

Vocational Outcomes for Individuals with Significant Physical Disabilities: Design and Implementation of Workplace Supports

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ABSTRACT

Individuals with significant disabilities still face multiple barriers to accessing paid community employment. The national unemployment data for persons with disabilities clearly reveals that many are not achieving employment at the rate of their non-disabled peers. This paper reports the findings of one program that provided supported employment services to individuals with significant physical disabilities. Specifically, the workplace supports that were developed and implemented for a group of individuals with spinal cord injury, cerebral palsy, and other significant physical disabilities will be described.

Despite the protection from laws such as the Americans with Disabilities Act (Wehman, 1992), individuals with physical disabilities continue to have a limited presence in the nation's workforce. People who experience spinal cord injuries, cerebral palsy, or other physical disabilities usually are very challenged by work entry or reentry. Health issues, transportation, social security disincentives, and personal care needs all have been documented as impediments to employment for this group of unserved individuals (Wehman, Wilson, Targett, West, Bricout, & McKinley, in press).

A closer look at some of these issues and how they effect the probability of work outcomes demonstrates many reasons that competitive employment has remained an elusive goal for large numbers of persons with physical disabilities. For instance, the physical capacity and ability to move within the workplace and perform tasks is one major challenge facing rehabilitation specialists who work with these individuals to find appropriate job matches (Inge, Wehman, Kregel and Targett, 1996; Inge, Wehman, Strobel, Powell, & Todd, 1998). At the same time, managing travel arrangements and reducing mobility barriers becomes a major barrier to be removed, since transportation can be notoriously unreliable (Wehman et al., in press).

Another issue is the disincentives associated with work for many people who are dependent on Social Security Disability Income (SSDI), Supplemental Security Income (SSI), and Medicare or Medicaid funding for health benefits. These programs place varying levels of restriction on one's ability to work without losing benefits. Not surprisingly, when Congress held hearings on the barriers to employment, many beneficiaries reported that they were afraid to work for fear of losing medical and cash benefits. It has been estimated that 4.8 million people will receive SSDI benefits in 1999, and another 4.3 million will receive SSI (Croser, 1999).

With the many health care needs associated with physical disabilities as well as assistive technology needs, the prospect of trying out a new job and subsequently losing benefits is not an

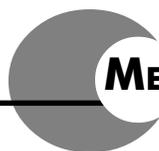
enticing thing to do. In addition, if an individual with a significant disability has been living in a nursing home, the fact that most of the money earned must be returned for care is not a motivator for attempting to become more independent. For instance in Virginia, individuals who reside in intermediate care facilities such as nursing homes can keep a maximum of \$196 per month of their earnings. Any amount beyond this must go to their care. In addition, individuals residing in an ICF cannot benefit from social security work incentives such as having a Plan for Achieving Self-Support (PASS) or Impairment Related Work Expense (IRWE). Therefore it is not surprising that many do not become employed.

These are only some of the barriers to competitive employment for persons with significant physical disabilities. Clearly, there are other impediments such as the need to overcome the attitudinal barriers of employers and rehabilitation service providers. Employers may have difficulty understanding how a person with limited physical abilities can perform the essential functions of a job. Service providers often focus on the person's disabilities rather than abilities. Focusing on a person's limitations and disabilities can result in an inability to match the person's interests and talents to a potential job in the community.

In order for this group of unserved individuals to be successful in joining the nation's workforce, a number of supports must be implemented. Supported employment allows for the needed intervention and support that can be tailored to each consumer. More specifically, a person's abilities and interests are highlighted during the assessment process (Parent, Unger, & Inge, 1997), allowing the job coach to use these identified interests and abilities for career development and job matching (Brooke, Inge, Armstrong, & Wehman, 1997). Assistive technology can then enhance the consumer's abilities (Inge, et al., 1996; Inge, et al., 1998); while job-site

training reinforces and strengthens them (Inge, 1997; Sowers, 1995). Together this "package of supports" can facilitate employment for a group of individuals who have not achieved success at the rate of their "able-bodied" peers.

Therefore, it is the purpose of this paper to describe how workplace supports were developed and implemented for a group of individuals with spinal cord injury, cerebral palsy, and other significant physical disabilities. The majority had never worked or had not worked for a significant period of time due to the challenges associated with their disabilities as well as the other barriers previously discussed. This paper chronicles how interventions were made and outcomes achieved.



METHOD

This program took place at a major university research center that provides research, training, and demonstration services for people with significant disabilities. The project was funded by grant support and was designed for the purpose of targeting those individuals with significant physical disabilities for work entry or reentry who had been unable to gain employment on their own. In order to identify potential participants, the project staff communicated with local rehabilitation counselors, the administrator and social workers for a large nursing home (ICF) for people with physical disabilities, family members, and physicians from local rehabilitation hospitals. Ultimately, twenty-one individuals were placed into employment for whom cumulative support needs and work outcomes were tracked. This report should be considered interim as the program is continuous and ongoing with additional persons being referred to the program. Tables 1 and 2 on the following page, provide a demographic profile of the participants including where they lived and the nature of their disabilities.

TABLE 1 -- SUMMARY OF PARTICIPANT DEMOGRAPHICS

Characteristics	Percent
Sex	
male	62%
female	38%
Age	
17-25	14%
26-35	29%
36-45	48%
46-55	9%
Primary Disability	
Cerebral Palsy	43%
Spinal Cord Injury	38%
Traumatic Brain Injury	14%
Other Developmental Disability	5%
Education	
High School Graduate	19%
Certificate of Completion	14%
Nine to 11 years	33%
Eight years of less	34%
Residence	
ICF - Nursing Home	48%
Home with Family Members	14%
Supervised Apartment	19%
Independent Living	19%
Prior Employment History	
None	52%
Unemployed since acquiring disability	38%
Intermittent/minimal work history	10%

Forty-three percent of the participants had a primary disability of cerebral palsy; 38% spinal cord injury; 14% traumatic brain injury; and 5% other developmental disability. Of the 21 individuals who became employed, 48% lived in an ICF nursing home for people with significant physical disabilities who had intensive daily living support needs. Another 19% lived in a supervised apartment complex designed for people with disabilities. The remainder resided in the community, with 14% living at home with family members and 19% residing independently in a home or apartment of their own. Essentially, 2/3's of the participants lived in segregated settings for

TABLE 2 -- SUMMARY OF PHYSICAL CHARACTERISTICS IMPACTING WORKPLACE SUPPORT NEEDS

Characteristics	n	%
Upper Extremity Mobility		
• Significant involvement both upper extremities	13	61.9%
• Moderate Involvement in both upper extremities	3	14.3%
• Mild involvement	2	9.5%
• Full mobility of upper extremities	3	14.3%
Amputation		
• Manual Wheelchair	7	33.3%
• Power Wheelchair	13	62.0%
• Motorized Scooter	1	4.7%
Communication		
• Significant speech involvement	6	28.5%
• Moderate speech involvement	2	9.5%
• No communication support needs	13	62.0%
Chronic Health Issues		
• Interfere with Work	4	19%
Transportation		
• Specialized bus services	21	100%

people with significant disabilities while only 1/3 resided in inclusive environments.

Criteria for acceptance into the project was that the individual must experience a significant physical disability and be chronically unemployed. As such, 52% of the group had never been employed; 38% had not been employed since acquiring their disabilities; and the remaining 10% had an intermittent/limited work history. All were users of manual wheelchairs or powered mobility devices. The majority, 76%, had significant and/or moderate motor involvement in both upper extremities. Only 14.3% had full mobility in their upper

extremities with another 9.5% having mild involvement. All required personal assistance services in dressing and preparing for work; 76.2% needed some assistance on the job; and 23.8% required intensive personal assistance in the workplace. No one in the group was independent in travel skills; all required specialized transportation services to travel in the community. Thirty-eight percent had significant to moderate speech involvement making it difficult for them to communicate with unfamiliar people. Finally, 19% had some type of chronic health issue such as pressure sores, chronic urinary tract infections, and chronic pain that interfered with working.

PROJECT STAFF

Staff directly responsible for assisting the project participants in identifying and obtaining employment were three employment specialists, the project principal investigator, project director, and a rehabilitation engineer. Of the three employment specialists, one worked on the project for a period of 2 years. This individual had 5 years experience working as a job coach with individuals who had severe cognitive disabilities, but he had minimal experience with those having physical disabilities. This individual had a high school diploma. When he resigned to take another position, this job coach was replaced with a young woman who had a master's degree in rehabilitation counseling. She had just completed her degree work and had no experience as a job coach. The other two employment specialists both had undergraduate degrees in psychology with one having 3 years experience and the other 2 years experience training individuals with cognitive disabilities. None of these employment specialists had any prior training in evaluating or selecting assistive technology (AT) devices or providing training and technical assistance to customers in the workplace on AT application.

The project principal investigator was a registered occupational therapist with a master's

degree in severe disabilities and a Ph.D. in education. She had 20 years experience working with individuals with severe disabilities, ten of which also included experience managing supported employment demonstration projects for persons with severe cognitive disabilities. The staff also had access to a rehabilitation engineer who was employed by the State Office of the Department of Rehabilitative Services. He had 10 years experience as a rehabilitation engineer in the state system. These individuals served as consultants to the employment specialists for assistive technology identification, selection, and fabrication. The rehabilitation engineer also provided hands on assistance in the workplace for fabrication of devices. Finally, the project director had 10 years experience supervising supported employment programs for individuals with traumatic brain injury, mental retardation, and other developmental disabilities. She served as coordinator for the project's job development activities.

The job coaches were responsible for directly assisting the customers with disabilities, employers, and coworkers in the workplace related to all job site needs. Initially, the employment specialists received training on assistive technology devices and services. This included attending a day-long assistive technology workshop and a half-day individualized workshop presented specifically for them by an individual with more than 15 years experience fabricating devices for individuals with severe disabilities. In addition, the rehabilitation engineer, the project principal investigator and director provided ongoing consultation and technical assistance to the employment specialists on assistive technology application. More information will be discussed on this aspect of the project later in this paper.

ASSESSMENT

Assessment for individuals with significant physical disabilities has focused on the identification of assistive technology services and devices

which facilitate the person's function or overcome environmental barriers to participation. Typically, this evaluation has taken place in clinical settings. In light of the fact that many assistive technology devices are abandoned when using a clinical approach (Phillips & Zhano, 1993; Stineman, 1998), the goal of this program was to conduct an evaluation of each customer's needs within "real-life" environments related to specific employment goals. Therefore, the assessment process included identification of the individual's career goals, an environmental analysis of the consumer's functional capacity, an assessment of current assistive technology applications that could be applied to the individual's identified career goals, and finally assessment of the customer's potential support needs within the workplace. This functional approach to evaluation has been referred to as a customer profile (Brooke, Inge, Wehman, & Armstrong, 1997; Inge et al., 1996).

Customer Profile. A customer profile was completed for each individual (focus person) who was referred to the project. The first step involved using a person-centered approach, specifically the PATH process, which was developed by Pearpoint, O'Brien, and Forest (1993) to assist the individual, family members, advocates, and support professionals in developing a vision for the focus person's future. Inservice training on person-centered planning was provided for all project staff by a skilled facilitator who had been trained by Pearpoint and Forest.

PATH was used to assist customers in determining career/employment dreams and goals, as well as to set a course for the accomplishment of these goals. The process incorporated a two hour meeting during which individuals, who were familiar and important to the focus person, were invited to assist in identifying a career path. When setting up these initial meetings, customers were asked to identify friends, family members, professionals, and any

other person involved in their lives who could assist them in identifying career goals. Most of the project participants identified parents, siblings, staff from their residential facilities, rehabilitation counselors, as well as professionals such as social workers and occupational therapists who had been important in the past. There were no limitations placed on the number of participants. Size of the meetings varied from project customer to customer, with as few as two attendees at one meeting to as many as 20 at another. The only criteria was that the individuals invited had to be approved by the person whose employment interests and dreams were being identified.

The PATH meeting provided a forum for everyone to brainstorm and share their ideas and expertise in order to formulate a blueprint for assisting the customer in making his or her employment dream a reality. The purpose of the PATH meeting was to find out what the individual would like to do remembering that she or he may not be able to articulate specific careers, offer suggestions of jobs in that interest area, and determine possible supports that would be necessary in order to pursue these interests. In all instances, each person was able to identify at least some direction for continued activities that eventually led to job development and employment opportunities. Several individuals participated in situational assessments (Moon, Inge, Wehman, Brooke, & Barcus, 1990) to further define their career goals. These opportunities were individualized to each participant's needs, and everyone did not participate in the same support activities.

While the PATH meetings set the stage for individualized customer directed activities, they were also used to mark milestones towards employment for each individual. All participants received their PATH graphic to be posted in a location of their choice. As items on the

diagram were completed or achieved, the individuals checked off their accomplishments.

Assessing Functional Capacity. In addition to PATH meetings, the employment specialists for the project spent individualized time with each participant to discuss his or her plans for employment. These informal observation and interview sessions provided a wealth of information to include 1) assistive technology devices being used by the customers; 2) personal care support needs; 3) perceived barriers that had prevented employment in the community; 4) personal interests; and 5) physical abilities. These meetings took place in a setting of the customer's choice and involved doing an activity selected by the customer. Some of the selected activities included going out to dinner, going shopping, and attending a community event. The selected activity also provided insight into each person's interests and abilities. For instance, the employment specialist was able to evaluate if the individual could select an activity of interest, set up an appointment to get to the location, and use his or her wheelchair independently. Since many of the customers selected shopping as an activity, the employment specialist was able to assess many and varied functional skills such as money use, reading, personal care, and choice making. After a customer had completed a PATH, participated in a functional activity, and had an opportunity to meet and talk with the three employment specialists, the customer selected the job coach that he or she preferred to assist with the employment search and training components.

Assistive Technology Assessment. Each customer was asked to describe the technology that he or she was currently using to complete functional activities during the PATH meeting, as well as to demonstrate the use of technology while participating in the behavioral/functional observations and informal interviews. For instance, one project customer demonstrated using a mouthstick to access the telephone in her room.

This mouthstick was later used when she began her job as a receptionist at a small business development agency. Another talked about using a headpointer to type simple letters on a typewriter to a friend in Michigan during her PATH meeting. This device now serves her at work for data entry.

If the individual was not using any assistive technology devices, project staff did not immediately refer the person for a traditional assistive technology evaluation. The intent at this point was to identify currently used devices rather than randomly select and train on devices that might not transfer to a job not yet located. Job specific assistive technology assessment and selection occurred after the individual's job had been selected and the customer was an employee of the business.

JOB DEVELOPMENT

Job development was completed using a customer-specific approach. Each individual was assisted by an employment specialist in locating a job using the information generated by the customer profile. More specifically, the program used informational interviewing that generated an opportunity to conduct a job analysis of potential positions. This led to job restructuring and the development of employment proposals that ultimately resulted in the employment of project customers with disabilities. Each of these components will be discussed below.

Informational Interviewing. Since all of the customers served by this program had significant physical disabilities, they most likely would be unable to fill existing job openings. In an effort to match the needs of the businesses with the skills and abilities of the customers, the employment specialists focused on the "hidden job market" or on restructuring existing positions. The goal of the initial contact was to get an appointment with an employer in order to obtain information on the business and to identify potential needs that could be met by a customer

with a significant physical disability. Strategies for obtaining an appointment with a business included an introductory letter, a telephone call, or a “cold” call. In general, the employment specialists were slightly less successful in gaining access to an appointment when a letter of introduction was mailed vs. telephone or cold calls. Regardless of the strategy used, they were successful in scheduling an appointment in 36% of the total contacts made. The type and number of contacts made during the course of the program are outlined in Table 3 below.

Before the meeting, the employment specialist did initial research on the company to determine what services or products were provided, who the customer base was, and what types of positions might be available. In general, employers were asked to schedule approximately 20 minutes for an initial meeting. Questions during this meeting focused on potential benefits to the company (e.g., What tasks require employee overtime? What is not getting done in your business? What would make things easier for you or your employees?)

Job Restructuring. During the informational interviews, the employment specialists obtained information about possible areas for job restructuring within a company. When inquiring about possible opportunities to restructure

a position, the job coaches focused on ways the company could save money, time, or increase productivity by hiring a project customer. By addressing the employer’s bottom line, the employment specialist focused on the prospective benefits to the company rather than on the person’s disability. Also, by targeting specific tasks that were not being done, or not getting done in a timely manner, positions were developed to meet the employer’s needs. This approach to job restructuring seemed to eliminate the problem of accepting jobs with existing production standards that proved difficult to impossible for the customers with physical disabilities to meet.

The employment specialists were careful to consider restructuring jobs where customers could reasonably complete the job duties with accommodations. Therefore, a working knowledge of available assistive technology devices allowed the employment specialist to see possibilities for people when talking with an employer. When in doubt, they referred to the rehabilitation engineer and other project staff to determine if technology could be fabricated or purchased to bridge the gap between the customer’s abilities and the restructured job requirements. Accepting a position for which no technology exists or where there are no

TABLE 3 -- INITIAL EMPLOYER CONTACTS

Contact Method	Number of Employers Contacted	Number of Appointments	# Jobs	% of Contacts Resulting in an Appointment	% of Appointments Resulting in Jobs
Letters	144	37	2	25.7%	5.4%
Cold Calls Visits	232	85	2	36.6%	2.4%
Telephone	1890	697	19	36.9%	2.7%
TOTALS	2266	819	25	36.1%	3.1%

ideas for possible device fabrication only dooms the person with a disability to failure.

Once tasks were identified with an employer, the specifics of the restructured position were negotiated. Many times, the process was an informal conversation where the employers' questions about how a person would complete a specific task were addressed. After the initial negotiation was completed, the customer with a disability interviewed for the position.

Employment Proposals for Restructured Positions. In other instances, a more structured approach was taken that included the development of a formal employment proposal.

The employment proposal allowed the employment specialist to highlight the prospective employee's skills, the job duties that he or she would perform, and how the individual with a disability could complete the essential functions of the job with support of the employment specialist and assistive technology. This allowed the employment specialist to answer the employers' questions or concerns about the restructured position or potential employees. The proposal also highlighted the customers' skills, not their lack of experience or education. Figure 1 below is an example of an employment proposal developed for a large business in the Richmond, VA area.



FIGURE 1 -- EMPLOYMENT PROPOSAL FOR PART-TIME BINDER ASSEMBLY POSITION

<p>RATIONALE:</p> <p>Ensure timely response to customer requests for information by hiring a person who will perform the following tasks:</p> <ul style="list-style-type: none">● Assemble Commercial and Industrial Binders● Pull Orders for Literature● Respond to literature orders within 14 days of request● Enter completed orders into computer
<p>PROPOSED EMPLOYEE:</p> <p>T.L. is an enthusiastic person who is interested in performing the job duties listed above. He has gained experience in information dissemination through a volunteer experience at a local library. T.L. is extremely motivated to work and offers strong attention to detail which will ensure that your customers will receive prompt and courteous service.</p>
<p>HOW:</p> <p>With the introduction of a few accommodations. T.L. will be able to perform the job duties outlined above. In order to ensure that he will have access to the information needed to fill orders, "frequently used" literature will be placed on a "lazy susan" filing system at his desk. Information that is needed less frequently will be placed on the shelves behind his desk. An electric hole punch will be obtained, at a cost of \$80, to enable T.L. to prepare literature for the binders. All accommodations will be approved by the office service coordinator to ensure that they will not interfere with the operations of the department.</p>
<p>CONDITIONS:</p> <p>T. will provide these services for \$4.75 an hour, for 5 hours week. If hired, T.L. will be an employee of _____. An employment specialist from Project Access will :</p> <ul style="list-style-type: none">● identify needed technology● assist T.L. in learning his job tasks● ensure that assigned job duties are completed to your satisfaction until the appropriate technology is in place● be available on an ongoing basis after the initial training phase for any issues that may arise.

The initial contact for this company was a letter of introduction that was mailed to the company president May 24, 1996 followed by a series of phone calls and meetings. On June 4, the Human Resources (HR) Manager called the project staff to express an interest in hiring a person with a disability, and a meeting was scheduled for June 17. During the initial meeting, project staff explained the services available, focusing on the benefits of such assistance with the identification and selection of assistive technology, on-going support for the employee with a disability, training opportunities, as well as how the program could save the company money. The following questions were posed to determine where there might be opportunities to save money by restructuring a position: What's not getting done or getting put off? What tasks would increase company productivity? Are you paying overtime, and if so for what job tasks?

The HR Manager asked the Office Services staff to consider these questions, and a backlog of orders for promotional binders was identified as a potential job for restructuring. The manager and staff determined that if a person was hired to respond exclusively to requests for information, the company could provide more timely service to customers and thereby increase business. A second meeting was scheduled on July 11, during which time the project staff discussed the restructured position with the Office Services Coordinator and the HR manager. An employment proposal was used to outline the primary functions of the position along with suggested accommodations. An interview was scheduled for August 8 with the applicant, the employment specialist, the Office Services Coordinator, and the Office Services Manager. The individual was offered the position on August 28, 1998 and a September 5 start date was established.

In most of the project case studies, job restructuring and employment proposals evolved over a period of weeks and months. For example,

the job used here as an example of an employment proposal evolved over an eleven week period. Each customer became an employee of the business and was hired at minimum wage or better. None of the customers received less than minimum wage, and all placements were individual supported employment placements. Please refer to Table 4 on the following page for a summary of job titles, wages, as well as total wages earned by the individuals served by this program.

JOB SITE TRAINING AND ASSISTIVE TECHNOLOGY

All of the project participants received supported employment services beyond initial job development and placement to ensure long-term employment success. Services provided after employment included assistance with arranging and using specialized transportation services; identification, fabrication, and purchase of assistive technology devices; instruction and support for learning job tasks; as well as developing workplace skills such as interacting and responding to coworkers and employers. Job site interventions were designed to provide as much support as each person with a disability needed and desired during the initial stages of employment. These supports were gradually withdrawn as provided by the employment specialist and transferred to the coworkers and supervisors of the workplace as the customers became comfortable and satisfied in their work settings.

Assistive technology application.

Job matching and placement occurred before technology was purchased or fabricated. During the initial days on the job, the employment specialist completed tasks that the customer could not while the technology was being identified and purchased. The employment specialist acted as the "coordinator" of all AT workplace supports. As such, he or she



TABLE 4 -- LENGTH OF EMPLOYMENT AND CUMULATIVE WAGES

Customer	Job(s)	# Months Worked	Wage per hour	Total Wages Earned
M.S.	Data Entry - VA Commonwealth University	32	6.04	\$7,731
T.L.	Clerk Assistant - Alpha Laval Manufacturing	30	5.25	\$7,560
J.S.	Receptionist - Small Business Development Center	29	5.50	\$12,760
L.M.	Box Folder - Pizza Hut	29	5.15	\$5,376
C.G.	Frame Finisher - Ben Franklin Frame Shop	25	5.25	\$4,914
T.F.	Telemarketing - National Wheel-chair Sports	23	5.15 6.50	\$23,056
S.T.	Mail Room Clerk - First Union Customer Service - VCU Student One-Card	22	7.50 6.27	\$17,089
M.W.	Computer Kiosk Technician - VCU	21	8.00	\$15,680
R.W.	Cashier - Borders Books and Music	19	6.25	\$11,500
J.W.	Internet Technician - VCU	16	8.00	\$15,360
L.F.	Dispatcher - VA Overland	15	5.75	\$9,919
A.F.	Billing Assistant - Thurbers	14	5.15	\$4,326
J.S.	Data Entry - Aramark		5.25	\$4,200
J.S.	Substance Abuse Lecturer	15	5.50	\$1,500
B.C.	Cloths Processor - Wal-mart Prep work - Pizza Hut	9	5.15 4.75	\$1,644
S.G.	Customer Service - YMCA	9	5.15	\$1,112
S.C.	Stock Clerk Assistant Data Entry - VCU	8	5.00 6.04	\$3,193
L.R.	Food Prep - Pizza Hut	7	5.15	\$1,154
D.T.	Data Entry - Aramark	4	5.25	\$1,680
D.S.	Customer Service - GTE Wireless	3	7.75	\$1,860
S.M.	Sales Associate - Willies Records & Tapes	3	6.00	\$1,080
N = 21	N = 25	Mean: 15.66 Months	5.87	Mean: \$7,271

was responsible for 1) assisting the customer in identifying funding sources for technology; 2) determining which professional could provide services and devices; and 3) training and technical assistance on the use of devices to the consumer, employers, and co-workers in the workplace. Staff held weekly meetings to include the principal investigator, project director, and employment specialists. Each case was discussed using a brainstorming approach to problem solving to determine any special accommodation needs. Strategies for bridging the gap between the customer’s abilities and the requirements of the job were suggested and tried in the workplace.

Initially, the employment specialists relied heavily on the rehabilitation engineer for most of the low as well as high technology solutions. However, as the project evolved, they began to successfully identify and apply many of the needed low technology devices. The rehabilitation engineer continued to provide all of the support fabricating devices needed to fill needs for which no commercial products were available.

Project staff and the consulting rehabilitation engineer conducted job site evaluations of the customers’ technology needs in the workplace. In only one instance did a customer receive an evaluation in a setting other than the job site. In that example, the customer required an adaptive keyboard for data input. Instead of bringing multiple devices to the job-site, the customer was evaluated on keyboard use in an occupational therapist’s clinic where devices were available. Once the choices were narrowed to a specific option, that device was brought to the workplace for evaluation prior to purchase.

RESULTS

A total of 28 customers were served by this program with 25 job placements made. The

individuals served by this project worked an average of 15.66 months, and each earned an average of \$7,271 in wages. Customers were hired by both small and large businesses to do a variety of tasks to include data entry, customer service, clerical assistance, as well as food prep.

The average amount of time expended in development of a position at a large business was 12.4 weeks. The range was 1 week to 42 weeks. The average amount of time for development of positions in small business was 3.29 weeks, with a range of 2 days to 10 weeks. The average length of time expended in pre-placement activities per customer was 47.6 hours. Post placement intervention hours from placement to stabilization per customer averaged 75.3 hours. Pre-placement activities included the development of the customer profile as well as job development and placement activities. Post-placement activities included job site training, assistive technology identification and support, as well as ongoing follow-up and support for job maintenance. This data is summarized in Table 5 below.

TABLE 5 -- MEAN SUPPORT NEEDS PER CUSTOMER

	Mean Initial placement n = 21	Mean Second Placement n = 4
Pre-placement Intervention Hours	47.6 hours	82.4 hours
Post-placement Intervention Hours to Stabilization	75.3 hours	61.4 hours
Weeks to Stabilization	8.1 weeks	6 weeks
Weeks Employed	51.9 weeks	42.8 weeks
Intervention Hours per Week for Extended Services	1.6 hours	2.3 hours

The assistive technology support needs of the project customers varied from individual to individual; however, the majority of the supports were considered low technology in nature. A total of 100 accommodations were put into place by project staff across 23 jobs with a total cost of \$11,235. The average cost per accommodation was only \$112.35. The most expensive assistive technology device was a computer with voice-activated software which was actually donated to the job site by the state vocational rehabilitation agency. The job site where this was needed was not required to make the accommodation, since there were fewer than 15 employees hired by the company. The least expensive "device" was an eraser on the end of a head-pointer, which costs only a few cents.

In several instances, assistive technology was rented for the customer while funding was arranged. For instance, a customer needed to have a power wheelchair for mobility. This was rented by the project while her case manager worked out arrangements for Medicaid to fund the power chair. The cost for this technology was not figured into the total cost for project accommodations, since it was provided by the ICF where the customer resided. Table 6 compares the costs of the technology purchased and fabricated for the program's customers to the national data from the Job Accommodation Network.

DISCUSSION

This paper has described the efforts of one program that provided supported employment opportunities to individuals with significant physical disabilities. The results of the program are limited by the small number of participants and the time frame. A longer time period and additional illustrations of success are needed to demonstrate the full effectiveness of this approach.

TABLE 6 -- COMPARISON OF PROJECT ACCESS ACCOMMODATION COSTS TO NATIONAL DATA

Accommodation Costs	Job Accommodation Network (JAN) Data	Project Access Findings
No cost	19%	7%
Between \$1 and \$500	50%	88%
Between \$501 and \$1,000	12%	5%
Between \$1,001 and \$2,000	7%	0%
Between \$2,001 and \$5,000	9%	0%
Greater than \$5,000	3%	0%

* **Please note:** Items in this category include surplus equipment that was donated for use by project customers.

However, recognizing these limitations, several conclusions still may be drawn and a number of unique issues and concerns raised.

First, people with significant physical disabilities clearly benefit from supported employment services. The individuals served were chronically unemployed due to a variety of reasons. The approach used provided the necessary advocacy, intervention, and long term support required to facilitate positive employment outcomes for both the individuals and their employers. Furthermore, the customers reported an enhancement in their quality of life. Businesses also benefitted as evidenced by the high retention rate among participants. This leads to a reduction in employer costs associated with turnover, like recruitment and training. Overall both parties benefitted for a variety of reasons.

Second, with the exception of time expended in job development, the types of services

described here, appear to be cost effective. The majority of pre and post employment interventions did not incur exorbitant costs. Additional data, collected over time, may reveal that costs will continue to decrease. Regardless, it is important for us as a society to recognize the significance of affording all Americans with the right to work, including individuals with the most severe disabilities, even if this means providing intensive services and the long term supports, despite the additional costs.

Five of the challenges that were faced by the project are of critical importance: 1) the development and utilization of effective marketing and job development practices; 2) the development and utilization of functional assessment procedures; 3) the utilization of effective assistive technology supports; 4) the utilization of an effective media campaign to battle negative perceptions; and 5) the development of long term and responsive funding.

MEETING BUSINESS NEEDS

The employer contact data presented earlier in this paper points to a very real barrier related to employers viewing individuals with physical disabilities as qualified applicants. Specifically, project employment specialists made 819 appointments that ultimately resulted in only 25 jobs. Late in the first year of the program, staff held an employer focus group in an attempt to address some of the barriers they were facing in identifying jobs for customers. Ten employers representing small to large businesses in the Richmond metropolitan area attended. One prevailing theme that emerged was that the employers did not view individuals with significant physical disabilities as qualified applicants for existing positions within their companies. The employers raised numerous questions concerning production standards, the cost of accommodations, and the individuals perceived inability to perform essential job functions as they existed.

The clear message is that supported employment programs must become more efficient in selling their services to meet businesses existing needs. Job restructuring must be presented as a way for businesses to save money by eliminating the need for overtime, as well as a way to complete job tasks not typically accomplished to ultimately make the company more effective and efficient in serving its customers. The employers emphasized the need to view hiring individuals with disabilities from a job restructuring approach rather than the notion of creating jobs. Job creation is perceived as increasing costs rather than increasing company efficiency.

However, relationship building takes time, as does obtaining the necessary information about a company in order to sell supported employment services. In essence, the employment specialists had to establish a collaborative relationship with the businesses they dealt with by explaining how a person with a significant physical disability could perform the essential functions of a job. This was accomplished one business and one employer at a time. Clearly, in order to make a significant impact on the unemployment rate of people with significant disabilities, rehabilitation personnel, advocates, and family members must disseminate more efficiently and effectively knowledge of what an individual with disabilities can do with carefully prescribed supports.

ASSESSMENT

Individuals who have very limited or no work experience will have a difficult time expressing their job preferences, strengths, and support needs. Limited information exists on how to determine the vocational interest, abilities and support needs of people with significant physical disabilities. These individuals and program staff need to have access to a

variety of creative and functional approaches like the ones described in this paper to assist with developing a personal vocational profile that will provide a direction for career development. This project used a combination of approaches very successfully to include PATH, functional assessments, community behavioral observations, as well as situational assessments. Supported employment staff will need training on how to effectively implement these approaches in order to assist their customers with making appropriate career decisions.

ACCESS TO TECHNOLOGY AND SUPPORTS

Once employed, this group of individuals was very successful in achieving independence within the workplace. The fact that the majority of the technology identified and put into place was obtained commercially and was of low cost is evidence that individuals can be supported successfully with minimal costs to the businesses. In addition, the technology applications were orchestrated successfully by employment specialists with the support of a rehabilitation engineer rather than by using a more traditional and costly approach to assessment and implementation. Money was not expended on devices that ultimately were not used in the workplace, which addressed the problem of technology abandonment often cited as a problem in the literature.

While it was not unusual for assistive technology to be either: a) owned by the individual with a disability, b) ready made and available for purchase, or c) created by the service staff, sometimes items were needed that required more complex fabrication skills. While a vocational rehabilitation engineer was readily available to this project, many community programs do not have access to such personnel due to staffing or a back-log of service requests. State vocational rehabilitation agencies and providers need to find ways to expand and enhance rehabilitation

engineering services to ensure greater and quicker access to technology and adaptive equipment.

Also, there may be some uncertainty about who should pay for the AT and other accommodations. Some of the individuals who went to work did not qualify for existing positions, and jobs were restructured to create work from marginal duties of other existing jobs. In this program, most costs were not significant, and a cost sharing approach was used. Other accommodations that businesses made at no cost to them included redesigning the immediate work environment to reduce excessive movement and allowing modified or flexible work schedules. Many employers appeared more readily agreeable to interview applicants when notified that the AT would be primarily funded by an outside resource, and the employment specialist would be available to assist with:

- a) identifying and arranging for the purchase of AT; and
- b) the employment specialist guaranteed that the work would be done to the required standards while the new employee was waiting for the AT, learning the job, or how to use the AT.

Some individuals needed assistance with activities of daily living at work, such as eating or going to the restroom or coworker support to perform certain parts of the job that the person could not accomplish alone. Service providers and job seekers with significant physical disabilities need to consider how these issues will be addressed, prior to accepting a job offer. In some cases a simple change in scheduling may eliminate the need for the person to eat a full meal, take medication, or go to the restroom at the workplace. In our project, coworkers were more than willing to assist with eating, drinking, and the completion of work related tasks but were less likely, and in some cases resistant, to assist with toileting needs. The vast majority of

individuals served by this project choose to limit fluid intake, schedule work for limited hours, and wear protective clothing or catheters to deal with their personal hygiene needs. Clearly, the use of personal assistance services and natural supports within the workplace must be developed further.

CHANGING PUBLIC PERCEPTION

This project's observations revealed that the general public, business personnel, people with disabilities and vocational rehabilitation professionals need to embrace a stronger and more powerful conviction that every person should have the opportunity to work when given the proper workplace supports. All of the individuals who participated in this project made a meaningful contribution to a business and society. As more people with significant disabilities go to work, positive changes should occur in the attitudes of others related to the ability of people with severe disabilities. A more aggressive national media campaign is needed that highlights the idea that "disability does not mean inability". Such a campaign could promote the value that people with disabilities should work while combating existing stereotypes and myths.

ADEQUATE FUNDING

Funding for supported employment services remains a serious problem, even though research has revealed financial benefit cost ratios related to this option. The current mechanisms of funding severely limit access to supported employment for people with the most significant disabilities. State vocational programs are encouraged to review the characteristics of the persons being served by supported employment, to

ensure the funding is being used as intended, for people with the most severe disabilities. Furthermore, opportunities to use blended funding and other resources should be examined like on the job training funds paired with job coach training services.

Also, when individuals need this type of service option it is critical that funding not be restricted to the point where adequate support cannot be provided. Many individuals will require extensive and extended support. A lack of funding for long term support severely limits those who can take advantage of supported employment. Not only does the lack of funds restrict access to service, it also determines whether or not supported employment is available at all. States who have been successful in developing innovative and creative ways to fund long term supports need to share this with others.

In closing, this demonstration program revealed that individuals with the most severe physical disabilities can work when provided with effective supports. As we move toward the Year 2000, the United States economy is booming with jobs that do not require physical competence. This report of individuals with significant physical disabilities working is heartening, because with the right supports tens of thousands more who are at home, in nursing homes, day activity centers, or sheltered workshops could be competitively employed. All the participants of this project earned at least minimum wage, were employees of the company where they worked, and became independent of an employment specialist's daily intervention.

References:

Brooke, V., Inge, K.J., Armstrong, A., & Wehman, P. (1997). Supported employment handbook: A customer-driven approach for persons with significant disabilities. Richmond: Virginia Commonwealth University, Rehabilitation Research and Training Center on Supported Employment.

Croser, M.D. (1999, March/April). Every little bit helps. AAMR News & Notes, p. 2.

Inge, K.J. (1997). Job-site training. In V. Brooke, K.J. Inge, A. Armstrong, & P. Wehman (Eds.). Supported employment handbook: A customer-driven approach for persons with significant disabilities (pp. 159-204). Richmond: Virginia Commonwealth University, Rehabilitation Research and Training Center on Supported Employment.

Inge, K.J., Wehman, P., Kregel, J., & Targett, P.S. (1996). Vocational rehabilitation for persons with spinal cord injuries and other severe physical disabilities. American Rehabilitation, 22(4), 2-12.

Inge, K. J., Wehman, P., Strobel, W., Powell, D., & Todd, J. (1998). Supported employment and assistive technology for persons with spinal cord injury: Three illustrations of successful work supports. Journal of Vocational Rehabilitation, 10(2), 141-152.

Moon, M.S., Inge, K.J., Wehman, P., Brooke, V., & Barcus, J.M. (1990). Helping persons with severe retardation get and keep employment: Supported employment strategies and outcomes. Baltimore, MD: Paul Brookes Publishing Company.

Parent, W., Unger, D., & Inge, K.J. (1997). Customer profile. In V. Brooke, K.J. Inge, A. Armstrong, & P. Wehman (Eds.). Supported employment handbook: A customer-driven approach for persons with significant disabilities (pp. 46-97). Richmond: Virginia Commonwealth University, Rehabilitation Research and Training Center on Supported Employment.

Pearpoint, J., O'Brien, J., & Forest, M. (1993). PATH a workbook for planning positive possible futures: Planning alternative tomorrows with hope for schools, organizations, businesses, families. Toronto, Canada: Inclusion Press.

Sowers, J.A. (1995). Adaptive environments in the workplace. In K. Flippo, K.J. Inge, & J.M. Barcus (Eds.). Assistive technology: A resource for school, work, and community (pp. 167-186). Baltimore, MD: Paul H. Brookes Publishing Co.

Wehman, P. (Ed.). (1992). The ADA mandate for social change. Baltimore, MD: Paul Brookes Publishing Co.

Wehman, P., Wilson, K., Targett, P., West, M., Bricout, J., & McKinley, W. (in press). Removing transportation barriers for persons with spinal cord injuries: An ongoing challenge to community reintegration. Journal of Vocational Rehabilitation.