

The Role of Two-Year Colleges in Providing and Developing an Educated and Highly Competitive Bioeconomy Workforce

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The competitiveness and productivity of the bioeconomy industry in the US relies greatly on a large workforce pool of highly educated and professionally trained technicians and other such support personnel. Technically skilled personnel represent, by far, the largest part of the private-sector workforce foundation. Technicians are responsible for the crucial bench-level implementation of biological research innovations to be commercialized by the private-sector bioeconomy.

The development of a competitive technical bioeconomy workforce is dependent on life sciences programs offered by four-year universities and two-year academic facilities including traditional community colleges as well as colleges for the community such as technical colleges.

Four-year academic programs in the life sciences generally address biotechnology laboratory skills on a more theoretical level. In contrast, two-year colleges offering life sciences programs specializing in understanding, acquiring and actively mastering biotechnology laboratory and related scientific skills provide a very focused approach, training a large number of educated life sciences technicians. Accordingly, two-year biotechnology facilities are more efficient and time- and cost-effective for the students and for the life sciences industry in producing a workforce ready to transition directly into the private-sector bioeconomy.

The success of developing a competent bioworkforce advanced by two-year colleges offering appropriate biotechnology programs relies on close cooperative relationships between local colleges and regional life sciences businesses. Specifically, academic training should complement ever changing business expectations and needs such that students can successfully transition from two-year college graduation into biobusiness employment. Two-year biotechnology college programs are perfectly positioned to team up continuously with local biotechnology businesses when developing academic learning and laboratory skills outcomes. Close collaboration of this kind between two-year academic facilities and the life sciences industry is not easily feasible involving a four-year university due to differences in academic flexibilities and missions.

In order for competitively staffed and equipped two-year biotechnology programs to succeed in producing this significant portion of the bioeconomy workforce, the academic learning and training effort must be accompanied and supported by:

- An effective outreach program between local high schools and colleges, channeling prospective high school graduates into a two-year biotechnology program;
- Collaboration agreements and establishment of liaison teams continuously linking academics and biobusiness entities defining strategic academic and job training goals;
- A funded student internship program in a local biobusiness, bridging college academics and biotechnology business experiences.

The successful mission of a two-year biotechnology program depends on Federal funding allowing the realization of large and effective biotechnology job training programs. Furthermore, a Federal grant program for two-year biotechnology programs must be created that specifically addresses the herein described funding needs of such academic facilities involved in training and boosting the nation's bioeconomy workforce.

Federal funding of academic outreach and collaborative academic-business agreements need to be persistent and sustaining to have a long lasting impact on the creation of a competitive bioeconomy workforce. Likewise, a public-private funding partnership initiative must be in place to fund an internship stipend program allowing financially disadvantaged and other students during their last academic term to work and gain valuable and significant real-time experiences in a biotechnology business.

In summary, the role of technical colleges offering biotechnology programs is to produce increased numbers of highly educated graduates in the life sciences enhancing the national bioeconomy workforce by supplying highly competent technicians. Therefore, two-year colleges promote the nation's efforts to boost its economic and educational competitiveness worldwide addressing 21st century global challenges in health, energy, food production and the environment.