NATIONAL ARCHIVES AND RECORDS ADMINISTRATION
1985

Federal Register

Tuesday,
June 26, 2001

Part IV

Department of Education

National Institute on Disability and Rehabilitation Research

Final Funding Priorities for Fiscal Years 2001–2003 for Four Disability and Rehabilitation Research Projects; Invitation for Applications for Fiscal Year 2001 New Awards and Announcement of Pre-Application Meetings; Notices

DEPARTMENT OF EDUCATION

National Institute on Disability and Rehabilitation Research; Notice of Final Funding Priorities for Fiscal Years 2001–2003 for Four Disability and Rehabilitation Research Projects

AGENCY: Office of Special Education and Rehabilitative Services, Department of Education.

ACTION: Notice of final funding priorities for fiscal years 2001–2003 for four disability and rehabilitation research projects.

SUMMARY: We are announcing four final funding priorities under the Disability and Rehabilitation Research Projects and Centers Program (DRRP) of the National Institute on Disability and Rehabilitation Research (NIDRR) for FY 2001–2003: Assistive Technology Outcomes, Impacts and Assistive Technology Research Projects for Individuals with Cognitive Disabilities, Resource Center for Community-based Research on Technology for Independence, and Community-based Research Projects on Technology for Independence. We take this action to focus research attention on areas of national need. We intend these priorities to improve the rehabilitation services and outcomes for individuals with disabilities.

DATES: These priorities take effect on July 26, 2001.

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Individuals with disabilities may obtain this document in an alternative format (e.g., Braille, large print, audiotape, or computer diskette) on request to the contact person listed in the preceding paragraph.

SUPPLEMENTARY INFORMATION: This notice contains final priorities under the Disability and Rehabilitation Research Projects and Centers Program (DRRP) for Assistive Technology Outcomes, Impacts and Assistive Technology Research Projects for Individuals with Cognitive Disabilities, Resource Center for Community-based Research on Technology for Independence, and Community-based Research Projects on Technology for Independence.

The final priorities refer to NIDRR's Long-Range Plan (the Plan). The Plan can be accessed on the World Wide Web at: *http://www.ed.gov/offices/OSERS/NIDRR/#LRP.*

National Education Goals

The eight National Education Goals focus the Nation's education reform efforts and provide a framework for improving teaching and learning.

This notice addresses the National Education Goal that every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

The authority for the program to establish research priorities by reserving funds to support particular research activities is contained in sections 202(g) and 204 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 762(g) and 764(b)). Regulations governing this program are found in 34 CFR part 350.

Note: This notice does *not* solicit applications. A notice inviting applications is published in this issue of the **Federal Register**.

Analysis of Comments and Changes

On April 6, 2001, we published a notice of proposed priorities on the Assistive Technology Outcomes and Impacts and the Assistive Technology Research Projects for Individuals with Cognitive Disabilities in the **Federal Register** (66 FR 18366). The Department of Education received 12 letters commenting on the notice of proposed priorities by the deadline date. Technical and other minor changes—and suggested changes we are not legally authorized to make under statutory authority—are not addressed.

Priority 1: Assistive Technology Outcomes and Impacts

Comment: The primary stakeholder regarding AT outcomes is the person who uses (or is expected to use) a particular AT device. Family members and caregivers are secondary consumers, however, they may be considered primary stakeholders in the sense that two thirds of all AT is procured through first party and family funding. Therefore, it is crucial that this priority require applicants to focus on the individual with a disability rather than other primary and secondary stakeholders.

Discussion: NIDRR feels the priority is sufficiently flexible to allow the applicant to propose methodological approaches that focus on the needs of primary stakeholders such as individuals with disabilities. The peer review process will evaluate the merits of the proposal.

Changes: None.

Comment: One commenter is concerned about using the word ''intervention'' in the general purpose statement suggesting that it is a poor choice of words and may be misinterpreted. The commenter recommends dropping the word altogether so that the last sentence of the general purpose statement reads ''* * * determine the efficacy and utility of AT and the implications.''

Discussion: NIDRR agrees that the term ''interventions'' may be misconstrued because of varying definitions and interpretations.

Changes: The word ''interventions'' has been dropped from the general purpose statement.

Comment: The second bulleted activity lists a number of relevant organizations that applicants must collaborate with. Given that AT users are the primary targets of this priority, this bulleted activity should be expanded to include AT users.

Discussion: The second bulleted activity enumerates relevant NIDRR projects and not specific stakeholders. The purpose of this priority is to investigate AT outcomes and 2 impacts and cannot be carried out without the full participation and support of AT users.

Changes: None.

Comment: The assessment and evaluation of AT should include questions related to both positive and negative impacts of AT use and the acquisition of AT through various financial means.

Discussion: Economic and cost factors, as well as positive and negative outcomes, of AT use are discussed in the background statement. An applicant can propose methodological approaches to measure outcomes and impacts that take into account both positive and negative impacts of AT use and the acquisition of AT through various financial means and the peer review process will evaluate the merits of the proposal.

Changes: None.

Comment: One commenter feels that the application of AT to specific populations (such as frail elderly persons, infants and toddlers, and their care providers) should be examined in terms of financial benefits to individuals and care systems as well as functional outcomes for individuals.

Discussion: NIDRR agrees with the commenter that an examination of the application of AT to specific populations and its impact on care systems as well as individuals is critical to the development of useful measurement systems and this was mentioned in the background statement. An applicant may propose to examine the financial benefits to individuals and care systems as well as functional outcomes for individuals with disabilities and the peer review process will evaluate the merits of the proposal.

Changes: None.

Comment: One commenter suggested that long-term outcomes need to be addressed specifically. Preliminary research indicates that the use of AT will delay institutionalization and, along with personal attendant services, will maintain a person in a relatively independent state for a given period of time. For people with significant disabilities, including those with Alzheimer's and other dementia diseases who use assistive devices, it may be useful and instructive to discover the long-term effects of reliance on AT for independent living.

Discussion: NIDRR agrees that maintaining an independent life style for as long as possible is critical for all people and that the use of AT plays an important role in independent living. The background statement and the priority support the commenter's contention. An applicant may propose ways to measure the impact of AT on maintaining independence in its application and the peer review process will evaluate the merits of the proposal.

Changes: None.

Comment: The cost-benefit of AT on healthcare is an essential impact question. Efforts to evaluate the appropriate use of AT and its financial benefits to insurance providers (both public and private) are essential. Related to this issue is the impact of managed care systems on the appropriate provision of AT to persons with disabilities. The positive or negative effects of this type of delivery system should be investigated in terms of long-term health outcome, including the reduction of time spent in healthcare institutions, for individuals with disabilities.

Discussion: NIDRR agrees that there are a myriad of issues related to the cost, economics, and financial benefits of AT. An applicant may propose to investigate issues related to the cost, economics, and financial benefits of AT and the peer review process will evaluate the merits of the proposal.

Changes: None.

Comment: The same commenter believes that the impact of expanding approved lists of durable medical equipment through DMERCs on individual outcomes should also be assessed.

Discussion: Developing lists of approved durable medical equipment through DMERCs and assessing their impact on individual outcomes is beyond the scope of this priority.

Changes: None.

Comment: One commenter cites the need to develop methods and standards of practice to help organizations monitor the quality of services and outcomes.

Discussion: Developing methods and standards of practice for organizational monitoring of quality assurance is beyond the scope of this priority.

Changes: None.

Comment: The same commenter feels that three levels of information must be measured; the impact of AT on the individual, the impact on the community and how and in what context the service was delivered.

Discussion: NIDRR agrees that these are important dimensions of AT use and addressed these factors in the background statement. An applicant may propose ways to measure the different levels of impact of the provision of AT on the consumer, on the community, and the context in which the AT was provided. The peer review process will evaluate the merits of the proposal.

Changes: None.

Priority 2: Assistive Technology Research Projects for Individuals With Cognitive Disabilities

Comment: Four commenters suggest that an activity should be added to the priority requiring applicants to investigate ways of making the Internet accessible to people with cognitive disabilities.

Discussion: NIDRR agrees that access to the Internet, and therefore, information is extremely important for persons with cognitive disabilities. An applicant could propose to investigate ways to make the Internet more accessible for persons with cognitive disabilities and the peer review process will evaluate the merits of the proposal.

Changes: None.

Priority 3: Resource Center for Community-Based Research for Independence; Priority 4: Community-Based Research Projects on Technology for Independence

On April 6, 2001, we published a notice of proposed priorities in the **Federal Register** (66 FR 18360). The Department of Education received 14 letters commenting on the notice of proposed priorities by the deadline date. Many of the comments concerned both priorities, raised multiple issues and suggestions, and overlapped with other comments. NIDRR is responding to the comments on priority one and priority two jointly. As a group, the comments indicated a need to clarify the purposes and expectations for these priorities and to explain some of the legislative and regulatory constraints under which they were proposed. Technical and other minor changes—and suggested changes we are not legally authorized to make under statutory authority—are not addressed.

General Comments

Comment: Several commenters suggested that each project be required to address a variety of different topics, such as rural areas, effects of technology on health outcomes, 5 specific disability populations, such as deaf individuals, caregivers, or families.

Discussion: A major purpose of this program is to address issues, within the general area of access to appropriate technology, that are identified as important by individuals with disabilities. This priority is concerned generally with research on understanding potential roles for community-based disability organizations in research on increasing access to Assistive Technology (AT) and systems technology, and with developing partnerships and research strategies for use by community-based disability organizations. NIDRR elects not to further constrict the selection of problems for study. Applicants may elect to study issues of single disability populations or cross-disability concerns, and may target any populations relevant to improving access to technology, including families, caregivers, professional service providers, product distributors, or others. It is up to the applicants to convince the peer reviewers of the importance of the problem they elect to address.

Changes: None.

Comment: Several commenters discussed the definition of community-based disability organization and of consumer control. The gist of these comments related to either: declaring certain types of organizations (e.g., University Affiliated Programs, now named University Centers of Excellence, or facility-based employment programs) to be community-based organizations; restricting the competition to consumer-directed organizations; or declaring various types of organizations to be either eligible or ineligible for the competition. One commenter argued that the intent to "involve community disability organizations" is objectionable, and that grants should be made only to grassroots organizations, and not universities.

Discussion: NIDRR does not have the authority to restrict eligibility for the DRRP competition beyond that specified in the statute. The regulations specify that any public or private organization, whether nonprofit or for-profit, institution of higher education, or Indian tribe or tribal organization, is eligible to apply for a grant in this program. Since the purpose of this priority is to build research capacity in community-based disability organizations to study problems of access to technology, NIDRR requires in the priority that any application to be funded must include a community-based disability organization, either as sole applicant or as a partner in the endeavor. According to the priority, ''A community-based disability organization is a consumer-directed disability organization * * * consumer control is the key.'' While NIDRR regulations do not define these terms, regulations for the Independent Living Programs, also funded under the Rehabilitation Act, as amended, define ''consumer control'' to mean that ''a center or eligible agency vests power and authority in individuals with disabilities * * *'' [34 CFR 364.4 (b)]. Further, dictionary definitions and the sense of this priority indicate that community-based organizations are not institution-based, and that disability organizations are those of, by, and for persons with disabilities. It will be up to the peer reviewers in applying the selection criteria to judge how well an application responds to the purposes of the priority of building research capacity in community-based disability organizations and works through community-based disability organizations to ''* * * broaden the inclusion of persons with disabilities in developing practical and affordable solutions to AT and environmental access problems and needs''.

Changes: None.

Comment: Several commenters discussed standards and requirements for AT to be developed under these grants. At the same time, other commenters pointed out that there were many barriers to access beyond the development of new technology.

Discussion: The priority does not address development of technology, but rather research on improved access to technology. Applicants could propose to develop new technology or devices if the project met the basic purposes of building research capacity in community-based disability organizations by addressing issues of increasing access to technology, both individual AT and systems (environmental access). However, NIDRR does not anticipate that development of new technology will be the focus of all, or even any, of these projects. Issues of improving access also include distribution, diagnosis and prescription, funding, maintenance, training, and other problems. Potential applicants are referred to both the NIDRR Long-Range Plan (1999) and the Blueprint for the Millennium: An Analysis of Regional Hearings on Assistive Technology for People with Disabilities (1998) for discussions of the complex issues in technology access for individuals with disabilities. It is up to the applicants to convince the peer reviewers of the importance of the problem they elect to address.

Changes: None.

Comment: Several commenters asked that additional NIDRR centers or entities funded from other sources be specified as resources for cooperation in the priority.

Discussion: The priority states, ''Coordinate with appropriate federally-funded projects.'' The priority then provides examples of what may be included. It is not feasible or necessary to list all potential cooperators, and astute applicants will survey the field to identify the most appropriate organizations for coordination to advance the success of their proposed projects.

Changes: None.

Comment: One commenter requested a clarification of the meaning of ''environmental access'' and whether it applies only to AT, or could include other environmental issues.

Discussion: The priority refers to AT and environmental access. The Plan refers to technology to improve function and technology to improve access to the built environment. Modifications to the physical and telecommunications environments, including applications of universal design, may include architectural modifications, signage for persons with sensory or cognitive limitations, and public transit modifications that enable persons with disabilities to access the broader environment.

Changes: None.

Comment: One commenter stated that there should be a requirement that every applicant must indicate how they are developing research capacity among individuals with disabilities.

Discussion: NIDRR agrees that this is an important aspect of the projects and has added language in the priority to this effect.

Changes: The language ''applicants must describe how they will develop research capacity among individuals with disabilities at the community level'' has been inserted as paragraph (c) in the final section of both priorities.

Comment: One commenter noted that although dissemination of project findings through electronic media is often effective, it would be inappropriate to limit the dissemination of findings to electronic media and that accessible electronic media in combination with other accessible media should be used.

Discussion: Selection criteria for dissemination activities address appropriateness of dissemination approaches and that such methods are accessible to individuals with various disabilities.

Changes: None.

Disability and Rehabilitation Research Projects and Centers Program

The authority for Disability and Rehabilitation Research Projects (DRRP) is contained in section 204 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 762(g) and 764(b)). The purpose of the DRRP program is to plan and conduct research, demonstration projects, training, and related activities to—

(a) Develop methods, procedures, and rehabilitation technology that maximizes the full inclusion and integration into society, employment, independent living, family support, and economic and social self-sufficiency of individuals with disabilities; and

(b) Improve the effectiveness of services authorized under the Act.

Priority 1: Assistive Technology Outcomes and Impacts

Background

One of the greatest challenges facing health care systems, social services providers and policymakers is to ensure that scarce resources are used efficiently. To a large extent, this challenge explains the growing interest in outcomes research and evidence-based medicine.

Particular interest in outcomes of assistive technology (AT) is related to the amount of dollars spent on developing and manufacturing AT, AT service delivery and to the need to improve the functional independence and well-being of persons with disabilities of all ages. Yet, assessment of the impact of technology on function and other productivity and quality of life outcomes lags behind outcomes measurement in other areas of rehabilitation.

There are several factors that promote concern about the paucity of outcomes research in AT including the: (a) Ability to demonstrate efficacy of new devices; (b) need to examine effectiveness of devices over time; and (c) need to chart future research and development to improve devices (Fuhrer, M. J., ''Assistive technology outcomes research: challenges met and yet unmet,'' *American Journal of Physical Medicine and Rehabilitation*, 2001, In press). Outcomes research and analysis is also needed to guide decisionmaking across multiple levels of policy and program development, including: (a) Decisions on a societal level regarding types of public programs and services to fund; (b) decisions on a programmatic level regarding what services to continue, enhance, modify or eliminate; (c) decisions on an individual level regarding AT recommendations and interventions; and (d) decisions on a research level regarding the comparative effectiveness of individual devices and the impact on future designs (Smith, R., ''Measuring the outcomes of assistive technology: challenge and innovation'', *Assistive Technology,* Vol. 8, No. 2, pgs. 71–81, 1996).

In the face of a growing interest in outcomes, the inconsistent use of terminology contributes to the confusion that exists in the application of a generally accepted outcomes approach. In the field of rehabilitation, outcomes measurement has focused on creating outcomes management systems and measuring and communicating outcomes. Rehabilitation has led the health care field in its emphasis on changes in function as an outcomes measure. Still, even in rehabilitation, outcomes measurement systems have typically focused on process variables, i.e., the outputs of products and services, and not on gains to the individual or society in either the short or long term. Wilkerson posits that this emphasis on process will change because of three factors: (a) The pressure to cut costs; (b) growth of consumerism leading to increased input from users and increased focus on the needs of the end user; and (c) concerns about quality in relation to costs (Wilkerson, D., ''Outcomes and accreditation—The paradigm is shifting toward outcome,'' *Rehab Management,* August/September, pgs. 112–115, 1997).

Outcomes research is defined in different ways across rehabilitation and health services research as well as in the social services field. The Foundation for Health Services Research (Foundation for Health Services Research, *Health Outcomes Research: A Primer,* Washington, DC, 1994) characterized outcomes research as research focused on the ''end results of medical care—the effect of the health care process on the health and well-being of patients and populations.'' The Institute of Medicine (IOM) (Feasley, J.C., ed., *Health Outcomes for Older People: Questions for the Coming Decade,* Washington, DC: National Academy Press, 1996) expanded this definition to include ''the clinical signs and symptoms, well-being or mental and emotional functioning; physical, cognitive, and social functioning; satisfaction with care; health-related quality of life, and costs and appropriate use of resources.'' Outcomes research has also been defined as research designed to discover the sustained impact of rehabilitative strategies and treatments in the everyday lives of persons with disabilities. ''Outcomes research attempts to build a bridge between interventions and long-term improvements in the lives of persons served as they reenter the community'' (Johnston, M., et al., ''Outcomes research in medical rehabilitation—foundations from the past and directions for the future,'' *Assessing Medical Rehabilitation Practices: The Promise of Outcomes Research,* Marcus J. Fuhrer, ed., pgs. 1–42, 1997). Regardless of how it is defined, outcomes research is part of the larger framework of program evaluation (Fuhrer, op. cit., 1997), and includes both outcomes analysis and outcomes measurement also known as performance measurement (Jennings, B.M. and Staggers, N., The language of outcomes, *Journal of Rehabilitation Outcomes Measurement,* Vol. 3, No. 1, pgs. 59–64, 1999).

Rehabilitation outcomes are changes produced by rehabilitation services in the lives of service recipients and their environments. Outcome indicators are measures of the amount and frequency of those occurrences, and include service quality. Within this perspective, some analysts use the word ''impacts'' to distinguish between long-term outcomes or end results that occur on a societal versus an individual level. Still others use the term ''impact'' more strictly to refer to estimates of the extent to which the program actually ''caused'' particular outcomes (Hatry, H., et al., *Customer Surveys for agency managers: What Managers Need to Know,* Washington, DC: Urban Institute, 1998). Deconstructing these various definitions and types of outcomes and impacts requires recognition of complexity on many levels.

Although AT has grown as a discipline and as an industry over the past two decades, there has not been a corresponding maturity in developing or assessing the outcomes or impacts of AT upon individuals with disabilities. AT devices and services outcomes also may be difficult to define because of the ways AT is used. For example, AT is used to increase participation in the environment, enhance normative social roles, promote and sustain employment, and facilitate activities of daily living. Some devices, such as computers, increase access to information and support life long learning. AT devices vary significantly from highly complex and sophisticated computer-operated systems to low tech approaches that can be easily purchased or built. Complicating the issue even further are the individual characteristics of the AT user and the varied environments in which users live, work, and learn.

Approximately one-third of AT devices will be abandoned by the user (Phillips, B. and Zhao, H. ''Predictors of assistive technology abandonment'', *Assistive Technology,* Vol. 5, pgs. 36–45, 1995). There are many reasons why individuals with disabilities choose to accept or reject AT devices. Since public funds provide a major source for purchasing AT devices and services, useful and accurate measures of outcomes and impacts is critical for accountability and to avoid wasteful outcomes. Is abandonment a negative or could it be a positive outcome? Abandonment has been viewed as the end result of fragmented service provision, poor assessment techniques, lack of consumer choice in device selection, inattention to device use across environments, inadequate training, costly repairs, need to upgrade and obsolete or inappropriate technology. However, abandonment may be a natural phenomenon related to improved physical or cognitive function, the result of a technology upgrade or because different technology is a better fit between the end-user and the environment.

There are other reasons to account for the lack of momentum in measurement development and outcomes and impact research on AT. Most of the endorsements of a particular device or service are based on anecdotal information (Fuhrer, 1999) rather than data generated from research. Frank DeRuyter (''Evaluating outcomes in assistive technology: do we understand the commitment,'' *Assistive Technology,* Vol. 7, No. 1, pgs. 3–16, 1995), observed that historically, AT was considered a remedy to impairment or dysfunction, and the urgency of consumer need was of greater importance than relying upon data to document the efficacy of a particular device. In addition, quality was perceived as too abstract and difficult to measure and define. Vendors and practitioners may feel threatened by potential findings and accountability demands, which may also have contributed to the lack of outcomes studies (DeRuyter, op. cit., 1995).

While the AT arena is complex and broad, several outcomes studies have focused on a discrete segment of the entire system. Smith says that there are essentially two domains of outcome measurement: the performance of an individual using assistive technology and the cost of achieving the level of performance (Smith, R. O., ''Accountability in assistive technology interventions: measuring outcomes,'' *Volume I—RESNA Resource Guide of Assistive Technology Outcomes: Measurement Tools,* pgs. 15–43, 1998). Minkel proposed that the primary measure to determine the value of the assistive technology is the basic formula of outcomes divided by cost (Minkel, J., ''Assistive technology and outcomes measurement: Where do we begin?'' *Technology and Disability,* July, pgs. 285–288, 1996). There are others within the AT community who operate under the assumption that improvements and innovation in technology will ''naturally'' lead to successful use and implementation, and therefore do not need to be evaluated. From this perspective, technological solutions have been viewed as a panacea without the benefit of data to support prevailing assumptions (DeRuyter, F., ''Concepts and rationale for accountability in assistive technology,'' *Volume I—RESNA Resource Guide of Assistive Technology Outcomes: Measurement Tools,* pgs. 2–15, 1998).

At a minimum, the process of evaluating AT outcomes must measure and establish a baseline of what works, identify how well and for whom it works, and at what level of economy and efficiency. This process will necessitate taking information from several performance monitoring dimensions (De Ruyter, op. cit., 1998). In approaching the challenges of AT outcomes measurement, it is important to identify if the outcomes relate to the AT product or service, the user, or to the environment in which the technology is being used. While not standardized or widely endorsed, a variety of measurement techniques and instruments are currently utilized. These measurement tools tend to be specific to a given practice area or limited to a functional domain, (*Volume I: RESNA—Resource Guide for Assistive Technology Outcomes: Measurement Tools*, 1998).

To proceed with assessing AT outcomes and impacts, the following questions need to be addressed. First, what are the key gaps and weaknesses in our knowledge of AT use and its impacts? Are the key research questions related to a particular intervention at a particular point in time? How do device modifications and upgrades change the intervention? How do characteristics of the population including severity of impairment, duration of disability, presence of co-morbidities, aging and other sociodemographic factors influence technology utilization and bias outcomes study? What is the role of environmental, economic, awareness and training barriers in AT use and outcomes? These different levels of outcomes can look at impacts and effects of technology at one point in time, more typically a clinical or functional outcome, or can be examined in terms of long-term impacts on individual quality of life, productivity and social participation. As one researcher expressed it, in addition to longitudinal studies, ''the research agenda must consider lifelong use of assistive technology, documenting effectiveness of that technology as an intervention, identifying stages for reconsideration of its use, and defining environmental and social considerations'' (Turk, M. A., ''Early development-related condition,'' *Assessing Medical Rehabilitation Practices—The Promise of Outcomes Research*, Marcus J. Fuhrer, ed., pgs. 367–392, 1997).

Innovations in AT will continue to evolve and many AT users, as they have in the recent past, will experience increases in independence, function, and general well being. Concurrently, the gap between the promise of technology and the ability of individuals and funding sources to afford them will continue to widen. This will result in a greater need for knowledge about the cost-effectiveness and efficiency of particular devices and services (Fuhrer, M.J., ''Assistive technology outcomes research: challenges met and yet unmet,'' *American Journal of Physical Medicine and Rehabilitation*, 2001, In press).

Priority 1

We will establish multiple research projects on AT outcomes and impacts to determine the efficacy and utility of AT and the implications for abandonment of AT devices. In carrying out these purposes, the projects must:

(a) Assess the current status of AT outcomes and impacts measurement systems and approaches, identifying measurement methodologies, characteristics of key instruments including utility to AT field, and critical gaps in measurement;

(b) Based upon the findings of paragraph (a), evaluate efficacy of existing measurement instruments or develop and evaluate new outcomes and impacts measurement methodologies to meet the needs of AT stakeholders; and

(c) Investigate and analyze the complexity of factors contributing to the abandonment of AT, including age-related changes, and identify how these factors are incorporated into outcomes and impacts measurement instruments.

In addition to activities proposed by the applicants to carry out these purposes, each project must:

- Develop and disseminate to AT stakeholders and other interested and relevant audiences, as determined by NIDRR, materials on AT outcomes studies and impacts analyses and, periodic updates on the project's milestones, products and results; and
- Collaborate with relevant NIDRR-sponsored projects, such as the AT/IT Consumer Survey (University of Michigan), the RESNA Technical Assistance projects, and the RRTC on Medical Rehabilitation Outcomes, as identified through consultation with the NIDRR Project Officer.

Priority 2: Assistive Technology Research Projects for Individuals With Cognitive Disabilities

Background

Technology and assistive devices have commonly been used to assist persons with mobility, communication and sensory difficulties. Because of the positive impact that technology has played in the lives of these individuals, there is now a strong push toward the development of such devices for people with cognitive disabilities. The Assistive Technology Act of 1998 defines an AT device to be any item, piece of equipment or product system whether acquired commercially off the shelf, modified or customized that is used to increase, maintain or improve functional capabilities of individuals with disabilities. Rapid advances in technology provide great potential for development of new devices or adaptation of available devices to assist individuals with cognitive disabilities to develop and maintain skills.

Technology professionals, such as computer scientists and rehabilitation engineers, have limited experience applying AT solutions to users with cognitive disabilities. Nor do they yet understand the mapping between specific needs and equally specific design solutions. Most people with cognitive disabilities have a range of learning and processing capabilities. Wide variations in cognitive functioning make it difficult to develop generic solutions appropriate for all individuals. Functional capabilities associated with these disabilities may include wide ranges of ability in memory, reasoning, and language comprehension. Cognitive functioning also includes perception, problem-solving, conceptualizing, reading, thinking and sequencing (Electronic and Information Technology Access Advisory Committee, ''EITAAC Report, May 13, 1999,'' A Report to the Architectural and Transportation Barriers Compliance Board). Common strategies to improve functioning in activities of daily living across various cognitive disabilities need to be identified, as do, issues regarding information processing that may be unique to each of these groups.

Persons with cognitive disabilities often have difficulty in carrying out Instrumental Activities of Daily Living (IADLs) because of problems with time management and information retrieval. Researchers are experimenting with the use of electronic personal computers to compensate for memory problems. Other researchers are examining methods of matching individual cognitive problems with compensatory strategies provided by a variety of commercially available portable electronic devices. In traumatic brain injury treatment, researchers are investigating the use of virtual reality technology to test visual acuity and reaction times to stimulus. Research is also being conducted on the use of text-based messages to enhance communication.

Technology is often viewed as facilitating employment of persons with disabilities. However, inaccessible technology can be a barrier to all persons with disabilities. This is particularly true for persons with cognitive impairments who may have difficulty using telephones, computers, and other equipment that are staples of most work environments. Developers and manufacturers of AT often do not consider issues of cognitive access and flexibility when designing their products.

While the congruence between the promise of AT and the needs of many people attempting to achieve community integration is obvious, little has been written about the manner in which technology affects community adaptation or the service needs of individuals with cognitive disabilities in community settings. While specific manifestations of AT have identifiable benefits, the central question needs to be empirically addressed—how can assistive technologies contribute to community integration and in what manner can the linkage be facilitated? The state of knowledge about the use of AT for persons with cognitive disabilities, as well as the outcomes of that use or lack of use and the cost-effectiveness in achieving community integration is limited. There are only a few large assessments of the technology needs of persons with cognitive disabilities and results are ambiguous because of difficulties in identifying persons with low incidence conditions and specific technology needs within the study population (Lakin, C. et al., NIDRR Long-Range Plan Commissioned Paper on Community Integration, 1996).

In order to take advantage of any potential that technological advances may have, it is important to define what makes a device easier or more difficult for a person with a cognitive disability to use. Products that are simpler and require fewer cognitive skills are easier to operate for everyone (Vanderheiden, G., 1992, ''A brief look at technology and mental retardation in the 21st century,'' in Mental Retardation in the Year 2000, Louis Rowitz, ed., New York: Springer-Verlag). ''Design guidelines'' must then be communicated to the manufacturers of consumer products and business information systems. Instructions for training on the use and maintenance of the device also need to be part of this design process. It is important for designers to be aware of the real world tasks with which the user has difficulty; hence, research needs to include persons with cognitive disabilities at the front end of all technology development. End product affordability is important not only in meeting consumer needs, but also in creating the market demand that will encourage manufacturers to enter production.

The NIDRR Long-Range Plan discusses three objectives in developing technology to meet the needs of people with limitations in cognitive functioning: to assure that new technologies are accessible and do not exacerbate exclusion from mainstream activities; to assist people with cognitive limitations in the performance of daily activities; and to develop technologies that can enhance or restore some cognitive functions (NIDRR, Long-Range Plan: 1999–2003, pg. 57).

The University of Colorado recently accepted a gift of $250 million. The endowment will fund advanced research and development of innovative technologies to enhance the lives of people with cognitive disabilities. The endowment, to be paid over five years, will be used to establish the Coleman Institute for Cognitive Disabilities located at the University of Colorado. Applicants for this project should provide information on proposed coordination with the Coleman Institute.

Priority 2

We will establish multiple research projects on technology access for persons with cognitive disabilities leading to practical and affordable solutions to identified community and workplace needs of this population. The projects must:

(a) Conduct an assessment of state-of-the-art technology applications for persons with cognitive disabilities;

(b) Based on the assessment results of paragraph (a), identify technology gaps and needs for persons with cognitive disabilities and make recommendations for new technology and modifications to existing technology;

(c) Identify features that may be incorporated into existing, commercially available technology that could benefit persons with cognitive disabilities; and

(d) Develop and explore strategies for strengthening partnerships with developers and manufacturers of devices in order to facilitate the development of new technologies and applications to incorporate cognitive access.

In addition to the activities proposed by the applicants to carry out these purposes, the projects must:

- Coordinate with the appropriate Federal agencies and privately-funded projects, such as the University of Colorado's Coleman Institute for Cognitive Disabilities, that are relevant to the applicants proposed activities as identified through consultation with the NIDRR project officer; and
- Involve individuals with cognitive disabilities in all aspects of the project.

Priorities for Community-Based Rehabilitation Projects on Technology for Independence

Background on Issues in Involvement of Community-Based Organizations of People With Disabilities in Promoting Technology for Independence

As stated in the Plan, ''It is the mission of NIDRR to generate, disseminate, and promote the full use of new knowledge that will improve substantially the options for disabled individuals to perform regular activities in the community, and the capacity of society to provide full opportunities and appropriate supports for its disabled citizens.'' Assistive Technology (AT) and environmental access play key roles in this mission. The Plan provides detailed definitions, examples, and research objectives for AT and environmental access, including universal design.

According to a National Center for Health Statistics report titled ''Trends and Differential Use of Assistive Technology Devices: United States, 1994,'' approximately 17 million people used at least one AT device. AT and related environmental access approaches (environmental access approaches include the concept of universal design) help people with disabilities function on a more equal basis in society. For more information on the contributions of AT and access solutions, see the examples and links to relevant web sites provided by the United States Architectural and Transportation Barriers Compliance Board, also known as the Access Board (*http://www.access-board.gov/*), and the Doorway to Research on Technology for Access and Function at the National Center for the Dissemination of Disability Research (NCDDR) (*http://www.ncddr.org/rpp/techaf/index.html*).

The new paradigm of disability embodied in the Plan requires analysis of the extent to which AT and environmental access helps individuals with disabilities in attaining full participation in society. Much of NIDRR's work reflects the components of the Independent Living (IL) philosophy: consumer control, self-help, advocacy, peer relationships and peer role models, and equal access to society, programs, and activities. IL and achieving community integration to the maximum extent possible are issues at the crux of NIDRR's mission. Furthermore, NIDRR is committed to the creation of a theoretical framework with measurable outcomes that is based upon the experiences of individuals with disabilities.

To improve ''end-user'' participation in addressing AT problems, and related environmental access solutions, NIDRR will support projects that involve community-based organizations in researching AT related problems and needs. Two types of projects will be supported. The first type includes research projects that will investigate the use of, and need for, AT devices and services at the community level. The second type of project is a community-based research ''Resource Center'' that will develop, evaluate, and disseminate improved research and training methods appropriate to AT and environmental access involvement of community-based disability organizations. The Resource Center will also provide AT and environmental access technical assistance to community-based organizations and will foster cooperation among the funded projects. These community-based research projects will broaden the inclusion of persons with disabilities in developing practical and affordable solutions to AT and environmental access problems and needs.

In recent years, a number of NIDRR grant competitions have led to research projects and activities that aim at improving access to AT and reducing environmental barriers. For many years, NIDRR funded grants to States under the Technology-Related Assistance for Individuals with Disabilities Act of 1988 (Tech Act). In addition to research programs under title II of the Rehabilitation Act of 1973, as amended (29 U.S.C. 796) (the Rehabilitation Act), NIDRR now has responsibility for AT programs under the Assistive Technology Act of 1998 (AT Act), which replaced the Tech Act. A June 5, 2000 notice (65 FR 35768–35774) for a new Alternative Financing Program under title III of the AT Act identified numerous issues affecting access of people with disabilities to AT. An April 5, 1999 notice (64 FR 16531) under NIDRR's Rehabilitation Engineering Research Center (RERC) program discussed the importance of improving access to the environment through universal design. For information on ongoing and completed NIDRR-supported activities in these areas, contact the National Rehabilitation Information Center at or telephone 1–800–346–2742.

This year, NIDRR anticipates awarding a number of projects related to AT and environmental access. For updates on the status of announcements please see the Education Department Forecast of Funding Opportunities under Department of Education Discretionary Grant Programs for FY 2001 at: *http://ocfo.ed.gov/grntinfo/forecast/forecast.htm*

According to the Rehabilitation Act, the purpose of IL programs is ''to promote a philosophy of consumer control, peer support, self-help, self-determination, equal access, and individual empowerment, equal access, and system advocacy, in order to maximize the leadership, empowerment, independence, and productivity of individuals with disabilities, and the integration and full inclusion of individuals with disabilities into the mainstream of American society.'' The concepts in this philosophy of consumer control, peer support, and self-help place these title VII independent living centers (CILs) within a broader world-wide grouping known as ''community-based'' organizations.

The term ''community-based'' organization has varying meanings in disability and rehabilitation programs and in social research. For the purpose of these two priorities, a ''community-based disability organization'' is a consumer-directed community organization such as a CIL. Consumer control is the key. Some community rehabilitation service organizations, for example psychosocial rehabilitation programs, also value consumer direction. Other disability-related organizations are located in community settings, but do not have significant consumer direction. Section 7 of the Rehabilitation Act, for example, identifies community rehabilitation programs as providers of AT devices and services for persons with disabilities, but such organizations may or may not be consumer directed. Organizations with consumer direction, including CILs and other organizations such as protection and advocacy (P&A) agencies, are in a unique position to help identify and study the specific needs for AT and environmental access of individuals from diverse populations and therefore are the focus of this research effort.

A number of private foundations and international agencies have identified the value of investing in ''grassroots'', consumer-directed organizations, particularly in public health and economic development. These organizations aim at reducing poverty or specific diseases such as HIV/AIDS, or they provide assistance to special needs groups such as people in troubled urban and rural areas (see the World Wide Web sites or publications of the Pew Fund for Health and Human Services *http://www.pewtrusts.com/*, the World Health Organization *http://www.who.int/*, and the Robert Wood Johnson Foundation *http://www.rwjf/org/index.jsp* for examples).

Community-based research encompasses a broad set of research activities with differing, and sometimes competing, concepts and methods. Sociology, anthropology, community psychology and public health, for example, use applied community research methods. For the purpose of these two proposed priorities, community-based research is intensive, systematic study directed toward new or full scientific knowledge or understanding of AT or environmental access problems. In addition, the research must be completed in the community under the direction of community-based disability organizations (Sclove, R.E, Scammell, M.L. & Holland, B. (1998). Community-based Research in the U.S. Amherst, MA: The Loka Institute (*http://www.loka.org/*)).

Community-based disability and rehabilitation research puts primary emphasis on assisting persons with disabilities by producing and disseminating knowledge and technology and promoting and advancing the rehabilitation and integration process at the community level. Community-based disability and rehabilitation research, according to these two priorities, applies to the use of, or need for, AT devices and services by persons with disabilities in the community, and related issues of environmental access. Such research should be performed by qualified researchers in cooperation with community-based disability organizations. NIDRR supports the notion that persons with disabilities provide unique perspectives about living with disability and must be included in community-based research projects to the greatest possible extent. Their experience with, and interest in, finding practical solutions to problems encountered in home, school, place of work, and community make them informed participants, if not particularly qualified researchers. To ensure that technology-related problems relevant to persons with disabilities are studied, contributions from such persons are encouraged. In addition, university-based research on disability needs to be complemented by community-based research to provide the community with useful and immediate tools, technologies, and knowledge for overcoming barriers to access and participation in economy and society.

Community-based rehabilitation research is particularly suited for persons with disabilities. According to the University of Washington School of Public Health and Community Medicine's Principles of Community-Based Research, a research partnership between a university and community-based organizations should accomplish the following:

- Community partners should be involved at the earliest stages of the project, helping to define research objectives and having input into how the project will be organized.
- Community partners should have real influence on project direction—that is, enough leverage to ensure that the original goals, mission, and methods of the project are observed.
- Research processes and outcomes should benefit the community. Community members should be hired and trained whenever possible and appropriate, and the research should help build and enhance community assets.
- Community members should be part of the analysis and interpretation of data and should have input into how the results are distributed. This does not imply censorship of data or of publication, but rather the opportunity to make clear the community's views about the interpretation prior to final publication.
- Productive partnerships between researchers and community members should be encouraged to last beyond the life of the project. This will make it more likely that research findings will be incorporated into ongoing community programs and therefore provide the greatest possible benefit to the community from research.
- Community members should be empowered to initiate their own research projects that address needs they identify themselves.

Priority 3: Resource Center for Community-Based Disability and Rehabilitation Research Projects on Technology for Independence

There is a need for capacity-building on conceptual and methodological approaches to research on the involvement of community-based organizations of people with disabilities in promoting technology for independence. There is need for training, technical assistance, and dissemination efforts to guide ongoing efforts. Advice and strategies are needed in specific areas including, but not limited to, research designs and methodologies, case studies, focus group research, AT and environmental assessment, small sample surveys, participant observation, ethnography, and participatory action research. There is a need to develop ''how-to-do'' materials on disability-related AT and environmental access community-based research, reference resources, web-based access to materials, and other means of communicating knowledge about community-based rehabilitation research in the U.S.

Priority 3

We will establish a resource center to assist Disability and Rehabilitation Research Projects on Technology for Independence and other related NIDRR activities under the Plan with capacity-building for improving the involvement of community-based organizations of people with disabilities in promoting technology for independence.

In carrying out these purposes, the project must:

(a) Establish and conduct a significant and substantial resource program on capacity-building in research, training, and TA on the involvement of community-based disability organizations in promoting technology for access and function that will contribute to the advancement of knowledge in accordance with the Plan.

(b) Disseminate findings from the Resource Center's program on community-based research to DRRPs on Technology for Independence and other related NIDRR-funded activities under the Plan; and

(c) Describe how the resource center will develop research capacity among individuals with disabilities at the community level.

In addition to the activities proposed by the applicant to carry out these purposes, the Resource Center must:

- Involve individuals with disabilities and, if appropriate, their representatives, in planning and implementing the research, training, and dissemination activities, and in evaluating the Center;
- Coordinate with appropriate federally funded projects. Coordination responsibilities will be identified through consultation with the NIDRR project officer and may include outreach to specific NIDRR DRRPs, RERCs, RRTCs, DBTACs and AT Projects; Office of Special Education technology projects and Parent Training and Information Centers; and Rehabilitation Services Administration training, special demonstration, and IL projects;
- Convene a formative review session within six months of project award with the DRRPs on Technology for Independence to assist these community-based rehabilitation researchers in the finalization of their research plans, and to help them with the commencement of their research projects; and
- Conduct a state-of-the-science conference, including the DRRPs on Technology for Independence, in the third year of the grant and publish a comprehensive report on the final outcomes of the conference in the fourth year of the grant.

Priority 4: Community-Based Disability and Rehabilitation Research Projects on Technology for Independence

The Plan identifies disability in terms of the relationship between the individual and the natural, built, cultural, and social environments (63 FR 57189–57219). The Plan focuses on both individual and systemic factors that have an impact on the ability of people to function. The elements of the Plan include employment outcomes, health and function, technology for access and function, and IL and community integration. To attain the goals in these areas, the Plan also includes capacity building for research and training, and to ensure knowledge dissemination and utilization. Each area of the Plan includes objectives at both the individual and system levels. For example, the technology for access and function area of the Plan includes research objectives to develop AT that supports people with disabilities to function and live independently and obtain better employment outcomes, and research objectives to promote improved access to the built environment and concepts of universal design. It is clear that the challenges and opportunities for AT and improved environmental access reflect all of the priority areas of the Plan.

Priority 4

We will establish research projects to involve community-based disability organizations in AT and environmental access research leading to practical and affordable solutions to identified problems and needs, and building research capacity at the community level and in community-based organizations serving persons with disabilities.

In carrying out these purposes, a project must:

(a) From the examples of research objectives below, conduct a significant and substantial research program on the involvement of community-based disability organizations in promoting technology for access and function that will contribute to the advancement of knowledge in accordance with the Plan by:

- Investigating and developing research questions, methodologies, and recommendations for use by other research entities in solving technology-related, engineering, psychosocial, economic and other problems at the individual and systems levels, in the United States (U.S.); and
- Designing and testing models for partnership of community-based disability organizations in research, participant observation studies and other qualitative and quantitative research approaches to using technology in community-based settings;

(b) Disseminate findings from community-based research to persons with disabilities, their representatives, disability and rehabilitation service providers, researchers, planners, and policy makers; and

(c) Describe how the applicant will develop research capacity among individuals with disabilities at the community level.

In carrying out these purposes, the project must:

- Coordinate with appropriate federally funded projects. Coordination responsibilities will be identified through consultation with the NIDRR project officer and may include outreach to specific NIDRR DRRPs, RERCs, Rehabilitation Research and Training Centers (RRTCs), Disability Business Technical Assistance Centers (DBTACs) and AT Projects; Office of Special Education technology projects and Parent Training and Information Centers; and Rehabilitation Services Administration training, special demonstration, and IL projects.
- Involve individuals with disabilities in key decision-making.
- Participate in a formative review session to be convened by the Resource Center within six months of award, and cooperate with the Resource Center's capacity-building and evaluation activities.
- Participate in a state-of-the-science conference in the third year of the grant.

Selection Criteria

The selection criteria to be used for these competitions will be provided in the application package for each competition.

Applicable Program Regulations: 34 CFR part 350.

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(Catalog of Federal Domestic Assistance Numbers 84.133A, Disability Rehabilitation Research Project)

Program Authority: 29 U.S.C. 762(g) and 764(b).

Dated: June 20, 2001.

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[FR Doc. 01–15959 Filed 6–25–01; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF EDUCATION

[CFDA No.: 84.133A]

Office of Special Education and Rehabilitative Services; National Institute on Disability and Rehabilitation Research

ACTION: Notice inviting applications for fiscal year (FY) 2001 new awards and announcement of pre-application meetings.

SUMMARY: We invite applications for new FY 2001 grant awards for four Disability and Rehabilitation Research Projects and Centers Program (DRRP) on: (1) Assistive Technology Outcomes and Impacts, (2) Assistive Technology Research Projects for Individuals with Cognitive Disabilities, (3) Resource Center for Community-based Research on Technology for Independence, and (4) Community-based Research Projects on Technology for Independence.

Purpose of the Program

The purpose of the Disability and Rehabilitation Research Projects and Centers Program is to improve the effectiveness of services authorized under the Rehabilitation Act of 1973. We take this action to focus research attention on an area of national need. The priorities are intended to improve rehabilitation services and outcomes for individuals with disabilities.

National Education Goals

The eight National Education Goals focus the Nation's education reform efforts and provide a framework for improving teaching and learning.

This notice addresses the National Education Goal that every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

Applicable Regulations

The Education Department General Administrative Regulations (EDGAR), 34 CFR Part 74, 75, 77, 80, 81, 82, 85, 86 and 97; and the following program regulations: Disability Rehabilitation Research Projects and Centers—34 CFR part 350, and the Notice of Final Priority published elsewhere in this issue of the **Federal Register**.

Pre-Application Meeting

Interested parties are invited to participate in pre-application meetings to discuss the funding priorities. In each meeting you will receive technical assistance and information about the funding priority. You may attend the