

COMPETENCY-BASED EDUCATION

A Study of Four New Models and Their Implications
for Bending the Higher Education Cost Curve

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Donna M. Desrochers
Richard L. Staisloff

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INTRODUCTION

Competency-based education (CBE) is drawing renewed attention within higher education. Concern about the quality and price of traditional academic programs has generated interest in alternate education delivery models. A new generation of emerging CBE programs offer the potential for colleges and universities to set clearer expectations about what students must know, understand, and be able to do to earn degrees in specific disciplines or majors, and at lower cost to students and institutions than in traditional degree programs.

Success for these new delivery models will require that they positively affect student completion while also producing sustainable business models. To date, little research has been undertaken on the financial underpinnings of newer CBE business models. With a rapid expansion in the number of colleges and universities considering or already developing new CBE programs, additional inquiry is necessary. This study, funded by Lumina Foundation, provides a first look at four such programs from a business model perspective.

The information in this study was drawn from four diverse colleges and universities or systems, which for simplicity we refer to as institutions. Each offers classroom-based and/or online degree programs and have launched competency-based programs that are at different stages of development and implementation:

- University of Wisconsin-Extension: *UW Flexible Option*
- Kentucky Community & Technical College System: *Learn on Demand*
- Brandman University: *MyPath*
- Walden University: *Tempo Learning*

These four institutions have initiated at least one CBE degree program, with several of them planning to rapidly expand their CBE degree offerings.

These institutions are among 30 colleges and universities and four public higher education systems in the Competency-Based Education Network (C-BEN; See Appendix Table A1). The C-BEN network was created by field-leading institutions to accelerate progress on resolving common challenges such as defining elements of high-quality program design and student learning assessment and also identifying the need for new business processes and systems to support scalable CBE programs.

While the programs examined at these four institutions represent different approaches to CBE development and implementation, they do not necessarily capture the diversity found across CBE programs nationally. The range of information the institutions shared, however, begins to answer the following questions:

1. What do CBE **business models** look like?
2. How much **start-up investment** is required to launch a CBE program?
3. What are the **operating costs** required to support CBE programs?
4. Which **business model levers** are employed to change the cost of delivering education?
5. How do CBE business model structures and financial metrics **compare to those of traditional higher education programs**?

The findings from the four institutions in this study suggest that CBE programs do offer an opportunity to bend the higher education cost curve by lowering the cost of instructional delivery and potentially offering students faster pathways to demonstrate content mastery. Those advantages, however, require “patient capital,” as the time to reach the point where annual revenues at least equals operating expenses can take five years or more. Furthermore, getting to breakeven demands significant up-front investment if institutions are committed to changing the way instructional and academic support services are delivered.

INITIAL FINDINGS FROM FOUR INSTITUTIONS

Success for these new delivery models will require that they positively impact student completion while also producing sustainable business models.

Business Model

- CBE business models attempt to use lower price points, efficiencies in content creation and delivery, and economies of scale to reduce the costs of serving students and to improve affordability for students and their families.
- Low price points, in some cases established before business models were finalized, reduced the institutions' flexibility around revenue generation. This will require the CBE programs to maximize efficiencies and economies of scale to achieve breakeven and, eventually, financial margins.
- Removing time as a primary measure of progress within some CBE programs not only affects the student experience but also the business model, requiring investments in new infrastructure as well as fundamental changes in work flows, policies, and business processes and systems to support this altered experience.
- CBE offers the opportunity to adjust faculty roles and adopt technologies that permit higher student-to-faculty ratios while maintaining educational quality. Advances in information technology (IT), learning science, and new business processes and systems permit institutions to serve more students by leveraging existing faculty, and allowing them to specialize in areas such as student mentoring or program design and learning measurement.

Initial Investment and Program Costs

- The four institutions in this study spent an average of \$382,000 to develop single degree programs that typically would require two years of study in a traditional educational setting.¹ Actual single-program development costs varied across institutions, from \$78,000 to \$700,000, depending on whether learning outcomes and competency units had been modified from existing curricula (lower cost) or CBE programs had been built from the ground up (higher cost). These investments might not be representative across the range of CBE programs being put into place nationally.
- Institutions invested \$4.2 million, on average, to develop an array of CBE programs during the initial implementation year, with a variance of \$1.5 million across institutions.² The number of CBE programs initially developed by these institutions ranged from one to five. Almost one-quarter of this spending, on average, was dedicated to curricular development, with the remainder spent on staffing, technology, and other expenditures required to develop an infrastructure for supporting competency-based programs.
- Most programs required additional technology and curricular investments after launch. Multiyear investments ranged from \$6.3 million to \$11 million during the first three years, after additional technology and curricular costs incurred during the first two years of operation had been added to the initial-year investments.

¹ A course of study that typically requires two years includes associate degrees, bachelor's degree coursework in the major, and many masters-level programs.

² Initial and multiyear investment data only include institutions and programs that provided complete accountings of initial investment costs.

Ongoing Costs and Cost Levers

- The four CBE programs expect to spend an average of \$3,200 per student once their programs mature. Spending averaged \$52,500 per student during the launch year.
- Academic spending accounted for about 43 percent of overall program spending, on average, during the launch year. As programs matured and enrolled more students, initial technology investments declined from an average of 19 percent to 8 percent of total costs and spending on academic costs increased to about one-half of total costs.
- Three of four institutions expect their CBE programs to break even by the fifth year when it comes to covering annual operating costs.
- These four institutions face longer payback periods to recoup their up-front investments. One institution expects to generate enough revenue to recover its initial investment and operating costs by Year Six; others expect it to take longer.

Benchmarks

- By the sixth year of operation, these four institutions anticipate that, on average, their CBE programs will be operating at half the cost of their traditional academic programs. These savings are projected to extend across academic programming, student services, and institutional support activities.
- These institutions also allocated financial resources differently for CBE programs than for their traditional academic programs, devoting greater spending to design and delivery of CBE programs and less funding to student services. However, lower student service funding levels were influenced by the inclusion of academic success coaches in the academic expenditures under CBE models.

All four institutions included in this study made efforts to “deconstruct” the credit hour in some respect, moving toward new methods of student engagement and assessment of student learning. The commitment to “reconstructing” student learning in ways that move beyond the credit hour varied, and this was evident in the level of investment in infrastructure made to support future scale. The four institutions operated on a continuum between integrating competency-based approaches into traditional academic programs and creating brand-new learning and service delivery environments in which CBE could be offered based on demonstrated proficiency or learning mastery at lower expense and greater scale.

QUICK FACT

»» 6 years

Institutions project that by the sixth year of operation, their CBE programs will be operating at half the cost of their traditional academic programs.

»» 3 out of 4

Institutions in the study expect their CBE programs to break even by the fifth year.

WHAT ARE COMPETENCY-BASED EDUCATION PROGRAMS? WHY INVEST?

Competency-based education programs have been offered for many years and in various formats. Recently developed CBE programs have made greater use of IT and have been designed with cost and price more explicitly in mind. CBE is a form of education that combines an intentional and transparent approach to curricular design with an academic model in which the time it takes to demonstrate competencies varies while expectations about learning are held constant. Learners acquire and demonstrate their knowledge and skills by engaging in learning exercises, activities, and experiences that align with clearly defined program-level outcomes. Learners receive proactive guidance and support from faculty and staff members, and they earn credentials by demonstrating proficiency or mastery through multiple forms of assessment, often at a personalized pace (Competency-Based Education Network, 2016).

Some elements common to CBE programs that have the potential to significantly affect program costs and business model design³ include:

A Different Approach to Curriculum Development and Delivery

- The process of designing program maps, rubrics, and embedded assessments eliminates program redundancies while allowing thoughtful, repeated exposure to opportunities to demonstrate particular types of learning.
- Learning assessments are embedded in curricula so that student progress can be monitored, allowing predictive modeling which targets students for real-time remediation and other interventions.
- At some institutions, competency-based approaches decrease reliance on commercial textbooks and increase use of free or open educational resources that save students money.

A New Faculty Model

- Faculty roles can look the same as in traditional academic instruction. Or, they can be unbundled and look quite different, because competency-based approaches lend themselves to further specialization among faculty roles.
- Some institutions separate subject-matter-expert faculty who design programs and assessments from mentoring faculty and staff, who serve as primary contacts with students. In addition, some programs have additional student supports and faculty who solely handle learning assessments.
- Handling the assessment of learning with specially trained faculty or staff members can lead to continuous improvement.

A New Student Experience

- Creating integrated, cross-disciplinary curricula can eliminate redundancies in an academic program's focus on specific knowledge, skills and abilities, leading to increased efficiency and cost effectiveness for students and institutions.
- Within parameters set by federal financial aid policies, students can advance through many programs of study at flexible rates. In advancement-by-mastery or proficiency programs, students can accelerate progress toward their degrees, saving time and money.
- Coupled with generous transfer policies, recognition of prior and emergent learning can substantially reduce time to completion, especially for adults.

³These program elements were drawn from two unpublished documents: 1) a January 2014 "Experimental Sites Concept Paper: Competency-Based Education," which was a multi-institution response to the U.S. Department of Education's Request for Information: "Our Case for Experimental Sites That Waive Specific Provisions in Title IV Laws and Regulations to Test Approaches That Enable More Students to Benefit From Competency-Based Degree Programs," and 2) a background briefing prepared for Lumina Foundation by Lumina consultant Michael Offerman, "Beyond Seat Time: New Learning Models."

Early approaches to incorporating competencies into higher education often were rooted in traditional academic formats. Some institutions defined competencies for existing credit- and course-based programs, but to date only a small number of programs have developed alternative assessments to evaluate student learning (e.g., portfolio assessments and projects). Other models encourage students to earn college credit for existing knowledge and experience through “prior learning assessments (PLA)” before formally enrolling in CBE programs⁴ (Klein-Collins, 2012; Porter and Reilley, 2014).

There is often significant confusion about the relationship between CBE and PLA. Although some credit-based CBE programs allow PLA, it is used similar to how traditional course-based non-CBE programs use PLA. That is, they assess students’ prior learning, map it back to the relevant course(s), and either assign “credit” for the PLA or waive the course requirement(s). CBE programs, including federally authorized Direct Assessment CBE programs, are able to rely on PLA as a tool as long as they do so before a student is fully enrolled in the program, because the assessment of existing knowledge and skills is ineligible for federal student aid.⁵

Current interest in competency-based education is growing around models designed to lead students through programs that assess competencies and culminate in specific credentials. These programs have institutionally defined program-level learning outcomes and general competencies aligned with their course content and proprietary learning assessments. The programs are delivered either on campus or online through web-based technology platforms.

These common features aside, not all CBE programs examined in this study were similarly designed. Some CBE programs continued to operate using a credit-hour model, in which competencies are “mapped back” to credit-bearing courses. Students receive course credit for demonstrating various competencies and, as in traditional programs, are awarded degrees after they have accumulated specific numbers of credit hours or competency units. Credit-hour programs are generally the easiest and least costly types of CBE programs to develop, but such programs do not fully tap the potential of competency-based education to allow progress based on demonstrated proficiency or learning mastery.

Other programs use the federally authorized Direct Assessment model, mentioned earlier, to measure progress based on learning milestones and award degrees to students who demonstrate program-level competencies without regard for credit hours.⁶ Building CBE programs from the ground up—and creating credit-hour equivalencies to meet federal student aid regulations—increases the complexity of developing and administering these programs. It is a higher-risk, potentially higher-reward strategy. Building from the ground up can make Direct Assessment programs costlier to develop initially than programs that modify existing credit-hour courses.

Historically, competency-based models served a niche area of higher education focused largely on adult learners. However, it is now estimated that between 200 and 600 institutions are interested in developing, building, or offering CBE programs (C-BEN, 2015; Fleming, 2015a; Public Agenda, 2015). And a few recently developed programs, such as those offered by Purdue University and the University of Texas System, are aimed at first-time, full-time students who are of traditional college ages.

Historically, CBE models served a niche area of higher education focused largely on adult learners. **Now it is estimated that between 200-600 institutions are developing CBE programs.**

⁴ Prior learning assessments include standardized exams, such as Advanced Placement (AP) or College Level Examination Program (CLEP), formal evaluations of non-college programs (e.g., corporate or military training), or completion of individualized assessments that are often portfolio based.

⁵ Because PLA assesses learning that occurred previously, it is ineligible for Title IV federal student aid and cannot be fully integrated into CBE programs. Whether directly assessed or credit-based learning, CBE programs that are using PLA as a tool must take care to distinguish the CBE components of their programs which take responsibility for further learning—and thus are eligible for federal financial aid—from those components of the CBE program that solely assess existing knowledge and skills and are not eligible for such federal support.

⁶ The U.S. Department of Education requires that Direct Assessment programs create “credit-hour equivalencies” for their competencies as part of federal financial aid regulations.

Most CBE program enrollments are quite small relative to other, credit-based programs. The best-known institution offering competency-based education is Western Governors University, which enrolls more than 69,300 students in graduate and undergraduate business, education, IT, and nursing programs. Total enrollments nationally in CBE programs are estimated in the low hundreds of thousands (Fleming, 2015b).

This new generation of CBE programs is just the latest sign of growing interest in CBE as a way for colleges and universities to plan, organize, deliver, and support education for students from all backgrounds who may be looking for alternatives to traditional academic programs. Often these students face barriers to accessing traditional higher education because of family responsibilities, affordability, and the length of time to completion. For students, CBE programs hold the promise of clearer, more-transparent paths toward degree completion, and possibly shortening the time, expense, and complexity of earning college degrees. For states, these programs could potentially boost their college-educated workforces if they can attract the more than 28 million adults ages 25 to 64 with college credit but no degree (U.S. Census Bureau, 2015).

Potential Advantages and Disadvantages for Students and Institutions

Interest in competency-based models has expanded during the past decade amid growing concern about the price and quality of higher education (Klein-Collins, 2012). Responding to these concerns, CBE programs offer a range of potential advantages, including improved college access for adults looking to capitalize on previous college or work experiences, and providing flexible time scheduling (Kelchen, 2015). In addition, CBE programs can provide paths for personalized progression. What students need to know, understand, and be able to do to earn credentials is clearly articulated and students can progress rapidly through competencies they have previously mastered, which could shorten the time to degree. Students also are provided additional time for mastering application of difficult concepts. Finally, these programs provide the opportunity for lower overall tuition, using pricing models such as subscriptions (e.g., structured around a set fee for a period, with “all-you-can-learn” services), that potentially shorten the time to degree and lower students’ total expenses.

Institutions also are in a position to benefit as changes in necessary infrastructure and staffing requirements permit them to deliver quality education more efficiently. CBE programs that are able to leverage technology and employ new faculty models could reduce academic delivery costs and limit unit-cost increases such as those incurred when traditional programs increase in size and scope. These lower delivery costs could, in turn, allow institutions to offer quality degree programs at prices lower than traditional instructional options.

That said, the advantages of making learning independent of time could have negative effects on CBE business models in the short term. Existing infrastructure to support student registration and tracking, financial systems, and learning management systems are generally structured around standard academic terms (quarters, semester, etc.) and often are unable to support non-term based learning. These challenges can require a significant investment in new or modified infrastructure to support non-term based programs. Further investment is generally required to allow these separate technology systems to share data, leading to the creation of “middleware.”

In addition, the move to non-term based programs requires a rethinking of how the college or university operates, demanding new business processes and systems. Although these investments might ultimately yield returns in terms of increased net revenue and enhanced service delivery, institutions must recognize the potential costs associated with a switch to non-term based learning programs when considering institutional capacity to support CBE models. Further research is needed in this area as programs evolve.

QUICK FACT



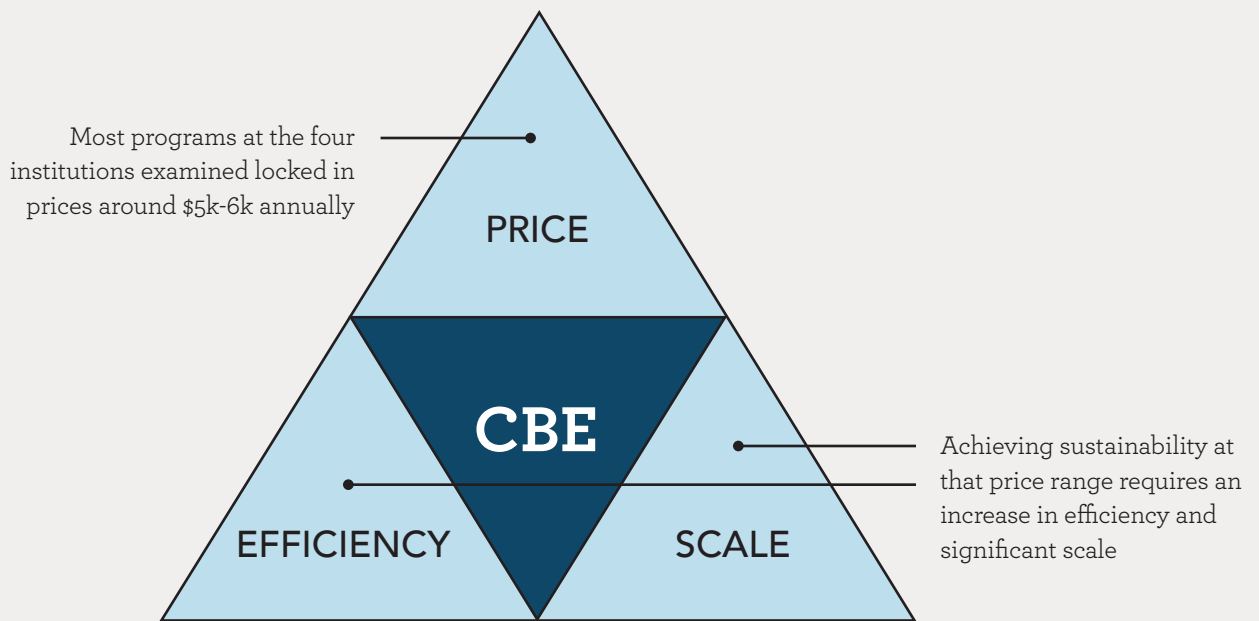
Total enrollments nationally in CBE programs are estimated in the low hundreds of thousands. (Fleming, 2015b)

COMMON CBE BUSINESS MODEL CHARACTERISTICS

Competency-based education demonstrates a unique set of business model components and interactions that vary in many respects from traditional higher education. When evaluating the business model behind CBE—including, but not limited to the four programs discussed in this study—three core components should be considered: price, efficiency of program delivery, and scale (See Figure 1).

FIGURE 1

CBE Business Model Components



Current CBE programs have quickly settled around a price range of \$5,000 to \$6,000 in annual tuition. This price range reflects historical pricing set by industry leader Western Governors University, combined with a desire to maximize access to CBE programs. In some cases, this price range was established before a full business model was developed and before the revenue streams and expenditure structures behind each CBE program were fully understood.

With low prices locked in from the outset, institutions must focus on the remaining two key levers of their business models: 1) Realizing efficiencies in program delivery and 2) Achieving economies of scale.

Institutions are attempting to increase efficiencies in their CBE models largely through better uses of labor. Their focus is on unbundling traditional roles around content creation, delivery, learning assessment, and student supports to further leverage personnel (See Box 1). This unbundling and leveraging will reduce the total cost of program delivery, assuming institutions can achieve projected student-to-staff ratios.

CBE programs shift the traditional faculty role in two significant ways. First, select faculty, often working in teams, serve as the primary architects of course content, either developing content or turning existing content into competencies and developing related learning assessments. The CBE model eliminates duplication common in traditional higher education, where multiple faculty design sections of the same course and programs are not designed with specific, program-learning outcomes in mind.

Second, faculty who are not engaged in content development have more time to provide subject matter expertise to students, initiated by faculty members. This unbundling of faculty roles allows them to provide more students with advice and assistance as they tackle different learning experiences.

Finally, technology also should allow programs to scale more efficiently, eliminating escalating labor costs that often accompany scale in more traditional models.

Analyses of breakeven points for CBE models at the four institutions in this study show they rely upon significant increases in the numbers of students served. Aggressive growth—averaging nearly 150 percent annually for five years—will be necessary if these four institutions expect to reach the necessary scale to break even, on average, within five years. Scaling programs to enroll more students reduces the unit cost of delivery and allows for sustainability at the lower established price points.

This need for scale is evident in most alternative business models developed in higher education during the past decade. Reaching projected scale often has proven the most difficult success milestone to achieve for these alternative models. The lack of familiarity with CBE programs among potential students and employers, combined with a lack of signaling from employers to students regarding the value of competency-based education, pose barriers for large numbers of students.

Balancing price, efficiency, and scale to create sustainable business models also can be influenced by the degree of business-process reinvention an institution pursues. Three of the four institutions examined in this study elected to significantly rethink their business processes to support non-term based instruction. This reinvention included the creation of new technology infrastructures, workflows, and policies and procedures. Although these changes represented significant initial investments in CBE, these field-leading institutions were motivated by a common desire to avoid the costly and time-consuming manual processes and workarounds that would have been required to make existing technology and human systems work.

The three key levers—price, efficiencies, and scale—can be adjusted and maximized within most traditional higher education models. But CBE affords an opportunity to create significantly more-efficient business models. In such cases, there will be an ongoing need to demonstrate evidence of productivity with quality to generate interest among students and employers, and to negotiate regulatory environments.

BOX 1

Unbundling of Faculty and Staff Roles

The new roles and responsibilities of faculty and staff in scalable CBE programs are expected to drive much of the savings for students and institutions. As a result of this unbundling, students may interact with multiple faculty and staff members in new ways. Although not all CBE programs have reorganized faculty and staff responsibilities, common new roles include:

1. *Faculty instructional designers:* These faculty teams define the learning outcomes, design the curriculum, develop the learning experience, and curate content.
2. *Assessment experts:* These faculty members design scoring rubrics and may evaluate student learning.
3. *Enrollment coaches:* A student's initial program contact could be through an enrollment coach who assists with administrative-related enrollment tasks such as admissions, payment, financial aid, credit transfer, etc.
4. *Academic success coaches* (also referred to as student success coaches, counselors, etc.): During the program, a student's primary point of contact could be a coach, who helps plan, guide, and monitor their academic progress.
5. *Mentoring faculty* (also referred to as subject-matter experts): Students also have access to experts, usually faculty members, who can facilitate learning.
6. *Learning outcomes assessors:* Assessments may be graded by staff or faculty using scoring rubrics created by assessment experts; some assessments are machine scored.

Note: If one or more of these roles is intended to satisfy the U.S. Department of Education's requirement that postsecondary programs provide "regular-and-substantive interaction with instructors" to participate in Title IV federal financial aid programs, the employees in these roles must meet the institutional accreditor's faculty requirements (U.S. Department of Education, 2014).

SHARED MODEL ELEMENTS AMONG PARTICIPATING INSTITUTIONS

The four institutions offering competency-based education programs included in this study are characteristic of the online, personalized, modular programs growing in popularity. The study, although limited in scope, captures initial data from a diverse set of four-year and two-year institutions operating in the public, private nonprofit, and for-profit sectors. The CBE programs examined include:

1. University of Wisconsin-Extension – *UW Flexible Option, or UW Flex*
2. Kentucky Community & Technical College System, or KCTCS – *Learn on Demand*
3. Brandman University – *MyPath*
4. Walden University – *Tempo Learning*

The most established program is *Learn on Demand*, which KCTCS launched in 2008-09. The program offers associate degrees and certificate programs across five broad program areas using a credit-hour model (See Table 1). *Learn on Demand* is the only program in the study which charges students by the credit hour or module, rather than offering an “all-you-can-learn” multi-month subscription.⁷

The University of Wisconsin’s *Flexible Option (UW Flex)*, launched in 2013-14, was developed in partnership with the UW System, UW campuses, and the UW-Extension. *UW Flex* offers a limited number of certificates, associate degrees, and bachelor’s degrees across four broad program areas. Bachelor’s degree programs are structured as completion degrees, and general education requirements can be satisfied with transfer credits or by completing *UW Flex*’s associate of arts and sciences degree. Each student can demonstrate an unlimited number of competencies during a three-month enrollment period for \$2,250 or proceed at a slower pace by paying \$900 for each “competency set” that is organized around a specific topic.

The two private institutions in the study entered the CBE marketplace in 2014-15, with each offering degrees in a single program area. Brandman University, a private nonprofit, unveiled *MyPath* and Walden University, a for-profit, established *Tempo Learning*. Through *MyPath*, students can earn a bachelor’s degree in business administration in various concentrations, with six-month subscriptions of \$2,700 which allows them to demonstrate unlimited competencies. *Tempo Learning* is the only program examined to initially focus on the graduate-student market, offering a graduate certificate and a master’s degree in early childhood studies, with unlimited, three-month subscriptions priced at \$1,500.

About the Data

The CBE programs included in this study were established in different years. However, the business models and finances are compared at similar points of program maturity.

The implementation year, or Year Zero, references the development period before students were enrolled and when initial investment costs were incurred.

Year One identifies the year programs were launched and students first enrolled. All study participants provided actual and/or estimated data through Year Six. Programs are considered mature in Year Six. However, some institutions plan to continue adding new degree programs.

Each institution provided actual data for Year Zero and Year One. Beginning in Year Two, some analyses contain projected data because programs have not been in operation long enough to provide actual data.

Confidential institutional data are not presented in ways that can be used to identify the institutions.

⁷ For example, a three-credit course comprising six competency-based modules would cost \$441; if the student elected to take just one module, the cost would be \$74.

TABLE 1

Competency-Based Education Program Characteristics at Four Institutions

	<i>UW Flexible Option</i>	<i>Learn on Demand</i>	<i>MyPath</i>	<i>Tempo Learning</i>
Institution/System	University of Wisconsin-Extension ⁸	Kentucky Community & Technical College System (KCTCS) ⁹	Brandman University (Chapman University System)	Walden University (Laureate Education Group)
Institution/System Sector	Public 4-year	Public 2-year	Private nonprofit 4-year	Private for-profit 4-year
CBE Launch Year	2013-14	2008-09	2014-15	2014-15
Types of Credentials Offered in 2014-15	BS AA/AS Certificate	AA/AS Certificate	BBA	MS Certificate
Program Areas in 2014-15 <i>(See Appendix Table A2 for detailed program offerings)</i>	<ul style="list-style-type: none"> • General Studies • Health • Information Technology • Business 	<ul style="list-style-type: none"> • General Studies • Health • Information Technology • Business • Marine Technology 	<ul style="list-style-type: none"> • Business 	<ul style="list-style-type: none"> • Early Childhood Studies
Enrollment Window	Second day of each month	Anytime	Any Monday	First Monday of each month
2014-15 Tuition/Subscription Price	\$2,250/3 months (\$900/Single competency set)	\$147/credit hour (module price: prorated based on number of credit hours)	\$2,700/6 months	\$1,500/3 months
	Excludes books and other course materials	Additional e-resources fee charged per course	Includes all course materials	Includes all course materials
Federal Financial Aid Framework	Direct Assessment approval Provides non-term financial aid	Credit hour Grant aid disbursed as percent of total funds awarded, based on percent of full-time enrollment, using credit hour calculation	Direct Assessment approval Provides non-term financial aid	Direct Assessment approval Provides non-term financial aid

⁸ At the University of Wisconsin, three four-year institutions offer *UW Flex* programs (Milwaukee, Madison, Parkside) and the associate degree programs are offered by all 13 UW Colleges.

⁹ At KCTCS, eight of 16 colleges in the system developed programs that were eventually offered.

Each of these CBE programs has more flexible enrollment windows than traditional credit-hour programs. Students can enroll year-round, with *MyPath* offering enrollment every Monday and *Tempo Learning* and *UW Flex* offering enrollment at the beginning of each month. *Learn on Demand* students can enroll anytime because they are charged by the credit or module.

One hurdle that competency-based programs have faced is accessing federal student aid. Title IV grant and loan programs are structured around the student credit hour and follow the traditional higher education calendar. Aid is awarded for set terms (e.g., a 15-week semester), which is often incompatible with the way CBE students enroll and participate.

Despite these structural incompatibilities, eligible CBE students in each of the four institutions can access federal student aid funding. Programs have adapted by creating credit-hour equivalencies for their competencies and agreeing to modified aid disbursement schedules with the U.S. Department of Education. The intricacies of awarding aid for competency-based programs will not be a focus of this study, because it only indirectly affects program revenues and has been addressed in other research (Lacey and Murray, 2015; Laitinen, 2012; Porter, 2014).

Efficiency: Academic Delivery Structure, Staff Ratios, and Compensation

The unbundling of faculty roles is expected to introduce new academic efficiencies in CBE. Together with technology, these changes permit higher student-to-faculty ratios than in traditional programs without compromising educational quality. The ratio of students to mentoring faculty across the institutions examined is expected to average about 200:1 after programs mature (See Table 2). There is significant variation among institutions, with ratios ranging from 400 to 100 students per course mentor. Ratios during the early implementation are typically much lower, with fewer than 100 students per faculty member. In traditional instructional formats, ratios range from 9 to 18 students per faculty member (NCES, 2015).

Most of the models in the study are expected to generate significant cost savings by increasing the instructional productivity of these faculty members rather than by employing lower-cost faculty. The average full-time salary for CBE faculty among university study participants is comparable to the national average salary (and benefit rates) for college professors, at about \$77,700.¹⁰

TABLE 2

CBE Business Model Metrics at the Four Institutions: Delivery Structure Ratios and Compensation

	Range	Average
Student/Staff Ratios (Projections)		
<i>Student/Course mentor</i>	100:1 – 400:1	200:1
<i>Student/Academic success coach</i>	120:1 – 450:1	230:1
Salary (FTE)		
<i>Course mentor</i>	\$75,000 - \$83,200	\$77,700
<i>Academic success coach</i>	\$38,000 - \$62,000	\$53,000
Benefit Rates		
<i>Full time</i>	20% - 50%	34%
<i>Part Time</i>	9% - 11%	10%
Cost to Score an Assessment	\$15 - \$35	\$25

Note: Staff and student ratios represent the ratios for mature programs that are fully operational. Metrics ranges and averages may not include data from all programs; data were unavailable for some programs or were provided in formats that were not comparable.

¹⁰ The average salary for full-time professors on nine-month contracts was \$77,300 in 2012-13 (NCES, 2015). Faculty may serve in dual roles as CBE mentoring faculty and traditional instructors, which may explain the comparable salary rates.

Academic success coaches are typically full-time staff members hired at lower salary points than faculty. Salaries range from \$38,000 to \$62,000, averaging \$53,000 at the four institutions. These salaries are in line with those of full-time instructional support staff in traditional higher education programs, which average about \$45,000.¹¹ Coaches have high rates of student contact, aided by software that monitors student persistence and performance. In mature programs, coaches could be expected to average a student load of 230 people, but there is significant variance in expectations, ranging from 120 to 450 students per coach depending upon the type and frequency of interactions.

The final piece unbundled from traditional instructional models is student assessment. The average cost of scoring an assessment is \$25, with the range of costs fairly comparable across the four participating institutions. Less complex competencies can be machine scored, while specially trained learning outcomes assessors use standard rubrics to evaluate more detailed portfolios or projects. In some programs, the people assessing student learning are hourly staff or adjunct faculty members and do not receive employee benefits, which can reduce compensation costs. However, CBE models must continue to have faculty as the “instructor of record” and faculty must initiate student contact and be in charge of assessing student learning. Accreditors and others require a central role for faculty in all academic programs, regardless of pedagogy. This includes faculty design of curricula as well as assessment design and the assessment of student learning.

Scale: Student Recruitment, Enrollment, and Retention

The financial success of competency-based business models depends heavily on the potential market of students interested in pursuing this form of education. Enrollment growth in the longstanding adult learning market¹² and among first-time, full-time college students, where CBE has been less well tested, is critical if institutions are to recoup their initial investments and cover operating costs. These four institutions have adopted strategies focused on recruiting individual students or on signing up businesses willing to refer their employees as potential students (business-to-business or B2B approaches).

Recruitment. Most study participants have a marketing plan and budget, and they employ various marketing strategies. Three of the institutions examined marketed primarily to individual students. They developed leads through multiple avenues, but online marketing was most common.¹³ Some of the institutions used e-mail and social media to attract students and followed up with students who previously had indicated interest but had not enrolled.

One institution employed an alternative strategy by partnering with local employers; this institution’s initial cohorts of students were primarily employees of partner companies. However, the institution expects to broaden the pool of potential students, particularly as it expands into television advertising.

CBE marketing budgets averaged below \$900,000 during the first two years of operation. Projected budgets often rose significantly as institutions planned to roll out new degree programs and scale existing ones. The marketing cost per new student ranged from \$1,300 to \$3,150 during the second year of operation (\$1,950, on average), reflecting the different intensities and strategies of various marketing plans (See Table 3).

Significantly improved student retention could boost the odds of the institutions breaking even and recouping their up-front investment costs.

¹¹ Authors’ analysis of data from the Integrated Postsecondary Education Data System (IPEDS).

¹² Traditionally, most CBE students are aged 25 to 49 and enrolled part time; half or more are women. Racial and ethnic diversity varies, but white students generally make up at least half of enrollments (Kelchen, 2015). Brandman University is a Hispanic-Serving Institution.

¹³ Institutions advertised using online keyword searches and added postings to their own course-based websites, as well as other educational or job-listing sites. Institutions also sought students who visited other free education sites such as Massively Open Online Courses (MOOCs), Kahn Academy, and Coursera.

TABLE 3

CBE Business Model Metrics at the Four Institutions: Student Recruitment, Enrollment, and Retention

	Range	Average
Marketing Cost per New Student (Year Two)	\$1,300 - \$3,150	\$1,950
Annual Enrollment		
Year One (Actual)	44 - 258	165
Year Three (Projected)	929 - 3,362	1,817
Year Five (Projected)	1,982 - 18,068	5,878
Average Retention Rate (Actual and Projected)	62% - 71%	67%

Note: Metrics ranges and averages may not include data from all programs; data were unavailable for some programs or provided in formats that were not comparable.

Among institutions that were able to provide marketing cost comparisons for their own standard online programs, no consistent pattern emerged. CBE marketing costs per new student ranged from 50 percent higher to more than one-third less than the per-student costs institutions incurred for their traditional credit-based online programs.

Enrollment. New programs typically enrolled small numbers of students, averaging 165 in the first year. But enrollment is projected to grow rapidly—by an average of 80 percent to 200 percent annually during the first five years—as a result of CBE expansion into new and existing degree programs. The institutions expect enrollments to grow fastest within the first few years of launching, to an average of 1,800 students by the third year of operation and nearly 6,000 students in Year Five. Even in the sixth year of operation, institutions are still projecting enrollment to grow between 20 percent and 70 percent.

There is a range of enrollment expectations among programs. At some programs, new CBE students will remain a small proportion of total enrollments (5 percent), while at others CBE students could make up as much as one-third of their overall enrollments five years after launch.

Retention. Because most of the institutions examined only recently launched their CBE programs, reported retention rates are preliminary. However, available data suggest that institutions have met or exceeded their projected retention rates. The actual/projected multiyear retention rates are quite similar across study participants, ranging from 62 to 71 percent, with an average rate of 67 percent.

The expected CBE retention rates among the study participants are comparable to, and sometimes higher than, those observed for full-time students in credit-based programs at similar types of institutions, which range on average from 48 to 74 percent.¹⁴ Part-time retention rates may be a better comparative metric for CBE programs, which ranged from 24 percent to 43 percent for credit-based programs at their own institutions.¹⁵ The planned CBE retention rates are optimistic, but the academic success coaches and student-centered technology investment common in CBE business models could effectively boost student outcomes. Significantly improved student retention could also boost the odds of the institutions breaking even and recouping their up-front investment costs.

¹⁴ Retention rates include first-time, full-time enrolled students who re-enrolled the following fall. Non-CBE retention rate data are from authors' analysis of IPEDS.

¹⁵ Part-time retention rates across comparable types of higher education institutions averaged 35 percent to 50 percent.

CBE PROGRAM COST DRIVERS

When developing any new business or service line, various types of costs are incurred during the development, launch, and growth cycles. The following financial analysis begins by looking at initial investment costs, separately considering the costs of infrastructure and course-content development. Next, ongoing delivery costs are examined, including total expenditures, net revenues (revenues minus expenditures), and the various levers driving program costs.

The financial information provided by study participants about their initial investments and ongoing costs are similarly organized around the three broad spending categories shown in Figure 2. These categories capture both staff expenses (new hires and allocated time of existing staff) and operating expenses.¹⁶ In some instances, institutional data were unavailable and therefore excluded from certain metrics.

FIGURE 2

CBE Spending Components

»» Academic Program

- **Curriculum** (development, maintenance, assessment design)
- **Learning Support** (mentoring faculty, academic success coaches, learning outcomes assessors)
- **Program Management/Coordination**

»» Institutional Support/Service

- **General Institutional Support** (senior management, finance, legal, human resources, and general operating expenses)
- **Marketing and Recruitment**
- **Student Services** (enrollment coaches, admissions, registrar, bursar, financial aid)

»» Technology

- **Technology Investment and Support** (computer software, hardware, information technology development and support)

¹⁶ Any investments in technology or curricular development that might have been capitalized in traditional accounting treatments are also included, but with the full cost reflected in the year the investment occurred.

WHAT LEVEL OF INVESTMENT WAS REQUIRED TO START THESE CBE PROGRAMS?

The up-front investments made by these four institutions to develop CBE programs were dependent on choices about program infrastructure, the number of degree programs developed, and the timing of these investments. As a way of accommodating these factors, the upfront CBE investment of these institutions is framed around the following questions:

1. What is the total pre-launch CBE investment?
2. What is the infrastructure-only cost, independent of the number of degree programs developed?
3. What is the average cost to develop a single degree program?
4. What is the additional, multiyear investment required after launch?

This study adopts a broad definition of initial investment to include all CBE spending incurred in the year before launch (e.g., before students are first enrolled). The initial investment is disaggregated to separately consider curricular development costs, which are dependent on the number of programs developed, and infrastructure costs, which are independent of the number of programs developed (See Figure 3). Infrastructure costs capture all non-curricular investments, including technology, institutional support, and management of the academic program. Because investments in curricular development and technology often extend beyond the implementation year, adding these costs to institutions' initial investments reflects their multiyear investments.

Institutions or college and university systems financed new CBE investments in various ways. For example, in Kentucky a development loan fund was established through which member colleges could borrow funds to develop *Learn on Demand* programs and later repay the loan from program revenues. *UW Flex* was financed through a combination of commitments from the UW System, reallocated funds from the UW Extension, foundation support, and a state budget request for ongoing base funding support. Private institutions generally used institutional resources to fund new CBE ventures.

FIGURE 3

Investment Components

>> Initial-Year Investment

- Curricular Development
- Infrastructure (All non-curricular spending)

>> Multiyear Investment

- Initial-Year Investment
- Additional 2-year Investment in:
 - Curricular development
 - Technology

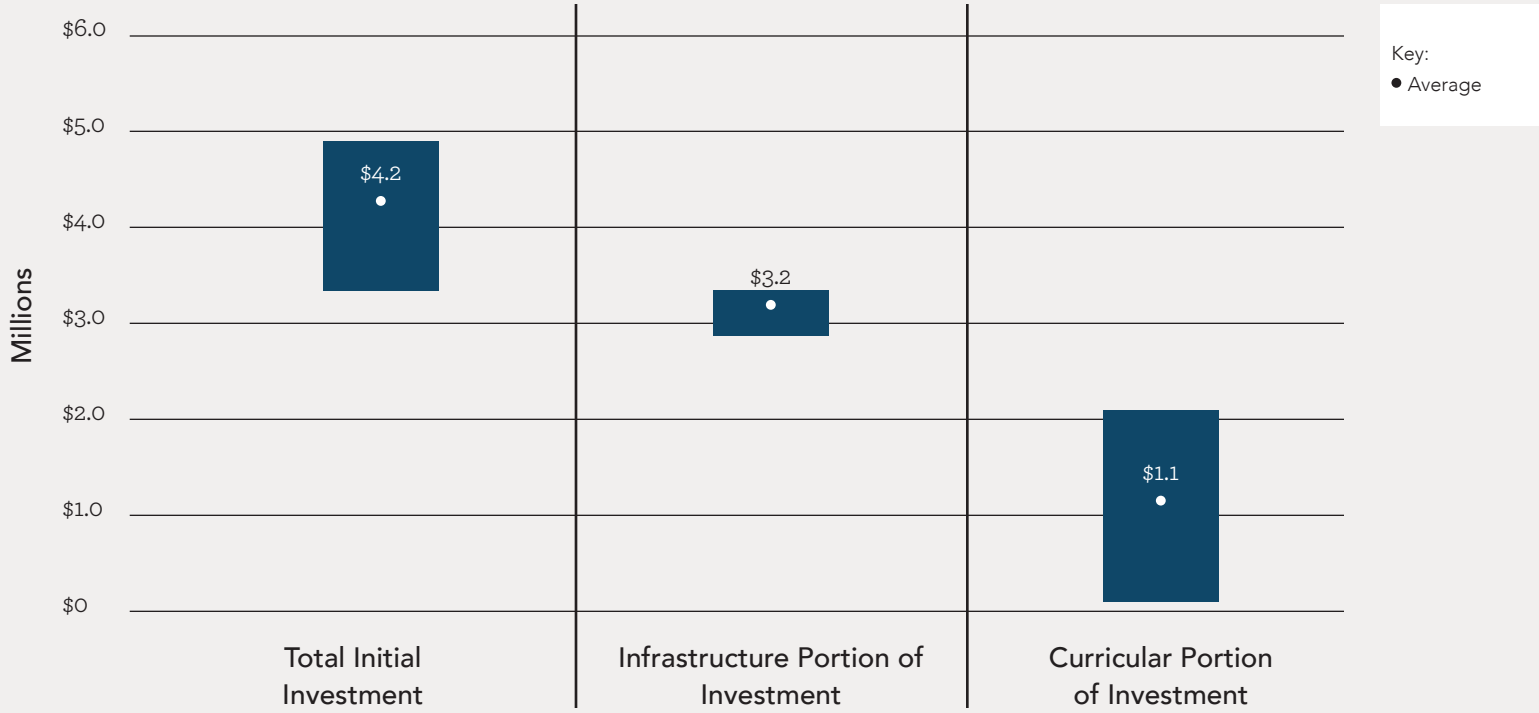
Initial Investment Costs: Curricula and Infrastructure

The initial investment in CBE averaged \$4.2 million among study participants providing a full accounting of costs (See Figure 4).¹⁷ The range of investments varied by \$1.5 million, which reflects the different activities in which institutions decided to invest. Some institutions invested heavily in curricular development, while others initially focused on building infrastructure. Of the \$4.2 million in initial investment, more than 75 percent was spent on creating infrastructure to support the programs, with the remaining 25 percent spent on curricular development.

Institutional investment on infrastructure-related activities averaged \$3.2 million, and ranged from \$2.8 million to \$3.3 million during the initial investment period. Curriculum investment averaged \$1.1 million, with each institution developing between one and five new degree program offerings.

FIGURE 4

Distribution of Initial CBE Total Investment, by Infrastructure and Curricular Components (Implementation Year Only), Four Institutions



¹⁷ One study participant did not have a complete accounting of its initial investment. This institution was excluded from certain analyses when its available data were not comparable to the comprehensive cost accounting provided by other institutions.

A closer examination of the three types of infrastructure investments (institution support/service, academic program management and coordination, and technology) shows that on average, institutions spent about 50 percent of their total initial investment on general institutional support/service. However, that percentage masks significant variance among institutions. Some institutions directed more than 80 percent of their initial investments to these support and service activities while others spent one-third or less of their start-up budgets in this area. Additional program management/coordination for the academic program averaged less than 10 percent of spending, as curricular design costs accounted for the majority of academic program spending.

The final share of the approximately 75 percent spent on infrastructure consisted of technology, which averaged 19 percent of the total initial investment across the four institutions. Technology is where the largest spending differences occurred, and the proportion of the initial investment dedicated to technology ranged from nothing to 47 percent. Several institutions made sizable initial investments in technology, while others delayed the adoption to later years or decided to use existing technologies that did not necessitate additional investment.

Institutions making significant initial technology investments spent an average of \$1.8 million, primarily investing in new software technology. The growing popularity of cloud-based IT reduced the need to invest heavily in hardware such as network servers.

Often, multiple types of software had to be purchased and/or developed to serve purposes beyond just the learning platform. New software investments in customer relationship management (CRM) and student information systems helped some institutions do the following: develop and manage enrollment leads, track non-term enrollment and financial aid, automate transcript data into other university systems, provide student and faculty interactions, and track learning progress. Additional investments focused on middleware solutions, allowing both legacy and new systems to work together in a CBE environment. Institutions also generally incurred annual software licensing fees.

Single-Degree Program Development Costs

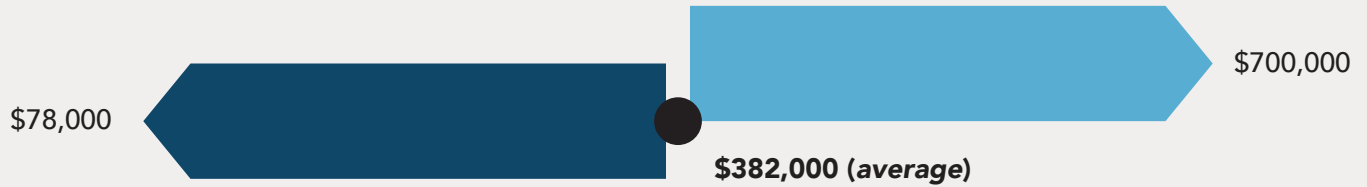
For institutions considering a new CBE initiative, the total cost will partially depend on the number of degree programs developed and whether they were newly developed or adapted from existing curricula. The per-degree program development cost includes investments made across multiple years and reflects the total number of degree programs developed.

Most of the degree-programs currently offered by these institutions reflect two years of coursework in a traditional delivery setting (e.g., associate or master's degree programs). Even among the bachelor's degrees offered by *UW Flex*, the content-development costs for each program reflect only the learning outcomes and competency units associated with upper-division coursework; any unmet lower-division degree requirements can be satisfied using *UW Flex's* two-year associate degree CBE offering or transfer credits. Only Brandman University has developed a full four-year bachelor's degree that incorporates both the lower- and upper-division coursework encompassed by a traditional four-year degree. In this study, those curricular-development costs were equated to a two-year degree to improve data comparability across institutions.

The cost to develop a degree program that would require two years of study in a traditional setting averaged \$382,000 (See Figure 5). The range of costs was significant, with the difference between the most- and least-expensive degree program development costs totaling more than \$600,000. These cost differences reflect, in part, the different curricular design methods, with programs constructing new direct-assessment programs facing higher costs than those redeploying existing credit-based courses into smaller competency-focused pieces. These costs may not be representative of costs across all colleges and universities designing or offering CBE programs. Additional research on this topic would benefit the field.

FIGURE 5

Range of Costs to Develop a Single CBE Degree Program Across Four Institutions (Equivalent to Two Years of Study in a Traditional Program)



Additional Investment Costs (Multiyear Investment)

In many programs, certain types of initial CBE investments extend beyond the first year. Even after CBE initiatives are launched, new degree programs are developed and technology investments continue. If additional curricular development and technology investments planned for the first and second years of operation are added to the initial-year investments, the total multiyear CBE investments range from \$6.3 million to \$11.0 million over three years. These multiyear investments generally represent non-recurring costs that are unrelated to scale; they are separate from the total operating costs to enroll students and deliver education, which rise as more students enroll.

WHAT DOES IT COST TO OPERATE THESE CBE PROGRAMS?

The CBE financial landscape changes once programs are launched. As with most new ventures, none of the recently launched CBE programs at the four institutions was immediately profitable. Alongside continued investment in infrastructure and new degree programs, institutions also incurred new costs related to instruction, admissions, and student services. These costs were accompanied by first-year enrollments averaging fewer than 200 students.

Most CBE study participants expect to draw a majority of their revenue from tuition. Some programs also planned to generate revenue from application fees or assessment fees. Programs at public institutions also benefited from external sources of financial support, including state support or system-level funding to offset operating losses.

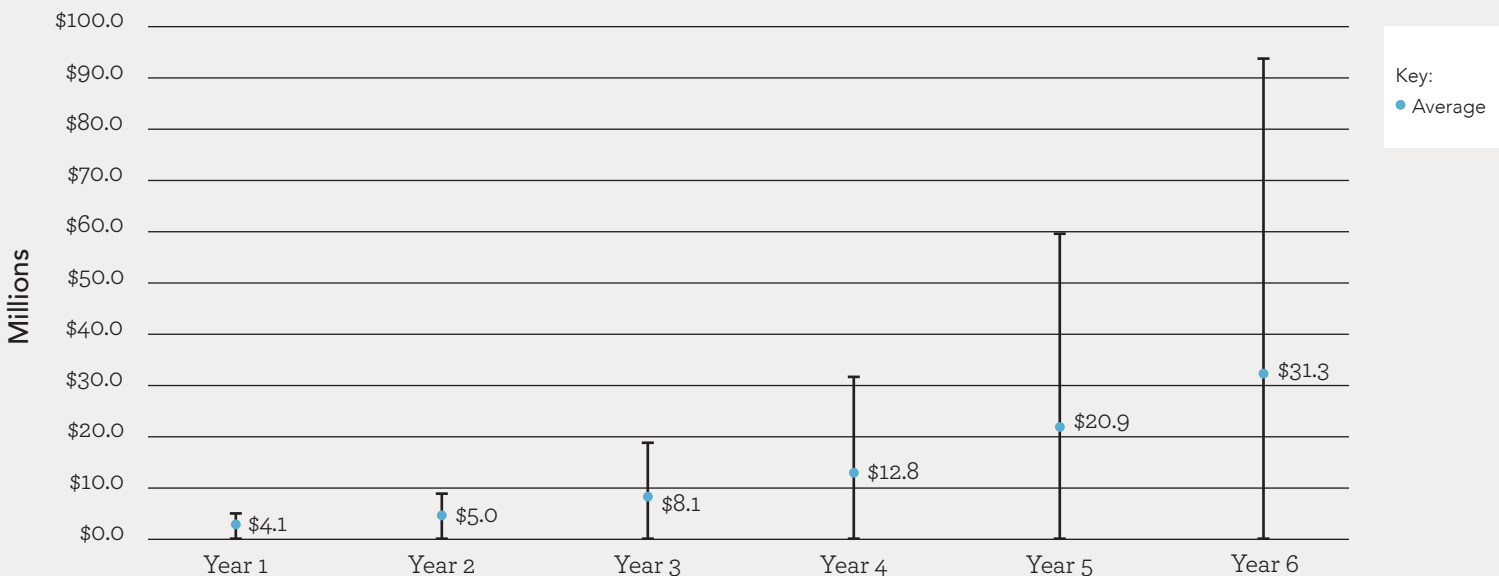
Ongoing Costs: Unit Costs, Breakeven, and Payback Periods

Average program spending during the first year of student enrollment was similar to the initial investment year, but it grew rapidly as more students enrolled and programs matured. During the first year of instruction, spending averaged \$4.1 million, or \$52,500 per student enrolled (See Figures 6 and 7). Total expenditures ranged from about \$800,000 to \$5.8 million, while per-student spending ranged from less than \$20,000 to more than \$100,000 per student. Because first-year enrollments did not generate enough tuition revenue for the CBE programs to fully cover their costs, net revenue losses averaged \$3.7 million, or \$49,400 per student, in the first year of operation (See Figure 8).

By Year Three, which includes projected data for most institutions, only one of the four CBE participants expects to break even and generate positive net revenue. By the fifth year of operation, three of the four programs in the study had become—or are expected to become—profitable. Average net revenue per student also turned positive, generating an average positive margin of \$200 per student.

FIGURE 6

Total CBE Expenditures, Four Institutions



In Year Six, the last year for which data are available or projected for all programs, spending is expected to continue to increase as a result of enrollment growth, averaging \$31.3 million. Net revenue is expected to average \$10.5 million. There was significant variance across institutions on both these measures, with net revenue in Year Six ranging from nearly -\$600,000 to \$33.9 million.

FIGURE 7

Average CBE Expenditure per Student, Four Institutions

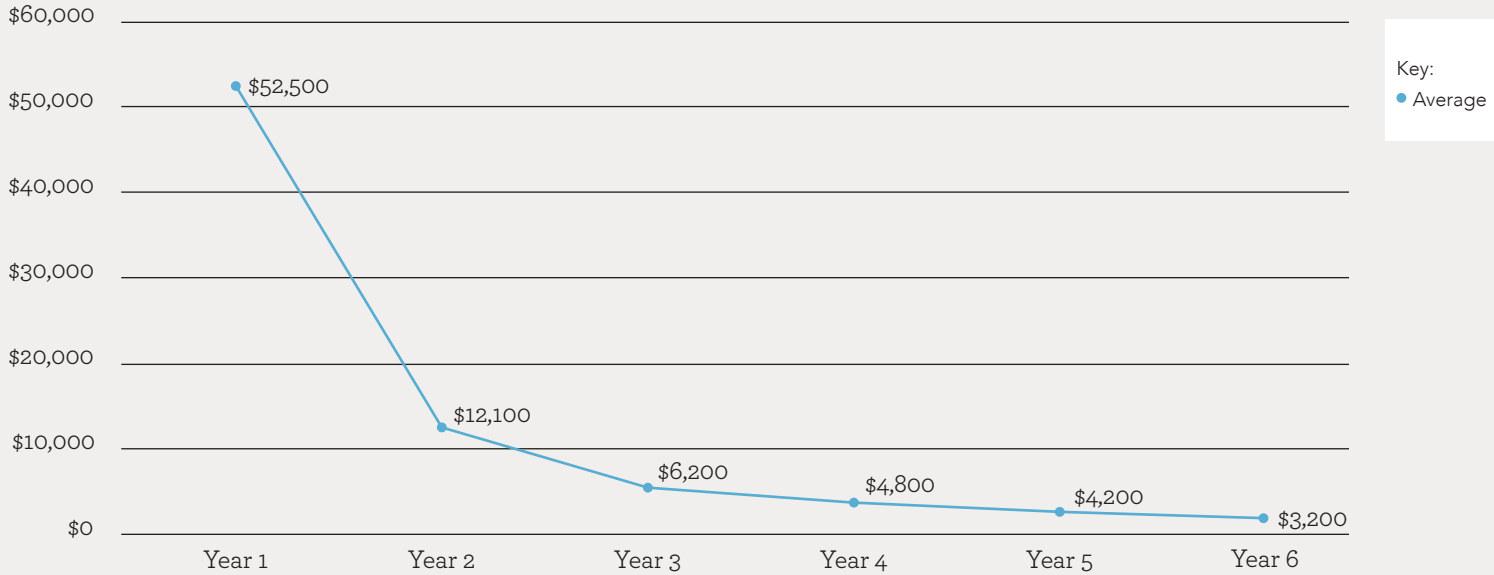
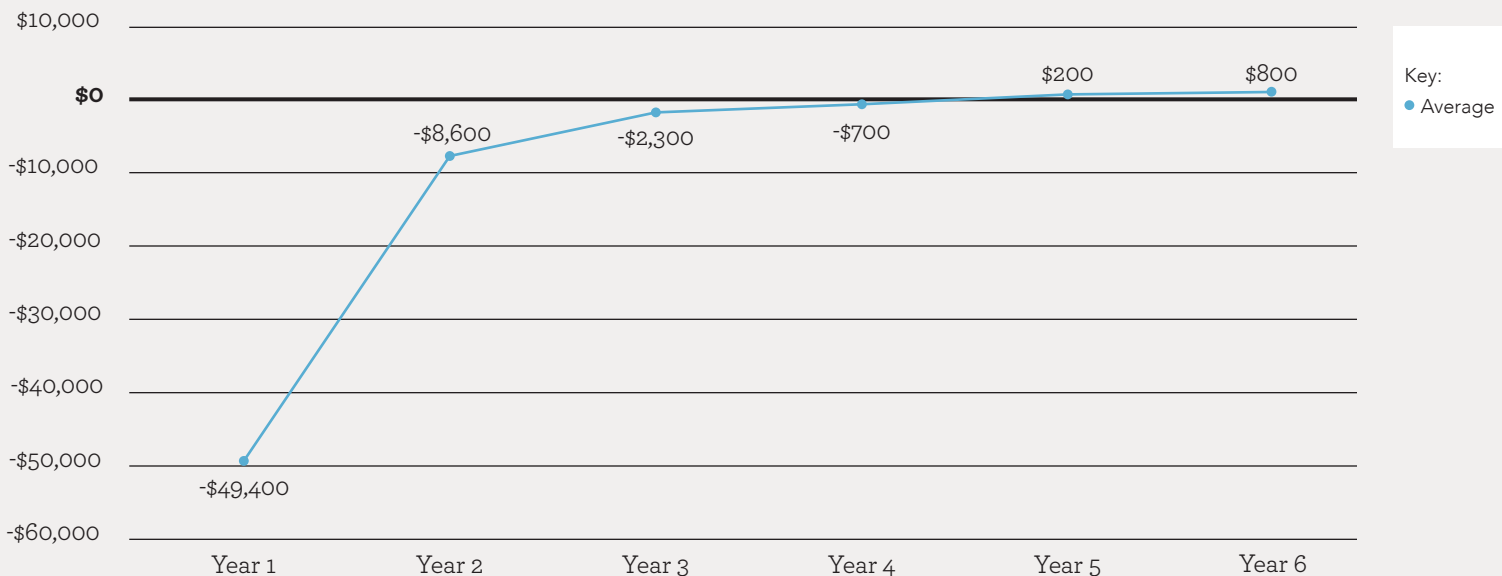


FIGURE 8

Average CBE Net Revenue per Student, Four Institutions



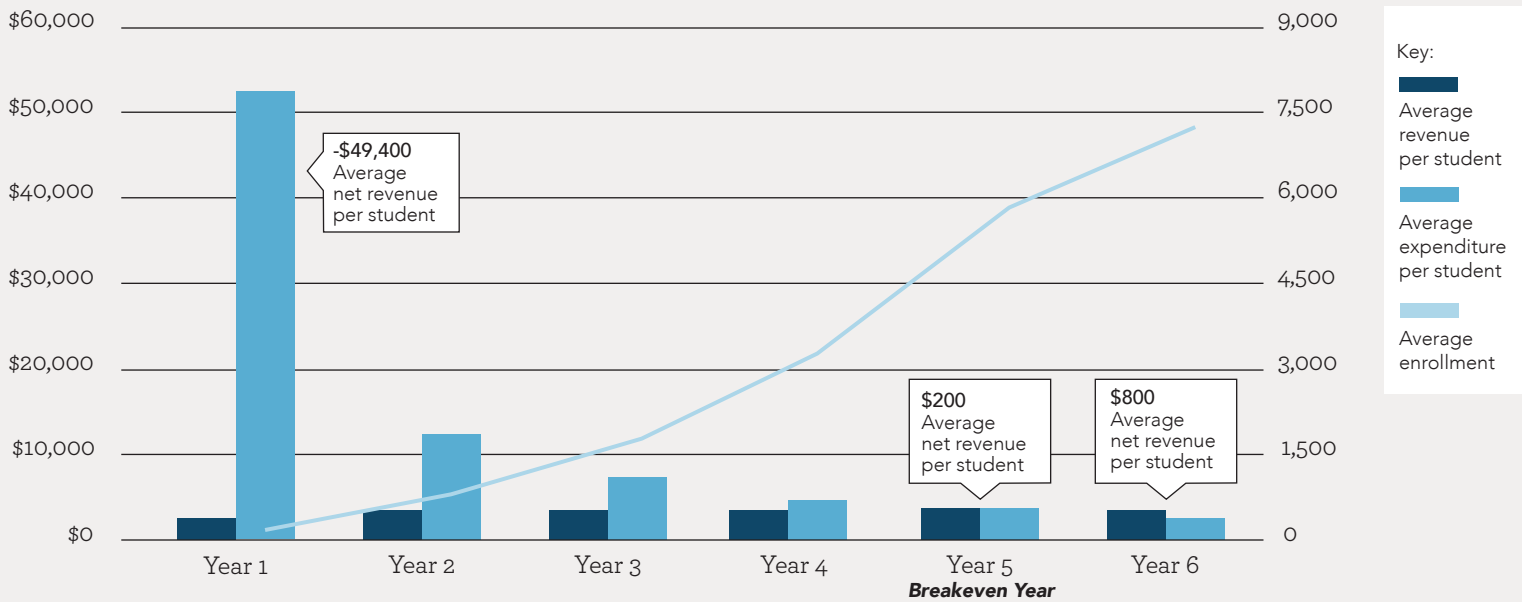
Much of the financial variance among the four institutions is related to actual or projected enrollment growth. On a per-student basis, the variance in spending and net revenue was much smaller compared to annual totals. Total expenditures per student averaged \$3,200 in Year Six, ranging from \$1,200 to \$5,200. The average positive margin per student is expected to be about \$800, with all institutions operating within a \$2,100 range.

Figure 9 shows the trends in per student revenues, expenditures, and enrollments in one illustration. Average expenditures per student are initially high because of low student enrollments, but they steadily decline as enrollments grow. Average revenue per student remains fairly steady because most study participants did not expect significant increases in tuition prices. The breakeven point—when annual per-student revenues exceed expenditures—occurs in the fifth year of operation, when enrollment averages just under 6,000 students.

Although a majority of the CBE programs expect to generate annual profits within five years, the payback period to recoup initial investments extends further. By the sixth year of operation, three programs still do not expect to generate enough total revenue to recoup their initial investments. However, one institution expects to recoup all of its costs by the fifth year of operation.

FIGURE 9

Average CBE Net Revenue per Student, Expenditure per Student, Enrollment, and Breakeven Year, Four Institutions



Note: The breakeven year reflects the first year that annual revenues per student exceed expenditures per student. The payback year (not shown) reflects the point where the total revenues since program launch exceed total expenditures (including initial investment and annual expenditures); the average payback in aggregate dollars occurs in Year Six (\$3.6 million).

CBE Ongoing Cost Drivers

Separating ongoing CBE costs by their main spending components—academic program, institutional support/service and technology—helps to illustrate the primary cost drivers as programs mature.

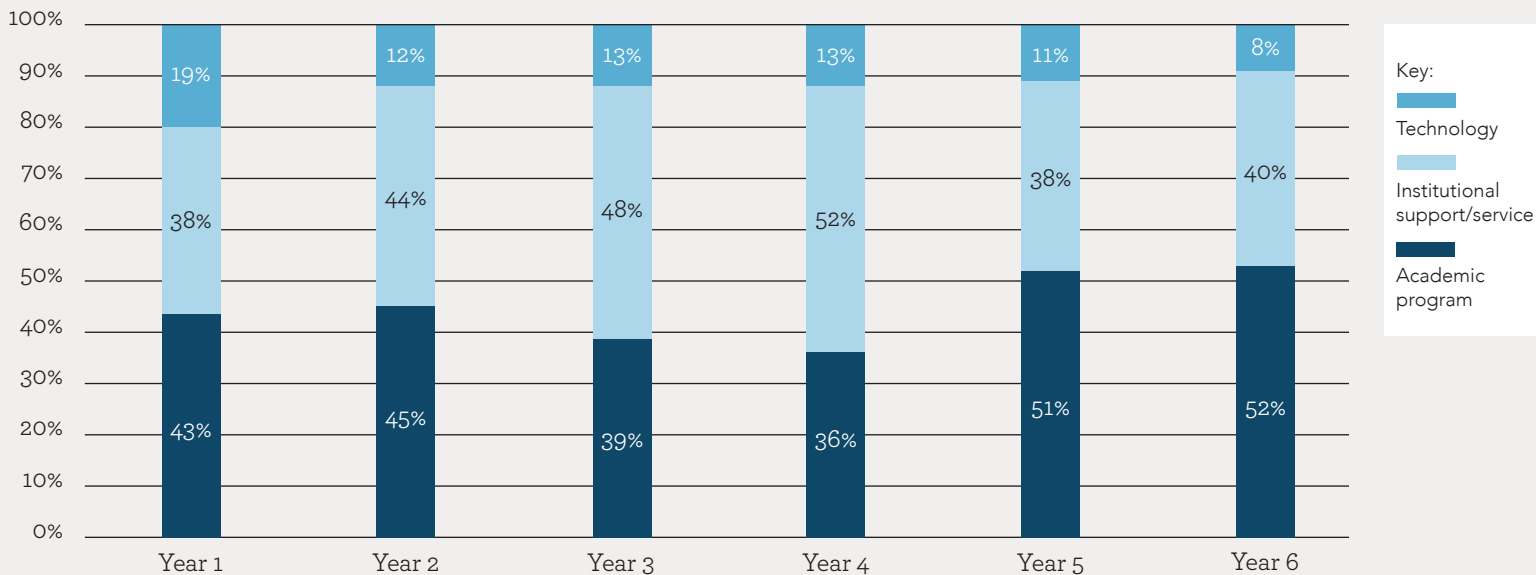
Initially, academic program expenditures represent the largest share of spending (43 percent on average). They then decline in the interim years before rising to account for more than half of all spending as programs mature (See Figure 10). However, these averages conceal variances, with initial academic program expenditures ranging from 25 percent to 62 percent of spending.

Institutional support and service initially account for the second-largest share of spending, but spending in this area increases—or is expected to do so—in subsequent years as marketing and recruitment efforts accelerate.¹⁸ Institutional support and service fluctuate between 40 percent and 50 percent of overall spending, on average.

Technology spending averaged almost 20 percent of total spending in the first year when institutions were continuing to make initial infrastructure investments. The technology share of spending decreased over time, averaging 8 percent by the sixth year of operation. Initially, technology spending varied widely among programs (7 to 38 percent in the first year) but narrowed considerably as programs matured (7 to 16 percent in Year Six).¹⁹

FIGURE 10

Average Share of CBE Spending, Four Institutions



¹⁸ In two programs, these cost increases are the result of increases in scale, but one program expects marketing costs per student to rise.

¹⁹ One institution was unable to provide separate estimates for technology investments; it is included in institutional support spending.

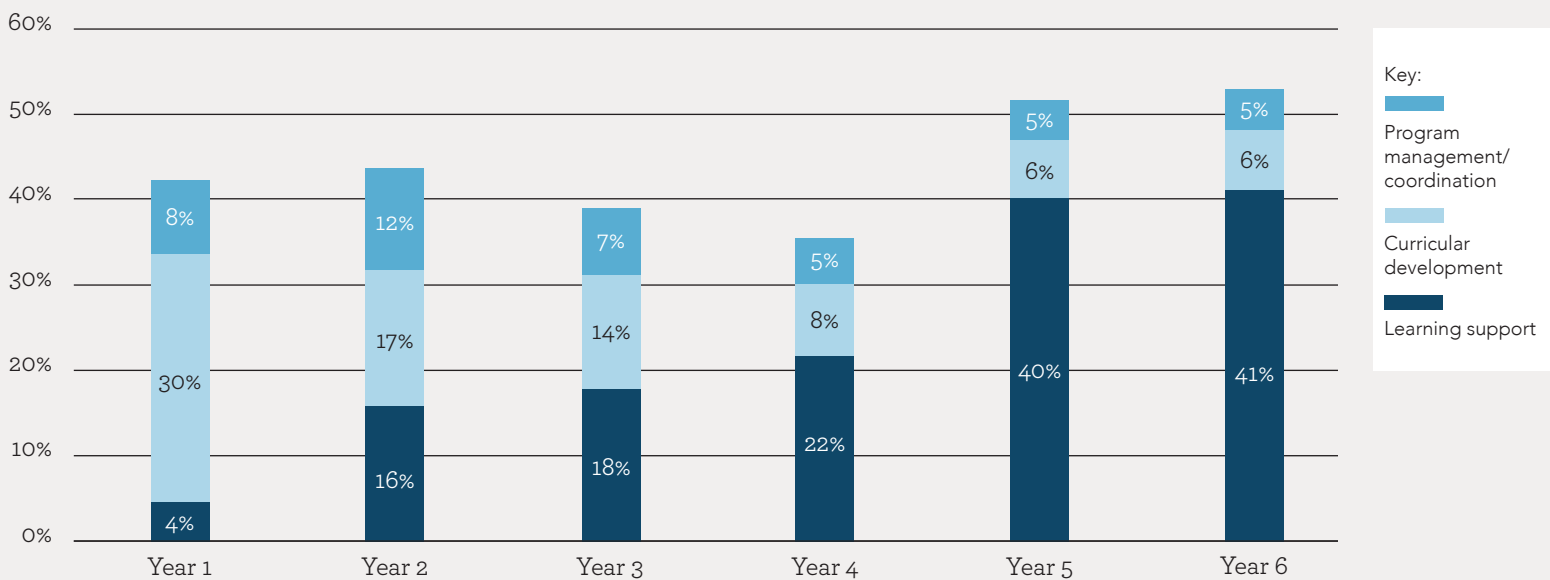
Academic Program

A closer examination of spending patterns within the academic programs shows they are consistent with expected activities in a burgeoning CBE initiative. In the early operating years, a sizable proportion of such program expenditures are directed toward curricular development, averaging 30 percent of total spending in the first year (See Figure 11). But as programs mature, the share of resources devoted to curricular development declined and spending on student learning supports increases—rising from 4 percent of total spending at program launch to a projected average of 41 percent at program maturity.

Program management and coordination accounted for a similar proportion of most CBE budgets. During the initial roll out, program management represented about 8 percent to 12 percent of total spending and is projected to decline to 5 percent as programs mature.

FIGURE 11

Average Share of CBE Spending on Academic Program Activities, Four Institutions



Learning support. Several of the institutions provided detailed cost information for different learning support activities, allowing a closer examination of the unbundled faculty model. At program maturity, about 57 percent of learning support resources were directed to mentoring faculty/learning outcomes assessors, on average, while the remaining 43 percent were spent on academic success coaches (See Figure 12). These proportions were generally consistent across the study years.

Only two of the four institutions used separate staff to assess learning. But information from these programs suggests they represent more than half of the spending attributed to mentoring faculty/learning outcomes assessors. This could reflect the emphases these CBE models place on faculty measuring student mastery and providing clear faculty guidance on areas that need additional student learning.

Institutional Support and Service

Institutional support and service activities are similarly organized in CBE and traditional college and university programs. Spending on general institutional support (e.g., senior staff, business operations, and other operating expenditures) averaged about one-quarter of total spending in the first year of operation, but declined as programs matured and resources increasingly were used to provide student learning supports (See Figure 13). There is significant variance across study participants, but in most programs the share of spending was higher in the early program years and was expected to decline over time. By the sixth year of operation, general institutional support accounted for only about 11 percent of total spending.

It may seem counterintuitive that the share of spending on marketing and recruitment was lower in the first year (7 percent) than in any other year. But in several institutions, the marketing budgets were expected to expand as more degree offerings were added and any potential technical or student support issues with early program rollout had been identified and resolved before aggressively scaling programs. At program maturity, almost 20 percent of total budgets are expected to go toward marketing and recruitment.

One of the smallest spending categories across all CBE program expenditures is the student services category (e.g., enrollment coaches, admissions, financial aid). Initially, only 5 percent of the total budget, on average, was spent on student service functions. Spending rises steadily across the years—or is projected to do so—as student enrollment increases. By the sixth year of operation, spending on student services is expected to average about 10 percent of total budgets.

FIGURE 12

Average Allocation of CBE Learning Support Spending, Year 6, Four Institutions

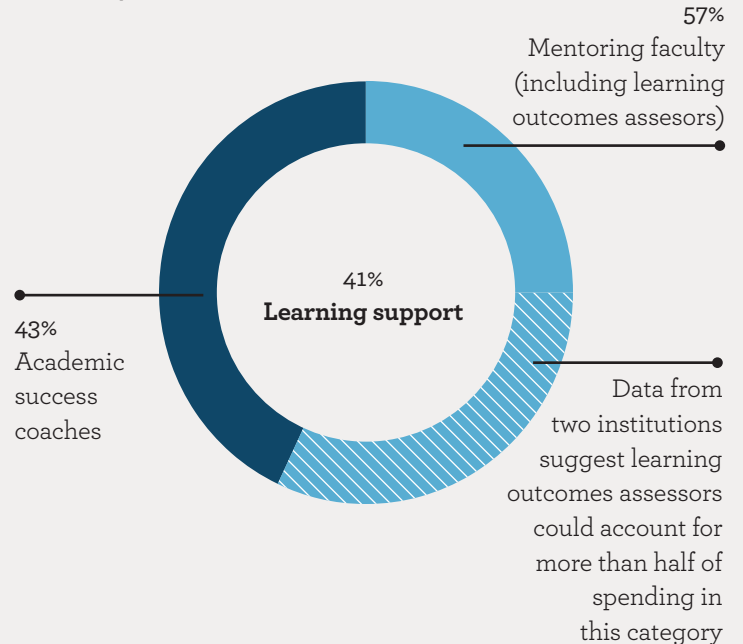
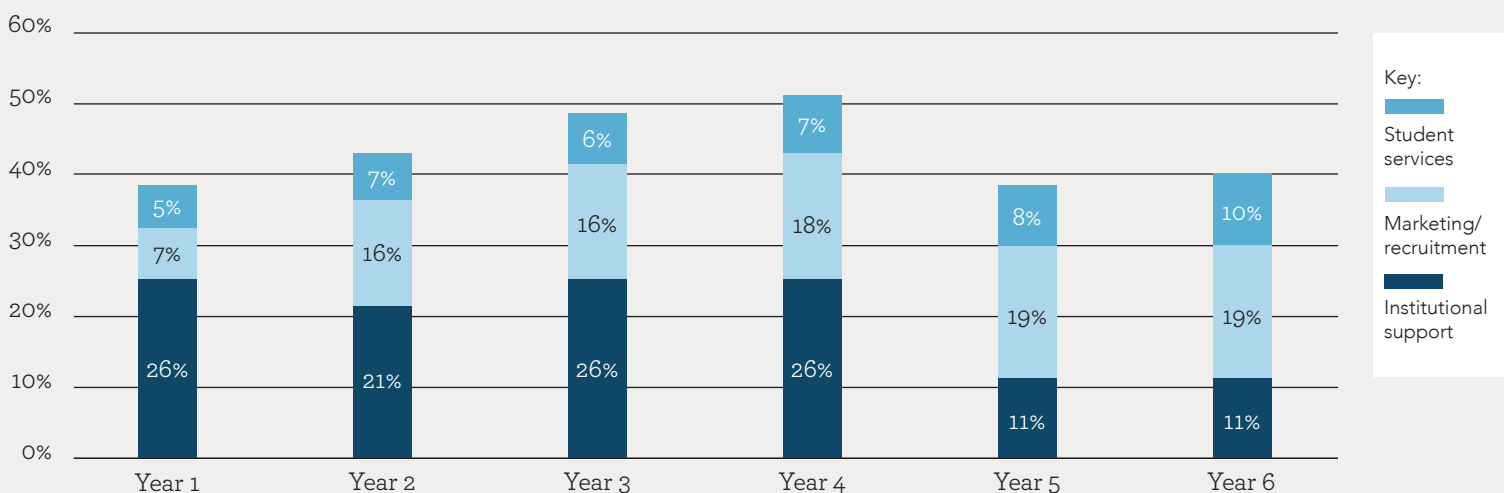


FIGURE 13

Average Share of CBE Spending on Institutional Support/Service Activities, Four Institutions



HOW DO COSTS OF THESE CBE PROGRAMS COMPARE WITH TRADITIONAL PROGRAMS?

The transformative business models adopted by CBE programs are expected to generate significant savings to institutions—and students—compared to traditional higher education. This section explores the extent to which those expected cost savings materialize by comparing the financial information from the four institutions we examined against three different categories of benchmark institutions:

- The four institutions' own data, which reflect costs associated with their traditional education models;
- Carnegie-sector²⁰ averages, which show the revenue and spending patterns of institutions similar to those offering CBE; and,
- Western Governors University, an established online competency-based learning institution in operation since 1997.

All benchmark comparisons use information about the four institutions' sixth year of CBE program operation to reflect spending patterns after the initial launch.

Benchmark Comparisons

Institutions spent significantly less per student in their CBE initiatives than in their traditional delivery models. Total spending per student averaged \$3,200 across the CBE programs and was nearly 50 percent lower, on average, compared to spending on education-related²¹ activities in these institutions' traditional programs (See Figure 14).

Spending reductions were widespread across different program functions. CBE program spending on academic program activities averaged \$1,500 per student and the combined spending on institutional support, marketing/recruitment, and technology averaged \$1,400 per student—reflecting average spending reductions of 29 percent and 43 percent, respectively, compared to traditional academic programs offered by their parent institutions.

Student services spending, which averaged \$300 per student across the CBE programs, showed the largest percentage reduction in spending (79 percent), but this also was the smallest spending category. However, student services typically encompass a broader range of services in support of traditional instructional programs, including, for example, student mental health counseling, intramural and/or intercollegiate sports, and academic advising. Advising is included as part of the academic delivery model in CBE programs, which essentially lowers student services spending. If spending on academic success coaches is moved into student services, it reduces the large cost savings observed in student services; this reclassification also lowers academic program spending even further.²²

QUICK FACT

» 50% lower

Total CBE spending per student was nearly 50% lower, on average, compared to the four institutions' traditional delivery models.

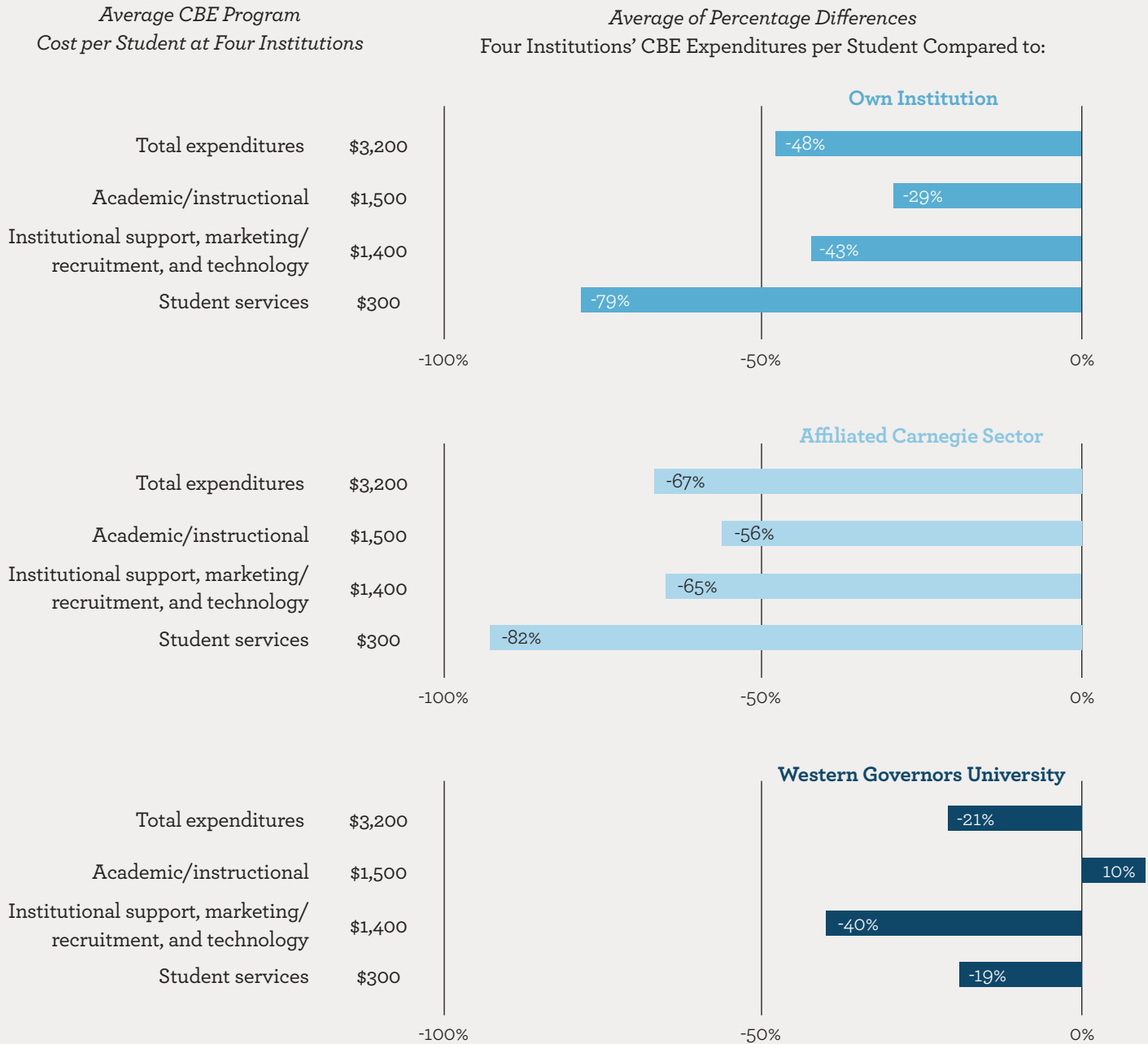
²⁰ The Carnegie category indicates the highest level of award an institution typically offers (e.g., associate degree, bachelor's degree, master's degree, or Ph.D.) and the sector identifies whether the institution is public, private nonprofit, or for-profit. Please see Appendix Table A3 notes for the Carnegie-sector category of each study participant.

²¹ Education and Related (E&R) spending includes only direct and indirect expenditures related to the educational mission (academic programming/instruction, student services, and a prorated share of institutional support, academic support, and operations and maintenance); spending on research, public service, and auxiliary enterprises is excluded.

²² Three institutions examined provided spending information on academic success coaches, allowing those expenditures to be moved from the CBE academic program to CBE student services to align more favorably with the way traditional instructional programs are structured. After CBE spending was reorganized, the average cost savings were similar in each of the three spending areas (about 44 percent lower in each area). But patterns varied across institutions; some of the programs expected larger academic cost savings while others expected larger savings in student service costs.

FIGURE 14

CBE Benchmarks: Four Institutions' CBE Spending per Student Compared to Each Institution's Traditional Credit Programs, Carnegie Sector, and Western Governors University



Note: Detail may not sum to total because of rounding.

A negative percentage indicates that the four institutions' CBE spending per student was less than the comparison group, on average, and a positive percentage indicates CBE spending was higher than the comparison group.

See Appendix Table A3 notes for additional information on benchmark definitions and comparison groups.

Data Source: Comparison data are from FY2013 and were drawn from the *Integrated Postsecondary Education Data System (IPEDS)* and the *Delta Cost Project IPEDS Database, 1987-2013*. CBE data reflect mature program estimates for Year Six of operation.

Similar spending reductions were observed when the CBE programs were compared with institutions in their affiliated Carnegie-sector categories. The average spending differences across programs at the four institutions were greater than or equal to those observed in comparisons with traditional programs offered by similar institutions. Total per-student spending on CBE is expected to be two-thirds lower than the Carnegie-sector averages.

Western Governors University (WGU) is a relevant benchmark because its business model is entirely about offering competency-based degree programs. WGU also is well established, having operated for nearly 20 years. However, WGU differs from the four institutions we examined in scale, serving more than 10 times as many students as mature CBE participants expect to on average. And because WGU is not part of a larger institution, it fully incurs costs that other institutions might share across their traditional credit-bearing and CBE programs, such as senior leadership or IT staff and services.

The variances between the four CBE programs we examined and WGU are smaller than comparisons involving CBE and traditional instructional models. However, average per-student expenditures across the four CBE institutions are 21 percent lower than at WGU. The largest cost variance occurs in institutional support, with CBE spending averaging 40 percent less than WGU. Academic program spending is 10 percent higher among the CBE programs examined than for WGU, which may reflect a scale advantage for WGU.

The net tuition revenue per student expected in the four institutions' CBE programs shows smaller relative differences against the benchmark groups than the total spending comparisons. Across the four institutions, net tuition revenue per student averaged \$3,700. The greatest variance was observed in comparisons with similar institutions, where net tuition revenue per student was about 50 percent lower, on average, in the CBE programs (See Figure 15). When the net tuition revenue expectations are compared against the four institutions' traditional academic programs and WGU only modest differences were observed, suggesting the revenue expectations are reasonable. The Carnegie-sector variance may reflect differential approaches in pricing and institutional aid strategies among institutions in their respective categories.

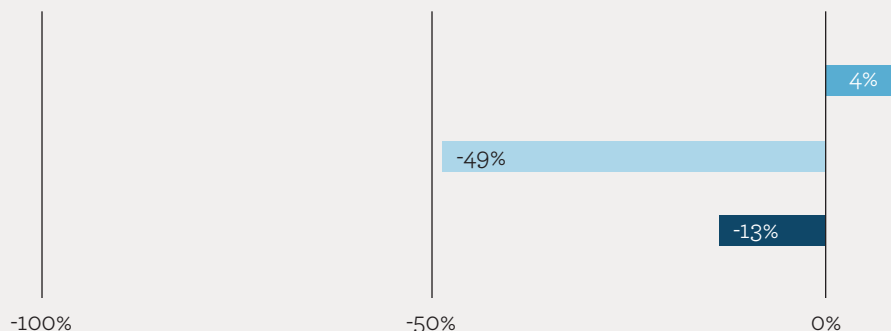
FIGURE 15

CBE Benchmarks: Four Institutions' CBE Net Tuition Revenue per Student Compared to Each Institution's Traditional Credit Programs, Carnegie Sector, and Western Governors University

Four Institutions' CBE Net Tuition Revenue per Student Compared to:

- Own Institution
- Affiliated Carnegie Sector
- Western Governors University

Average of Percentage Differences



Average CBE Net Tuition Revenue per Student at Four Institutions: \$3,700

Note: A negative percentage indicates that the four institutions' CBE net tuition revenue per student was less than the comparison group, on average, and a positive percentage indicates CBE net tuition revenue was higher than the comparison group.

See Appendix Table A3 notes for additional information on benchmark definitions and comparison groups.

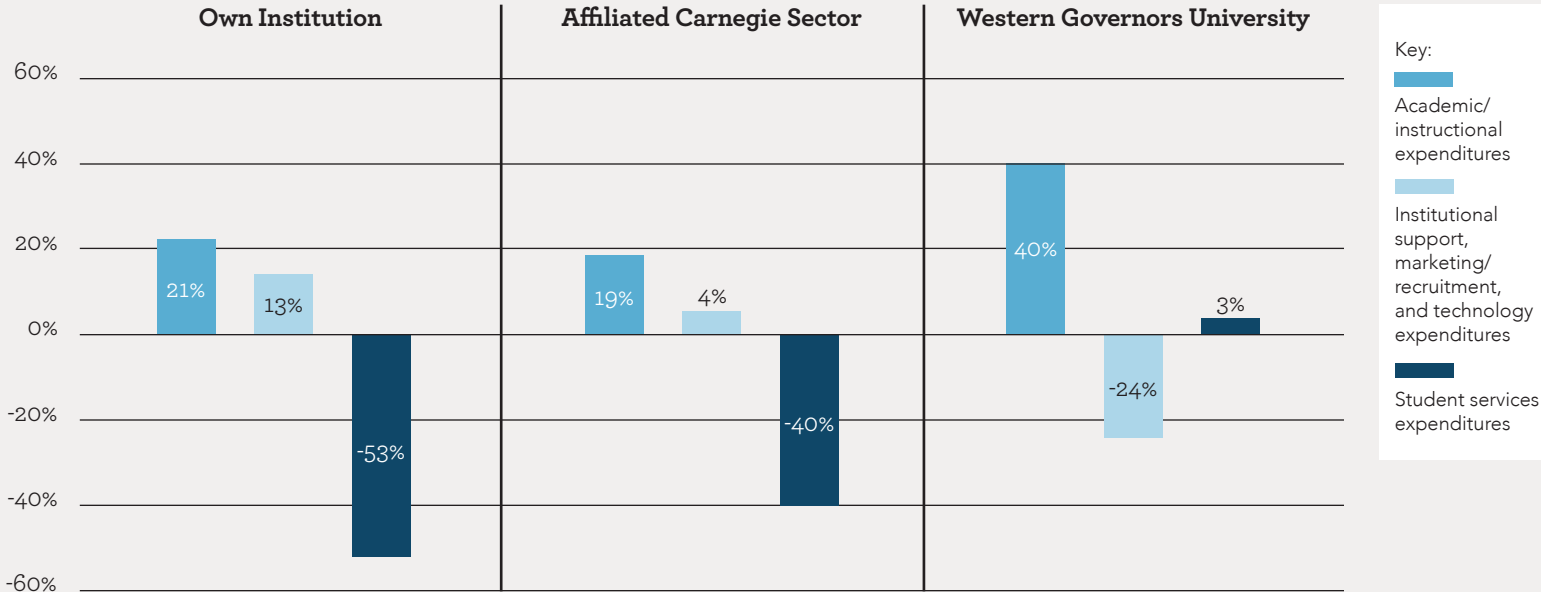
Data Source: Comparison data are from FY2013 and were drawn from the Integrated Postsecondary Education Data System (IPEDS) and the Delta Cost Project IPEDS Database, 1987-2013. CBE data reflect mature program estimates for Year Six of operation.

CBE programs also have shifted the way resources are distributed. When compared against traditional credit-bearing programs within their own institutions or against comparable Carnegie-sector institutions, the four institutions offering CBE programs directed larger shares of spending to academic programming and lower shares to student services, with modestly higher institutional-support-related costs (See Figure 16). Compared with WGU, mature CBE programs at these four institutions expect to allocate an equally small proportion of spending to student services but a larger share of their budgets for academic programming. They will also spend less on institutional-support activities. Other estimates (not shown) suggest these shifts in spending are largely related to unbundling and changing faculty roles.²³

These benchmarks suggest new CBE delivery models could significantly reduce costs in relation to traditional education models. However, the narrower differences that persist when compared with the more-established Western Governors University model suggest the financial models upon which these programs have been built could be difficult to achieve and sustain. Even with its significant advantage in scale, WGU has not been able to drive costs down to a level expected by the four institutions in this study.

FIGURE 16

CBE Benchmarks: Four Institutions' Change in the Distribution of CBE Spending per Student Compared to Each Institution's Traditional Credit Programs, Carnegie Sector, and Western Governors University



Note: Detail may not sum to total because of rounding.
 A negative percentage indicates that the four institutions' share of total CBE spending in the designated category was less than the comparison group, on average, and a positive percentage indicates the CBE share of spending in the designated category was higher than the comparison group.
 See Appendix Table A3 notes for additional information on benchmark definitions and comparison groups.
 Data Source: Comparison data are from FY2013 and were drawn from the Integrated Postsecondary Education Data System (IPEDS) and the Delta Cost Project IPEDS Database, 1987-2013. CBE data reflect mature program estimates for Year Six of operation.

²³ For three institutions, alternative spending distributions were derived after moving the advising function performed by academic success coaches from the CBE academic program to CBE student services (See Footnote 22). After this reallocation, comparisons against the benchmark groups show CBE programs spending smaller proportions of their budgets on academic program expenditures and a larger proportion on student services. These shifts suggest that expected cost savings are a result of shifting faculty roles.

STRATEGIC FINANCE DECISIONS THAT AFFECT THE BUSINESS MODEL

As colleges and universities evaluate opportunities to create CBE programs, several critical strategic finance questions should be considered. Responses to these questions are likely to significantly affect the ability of institutions to invest in achieving quality student outcomes and establishing sustainable business models. These questions include:

1. Will the institution create a model that holds learning constant and allows time to vary (such as through Direct Assessment)? Or, will the institution take a credit-bearing course model and map program-level learning outcomes and competencies to it?
2. How will the institution balance price, efficiency, and scale questions in setting expectations and moving toward a sustainable business model? How will making low price the primary driver of the business model affect other key levers, such as the unbundling of traditional roles and the numbers of students who will need to be educated for the program to break even?
3. How will the CBE design initiative support a reevaluation of learning activities and faculty roles to produce high-quality learning and student success?
4. What is the institution's ability to invest in new technology to support learning management and student information? Given the rapid changes in technology, how will the institution keep this technology current?
5. How long is the institution willing and able to support a new CBE program until breakeven is achieved, and at what cost?
6. What opportunities exist for federal, state, and local governments to promote and fund shared services that would support multiple institutions at reduced costs?

FORMATIVE CONCLUSIONS

CBE programs at these colleges and universities appear to provide opportunities to bend the higher education cost curve, producing savings for institutions and students. This reduction in expense, however, is dependent on the ability of these institutions to realize significant increases in efficiency in creating and delivering such programs, combined with enrolling many more students. Although existing CBE institutions are optimistic regarding their ability to achieve these efficiencies and economies of scale, the introductions of other innovative business models in higher education have met with difficulty in achieving similar goals.

Comparisons to Western Governors University's model, which benefits from more than a tenfold advantage in scale compared to the four programs in this study, also raise questions about the four institutions' growth projections.

Despite such challenges, competency-based education clearly represents an opportunity for higher education to break away from traditional, higher-cost instruction models that have proven resistant to change. Under the right conditions, based on this examination of a limited set of institutions offering CBE programs, competency-based education appears to offer promise for lowering costs to institutions and prices students pay for their educations.

Institutions electing to invest in CBE, however, will need to adopt a patient path. Building new, non-term based CBE programs from the ground up requires higher levels of investment than creating CBE programs that more closely adhere to traditional academic terms and the credit hour. In addition, the experiences of these four institutions indicates the time required to achieve breakeven *and* to recapture cumulative operating deficits could be significant. Although it may be possible for new entrants to the CBE market to create programs with less up-front investment, institutions should carefully project their start-up investment and compare this to their institutional capacity to support the investment and generate required returns.

The success of institutions pursuing more-aggressive investment strategies in totally new CBE programs will depend on achieving scale with lower costs while significantly improving student retention to further reduce their spending per student completion. The required levels of design and implementation effort, financial investments, and time to breakeven indicate CBE is not a quick-and-easy moneymaker. Institutions should assess their willingness to support CBE programs until they can become sustainable, both in terms of the dollars required and the required time and effort. A failure to understand these required levels of investment could prompt an early exit from CBE initiatives and losses of both time and money. However, the potential payoff in terms of increased student retention and progression and related reductions in recruitment, academic, and other expenses could make more-integrated, non-term based CBE programs worth pursuing.

Institutions with more-limited financial capacities than these four institutions should consider a carefully staged approach to developing CBE programs. Developing learning outcomes and competency assessments for existing curricula could serve as an introduction to CBE, although it does not fully tap into the non-term based potential of this pedagogy to allow progress based on learning mastery. However, such a cautious approach would give vendors additional time to develop technology systems suitable for non-term CBE and also would buy time to resolve complicated Title IV federal student aid regulatory issues around how to pay for non-term based CBE.

Regardless of the pace of CBE initiatives, colleges and universities should be aware of CBE's potential disruptive capability and resulting effects on long-time higher education business models. Competency-based education is a potential "game-changer" because it focuses on how students learn, retain, and use their knowledge—not on how much time they spend in the classroom. CBE programs combine state-of-the-art curriculum, creative learning opportunities, clear learning objectives, authentic "real-life" assessments, and a full array of support services so that, step by step, students can improve their knowledge, skills, and abilities.

...competency-based education clearly represents an opportunity for higher education to break away from traditional, higher-cost instructional models that have proven resistant to change.

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APPENDIX

Table A1: C-BEN Member Institutions

Antioch University	Davenport University	Northern Arizona University	University of Maine at Presque Isle
Brandman University	DePaul University	Purdue University	University of Maryland University College
Broward College	Excelsior College	Rasmussen College	University of Michigan
Capella University	Kentucky Commonwealth College	Salt Lake Community College	University System of Georgia
Central New Mexico Community College	Kentucky Community & Technical College System	Southern New Hampshire University	University of Texas System
Charter Oak State College	Lipscomb University	South Texas College	University of Wisconsin-Extension
City University of Seattle	Lord Fairfax Community College	Southwestern College	Walden University
Concordia University (Wisc.)	Los Angeles Trade-Technical College	Texas A&M-Commerce	Westminster College
Danville Community College		Thomas Edison State University	

Table A2: Detailed CBE Program Offerings of Study Participants

	<i>UW Flexible Option</i>	<i>Learn on Demand</i>	<i>MyPath</i>	<i>Tempo Learning</i>
<i>Institution/System</i>	University of Wisconsin System	Kentucky Community & Technical College System (KCTCS)	Brandman University (Chapman University System)	Walden University (Laureate Education)
<i>Programs Offered in 2014-15</i>	<p>AA/AS</p> <ul style="list-style-type: none"> • Associate of Arts and Science <p>BS</p> <ul style="list-style-type: none"> • Nursing, RN to BSN • Biomedical Sciences Diagnostic Imaging • Information Science and Technology <p>Certificate</p> <ul style="list-style-type: none"> • Business and Technical Communications • Global Skills • Sales • Project Management 	<p>AA/AS</p> <ul style="list-style-type: none"> • Associate in Arts • Associate in Science <p>AA/AS/Certificate</p> <ul style="list-style-type: none"> • Business Administration Systems • Computer and Information Technologies • Marine Technology • Medical Information Technology <p>Certificate</p> <ul style="list-style-type: none"> • Nursing – Nurse Aide 	<p>BBA</p> <ul style="list-style-type: none"> • Business Administration, Management, and Organizational Leadership • Information Systems Management • Supply Chain Management and Logistics • Marketing 	<p>MS</p> <ul style="list-style-type: none"> • Early Childhood Studies <p>Graduate Certificate</p> <ul style="list-style-type: none"> • Early Childhood Administration, Management, and Leadership

Table A3: CBE Benchmarks: Comparisons to Each Institution’s Traditional Credit Programs, Carnegie Sector, and Western Governors University

		Four Institutions’ CBE Programs Revenue/Expenditures Compared to:		
CBE Financial Category	CBE Programs at Four Institutions	Own Institution	Affiliated Carnegie Sector	Western Governors University
	Per student Average, Year Six	Average of Percentage Differences Across Study Participants		
Net Tuition Revenue	\$3,700	+4%	-49%	-13%
Total CBE Expenditures ²	\$3,200	-48%	-67%	-21%
Academic/Instructional Program Expenditures	\$1,500	-29%	-56%	+10%
Institutional Support, Marketing/Recruitment, and Technology Expenditures ¹	\$1,400	-43%	-65%	-40%
Student Service Expenditures	\$300	-79%	-82%	-19%
Share of Total Spending ³				
Academic/Instructional Program Expenditures	48%	+21%	+19%	+40%
Institutional Support, Marketing/Recruitment, and Technology Expenditures	43%	+13%	+4%	-24%
Student Service Expenditures	10%	-53%	-40%	+3%

Detail may not sum to total because of rounding.

¹ Benchmark is the combination of institutional and academic support.

² Benchmark is Education and Related (E&R) spending, which includes expenditures on academic programming/instruction, student services, and a prorated share of overhead (institutional support, academic support, and operations and maintenance).

³ The percentage shares in Appendix Table A3 are slightly different from those shown in Figure 10 to Figure 13 because of methodological differences.

The shares in Appendix Table A3 are based on the average cost per student; the shares in Figures 10 to 13 are based on each institutions distribution of total spending because per-student spending was unavailable in select years.

Note: CBE data reflect mature program estimates for Year Six of operation. Comparison data are from FY2013 and were drawn from the *Integrated Postsecondary Education Data System (IPEDS)* and the *Delta Cost Project IPEDS Database, 1987-2013*.

For institutions that are part of a larger system, the institutional comparison group includes only those colleges and universities that are participating in the CBE initiative.

For the sector comparison, each initiative was compared against its relevant Carnegie-sector category (KCTCS *Learn on Demand*: public 2-year institutions;

UW Flex: public nonresearch 4-year institutions; *Brandman MyPath*: private master’s institutions; *Walden Tempo Learning*: private for-profit 4-year institutions).

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ABOUT rpk GROUP

rpk GROUP is a leading consulting firm in higher education, supporting colleges and universities with their growth strategies by focusing on mission, market and margin opportunities.

Key areas of focus include academic portfolio and efficiency reviews, financial modeling for new initiatives, administrative services evaluation, the creation of resource allocation processes, and business model development to support strategic and facility master planning. The rpk GROUP team operates nationally and internationally.

rpk GROUP's work has involved traditional institutions of higher education, as well as the creation of new institutions and alternative learning and business models. Through this work, rpk GROUP has become a leading voice in the development of a new business model for higher education, working in partnership with institutions and foundations throughout the higher education sector.