

Chapter 11

Polk State College's Engineering Technology Program: An Innovative Solution to Industry Demands and Student Success

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ABSTRACT

This case study describes an open entry early exit (O3E) rolling enrollment program focused on untangling the web of systems, assumptions, roles, relationships, and interagency processes to address the national emphasis on affordable, compressed, and flexible degree attainment, particularly in science, technology, engineering, and math (STEM) talent gap areas. To this end, Polk State College has empowered students with an affordable, accessible option that was initiated as a result of a National Science Foundation-Advanced Technological Education (NSF-ATE) project award. The project was designed to transition a traditional engineering technology associate in science degree program to a hybrid competency-based (CBE), modular, non-term, self-paced, learner-centered, faculty-mentored format. As a work in progress, having shifted to CBE in Fall 2014, the O3E program team has undertaken and resolved numerous challenges, many of which are still emergent, and identified significant breakthroughs to provide a catalyst to the reconceptualization of higher education.

DOI: 10.4018/978-1-7998-1928-8.ch011

ORGANIZATION BACKGROUND

Polk State College has served as the primary access point to higher education for residents of Polk County, Florida since its inception in 1964. The College serves over 15,000 students in credit programs at two campuses and four centers located throughout the County, offering Associate in Arts, Associate in Science, and baccalaureate degrees, as well as certificates and workforce training options. Flanked by Orlando to its east and Tampa to its west, the County boasts miles of citrus groves, commercial farms, phosphate mines, nature preserves, and fresh-water lakes. Economic development efforts have attracted new industries to Polk that offer high-paying jobs and opportunities for advancement in industries such as transportation and logistics, health, advanced manufacturing, and financial services. All of these require an educated employment pool.

The College offers a variety of course delivery options including online, hybrid, and face-to-face courses in addition to small class sizes, affordable tuition, and alternative course and term schedules. With student success central to the organization's mission, Polk State has aligned its strategic direction through innovation, engagement, and value to maintain excellence and quality in current services, while also creating sustainable, dynamic systems that respond to local economic trends. The average age of degree-seeking students is 25, with a preponderance of part-time enrollment (75 percent). Approximately 40 percent of students were receiving financial aid in the 2017-2018 Academic Year. The majority, or 89 percent, of students live within Polk County, and 70 percent of graduates remain in the County. Polk State College is regionally accredited by the Southern Association of Colleges and Schools Commission on Colleges and is approved to offer the Associate of Science in Engineering Technology degree in the competency-based, open-entry/early-exit (O3E) model. It should be noted that this CBE program model is *not* a direct-assessment program and is still tied to the credit-hour structure.

SETTING THE STAGE

Higher education is generating new energy as a result of a number of disruptive, innovative agents that, while not exactly new, have acted as a catalyst to transform program and content delivery, enrollment and registration practices, financial aid, instructor roles, and the technology systems required to support these models. While Christensen's discussion of disruption in educational environments identifies online delivery as a means of attending to individual learner needs in K-12 and higher education (Christensen, Johnson, & Horn, 2010; Christensen & Eyring, 2011), it is posited here that online education is merely one of many variables or tools that can facilitate changes in delivery. Instead, the approach of individualization and personalization of the educational process serves as a catalyst to leverage the impact of competency-based education models to enable educational institutions to fundamentally transform existing systems. Technology tools, such as online mechanisms, provide a medium for instructional delivery; however, this does not necessarily begin to unravel the threads that have bound higher education to collective versus individual learning needs.

This chapter provides a case study of a program that seeks to untangle the web of systems, assumptions, roles, relationships, and interagency processes to address the national emphasis on affordable, compressed, and flexible degree attainment, particularly in science, technology, engineering, and math (STEM) talent-gap areas (Metropolitan Policy Program at Brookings, 2017; Klein-Collins & Baylor, 2013; Kelchen, 2015; Lumina Foundation, 2014; Weise, 2014). At Polk State College, the implemen-

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