

**Symposium on Undergraduate Nano-Education:
"Addressing the Challenges of Nanoscale Science & Engineering Education"**

Presentation: "Trends in the Development of Nanotechnology Degree Programs in the United States"
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Presenter Biography:

Jennifer Cleary is a senior project manager at the John J. Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey. With the center since 2000, Cleary performs a variety of research and capacity-building activities. Her current work is focused on developing industry-based intelligence on labor demand and supply issues. Cleary also assists policymakers to develop and implement research-based workforce and employer engagement strategies that promote economic growth.

Cleary has completed numerous studies that focus on the ways that new and emerging workplace trends and technologies are affecting the skill needs of employers and the responses of educational institutions to those needs. She has completed two studies relevant to nanotechnology, including a study of nanotechnology degree programs and the ways that nanotechnology is changing the skill needs of pharmaceutical companies in New Jersey.

Cleary holds a Masters degree in Public Affairs and Politics from Rutgers University and is enrolled in a Public Policy Ph. D. Program at the same institution.

Abstract:

Colleges and universities around the country are developing new ways to address the educational challenges that the evolution of nanotechnology and its emerging use in various industries presents. Research suggests that new degree programs are one way that postsecondary institutions respond to perceived labor shortages in areas of emerging technology (Stephan et al., 2007). This presentation, based on a study conducted in late 2008, offers a "snapshot" profile of nanotechnology degree programs in the United States. Nanotechnology degree programs are defined here as associate's, bachelor's, master's and doctoral degrees that use the term "nano" in the formal degree title. Researchers did not examine certificates, minors, tracks, or concentrations in nanotechnology. While not the most common, or even necessarily the most effective form of nanotechnology postsecondary education, nanotechnology degree programs represent institution-level change, presumably to address new knowledge and employment needs posed by nanotechnology. Researchers used structured Internet searches, expert recommendations, and existing degree program lists, several of which are funded by the National Science Foundation, to identify degree programs. The study also involved the analysis of institutional data, 15 interviews with faculty associated with active degree programs, and reviews of program-related Websites. Researchers also conducted a total of 14 interviews with faculty from inactive or ineligible programs during the course of the study to better understand the obstacles to establishing degree programs in nanotechnology. Overall, the study identified 49 degree programs, the majority of which are at either the associate's degree level or the graduate level. Motivations for establishing degree programs varies, with two-year programs focusing more on addressing the skill needs of employers. However, there is little correlation between areas of high nanotechnology patent activity and degree program placement. Employer involvement, inter- and intra-institutional course structure and content and other factors varied widely across programs. These findings reflect the emerging nature of nanotechnology and the lack of broad consensus regarding how to teach nanotechnology concepts effectively.