

## Chapter 7

# The Next-Generation CBE Architecture: A Learning-Centric Standards- Based Approach

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### ABSTRACT

*Institutions looking to adopt competency-based education often struggle with the technological challenges of supporting this model. In response, this chapter proposes a “born-CBE” infrastructure intentionally designed to support the data exchanges and workflows required by CBE. This modular infrastructure contains a system of record, a digital learning environment, a recommendation engine, a financial aid processor, a competency dashboard, and a competency transcript. In order for these components to work together cohesively, data standards for interoperability (LIS, OneRoster, and LTI) are essential. The authors then discuss the essential capabilities of the learning infrastructure. These include support for backward design, authentic assessments, various learning workflows, personalization and adaptivity, and learning and performance analytics.*

### INTRODUCTION

Faced with inefficiencies and challenges in higher education, many institutions are turning to competency-based education (CBE) to restructure their academic programs. While CBE is not a new model, recently it has generated renewed interest “in response to growing concerns over the last decade or more about both

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the quality and the cost of higher education” (Klein-Collins, 2013, p. 5). Weise and Christensen (2014) argue that traditional higher education has been set up to deliver a “coming of age” experience primarily to first-time, young adult students, thereby under-serving non-traditional students who are more interested in the formal academic path that a college degree provides rather than a college experience itself.

Remarkably, in 2013, roughly 71% of all college students fit into this so called “non-traditional” category, meaning the majority of America’s college students, if forced to engage in the traditional college experience, are receiving college experiences they do not want, cannot pay for, and often fail to lead to the outcomes sought for in the first place (Casselmann, 2013). CBE has gained momentum and support in the last few years, evolving as the most likely solution to this problem as well as to some of the other major issues institutions of higher education face today. In general, it appears that the CBE model is popular in serving those non-traditional students it is targeting. One of the largest and oldest CBE programs, Western Governors University (WGU), has grown from 500 students in 2003 to over 30,000 students in 2012, while continuing to grow at a pace of 30% per year (Mendenhall, 2012). Kamenetz (2015) estimates that around 200,000 students are enrolled in online CBE programs throughout the United States. Likely this number will continue to grow as universities see the possibilities of competency-based education in reaching and maintaining new students.

Competency-based education, however, is not a monolithic notion. As the previous chapters have made clear, there are a wide variety of permutations and manifestations of a learning model centered on student acquisition and certification of competencies. Accordingly, every institution implementing a CBE (or CBE-like) approach will have different infrastructure needs. There are, however, several generalizable requirements for CBE that require new kinds of workflows, data models, and integrations. The unfortunate reality, however, is that the legacy e-learning infrastructure and platforms — designed to support traditional learning models — do not readily lend themselves to CBE. The frame of reference of most current Learning Management Systems (LMSs) is the course and the majority of functionality centers around the instructors’ development and delivery of their courses. There is typically little to no data structure above or below the course and limited capacity to handle the data, tracking, and adaptive functionality necessary to manage CBE. This frequently results in courses that are very instructor-centered and static, progressing along an established timeline with no ability to adapt or respond to individual student needs. Yet competency-based education models require a learner-centric architecture that maps learning activities and assessments to a student’s specific learning goals (i.e., competencies); that progresses according to each student’s timeframe; and that enables the instructional experience to be tracked and adapted in response to each student’s needs.

This is why many early CBE institutions (e.g., WGU, College for America at Southern New Hampshire University (SNHU), and others) have built custom applications and platforms based on Customer Relationship Management (CRM) software (e.g., Salesforce) in order to track the progress of their students through their programs. In many cases, however, this type of retrofitting has proved to be a clunky, force-fitted implementation for CBE institutions.

## **Technological Challenges to Competency-Based Education**

The struggle to find an appropriate system for supporting competency-based education is illustrated in Staker’s (2012) case study of Western Governors University. When the university offered its first CBE courses in 1999, data for the 30 original students was maintained in Excel spreadsheets, eventually ending

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