

Title: Students with Disabilities and STEM: Lessons Learned from a Decade of NSF Funding

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Learning Outcome: Participants will learn about successful practices, resources, and challenges in 10 years of NSF funded projects that focus on students and STEM postsecondary education.

Abstract (60):

This presentation will discuss the findings of the Research in Disabilities Education Synthesis Project, a four-year synthesis research project that investigated the contributions of the NSF's Research in Disabilities Education (RDE) program to the field of STEM education. The focus is on post-secondary projects. Findings include successful practices, common challenges and solutions, and resources.

Summary (500 – 800):

Since its inception in 1950, NSF has played a significant role in maintaining U.S. preeminence in STEM research and innovation. Integral to the success of NSF's strategic goals is the improvement of STEM education of all Americans, including and to access previously untapped sources of STEM talent. According to the Committee on Equal Opportunities in Science and Engineering (CEOSE, 2006, p.1), "Women, underrepresented minorities, and persons with disabilities constitute the largest untapped pool of potential American scientists, engineers, technologists, mathematicians, and technicians."

Federal laws and regulations enacted over the past four decades have increased access to post-secondary education for individuals with disabilities (Belch, 2004; Strange, 2000; Vogel, Holt, Sligar & Leake, 2008). Thus, the proportion of students identified with a disability in both two-year and four year post-secondary settings has increased dramatically in the last three decades (American Youth Policy Forum and Center on Education Policy, 2002; National Center for Education Statistics [NCES], 2007) and has nearly doubled since 1990 from 3.5% (26% of those with disabilities) to 6.2% in 2009 (46% of those with disabilities) (Samuels, 2011). However, high rates of students with disabilities leave college without earning a degree (Belch, 2004; Nutter & Ringgenberg, 1993; U.S. Department of Education, 1999; Wolanin & Steele, 2004). Many of these students succeed in postsecondary STEM education, but many more could succeed in STEM courses and careers if barriers associated with including individuals with disabilities in STEM majors and careers could be overcome.

The Research in Disabilities Education program at the National Science Foundation, part of the Directorate for Education and Human Resources, invested in projects to broaden the participation and achievement of individuals with disabilities in science, technology, engineering, and mathematics (STEM) education and associated professional careers. In

2011, NSF funded the RDE Synthesis project to examine and describe the National Science the program portfolio from 2001-2011, and to describe the contribution of the projects, as a collective, to STEM education of students with disabilities. By providing a synthesis of the knowledge base of STEM education of students with disabilities, the project's purpose is to inform the field (e.g., secondary and postsecondary stakeholders) about contributions and resources as well as lessons learned in broadening the participation of student with disabilities in STEM education and careers. This presentation will discuss the findings of the synthesis project, focusing on the findings related to post-secondary projects.

An investigation 117 projects funded from 2001 – 2011 was conducted using mixed methods of analysis. In order to capture the breadth and depth of this decade of work, the team requested annual and evaluation reports from all projects. A focus group of PIs and Co-PIs of the projects was held at an NSF PI meeting during the initial year of the project. A document analysis was conducted and a comprehensive survey of PIs and Co-PIs was conducted. These data sources were used to capture lessons learned, challenges, and recommendations along with the overall results from the projects. Particular emphasis was placed on these issues: contributions to the knowledge base of STEM education and students with disabilities; research specifically related to postsecondary STEM learning by students with disabilities; successful practices at the secondary and postsecondary level that promote student interest, academic performance, retention in STEM degree programs, STEM degree completion, and career choices, and effective practices for transitioning students with disabilities across critical academic junctures, retaining students in STEM.

This paper will summarize the findings of this synthesis project by discussing three areas of findings related to the mission of AHEAD and conference participants: (1) overview of research contributions to the field of disabilities and STEM education; (2) common challenges and successful solutions; (3) effective strategies for recruiting, teaching, advising, and retaining students with disabilities in STEM postsecondary programs. In addition, the presenters will provide (4) a list of resources generated by the RDE projects during the 10-year period.

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