. Schmeling will focus on policy barriers and legal issues of importance to employers and employees.

Marjorie Bynum, Vice President of Workforce Development at the Information Technology Association of America will serve as Project Supervisor (.05 FTE). In this role, Ms. Bynum will provide critical linkages to the I.T. industry, both for the purposes of survey research on the employment practices of I.T. and non-I.T. firms, as well as the purposes of training and dissemination of promising strategies. She will facilitate the Best Practices I.T. Industry Awards program. In this, Research Associate, Brian DeAtley (.30 FTE), will assist her. Mr. DeAtley will work collaboratively with the project's Principal Investigator and two Co-Principal Investigators to conduct surveys and structured interview with I.T. employers, employees and federal grantees of I.T. employment demonstration projects. He will oversee the I.T. Works Innovation Grants program.

David Klein (.20 FTE) will serve as Director of Technology for the project. He will serve as a developer and instructional designer for all dissemination materials. In addition, he will assure that all project technology needs are met, including that used for dissemination and communication activities. Mr. Klein, A.B.D. in instructional design and technology, with the assistance of Rebecca Borg, graduate student in instructional design and technology, are instructional designers, and will work with Dr. Schartz and the content experts to design the distance learning and electronic dissemination activities, enhance the user experience and convey the information the project is collecting.

Barbara Maloney, Project Assistant (.20 FTE), will maintain all research files, assist with data collection, and also assist in the production of research reports and information materials.

Another important activity of the LHPDC is its year long research and policy seminar on issues related to disability. The seminar is offered to law students, graduate students in rehabilitation counseling, public policy, public health, education, and other disciplines, in

addition to well-qualified undergraduate students. The seminar functions as a yearlong practicum/research seminar. Students are assigned to projects within the LHPDC according to their interests and talents. They remain on the project for either one or two semesters, and may return to the LHPDC for further independent research with other projects. Students work closely with the PI and other professional staff on tasks that have both an educational, functional, and career component. The seminar usually enrolls between 10 and 15 students each year, many of who have disabilities. Students attain practical experience in research methods, public policy, and other facets of disability issues.

Task Control Monitoring System for Effective Project Administration

The project will employ a Task Control Monitoring System, an internal monitoring system based directly on project goals, to ensure that objectives are being performed satisfactorily and on time. The **I.T. Works Project Timeline** will be used as a standard against which to monitor the accomplishment of targeted project activities. During the first month of funding, the Project Director will develop a fine-tuned Work Plan, based on the timeline and on additional information about activities included in this proposal. This Work Plan will serve as the master list of project activities included in this proposal. This Work Plan will serve as the master list of project activities, which will then be assigned to staff members. The Work Plan will be numbered with a comprehensive numeration system. Individual tasks will be entered on the Task Control Tracking Log, thus serving as a record-keeping format for noting progress and delays in accomplishments on the project's scope of work. The time line will be used as a standard against which to monitor the accomplishment of targeted project activities.

The Project Director will review each weekly time log, as well as monthly summaries, to ensure that individual staff expends adequate time in necessary project activities. If

discrepancies are noted, the Project Director will work with the Project Administrator and Principal Investigator to modify time allocation. Concurrent with this review of time logs measured against the Master Work Plan, the Project Director will review both ongoing and upcoming tasks with responsible staff in monthly teleconferences with all staff. Relevant data and other pertinent products will be examined, discrepancies noted, and activities will be determined to be on-time or behind, with reference to the Master Work Plan. As needed, changes in staff time allocation or resources will be made to allow for accomplishment of any tasks behind schedule. In this way, all staff will not only be aware of their progress on overall project objectives, but their activities and reporting will be directly keyed to them. Overall, this system will facilitate ongoing, careful scrutiny of project activities with reference to the promised work scope.

H. Collaboration

As outlined in Section G. above, the collaboration of the Law, Health Policy and Disability Center (LHPDC) at the University of Iowa with the Information Technology Association of America (ITAA) brings together in a single project two organizations well equipped to achieve the project's research, training and dissemination activities. The project design combines LHPDC's extensive research, training and dissemination expertise with ITAA's ability to facilitate I.T. firms' involvement with the project, resulting in a partnership that will produce high quality results throughout all five years of the funding cycle.

In addition, ITAA's Workforce and Education Department's initiatives in monitoring the I.T. skills gap, best practice strategies for closing that gap, and information dissemination, training and technical assistance to the I.T. industry—along with the credibility and good will that ITAA enjoys within that industry—will enhance the project's ability to disseminate

promising strategies for promoting the employment and advancement of individuals with disabilities. ITAA's existing partnerships with the Department of Labor bring together I.T. employers and the Workforce Investment Boards to address critical training and retraining needs in today's workforce. ITAA's participation in America Connects Consortium allows the Association to provide technical assistance to communities throughout the United States.

Current projects underway at the LHPDC enhance the project's collaboration with other organizations. As a State Affiliate for the Great Plains Disability and Business Technical Assistance Center (Region VII), the Center provides technical assistance on a statewide to business and individuals on implementing the ADA. The Center's role with the Region VII DBTAC will expand beginning in October 2001 when it will begin to identifying and disseminating to the other states in Region VII best practice strategies for promoting the use of accessible I.T. in educational settings. In addition, I.T. technical assistance will be provided to entities throughout the Region through websites, checklists, email, list serves and other electronic means by David Klein, Rebecca Borg and other LHPDC technical staff. Collaboration with the Southeast DBTAC (Region IV) will be facilitated through the Project Director's role as Materials Development Specialist (.50 FTE) for that DBTAC. In this capacity, Ms. Weiss will compile and develop a series of "Best Practices" reports focusing on the integration and use of education-based I.T. in a variety of educational settings as well as on "Best Practices" that facilitate the hiring, career advancement and integration into the workplace of employees with disabilities.

In its role as a partner in the Rehabilitation Research and Training Center on Workforce Investment and Employment Policy for People with Disabilities, the LHPDC is assisting the Department of Labor, its regional Disability Coordinators, and the 23 Work Incentive Grantees

funded during the fall of 2001 with information, training, and technical assistance activities that improve the effective and meaningful participation of youth and working age adults with disabilities in Once Stops and comprehensive workforce development system. Its role as a member of the RRTC will also facilitate collaboration with the Center for Workplace Development at Rutgers University and the Center for the Study and Advancement of Disability Policy in Washington, DC. — allowing the project to disseminate its findings as well as training and information dissemination materials to the constituencies served by these two organizations.

The project will work with the National Center on the Dissemination of Disability Research to design and implement the most effective methods of information dissemination to a variety of targeted audiences, including dissemination through other NIDRR-funded I.T. projects such the National Assistive Technology Website (www.assistivetech.net), TechConnections, and the Information Technology Technical Assistance and Training Center (ITTATC). The project will collaborate with appropriate private and federally funded programs such as Community Based Rehabilitation Research Projects on Technology for Independence, Projects with Industry, I.T. training and employment projects funded by the Department of Labor and by the Rehabilitation Services Administration, and other projects identified in consultation with the NIDRR project officer.

I. Adequacy and Reasonableness of Budget

Costs are reasonable in relation to Project Activities

The Law, Health Policy and Disability Center [LHPDC] developed the projected costs per activity based on recent (three year) experiences with similar types of research and dissemination activities conducted on behalf of the U.S. Department of Labor and the U.S. Department of Education. Approximately 60 percent of costs are tied to personnel engaged in

the primary research studies with the assistance of the subcontractor, ITAA, and the advice of the Expert Panel. Knowledge and utilization activities including training, dissemination of printed materials in multiple and accessible formats, electronic communication, and web-site expansion of the LHPDC site to incorporate new materials from this project have been costed-out from prior experience with similar activities.

It is expected that in grant years two through five upwards of 500 companies will be reached with electronic and printed communications about the research findings, with an emphasis on strategies identified that are beneficial to the employer and potential skilled workers with disabilities. It is expected that in years two through five that 200 I.T. companies H.R. and other management will benefit from training activities offered by the project annually. It is expected that upwards of 500 individuals with disabilities and 100 disability-related organizations will benefit from information and training activities offered by I.T. Works. The total number of individuals and organizations across stakeholder groups expected to benefit from the project over five years is 1300. From a cost benefit ratio, the potential influence and impact of the project on these numbers of key individuals/organizations justifies the reasonable nature of the proposed expenditures.

Finally, the collaboration with ITAA, the leading trade group for I.T. employers, will increase the probability of reaching the key stakeholder group and influencing their future actions regarding hiring, training, and employment practices of persons with disabilities.

Extent to Which the Budget is Adequately Justified

Each section of the budget (personnel, supplies, travel, subcontracts, other) is subdivided to offer additional detail about projected costs related to proposed activities. In the section of the budget on personnel, the percent time for each individual is indicated and calculated based on

annual salary. A brief description of each staff member's primary role is provided that ties back to overall project activities. Each of the other major sections explain the basis on which costs were calculated, along with a brief description that ties these costs back to proposed activities. The subcontract with ITAA is described in detail to include a breakdown of its major costs for personnel and other critical activities related to research and dissemination activities. In all parts of the budget, the cost calculations provide a unit cost, such as the cost of a brochure, a teleconference call with the Expert Panel, or the cost of a trip. In each case, the unit cost is multiplied by the number of brochures, calls, or trips to generate a total cost. The budget narrative provides details of all project activities and the calculation used to explain a final number generated.

J. Plan of Evaluation

The Government Performance and Results Act (GPRA) of 1993 requires annual performance goals, program indicators, and measurable outcomes from all federally funded programs. Program evaluation is a powerful tool that can be used to:

- Assess progress toward program goals;
- Plan for future operations;
- Measure the impact of our training services on an ongoing basis;
- Measure the impact of our information dissemination on the target populations.

The National Institute on Disability and Rehabilitation Research (NIDRR) has outlined the goals of the **I.T. Works** project are:

1. Identify and evaluate I.T.-based training and employment recruitment, hiring, and placement strategies, including entrepreneurial opportunities, that promote successful employment for individuals with disabilities in the I.T. industry;
2. Identify, develop, and evaluate strategies to assist with overcoming barriers that limit opportunities for advanced skill development and promotions in jobs requiring significant I.T. knowledge and skills, including training for individuals currently working in I.T. industry and those in jobs requiring significant expertise with I.T.;
3. Develop and evaluate training programs to inform employers, educators, and individuals with disabilities about effective strategies that will assist with overcoming barriers for I.T.-based training and improve I.T.-based employment opportunities; and

4. Develop and implement a plan to disseminate the project's research results to the appropriate audiences.

Dr. Peter Blanck will lead the project's evaluation activities. The evaluation activities are divided into two parts: formative and summative. Formative evaluation is used to design and develop materials and typically consists of the following components: 1) evaluation by designers and developers, 2) evaluation by experts, and 3) evaluation with the target audience. Formative evaluation occurs during the process of designing and developing materials and procedures, after some materials and procedures have been developed and before the project has been finalized. The purposes of formative evaluation include assessing how well a project is meeting its goals, identifying strengths and weaknesses in the materials and procedures, and suggesting how materials, procedures, and other project constructs can be changed to improve their effectiveness. Summative evaluation, on the other hand, is generally applied at the last stages of a project and typically includes the following: 1) a description of how a project attains its goals, 2) what must be done to implement the finalized materials and/or procedures with the target audience, and 3) a description of the expected impact of the project.

Formative evaluations will help **I.T. Works** project staff manage the project effectively to track implementation and ensure progress. As described earlier in Section G) Plan of Operation, the project will use a management by objective process to establish performance indicators and timelines related to progress and completion of specific project objectives. Quarterly written reports submitted by all project staff will document critical findings and progress based on performance indicators. These reports will be reviewed by the Project Director as well as by Dr. Blanck to determine whether performance indicators and timelines are being met, identify unforeseen difficulties, and implement revisions as necessary.

Formative evaluations will be used to develop high-quality, effective research instruments, such as the surveys and questionnaires. As described in Section C) Design of Research Activities, the methodology of the research provides for designer, expert, and target audience review. Researchers on the project will evaluate the design of the research instruments. The Expert Panel will review the content of the surveys and questionnaires. The pilot sample of participants will be used to test the validity and reliability of the instrument outcomes.

For development of training, formative evaluations will be used to increase the effectiveness of the materials and delivery of the content. Training and instructional developers and researchers at the LHPDC will work together to identify and develop strategies for overcoming employment barriers, based on the outcomes of the research. Training and instructional developers will further develop instructional materials to deliver training of these strategies. Experts will periodically review the instructional materials for accuracy, clarity, and implementation issues, such as whether training realistically will be used by people, and whether the instruction is accessible. During various stages of the development process, samples from the target audience will be asked to participate in the training to evaluate it for clarity, thoroughness, and usability. Since the target audience of these trainings includes different populations, such as I.T. trainers and human resources personnel, people from each of these populations will be included to evaluate the training activities.

Because numerous dissemination activities are planned, each activity may be used to produce formative evaluations of the dissemination materials. For example, feedback from a conference presentation can produce information about the thoroughness, accuracy, clarity, and impact of the information presented.

Summative evaluations will be implemented at the end of each stage of the project to study outcomes and assess progress toward achieving goals. For the research component, Dr. Blanck and the researchers at the LHPDC will describe the constructs, research questions, and outcomes of the research. Using the outcomes from the research, they will suggest possible strategies that can be used by people in the populations studied to improve opportunities for employment in I.T. for people with disabilities. Based on these outcomes, they will suggest possible impacts of these strategies.

Once training activities are ready to be deployed to a public audience, a summative evaluation will be developed by the training developers and researchers at the LHPDC to address the following issues. First, the evaluation will describe the objectives of the training and how these objectives address the goals of the project. Second, it will outline how the training should be delivered, including what delivery platform should be used, how instructions for users should be delivered, how technical support should be addressed, what obstacles to effective training may arise and how to avoid them. Third, the evaluation should include how the training will affect its target audience, what to look for in the field, and suggestions on how to measure changes in the field once the training has been delivered.

Because of the longitudinal nature of the surveys, changes in employment for people with disabilities will be tracked, focusing on the possible effects of training in employment strategies. Relationships to external factors, including changes in hiring and employment for the larger population, changes in the economy, and changes in law and policy, will also be examined. Such influences will be reflected in end-of-year evaluations, which can suggest the impact of the project on I.T. employment for people with disabilities.

K. Project Staff –

Applicant Diversity

The University of Iowa, among the first public universities in the United States to admit women and minorities as students, values diversity among its students, faculty, and staff and has long been committed to the principle of equality of opportunity for minority group members and women. Resources available for University of Iowa faculty, staff, and students to assist the University in meeting its commitment to providing equal access to all include: an African American Council, an Associated University Women group, the Council on Disability Awareness, and the University Committee on Diversity.

The staff and students of the University's Law, Health Policy & Disability Center (LHPDC) at the Iowa College of Law represent diversity through their backgrounds, experiences and knowledge. Together, they represent one-third persons of color, one-third women, and one-third persons with disabilities; with overlaps within the three categories. In addition, most of the staff have family members with a disability, and thus have a further vested interest in helping to improve the lives and opportunities for individuals with disabilities.

With regard to the **I.T. Works** project itself, two of the core staff are persons with disabilities, two are women, and one is African American. Of the members of the Expert Panel who have already been identified, the following are individuals who have a disability: Jeffrey Pledger, an individual who lost his sight at the age of 27, is the President and Founder of AbleTV.net, the first global television network for the disabled. Kathy Keller is an individual with a disability who currently works as an Information Specialist/Web Developer for Texas Parks and Wildlife. Jim Danielson, an individual with a hearing impairment, works as the Editor/Communication Project Manager for the Chubb Group of Insurance Companies. Kevin

Ellerman, an individual who is blind, contributes his nationally recognized expertise on accessibility, assistive technology, and workplace accommodations.

Key Personnel and Staff: Core Staff

Principal Investigator - *Peter D. Blanck* will serve as principal investigator. He will provide oversight of research design and methods, develop analysis and findings from multiple data sources, and will lead project evaluation activities. Dr. Blanck currently serves as a Professor of Law, Psychology, and Occupational Medicine at the University of Iowa, and as the Director of the LHPDC. He received his Ph.D. in psychology from Harvard University and his J.D. from Stanford Law School. Dr. Blanck serves as a member of the President's Committee on Employment of People with Disabilities. As a Senior Fellow with the Annenberg Washington Program, he explored the implementation of the Americans with Disabilities Act (ADA), and has written articles and books on the subject, has received grants to study the law's implementation, and his work has received national and international attention. Dr. Blanck has served in the capacity of Commissioner on the American Bar Association Commission on Mental and Physical Disability Law, chair of the American Psychological Association's Committee on Standards in Research, and President of the American Association on Mental Retardation's Legal Process and Advocacy Division.

Co-Principal Investigator - *Kevin M. Schartz* will serve as co-principal investigator. As such he will conduct structured interviews, design data collection, review and analyze data, and help identify and develop promising strategies for I.T. employment and advancement. Dr. Schartz currently serves as Assistant Research Scientist to the LHPDC. He received his B.S. in both Psychology and Physical Science from the Kansas State University, and his M.C.S. in Computer Science, Software Engineering; M.A. and Ph.D. in Psychology from the University of

Iowa. Through his studies in psychology, his primary focus has been on cognitive processes, and his computer science background includes the design of computer programs. Dr. Schartz's professional activities include serving as a member of the Information Technology Committee within the Department of Psychology at Southwest Missouri State University.

Co-Principal Investigator - *Robert D. Dawson* will serve as co-principal investigator. He will lead survey and interview design for AT, I.T. and accessible I.T. practices, as well as assist in the development of training and evaluation activities related to the use of I.T. by individuals with disabilities. Dr. Dawson, who has a learning disability that affects both his reading and writing, is the coordinator in charge of the newly formed Iowa Center of Assistive Technology and Education Resources (ICATER). ICATER examines training and research needs regarding assistive technology and information technology from K-12 and post-secondary education through employment. Dr. Dawson serves as the liaison between the LHPDC and the College of Education for joint research and dissemination of materials. Dr. Dawson received a B.S. in Psychology and M.A. in Rehabilitation Psychology from Appalachian State University, and a Ph.D. in Counselor Education, Rehabilitation Counseling Program, from the University of Iowa. Dr. Dawson joined the LHPDC as a Ph.D. student and worked on various research projects, including the RRTC, the Comprehensive Work Incentives site, and the Summer 2000 Research Symposium.

Project Director - *Sally Z. Weiss* will serve as project director. She will be responsible for the day-to-day management of the project, coordination among staff and the Expert Panel, and will be responsible for operations of the program and financial oversight. Ms. Weiss currently serves as project coordinator for Project Leadership, an ADD-funded Project of National Significance to train self advocates and family leaders to shape and guide the

implementation of federal and state policies that promote self-determination. In addition, she is an Information Manager for the NIDRR-funded RRTC on Workforce Investment and Employment Policy for Persons with Disabilities. She also is involved with developing and implementing demonstration projects that enhance the economic self-sufficiency of persons with disabilities. Prior to joining Community Options in November 1999, Ms. Weiss worked for 11 years for the National Office of UCPA, where she served as Coordinator of National Projects, responsible for the oversight and management of 12 Federally funded employment, demonstration, information dissemination, training and technical assistance projects. Prior to this, Ms. Weiss was Information/Publications Coordinator for the National Office and also served as Project Director for Project Implement, a NIDRR-funded ADA training project focused on persons with disabilities and their family members. Ms. Weiss has both personal and professional experience with disability: she has a psychiatric disability and is also the parent of two young adults who have significant disabilities.

Associate Project Director - James L. Schmeling will serve as the associate project director. As such he will serve as the project administrator and senior researcher. His area of concentration will be policy barriers and legal issues of importance to employers and employees; he will serve as the coordinator with UI administrative activities. Mr. Schmeling serves as the Associate Director of the LHPDC. He received his J.D. from the University of Iowa, College of Law, in 1999, where he studied disability law and policy with Dr. Peter Blanck. At the Center, Mr. Schmeling provides ADA technical assistance to businesses and individuals through the regional DBTAC, to DOL Work Incentive Grantees through a DOL contract, and to other interested audiences through several comprehensive web sites. As a researcher, his studies

include: entrepreneurial activity, employment policy, work incentives, corporate culture, and other disability programs and policies.

Director of Technology - *David W. Klein* will serve as director of technology and will assure that project technology needs are met, including dissemination and communication activities, as well as serve as a developer/instructional designer for dissemination materials. Mr. Klein currently serves as the Associate Director of Technology for the LHPDC. In this capacity, his responsibilities include coordination of the use of technology in the Center and in Center projects, and he specializes in distance learning and Web usability and accessibility for people with disabilities. Mr. Klein is currently in the Ph.D. program in Instructional Design and Technology, working on his dissertation, with an expected graduation date of Fall 2002. Before his employment at the LHPDC, Mr. Klein managed the design and development of X-Plain, Web-based patient education software currently used on NIH's Medline Plus website. Mr. Klein holds a B.A. and M.A. in English from the Colorado State University. Formerly foster parents, Mr. Klein and his wife, Bette, are raising nine adopted children, a group that includes a variety of special needs, including cognitive and developmental disabilities.

Project Supervisor - *Marjorie Bynum* will serve as project supervisor as part of a subcontract with the Information Technology Association of America (ITAA). She will provide oversight and critical I.T. industry linkages for the project's research, training, and information dissemination activities. Ms. Bynum is Vice President of Workforce Development at ITAA. In her role as Vice President, Ms. Bynum oversees all of ITAA's numerous workforce and education initiatives that address the critical shortage of skilled I.T. workers in American industry. Her responsibilities also include initiating and developing new partnerships among industry, academia, and government; coordinating an annual Workforce Convocation event for

stakeholders on this issue; raising awareness about the career opportunities in I.T.; and lobbying on legislative issues dealing with I.T. training and education. Ms. Bynum makes numerous presentations across the U.S. on I.T. workforce and education issues. Ms. Bynum has a B.A. from North Carolina State University and an M.A. in English from the University of Maryland at College Park.

Research Associate - *Brian DeAtley* will serve as research associate as part of a subcontract with the Information Technology Association of America (ITAA). As such he will work collaboratively with the LHPDC and ICATER to conduct surveys and structured interviews with I.T. employers, employees and federal grantees. Mr. DeAtley is a Senior Program Manager with ITAA and is primarily responsible for the management of the Association's School to Career programs including the Career Cluster Initiative and the Techforce program. Mr. DeAtley also represents ITAA in their ongoing collaboration with the National Skills Standard Board. Mr. DeAtley's past experience includes managing workforce programs involving welfare to work projects and managing employment services for the DC Arc. Mr. DeAtley worked for Fairfax County Government for 10 years providing students with special needs help in entering the workforce. Mr. DeAtley has a M.A. in Education and Human Development from George Washington University and a B.A. from the University of Maryland.

Project Assistant - *Barbara Maloney* will serve as project assistant. Ms. Maloney will maintain all research files, assist with data collection and production of research reports and other project-related materials. Ms. Maloney currently serves as Administrative Assistant for Community Options, Inc. Ms. Maloney, an African American, has over 10 years experience in support activities with federally funded projects.

ii. Key Personnel and Staff: Expert Panel

The project's Expert Panel will play an integral part in the design, development and implementation of all project research, training and dissemination activities. The Expert Panel will consist of a total of 20 members and represent four broad categories of experience and expertise: 1) Individuals with disabilities who are working in the I.T. industry; 2) Employers in the I.T. Industry; 3) the Education and Training Sector; and 4) Federally funded I.T. Training and Employment Projects. At least two members of the five members in each category have already been identified and have agreed to serve on the Panel; their letters of commitment appear in Appendix 2. These individuals will also recommend additional members for their respective categories during the first month of Year One.

1) Individuals with Disabilities Who are Working in the I.T. Industry:

Mr. Jeffrey D. Pledger is the President and Founder of AbleTV.net, the first global television network for the disabled. After losing his sight at the age of 27, he obtained a B.S. in Business and Management information services from New York University and a M.S. in Telecommunications from George Washington University, graduating *cum laude* from both institutions. For the past nine years he has been employed by Bell Atlantic as a Senior Systems Specialist and Database Manager, while at the same time serving as the company representative on the Disabled Access Committee on X-Windows (DACX), and the Telecommunications Access Advisory Committee. He is a member of the universal design team sponsored by the Trace Center at the University of Wisconsin and is a beta tester of many software products concerning accessibility.

Kathy Keller is an individual with a disability who currently works as an Information Specialist/Web Developer for Texas Parks and Wildlife. In addition to her extensive technical

skills, Ms. Keller has first-hand experience with I.T. training programs through her work instructing other employees in I.T. applications.

2) Employers in the I.T. Industry:

Jim Danielson, an individual with a hearing impairment, currently works as the Editor/Communication Project Manager for the Chubb Group of Insurance Companies. Within the Chubb Group, he leads a task force to recruit and retain people with disabilities. He is the founder and former director of Hard or Hearing Outreach (HOHO), a chartered mentor program for hard of hearing adolescents.

Dr. Ernst Volgenau is the president and CEO of SRA International, Inc., based in Fairfax, Virginia, a company that he founded in 1978. SRA provides computer, communications, and management consulting services and software to business and government organizations. Since its founding SRA has sustained rapid growth and now totals almost 2,000 people. Dr. Volgenau has 30 years experience analyzing, designing, and developing large technological systems of all types. Dr. Volgenau received his Ph.D. in engineering in 1966 from the University of California at Los Angeles. He also holds a master's degree in electrical engineering and is a graduate of the U.S. Naval Academy.

Leslie Taylor is the Director of Employment for DynCorp, a multi million I.T. subsidiary based in Reston, VA. In her capacity as Director of Employment, she is responsible for identifying and recruiting top tier I.T. talent into the company. She also assists executive management in the development and implementation of strategic e-recruiting and retention methods. Leslie brings more than eleven years of human resources experience to DynCorp, as well as a proven business background, and a strong ability to focus on critical issues and achieve maximum results. Prior to joining DynCorp, Leslie worked at Computer Sciences Corporation

recruiting and staffing senior level I.T. talent. Leslie is a graduate of Leadership Fairfax- Class of 2000. She is pursuing a doctorate degree in Human Resources at Virginia Tech University. She holds a Masters degree in Human Resources Management & Development. Additionally, she is a member of SHRM (Society of Human Resource Management & Development), Project SAVE, the Washington Board of Trade - Workforce Group, and ITAA.

3) The Education and Training Sector:

Kevin Ellerman contributes his nationally recognized expertise on accessibility, assistive technology, and workplace accommodations. Mr. Ellerman, who is blind, is the former director of the Denver Community College Computer Technology Program for Persons with Disabilities that is the conceptual basis for Community Option Inc.'s (COI) PASS*IT*ON program. He is COI's technical advisor and trainer on PC-based technology accessibility solutions.

Dr. Robert J. Leneway has served as Director of the Merze Tate Center for Technology and School Reform at Western Michigan University for the past three years. In this capacity he is currently directing 2.1 million dollars of U.S. education grants in the area of school to work with special populations and preparing tomorrow's teachers to use technology (PT3). He is also serving as the Michigan coordinator for the ThinkQuest National catalyst grant as well as co-teaching Education Technology for Elementary Education to nearly 300 pre-service students. Dr. Leneway has a lifetime of leadership involvement with both the Association of Rehabilitation Programs in Computer Technology and the International Association of Business, Industry, and Rehabilitation (I-NABIR), most recently as their national chairperson.

John L. Bernard serves as executive director of the TECH-LINK program of Pittsburgh, PA. He is also the coordinator of the Institute of Advanced Technology (IAT), which has been

training students with disabilities in computer programming for the past 17 years. Mr. Bernard is a licensed psychologist and counselor, and also the acting president of SHOUT, inc.

4) Federally Funded I.T. Training and Employment Projects:

Dr. Hannah Gourgey has worked with the Austin Software Council's national grant to matriculate people with disabilities into the high tech community. She has a Ph.D. in communication with an emphasis on working with disadvantaged populations, and currently serves on the Business Advisory Board for the Texas School for the Blind and Visually impaired. Dr. Gourgey has experience with a broad range of disability through her work with both the PASS*IT*ON and Go*For*IT programs.

Robert Hull is Vice President for Research at the Cerebral Palsy Research Foundation (CPRF) in Wichita, Kansas. At CPRF, he has been instrumental in obtaining three five-year grants in 2000: a) a Project With Industry grant from the U.S. Department of Education; b) a statewide Benefits Planning, Assistance and Outreach grant from SSA; and c) a Rehabilitation Research & Training Center on Employer Incentives from the U.S. Department of Education. He holds a M.Div. from the Associated Mennonite Biblical Seminaries and a B.A. in Psychology with Honors from Indiana University. Mr. Hull was cofounder in 1996 and is current President of the Kansas Professional Grant Association. Prior to his position at CPRF, he served as Information Specialist in the Office of Research Administration at Wichita State University during which time two major proposal projects were completed. The first was a \$2.5 million SKILL training grant to the university and Cessna Aircraft Corporation from Kansas Department of Commerce and Housing. The second was a \$500,000 grant to Center Industries Corporation from the U.S. Department of Labor. In the rehabilitation field, he authored *Empowerment for*

Grantsmanship, a workbook used in seven training sessions held throughout Kansas in 1998 for the Kansas Council on Developmental Disabilities.

L) Adequacy and accessibility of resources

The LHPDC at the University of Iowa, in Washington D.C., and ICATER at the University of Iowa are committed to providing adequate facilities, equipment and other resources. LHPDC maintains offices in Iowa and one in Washington, D.C. The University of Iowa facilities include office space sufficient for all the staff, interns, meetings and small conferences, and all other space requirements. Additional space is available as needed for training events for up to 200 people. The University offices house the PI and the two Co-PIs. The Washington office provides space located convenient to federal offices that are involved in grants to projects that are committed to employment of people with disabilities. Space is available for meetings and small conferences as needed. The Washington office houses the project director and an administrative support staff member. Administrative and other support is available on an as-needed basis from other LHPDC staff and the University of Iowa according to its policies, including grant accounting, travel, accounts payable, and other standard support.

ICATER has a computer resource and assistive technology lab and administrative office space, houses the second Co-PI and his administrative support staff. The primary focus of the computer resource lab has been on students and educators at the University's College of Education. It maintains a number of assistive technology devices within the lab setting. This offers an environment for application, research, and training to University of Iowa students, faculty, and other community members, as well as the current project.

- For students with disabilities this lab allows equal access to software and computer programs offered at other Iowa Information Technology Centers. Students with visual, cognitive, and orthopedic disabilities use a variety of assistive technology devices to aid them in their educational goals leading to graduation.

- For researchers, the lab offers an ideal setting to gather information about the utility of assistive devices to in educating future teachers and those interested in career in IT, as well as study of the impact of assistive technology training towards utilization in the classroom. The training/tool lab setting enables future teachers, researchers, and those interested in careers in IT from University of Iowa exposure to assistive technology through class presentation's, workshops, and hands-on training as desired.
- AT/IT training also is offered to the community as a resource. Training has been conducted to area community colleges, local school systems, other nonprofit agencies, and parents of students.

Currently the AT lab contains 5 Windows-based computer systems and 2 Macintosh systems. Each of these computers has programs for different types of accommodations for persons with various disabilities. The lab has access to a CCTV for reading, Discovery boards and Key Largo boards as alternative input devices, several types of joysticks, trackballs, and single button switches.

The majority of computers have programs for screen reading, screen magnification, optical character recognition, and voice recognition on the computer. These include the following assistive technology devices currently offered in the lab:

- Juliet embosser
- Duxbury braille
- JAWS
- Outspoken
- Arkenstone Ruby Open book
- Reading Edge Reading machine
- Dragon Naturally Speaking
- Mac ViaVoice
- Kurzweil Voice Pro
- L & H Voice Xpress
- Power Secretary
- CloseView
- Inlarge
- ZoomText Xtra
- Write Outloud
- Co-Writer
- Kensington Track Balls
- Single switch device
- Alternative Joysticks
- Discovery boards

- Key Largo boards
- Onscreen keyboards
- CCTVs (Closed-Circuit Televisions)

Additional training facilities, computer resources, video recording, taping, editing, and production equipment are available at the LHPDC offices. We have the capability to produce VHS, CD, DVD, and web-based audio and video, as well as text-based training in electronic and paper formats, in alternative formats as needed.

Another important activity of the LHPDC is its yearlong research and policy seminar on issues related to disability. The seminar is offered to law students, graduate students in rehabilitation counseling, public policy, public health, education, and other disciplines, in addition to well-qualified undergraduate students. The seminar functions as a yearlong practicum/research seminar. Students are assigned to projects within the LHPDC according to their interests and talents. They remain on the project for either one or two semesters, and may return to the LHPDC for further independent research with other projects. Students work closely with the PI, Co-PIs, and other professional staff on tasks that have educational, functional, and career components. The seminar usually enrolls between 10 and 15 students each year, many of whom have disabilities. Students attain practical experience in research methods, public policy, and other facets of disability issues.

Facilities, equipment, and other resources are accessible to individuals who may use them. As noted above, ICATER has an array of assistive and accessible technology that may be configured as necessary for individual users. Additionally, there are 5 Windows and Macintosh systems available to students, clients and staff at the LHPDC that are located within accessible office space and available to the project. These may be configured to individual user needs. Several have assistive technology in place for current testing and evaluation needs. Additional

resources have been allocated to the needs for IT products in ICATER and LHPDC as needed. (See attached budget.) Offices have accessible meeting and conference space. LHPDC in Iowa and Washington, and ICATER, are located in accessible buildings. Training and dissemination activities will be carried out with strong awareness of legal and policy-oriented accessibility requirements and alternative formats, in consultation with leading members of the disability community, particularly in settings outside of our facilities, where the primary format may not be universally accessible.

Additional Selection Criterion

Two of the core key staff members for the **I.T. Works** project are persons with disabilities. Sally Weiss, project director, has a psychiatric disability. Reasonable accommodations provided for her include flexible hours and telecommuting. Robert Dawson, one of the co-principal investigators, is a person with a learning disability that affects both his reading and writing and whose graduation from high school was doubtful. He joined the LHPDC as a Ph.D. student and worked on various research projects, including the RRTC, the Comprehensive Work Incentives site, and the Summer 2000 Researcher's Symposium. While working in the LHPDC, Mr. Dawson learned the research and writing skills that enabled him to successfully complete his Ph.D. in Rehabilitation Counseling at the University of Iowa.

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