

---

# COMPETENCY-BASED LEARNING

## A REPORT BY THE UNIVERSITY SENATE AD HOC COMMITTEE

### JANUARY 2017

#### EXECUTIVE SUMMARY

The University Senate leadership charged an *ad hoc* Committee on Competency-Based Education (CBE)

to study whether it would recommend that Auburn University take the necessary steps to begin offering academic credit for competency-based education. The CBE Committee is further charged to issue a final report that includes either a recommendation to proceed, identifying specific degree programs that would appropriately be served by a CBE option; or a recommendation not to pursue CBE at this time. If the committee concludes that some form of CBE would be beneficial to Auburn University, the final report should take the form of a proposal that includes specific recommendations to be considered by the University Senate. A preliminary report should be presented to the Senate Executive Committee at a meeting scheduled for February 2, 2017. (*charging memo, July 8, 2016*)

The committee was chaired by Constance Relihan, Associate Provost for Undergraduate Studies, and included the following faculty and professional staff members: Donald Mulvaney (College of Agriculture), Erica D. Kierce (School of Nursing), Kelley M Noll (School of Nursing), Katie Boyd (Office of Academic Assessment), Shawndra Bowers (AuburnOnline), Margaret Marshall (Office of University Writing), Toni Carter (RBD Library), Tony Cook (Extension/4-H), Jimmy Lawrence (HCOB), and Elaine Coleman (Vet Med).

The group met biweekly to conduct its work. Members also interviewed individuals on and off campus and shared materials electronically. Tony Cook developed a Sharepoint site that served as a repository for materials gathered by committee members.

#### CONCLUSIONS:

Considerable confusion exists in the definitions of Competency-Based Education. The committee distinguished between the theoretical or teaching-focused goals of determining what students know and can do from the institutional structures and processes that support alternatives to traditional classroom-based, credit hour driven credentialing. We note that many of the goals associated with CBE – serving diverse populations of students in a flexible manner, providing employers with evidence of skills acquired, and enhancing the revenue streams for higher education – are achievable through hybrids or other means of instruction like online courses rather than uniquely requiring CBE programs. Since our charge specifically asks for recommendations about “offering academic credit for CBE,” we set aside alternative credit opportunities, like non-academic certificates, digital badges, or recognizing competencies demonstrated through ePortfolios. We found little evidence that institutions like Auburn are engaged in successful CBE programs, though many appear to be considering it in the same way that the

formation of this committee might be reported as evidence of “considering.” Finally, we found many challenges to CBE, especially the purest form of CBE that relies on direct assessment. Those challenges are detailed below.

After much investigation and considerable discussion, this committee concluded that we did not recommend the creation of the purest forms of CBE, which would require institutional-level support and have a mostly negative impact on existing university units such as the Registrar, the Miller Writing Center, and academic support units; it would create complications for institutional accreditation and student financial aid eligibility with little evidence of improvement in student success or financial benefits. The committee also found no demonstrated interest in or need for such programs on the Auburn University campus. The committee was more neutral, however, about CBE-type teaching strategies or hybrid programs that might be developed by programs interested in pursuing them. We note that hybrid versions of CBE, including credit by exam or other PLA programs, also carry with them costs and consequences that should be carefully considered before they are proposed. Such programs would also have to pass through the review process. Online learning or short-term instruction (like workshops) that do not result in a degree or official credit-bearing certificate may be better solutions to meet specific needs, and mechanisms for offering such limited-scope instruction are already available to departments and academic support units.

Theoretically, CBE appears to be a great idea – shifting the emphasis from what is taught to what is learned, and it presents new opportunities for certain learners whose educational needs might not otherwise be met. However, it is the opinion of the committee that in terms of practicality, the development and implementation of an effective CBE program – particularly one that utilizes direct assessment – takes a tremendous amount of commitment, time, and effort to prepare the necessary administrative policy, regulatory framework, and technological support structures. Nonetheless, with the work currently being done at the university to launch and support fully online undergraduate degree programs, some changes in policy and infrastructure systems could warrant re-examining institutional readiness for CBE from time-to-time.

## WHAT IS COMPETENCY-BASED EDUCATION?

Defining competency-based education (CBE) is a difficult task, especially since there many related terms used interchangeably when describing CBE programs. Outcomes-based, performance-based, active, personalized, and adaptive learning are all frequently used expressions for what may be a part of the instructional approach in a CBE program, but they can also be used separate and apart from one as well (EAB, 2015). There are also several terms related to evaluation measures and awarding credit, including portfolios, authentic assessment, prior learning assessment (PLA) and direct assessment (DA), which may or may not be used in a CBE program (EAB, 2015). To further complicate matters, there is no widespread agreement on how to even determine “competency” as compared with “mastery” or “learning outcome.” Table 1 provides a few descriptions of the key terms addressed in this report associated with CBE from differing perspectives.

<b>Table 1. Key Terminology Associated with Competency-Based Education</b>			
	<b>Federal (USDOE)</b>	<b>Accreditation (SACSCOC)</b>	<b>Academic Literature</b>
<b>Competencies</b>	The set of expectations that describes what a student should know and be able to do.	A clearly defined and measurable statement of the knowledge, skill, and ability a student has acquired in a designated program.	Well-defined skills students need to possess to demonstrate learning, show workplace readiness, and complete credential programs (EAB, 2015).
<b>CBE</b>	An innovative approach in higher education that organizes academic content or delivery according to competencies – what a student knows and can do – rather than following a more traditional scheme, such as by course.		An approach that emphasizes mastery of knowledge and skills regardless of the amount of time required and the method chosen to achieve mastery (Quality Matters, 2014).
<b>Competency-based program</b>	<p>1) A program that is organized by competency, but measures student progress using clock or credit hours, is a CBE program, but not a direct assessment program.</p> <p>2) In a direct assessment program, student progress is measured solely by assessing whether the student can demonstrate that he or she has a command of a specific subject, content area, or skill, or can demonstrate a specific quality associated with the subject matter of the program without a specified level of educational activity.</p>	<p>A program that is outcome-based and assesses a student’s attainment of competencies as the sole means of determining whether the student earns a degree or a credential.</p> <p>Such programs may be organized around traditional course-based units (credit or clock hours) that students must earn to complete their educational program, or may depart from course-based units (credit or clock hours) to rely solely on the attainment of defined competencies.</p>	An academic degree program in which learners accumulate a series of competencies that are documented, proceeding at their own pace rather than through successful completion of scheduled courses and accumulation of credit hours (Quality Matters, 2014).

There is neither a consensus among academics about the constitution of CBE, nor an official Federal definition; in general, CBE can be described as “an outcome-based approach that incorporates modes of instructional delivery and assessment efforts designed to evaluate mastery of learning by students through their demonstration of the knowledge, attitudes, values, skills, and behaviors required for the degree sought” (Gervais, 2016). CBE programs are often designed to build consensus with employers and improve alignment of training with industry needs (North Carolina CBE Project, 2016).

The CBE approach refocuses teaching and learning around competencies, emphasizes the application of learning, and stresses the mastery of skills and concepts, rather than credit hours or seat time, to determine progress towards degree completion. For example, a student might complete an undergraduate CBE bachelor's degree by demonstrating mastery of 95 competencies rather than completing 120 credit hours of course work. CBE students, who often come to the programs with prior work or life experience (e.g., veterans, underemployed, dislocated workers) progress at their own pace (Eduventures, 2015a).

The assessment of mastery in CBE programs can take several forms, including formal assessments of prior learning, and automated evaluations of online coursework; mastery can be measured directly through tests, projects, or other assignments (CIC, 2015; EAB, 2015). When discussing CBE, people are typically referring to its most explicit form, direct assessment.

A direct assessment program is an instructional program that, in lieu of credit hours or clock hours as a measure of student learning, utilizes direct assessment of student learning, or recognizes the direct assessment of student learning by others. The assessment must be consistent with the accreditation of the institution or program utilizing the results of the assessment. Direct assessment of student learning means a measure by the institution of what a student knows and can do in terms of the body of knowledge making up the educational program. These measures provide evidence that a student has command of a specific subject, content area, or skill or that the student demonstrates a specific quality such as creativity, analysis or synthesis associated with the subject matter of the program. Examples of direct measures include projects, papers, examinations, presentations, performances, and portfolios. (EAB, 2014)

However, it is possible to integrate competency-based approaches into traditional academic programs and create new learning environments based on demonstrated proficiency (RPK Group, 2016). A recent study by WICHE Cooperative for Educational Technologies (WCET) identified "early adopters" of CBE as utilizing either course-based models or direct assessment models (Book, 2104; USDOE, 2016). Currently, there exists a continuum of ways in which institutions are structuring their CBE programs (see Figure 1). Most are using credit-hour equivalencies and blended models to work within the parameters of the current federal and accreditation policies (EAB, 2015; Eduventures, 2015b; Everhart & Bushway, 2014; Klein-Collins, 2012).

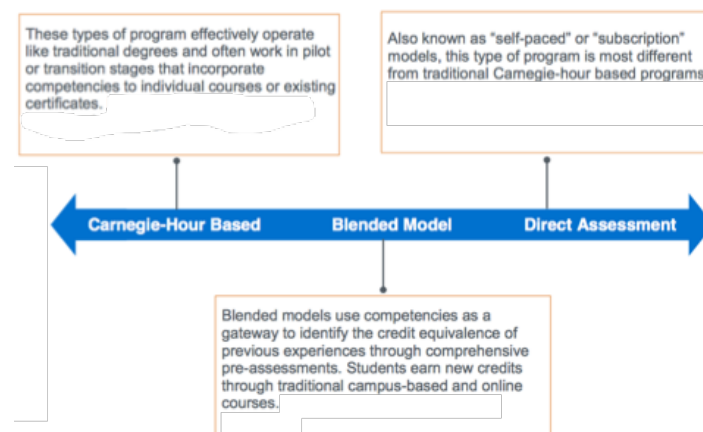


Figure 1: Key Distinctions between Approaches to Competency-Based Education (EAB, 2014)

Institutions often first incorporate competencies into existing courses and programs to gain institutional and faculty support and to determine the demand for competency-based programs. Many variables in course-based CBE programs, such as accreditation and infrastructure, require few new resources and are easy to implement because they follow existing patterns, have lower start up costs, and take less time to develop.

The U.S. Department of Education defines competency-based learning, for policy-making purposes, as “an innovative approach in higher education that organizes academic content or delivery according to competencies – what a student knows and can do – rather than following a more traditional scheme, such as by course” (USDOE, 2016). CBE programs may be “pure” in the sense that they are completely untethered to traditional definitions of the credit hour or the clock hour. The “direct assessment” involves specifically measuring a student’s knowledge and skills to the exclusion of credit hour or seat time elements. The DOE recognizes hybrid forms of CBE in which the traditional credit hour may be used in conjunction with pedagogical strategies that emphasize competency of student learning outcomes over the traditional means of determining course completion.

## DIGITAL BADGES/MICRO-CREDENTIALS

A relatively recent development that provides a digital form of recognizing or acknowledging learning achievement is awarding digital badges. As stated in a white paper referenced on the Badge Alliance website, “A badge is a symbol or indicator of an accomplishment, skill, quality or interest.” Further, “A ‘digital badge’ is an online record of achievements, tracking the recipient’s communities of interaction that issued the badge and the work completed to get it” (Badge Alliance/Why Badges, 2012). A more recent approach refers to digital forms of acknowledging learning achievement as micro-credentials. Digital Promise (<http://digitalpromise.org/>) has introduced “an innovative system of micro-credentials to recognize educators for the skills they learn throughout their careers” that ultimately leads to a digital badge. This approach enables educators to learn the competencies needed to implement system-wide goals, while at the same time also providing a framework for professional development, and permitting classroom artifacts to be included as part of their day-to-day implementation of the desired process.

Digital badges have been used to certify competencies. An example of this can be seen in the work done at Brandman University, which worked with Credly to “enable learners to attain, manage, and share portable digital badges and credentials earned through Brandman’s online competency-based degree programs” (Brandman University Teams Up, 2015). Once again to its credit, CBE in this context allows for connecting content with applied activity, which is often lacking in traditional educational programs where content coverage is the primary outcome. The promotion of individual achievement among professionals for public display via various social media is also an advantage of the system. Brandman’s venture is also one of the few institutions in the country to be able to award financial aid to a CBE direct assessment program by the U.S. Department of Education (Brandman University Teams Up, 2015).

Another example of digital badges in competency-based education is provided by the Kentucky Community and Technical College System. In this case, the System identified many of the same advantages cited by other institutions, however the digital badge methodology specifically appeals to them because it: 1) provides opportunities for quantifying outcomes; 2) enhances student understanding of achievement beyond letter grades; and, enables faculty and staff to better track the variety of professional development activities they complete (Brooks-Jeffers, 2015).

One other reference worth noting in this brief overview of digital badges is Educause’s “7 Things You Should Know about Badges,” (2012). This overview discusses the desire by employers to know who the institution is, what the value is of the credential, and how the institution is ensuring quality control over its administration. It also highlights the use of digital badges as a unique way for students to exhibit their prowess and initiative, as can also be seen with portfolios. In turn, badges enable institutions to review what they provide, how they provide it, and how they assess it. With lifelong learning continuing to evolve, institutions find themselves at the center of ongoing conversations regarding who provides what credentials, amidst additional entities that also compete to do so.

## RESEARCH: THE NATURE OF CBE IN U.S. HIGHER EDUCATION

The competency-based approach is not a new idea in American higher education. Various forms of competency-based programs have been in existence for half a century with roots in teacher education reform and vocational training (Klein-Collins, 2012; Nodine, 2016; Thomsen, 2015). However, the discussion around and the implementation of CBE has grown considerably in postsecondary education in the U.S. over the past several years. Approximately 500,000 students are expected to be enrolled in some form of CBE program by 2020 (“Ready for Primetime,” 3). Between spring 2014 and fall 2015, the number of public, not-for-profit, and for-profit colleges and universities reporting that they were either designing or implementing CBE programs rose from 52 to nearly 600 (“Keeping Up with Competency”; Fain, 2015c; Public Agenda, 2015b; Nodine, 2016). Of the 179 respondents to the 2015 *Survey of the Shared Design Elements & Emerging Practices of Competency-Based Education Programs*, “research universities were the most likely to have programs that were scaling up, at 33%” (see Figure 2).

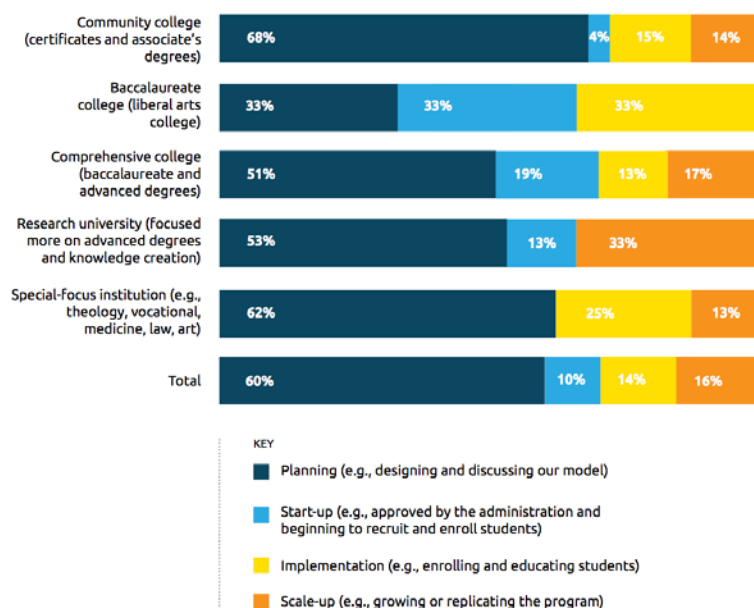


Figure 2: Institutional classification and CBE Phase of Development (Public Agenda, 2015a)

This current iteration of CBE development has been driven by several factors, including the growth and acceptance of online and hybrid education, the maturation of technologies that support personalized instruction and support,

pressure from policymakers and stakeholders to increase college completion rates and accountability for graduates, concern over rising higher education costs for traditional degree and certificate programs, increasing demand for alternative programming to accommodate working adults, and an increased emphasis on learning outcomes (Fain, 2015d; Public Agenda, 2015b; Nodine, 2016).

According to the United States Department of Education, “transitioning away from seat time, in favor of a structure that creates flexibility, allows students to progress as they demonstrate mastery of academic content, regardless of time, place, or pace of learning.” Such competency-based strategies include online and blended learning, dual enrollment and early college high schools, project-based and community-based learning, as well as other personalized learning opportunities (USDOE, n.d.). “Although the official definition of direct assessment suggests a separation from the historical credit hour, most competency-based offerings are linked to the credit hour in some capacity.” Two common examples are credit translation or integration of competency-based objectives within a traditional credit hour (EAB, 2014). Additionally, many institutions adapted elements of CBE to meet the needs of their student population and distinctive missions. These models include integrating CBE with the undergraduate curriculum, running CBE and traditional programs as distinctive units, with little or no interaction with campus-based programs, and targeting CBE at specific student populations, such as returning adult students or students pursuing professional credentials (CIC, 2015).

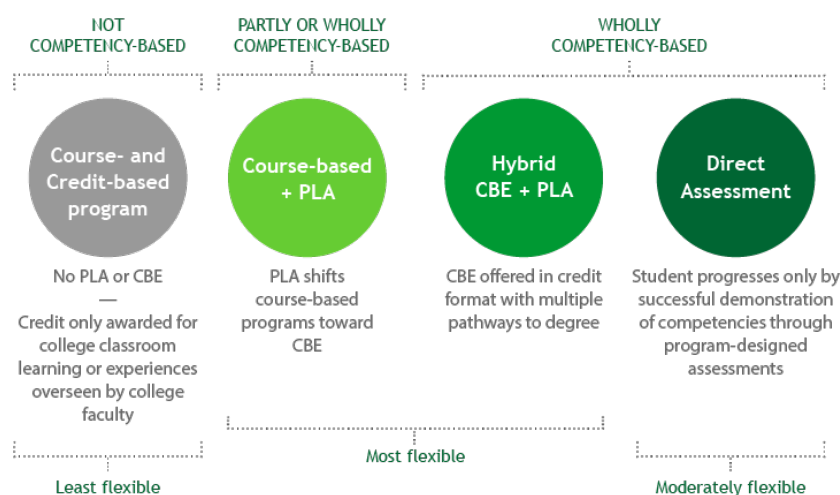


Figure 3: How is CBE related to Prior Learning Assessment (PLA)? (CAEL, 2016)

The faculty role in CBE programs is often quite different from that in the traditional model. The responsibilities of faculty are disaggregated to distribute some of the less academic tasks to staff positions. This “unbundling” has stakeholders concerned about the rigor and quality of teaching and learning in competency-based programs. Instruction has become an area of scrutiny by the Office of Inspector General, which has criticized the USDOE’s approval of direct assessment degrees and raised questions about the potential rise of poor-performing versions of competency-based education (Fain, 2015b).

Because most CBE programs have been in operation for less than five years and vary widely in their approaches, there is a limited research base upon which to make informed judgements. Furthermore, very few institutions even refer to their models as competency-based, but rather as “flex” or “accelerated” or “personalized” learning programs (EAB, 2015; Eduventures, 2015a; Everhart & Bushway, 2014; Nodine, 2016), making it difficult to make comparisons or draw conclusions. There are a few national consortiums, like the Competency-Based Education Network (C-BEN, <http://www.cbenetwork.org/about>), working to establish shared practices and create baseline

data from the ground up; although some organizations have made progress in developing and gaining support for overall frameworks for the general education core, like the Degree Qualifications Profile developed by the Lumina Foundation or the Liberal Education and America's Promise (LEAP) project of the AAC&U (Everhart & Bushway, 2014; Fain, 2015a; Klein-Collins, 2012); the CBE landscape is far from settling on any one agenda or structure.

While the growing body of research suggests that CBE may provide high-quality and cost-effective education in selected contexts, institutions should not assume that an investment in CBE will result in higher completion rates, decreased institutional costs, or lower student debt (see M. Adams, 2015). Colleges and universities face significant challenges in operationalizing CBE programs. For example, they must modify infrastructure systems (e.g., enrollment, financial aid, and academic records) to facilitate self-directed and self-paced student learning (EAB, 2015). Furthermore, most employers recently surveyed agree that having both field-specific and a broad range of skills and knowledge is more important for college graduates to achieve long-term career success, rather than field-specific skill sets alone (HRA, 2013). Until there is broader agreement about the nature and goals of CBE, it will be difficult to implement CBE on a national scale.

## PROGRAMS AT PEER INSTITUTIONS

A number of universities and other post-secondary institutions from across the country have initiated competency-based (CBE) programs using various approaches. Considerable information about CBE and how these institutions are incorporating it may be obtained through C-BEN, which lists member institutions on its website. (Interested faculty may also find the C-BEN Resource Library helpful.)

The following shows some of the C-BEN -listed programs at institutions that may be comparable to Auburn University and that may have potentially similar interests and aspirations. Auburn faculty may wish to consult some of these institutions as they consider or develop plans for a CBE program:

University of Michigan	<ul style="list-style-type: none"> <li>• Master of Health Professions Education</li> </ul>
Purdue University (Polytechnic Institute)	<ul style="list-style-type: none"> <li>• Bachelor of Science in Transdisciplinary Studies in Technology</li> </ul>
University of Wisconsin System	<ul style="list-style-type: none"> <li>• Associate of Arts and Science</li> <li>• Bachelor of Science in Nursing, RN to BSN completion</li> <li>• Bachelor of Science in Biomedical Sciences Diagnostic Imaging degree completion</li> <li>• Bachelor of Science in Information Science and Technology degree completion</li> <li>• Certificate programs in: Business and Technical Communications, Global Skills, Sales, Project Management, Substance Use Disorders Counselor</li> </ul>
University of Maryland University College	<ul style="list-style-type: none"> <li>• Bachelor of Arts in Public Safety Administration</li> <li>• Bachelor of Arts in Computer Networks and Security, Human Resource Management</li> <li>• 25 Master's Degrees</li> <li>• 2 Doctoral Programs</li> </ul>
University of Texas System	<ul style="list-style-type: none"> <li>• Bachelor of Science in Biomedical Science</li> </ul>
University System of Georgia	<ul style="list-style-type: none"> <li>• Bachelor of Arts in Communication-- Civic Leadership</li> <li>• Graduate Credential in Mathematics</li> </ul>



It should be noted that at research universities such as those identified above, administration of CBE programs is often not located within traditional academic college structures; instead, it is housed at the system level or within a unit that has a focus upon outreach and non-traditional student populations.

## THE REGULATORY FRAMEWORK

In addition to assessing the campus readiness for CBE implementation, it is important to consider the state and federal regulations that would impact the ability to offer CBE programs and the ability of students to use federal financial aid funds to support their tuition costs. In general, there are three constituents that must be satisfied before a CBE program can be implemented and financial aid provided to students: 1) the home state of the institution, 2) applicable accrediting bodies, and 3) the U.S. Department of Education (USDOE) (Lacey, A. and Murray, C., 2015). The present regulatory framework is not well suited for implementation of “Direct Assessment” CBE programs. Details about each constituent are provided below (Lacey, A. and Murray, C., 2015):

- 1) Obtaining state authorizations will take time, preparation, and being pro-active because a number of different processes must be considered simultaneously as the CBE program is designed, including: academic withdrawals, refunds, academic progress, graduation rate calculations, enrollment documentation, and even consumer information disclosures. As with other program submittals involving out-of-state programming, individual state permission may have to be obtained for CBE requests as well. Some legal parameters exist for minimum and maximum credit hour standards for specific academic programs. If professional licensing is involved, some states tie together select criteria and credit hour standards. An area of impact for the institution overall is the percentage of state aid tied to the number of full-time equivalent students and how the CBE initiative affects those numbers. Currently, the Alabama Commission on Higher Education provides no explicit guidance in its published materials to institutions wishing to develop CBE programs.
- 2) Auburn University’s regional accreditor, SACSCOC, has provided guidelines for institutions wishing to implement a direct assessment CBE program. These guidelines suggest that when the proposed CBE program is “a significant departure, either in content or method of delivery, from those [programs] offered when the institution was last evaluated, each program is considered a substantive change that requires approval by SACSCOC Board of Trustees” (see *SACSCOC Direct Assessment Competency-Based Educational Programs Policy Statement*). If more than 50% of the credential is based on measured competences rather than credit hours, the university is required to notify SACSCOC at least six months prior to the start date of the anticipated program. At that time, SACSCOC will evaluate the institution’s offering of direct assessment programs and include them when granting accreditation.

To meet SACSCOC requirements, Auburn University would need to:

- identify and articulate the educational contribution in terms of provided educational engagement, modules and exercises, assessment of student learning and other activities that expand student knowledge beyond prior learning.
- identify how faculty with subject matter expertise in the student’s academic program and in general education play a formative role in the CBE program.
- confirm the claim of the direct assessment program’s equivalence in terms of credit or clock hours and any other information the DOE may require.

One additional challenge (or consequence) of submitting a substantive change to SACSCOC is: *“Once an institution submits its prospectus or application and the document is reviewed by either the Committee on Compliance and Reports or by SACSCOC staff prior to approval by the Board, any information included therein that indicates possible non-compliance with any of the Core Requirements or Comprehensive Standards may lead SACSCOC to further review the institution, even if the prospectus is withdrawn or approval of the change is denied”* (Direct Assessment Competency Based Education SACSCOC Policy Statement). Essentially, substantive changes can lead SACSCOC to investigate the University if gaps are found within the prospectus.

- 3) To secure federal financial aid, the institution must also seek approval from the DOE, from which there are mixed results. Many CBE programs tied to the credit hour have qualified and secured federal financial aid. Direct assessment programs have struggled due to various assessment issues, as well as communication and resource issues. Resolving credit hour requirements within a CBE proposal is a hurdle that must be addressed **before** applying. The DOE has created an “Experimental Sites Initiative” involving multiple CBE institutions and agencies to waive credit hour and seat-time requirements. It is worth monitoring that initiative’s results, as well as CBE developments with current iterations of the Higher Education Act as one considers whether to begin crafting a state and federal application for CBE.

## STRENGTHS OF CBE PROGRAMS

For the right program and the prepared learner, CBE has the potential to be a flexible, fast paced, financially beneficial means for acquiring a degree or certificate. Potential benefits of CBE programs should be weighed carefully by prospective students and institutions. Programs which offer post-degree certificates may be a financial asset to the academic intuition. These programs generally attract learners who already understand basic concepts and are more likely to be successful. Post-degree certificate programs also do not generally require the same level of student support and academic coaching as other CBE programs.

Learners well suited for CBE programs are those who are self-motivated, organized, and prepared to begin the program of study. Students most likely to be successful are those who already hold a bachelor’s degree or higher in a competency-based area of study with relevant work experience. Learners who can successfully complete three or more courses during a section or subscription may find CBE programs permit faster progression towards completion and lower overall financial contributions.

Auburn University might find it advantageous to offer targeted CBE certificates to individuals seeking to develop skills needed in the poultry or other agricultural fields, in engineering fields related to specific areas of manufacturing, or in advanced areas of study for health professionals

## THE CONTEXT AT AUBURN UNIVERSITY

Programs that are considering developing a CBE program should rigorously study *The CBE and PLA Playbook: Tools for Alternative Credit Programs* (EAB, 2015). This thorough handbook provides clear discussion of all facets of CBE programs, including infrastructure needs, costs, and the time commitments required by faculty and administrative units. Development of a valuable CBE program would need to begin at least two years prior to the prospective launch date. It is essential to determine the right fit for the type of CBE program at Auburn University and the potential degree fields and types. The most conducive types of programs for CBE success are non-credit certificates (graduate or undergraduate) and for-credit certificates (graduate and undergraduate) (EAB, 2015). There are other types of CBE programs; however, their success rate and sustainability is lower.

If a program can build upon pre-existing Auburn University content, the costs both in funds and faculty time would be lessened. If program content will need to be built from scratch, then an adjustment in faculty workload to include a reduction in current obligations must be calculated into program costs. Collaboration with Industry partners might provide a useful strategy to determine if employers of Auburn University graduates perceive a need for CBE programs.

## CHALLENGES CBE PROGRAMS FACE AT AUBURN

Implementing a CBE program takes considerable time and requires a thoughtful process because program development would need to consider numerous challenges in addition to complying with regulatory concerns. These challenges may be grouped into four areas: 1) Administrative capacity of Auburn's "traditional-student" administrative offices and processes, 2) Curriculum development and creating strong direct assessments, 3) Redirection and overloading of resources, and 4) Financial constraints.

### 1.) ADMINISTRATIVE CAPACITY

Auburn, as a traditional four-year university, functions within the limits of the credit-hour. Most administrative processes rely on students taking courses aligned with credits. Moving away from this system and into pure direct assessment methods would require consideration of:

#### THE NEW BUDGET MODEL

Auburn has a new budget model whereby allocation is rooted in credit hours.

#### TRANSCRIPTING

A transcript is a comprehensive record of a students' academic coursework and progress at Auburn. It reflects credits earned and/or accepted. One major challenge a program would face would be determining course credit equivalencies: Many CBE programs are based on direct assessment programming and not on credit hour. Most regulatory agencies, college transfer credit, public funding formulas, and financial aid programs are tied to credit hour. Establishment of credit equivalencies for CBE courses would need to be considered and the program would need to work with Admissions and the Registrar's Office (at a minimum) to decide how the University would undertake transcribing CBE programs.

#### TUITION

Financial models for sustainability of CBE programs can be challenging. Cost of program start-up and management is substantial. A CBE program could cost more to manage than a traditional program.

#### STAFFING

Achieving scale is important to allow affordability to students while maintaining adequate resources to cover cost of delivery. CBE programs (even online) must involve faculty and mentors.

### 2.) CURRICULUM DEVELOPMENT AND CREATING STRONG DIRECT ASSESSMENTS

CBE programs require faculty to collaborate to build a strong curriculum in which students are engaged inside and outside of the classroom. CBE programs rely heavily on strong assessment practices that drive student progression through their learning. Curriculum development must consider the following areas:

#### TIME CONSTRAINTS AND COST

Program and course development can be time consuming and costly. They require extensive cooperation between administration, faculty members, support staff, student support centers, computer service centers, curriculum committees, and accrediting bodies. In addition to redesigning existing coursework, it may also be necessary to develop adaptive learning materials, which respond to the individual learning pace of the student.

#### VENDORS

Several vendors exist that support various aspects of CBE programs (curriculum development, learner support, data systems, other). Clear expectations and understanding of integration processes are important when dealing with external support systems. Negotiations with vendors by the institution rather than by individual faculty members is essential.

#### ASSESSMENTS

Metrics for measuring success must be agreed upon upfront to assure adequate rigor and quality of the educational program. These assessments must reflect student learning of the specific competencies aligned in terms of content and level of learning. Clear expectations must be articulated for program content including the role of faculty and staff, the expertise of contributors, and the nature of the assessment metrics.

#### ATTRACTING AND RETAINING STUDENTS

Consideration must be given for maintaining optimal student enrollment and retention. Who is the target audience? Will a flexible, self-paced program enhance or reduce retention rates and over what time frame?

### 3.) REDIRECTION AND OVERLOADING OF RESOURCES (FACULTY AND ADMINISTRATOR TIME).

#### INFRASTRUCTURE

A number of universities have found that stand-alone CBE programs are more efficiently run than those integrated into traditional academic programs. Establishing stand-alone units is costly; however, integration into existing traditional programs can tax the resources of personnel (administration, faculty, and staff) and infrastructure (IT services, library resources, student center resources, student records, and others). In many cases, centralizing academic advising and administrative support improves the efficiency of implemented programs. Early engagement of all participants is considered important for successful development of a CBE program.

#### FACULTY BUY-IN

Faculty must be consulted early when considering the development of a CBE program to determine interest and to establish shared governance. Only 15% of participants in a survey of 34 colleges, universities, and public university systems, involved with CBE were tenured or tenure-track. (Cleary, 2015).

The role of faculty members needs to be clearly defined in a CBE program since many of the traditional faculty responsibilities are “unbundled.” Faculty responsibilities typically fall into functional categories of curriculum development, instruction, coaching, advising, mentoring, and assessment. Much of the coaching, advising, and mentoring of students enrolled in CBE programs is handled by non-tenured track faculty members at many institutions.

#### PROMOTION AND TENURE

Clear policies should be established as to how faculty participating in CBE programs will be considered for promotion and tenure. CBE programs require a great deal of time from those actively participating in the design, delivery, and assessment of the program. Workload expectations are defined differently than the tri-partite expectations of traditional tenure-track faculty.

#### 4.) FINANCIAL CONSTRAINTS

Successful CBE programs are time consuming to implement and costly to manage. Financial projections and anticipated enrollments should be calculated carefully because the financial advantages of CBE programs are often elusive. Personnel involved in traditional academic programs may find it difficult to participate in a CBE program at an appropriate level. Additional personnel (ex. non-tenure track faculty) are frequently hired to manage CBE programs. In broad terms, the areas of concern are:

##### TYPES OF LEARNERS AND PROJECTING REVENUE

Prepared, mature learners who are comfortable with self-paced instruction may see significant savings in tuition costs if programs are priced according to a fixed tuition per time period model. For example, institutions that students provide access to all program materials for a 6-month period may see motivated students complete a higher percentage of the program components than is possible in a traditional credit-hour tuition model. Such students might be able to compress into a two-year period what would be covered in six traditional semesters, effectively saving themselves a year of tuition costs and permitting them to begin their wage-earning career more quickly. Attracting significant numbers of such students can help an institution generate significant new revenue. Students who are unprepared for the self-discipline required for self-paced learning may take longer to complete program requirements, resulting in no cost savings or even an increase in tuition costs.

##### INCREASED INSTRUCTOR AND STUDENT SUPPORT COSTS

Because of the unbundling of faculty roles, it may be possible to operate a high-quality CBE program, after a period of initial financial investment, with less time commitment from tenure-track research faculty (which permits them to focus more attention on research). Once courses have been developed, the teaching and advising of students may be performed by instructors and student services specialists in a more cost effective manner.

It must, however, be acknowledged that the circumstances that result in student savings and revenue generation may be difficult to obtain. Funding the support staff necessary to ensure that sufficient instructional support, student advising, student coaching, and tutoring is provided to assist students may be substantial. The *CBE and PLA Playbook* (EAB, 2015), for example, identifies the following list of kinds of expenses institutions may incur when implementing CBE programs:

- Faculty content development stipends
- Success coach salaries
- Psychometrician to design assessments
- Instructional design staff compensation
- Additional registrar and financial aid staff
- LMS plug-in purchases and systems integration
- CBE program web portal design

- Digital portfolio software
- SIS integration and configuration
- Vendor consultation (e.g., Blackboard implementation services)
- Recruitment Lead generation and qualification services
- Outreach for Business/Industry partnerships
- Program website design
- Direct email campaigns

## KINDS OF PROGRAMS BEST SUITED FOR CBE

Authors of *The CBE and PLA Playbook* (EAB, 2015) compared credential types to determine the ones best suited for CBE success. Results show that non-credit certificates (both undergraduate and graduate), for-credit graduate certificates, for-credit undergraduate certificates, and professional Master's degrees are most likely to result in successful CBE programs, especially when undertaken by students who have already obtained a Bachelor's degree – "proven learners" (Adams, 2015). Content areas that seem best suited for CBE programs, based on C-BEN institutions, include Business, Education, IT/Technology, and Nursing/Health.

## SPECIFIC RECOMMENDATIONS FOR THOSE CONSIDERING HYBRID-TYPE CBE PROGRAMS:

The Committee does not recommend that any specific Auburn program be encouraged to propose a competency-based program. It does, however, suggest that any program at Auburn University that wishes to pursue developing a hybrid-type CBE program carefully consider the costs, both in faculty time and in resources that are required to construct a high-quality CBE program. While CBE programs may in some cases provide benefits to students that are not available through other modes of instruction, it is difficult to construct high quality programs. The success of CBE programs depends upon strong faculty motivation to build such programs and a well-developed infrastructure to support CBE students.

If an Auburn University College, School, or Department wishes to consider implementing a hybrid-type CBE program, the Committee recommends that it consider the following areas of concern:

- 1) *The relationship between the proposed competency-based education and the institution's mission.* The more closely a CBE program can be tied to the teaching and research traditions and aspirations of the campus, the more institutional "owners" and supporters it will attract.
- 2) *The on- and off-campus approval process.* Early communication with College-level administration, the Provost, the SACSCOC liaison, and the University Curriculum Committee will be required for success. Many units on campus will be required to support a CBE program for the university to meet its accrediting standards and these units need to be consulted about plans early in the development process.
- 3) *The needs of prospective students.* Seek the backing of significant businesses in the region. Having regional employers provide insight into the skills and competencies new hires possess can also be helpful in determining competencies for new degree programs.
- 4) *Faculty control of the program.* Ensure that faculty will maintain control of the curriculum and assessments in the new programs despite any move toward "unbundling" areas of programmatic responsibility. Competency-based education will succeed in most mature public institutions only if

faculty members believe that the quality of education can be improved by the change, and that crucial decisions regarding content and testing will remain within the purview of their expertise.

- 5) *Cost.* Do not underestimate the financial resources required to build CBE programs. In addition to investments in curriculum overhaul, the costs of adjusting operational systems such as financial aid, advising, and course registration, tracking, and certifying must be faced. A “venture capital” attitude toward up-front investment with the prospect of longer-term productivity gains is appropriate.

## CBE RESOURCES

### ORGANIZATIONS

CBExchange: <http://www.cbexchange.org/>

Competency-Based Education Network (C-BEN) – National Consortium (Public Agenda):

<http://www.cbenetwork.org>

Council for Adult and Experiential Learning (CAEL) – CBE Jump Start Program (Lumina): <http://www.cael.org/what-we-do/competency-based-education>

EDUCAUSE - Next Generation Learning Challenges (Bill & Melinda Gates Foundation):

<http://www.educause.edu/events/breakthrough-models-incubator>

United States department of Education – Federal Student Aid – Experimental Sites Initiative:

<https://experimentalsites.ed.gov/exp/guidance.html>

### GUIDELINES

*Applying for Title IV Eligibility for Direct Assessment (Competency-Based) Programs* (2013). United States Department of Education Office of Postsecondary Education: Washington, DC.

<http://ifap.ed.gov/dpcletters/GEN1310.html>

*Competency-Based Education Experiment Complete Reference Guide*. Published in September 2015. U.S. Department of Education Experimental Sites Initiative: Washington, D.C.

<https://experimentalsites.ed.gov/exp/pdf/CBEGuideComplete.pdf>

*Direct Assessment Competency-Based Educational Programs Policy Statement* (2013). Southern Association of Colleges and Schools Commission on Colleges: Decatur, GA.

<http://www.sacscoc.org/pdf/081705/DirectAssessmentCompetencyBased.pdf>

*Notice Expansion of the Competency-Based Education Experiment Under the Experimental Sites Initiative, As Amended*. Published on November 15, 2015. United States Department of Education Office of Postsecondary Education: Washington, D.C. <http://ifap.ed.gov/fregisters/attachments/FR111815.pdf>

*Notice Inviting Postsecondary Educational Institutions to Participate in Experiments Under the Experimental Sites Initiative; Federal Student Financial Assistance Programs under Title IV of the Higher Education Act of 1965, as Amended*. Published on July 25, 2014. United States Department of Education Office of Postsecondary Education: Washington, D.C.

<http://ifap.ed.gov/eannouncements/attachments/072514ESIFederalRegisterNotice.pdf>

*Quality Standards for Competency-Based Education Programs—Draft*. Competency-Based Education Network, 2016.

[http://www.cbenetwork.org/sites/457/uploaded/files/CBEN\\_Quality\\_Standards\\_for\\_CompetencyBased\\_Educational\\_Programs.pdf](http://www.cbenetwork.org/sites/457/uploaded/files/CBEN_Quality_Standards_for_CompetencyBased_Educational_Programs.pdf)

*Regional Accreditors Announce Common Framework for Defining and Approving Competency-Based Education Programs*. Published on June 2, 2015. Council of Regional Accrediting Commissions.

[http://www.accjc.org/wp-content/uploads/2015/10/C-RAC\\_CBE\\_Statement\\_Press\\_Release\\_06\\_02\\_2015.pdf](http://www.accjc.org/wp-content/uploads/2015/10/C-RAC_CBE_Statement_Press_Release_06_02_2015.pdf)



## BOOKS

- Bradley, M. J., Seidman, R. H., and Painchaud, S. R. (2012). *Saving Higher Education: The Integrated, Competency-Based Three-Year Bachelor's Degree Program*. San Francisco, CA: Jossey-Bass.
- Bramante, F., & Colby, R. (2012). *Off the Clock: Moving Education from Time to Competency*. Corwin: Thousand Oaks, CA: Corwin.
- Hoogveld, A. (2003). *The Teacher as Designer of Competency-Based Education*. Doctoral Thesis. Open University of the Netherlands.  
[http://www.ou.nl/Docs/Onderzoek/Promoties/2003/Hoogveld\\_thesis\\_gedrukteversie.pdf](http://www.ou.nl/Docs/Onderzoek/Promoties/2003/Hoogveld_thesis_gedrukteversie.pdf)
- Quality Matters Higher Education Rubric Workbook, Fifth Edition* (2014). MarylandOnline, Inc: Annapolis, MD.
- Tritton, Brian (2008). *Competency-based Learning in Higher Education*. Master of Education Thesis. Victoria University. [http://vuir.vu.edu.au/2014/1/Brian\\_Tritton.pdf](http://vuir.vu.edu.au/2014/1/Brian_Tritton.pdf)
- Voorhees, R. A. (2001). *Measuring What Matters: Competency-Based Learning Models in Higher Education*. San Francisco, CA: Jossey-Bass.

## ARTICLES, REPORTS, AND WEBSITES

- 2013 CAEL Forum & News – Competency-Based Education.  
[http://www.cael.org/pdfs/cael\\_competency\\_based\\_education\\_2013](http://www.cael.org/pdfs/cael_competency_based_education_2013)
- Abner, B., Bartosh, O., Ungerleider, C., & Tiffin, R. (2014). *Productivity Implications of a Shift to Competency-Based Education: An environmental scan and review of the relevant literature*. Toronto: Higher Education Quality Council of Ontario. <http://www.heqco.ca/SiteCollectionDocuments/CBE%20Report-ENG.pdf>
- Adams, M. (2015). "Three Myths About Competency-Based Education. Education Advisory Board.  
<https://www.eab.com/research-and-insights/continuing-and-online-education-forum/white-papers/2015/three-myths-about-competency-based-education>
- "Alternative Credentials, Defining Your Programs for Maximum Impact," *Insights: Online and Continuing Education*. Vol 1. Ed. 19. <http://www.eduventures.com/wp-content/uploads/2015/09/Alternative-Credentials.pdf>
- A Report from Public Agenda with support from The Bill & Melinda Gates Foundation and Lumina Foundation (2015). [http://www.cbenetwork.org/sites/457/uploaded/files/Shared\\_Design\\_Elements\\_Notebook.pdf](http://www.cbenetwork.org/sites/457/uploaded/files/Shared_Design_Elements_Notebook.pdf)
- Badge Alliance/Why Badges, <http://www.badgealliance.org/why-badges/>, 2012.
- Baughman, Jacquelyn (2012). *Student professional development: Competency-based learning and assessment in an undergraduate industrial technology course*.  
<http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=3599&context=etd>
- Book, Patricia A. (2014). "All Hands on Deck: Ten Lessons from Early Adopters of Competency-based Education," Western Interstate Commission on Higher Education, May, 2014,  
<http://files.eric.ed.gov/fulltext/ED546830.pdf>
- [Brandman University Teams Up with Credly to Issue Digital Badges as Part of Competency-Based Education Degrees](http://blog.credly.com/brandman-cbe-badges/) (2015). *Blog.Credly.Com* <http://blog.credly.com/brandman-cbe-badges/>

- Brooks-Jeffiers, P. (2015). Using Digital Badges for Competency-Based Recognition. <http://evollution.com/programming/credentials/using-digital-badges-for-competency-based-recognition/>
- Bushway, D. and Everhart, D. (2014). Investing in quality competency-based education. *Educause Review*. Retrieved from <http://er.educause.edu/articles/2014/12/investing-in-quality-competencybased-education>
- Cleary, M. N. (2015). *Faculty and staff roles and responsibilities in the design and delivery of competency-based education programs: A C-BEN snapshot*. <http://online.flipbuilder.com/cvra/fhkz/>
- Competency-based Education and Quality Assurance: Emerging Themes Discussed at the 2014 National Convening.(2015) [http://www.cael.org/pdfs/2014\\_cbe\\_convening\\_findings\\_report](http://www.cael.org/pdfs/2014_cbe_convening_findings_report)
- Competency-Based Education (CBE) Ecosystem Framework (2015). [http://www.cbenetwork.org/sites/457/uploaded/files/CBE\\_Ecosystem\\_Report.pdf](http://www.cbenetwork.org/sites/457/uploaded/files/CBE_Ecosystem_Report.pdf)
- Council for Adult and Experiential Learning (2016). Competency-based education. Retrieved from <http://www.cael.org/higher-education/competency-based-education>
- Council of Independent Colleges (2015). Innovations in teaching and learning: Research brief 1 – Competency-based education. Retrieved from <http://www.cic.edu/Programs-and-Services/Programs/Documents/CICBrief1-CBE.pdf>
- Curwood, Maurice R. (2004). *Competency-based Training and Assessment in the Workplace*. [https://minerva-access.unimelb.edu.au/bitstream/handle/11343/38977/66198\\_00001072\\_01\\_Final\\_Master\\_Copy.PDF?sequence=1](https://minerva-access.unimelb.edu.au/bitstream/handle/11343/38977/66198_00001072_01_Final_Master_Copy.PDF?sequence=1)
- Customized, Outcome-based, Relevant Evaluation (CORE) at Lipscomb University. (2015) [http://www.cael.org/cael\\_lipscomb\\_case\\_study](http://www.cael.org/cael_lipscomb_case_study)
- “Deconstructing CBE: An Assessment of Institutional Activity, Goals, and Challenges in Higher Education.” Ellucian, Eduventures, and the American Council on Education
- Demers, G., Woodburn, Andrea J., and Savard, Claude (2006). *The Development of an Undergraduate Competency-Based Coach Education Program*.
- Desrochers, Donna M., and Staisloff, Richard L. (2016). *Competency-based Education: A study of Four New Models and Their Implications for Bending the Higher Education Cost Curve*. October 2016.
- “Direct Assessment Competency-Based Educational Programs—Policy Statement.” SACSCOC <http://www.sacscoc.org/pdf/081705/DirectAssessmentCompetencyBased.pdf>
- EAB - Competency Based Education links. <https://www.eab.com/SearchAll?q=CBE>
- Education Advisory Board (2014). Financial models for competency-based education: A research brief. Retrieved from [http://www.centralaz.edu/Documents/ipr/cbe\\_eab\\_report.pdf](http://www.centralaz.edu/Documents/ipr/cbe_eab_report.pdf)
- Education Advisory Board (2015). The CBE and PLA playbook: Tools for alternative credit programs. Retrieved from <https://www.eab.com/research-and-insights/continuing-and-online-education-forum/updates/2015/about-the-cbe-and-pla-playbook>

- Educause (2012). "7 Things You Should Know about Badges."  
<https://net.educause.edu/ir/library/pdf/eli7085.pdf>,
- Eduventures Insights (2015a). The competency craze: A primer to inform the conversation. Retrieved from  
<http://www.eduventures.com/role-based-research/>
- Eduventures Insights (2015b). The competency-based education landscape: Part one – College and universities.  
<http://www.eduventures.com/role-based-research/>
- Eduventures Insights (2015c). The Competency-Based Education Landscape. Part Two: Organizations and Enablers.  
<http://www.eduventures.com/role-based-research/>
- Eduventures Insights (2015d). The Competency-Based Education Landscape. Part Three: Tools and Technologies.  
<http://www.eduventures.com/role-based-research/>
- EDUVENTURES. Online Education in 2015: Six Cases of Innovation. Parts 1-3. *Online and Continuing Education*, 1(1).
- Everhart, D. and Bushway, D. (2014). Investing in quality competency-based education. *EDUCAUSE Review*.  
<http://er.educause.edu/articles/2014/12/investing-in-quality-competencybased-education>
- "Faculty and Staff Roles and Responsibilities in the Design and Delivery on Competency-Based Programs: A C-BEN Snapshot," *CBEN*. December 2015. <http://online.flipbuilder.com/cvra/fhkz/>
- Fain, Paul (2016a). "Efficiency, at Scale." *Inside Higher Ed*. October 18, 2016  
<https://www.insidehighered.com/news/2016/10/18/competency-based-educations-business-model-offers-promise-report-finds>
- Fain, Paul (2016b). "Purdue U gets into competency-based education with new bachelor's degree," *Inside Higher Ed*. March 30, 2016. <https://www.insidehighered.com/news/2016/03/30/purdue-u-gets-competency-based-education-new-bachelors-degree>
- Fain, Paul (2015a). Defining college. *Inside Higher Education*. August 14, 2015.  
<https://www.insidehighered.com/news/2015/08/14/aacus-moderate-strong-voice-competency-based-education-and-disruption>
- Fain, Paul (2015b). Defining competency. *Inside Higher Education*. June 17, 2015.  
<https://www.insidehighered.com/news/2015/06/17/new-letters-us-and-accreditors-provide-framework-approval-competency-based-degrees>
- Fain, Paul (2015c). Keeping up with competency. *Inside Higher Education*. September 10, 2015.  
<https://www.insidehighered.com/news/2015/09/10/amid-competency-based-education-boom-meeting-help-colleges-do-it-right>
- Fain, Paul (2015d). "Feds move ahead with experimental sites for competency-based education." *Inside Higher Ed*. January 13, 2015. <https://www.insidehighered.com/news/2015/01/13/feds-move-ahead-experimental-sites-competency-based-education>
- Fain, P. (2015e). Caution on competency. *Inside Higher Education*. October 5, 2015.  
<https://www.insidehighered.com/news/2015/10/05/us-inspector-general-criticizes-accreditor-over-competency-based-education>

- Fain, Paul (2014a). "Accreditors' Role in the Expansion of Competency-based Education." *Inside Higher Ed*. September 10, 2014. <https://www.insidehighered.com/news/2014/09/10/accreditors-role-expansion-competency-based-education>
- Fain, Paul (2014b). "Competency-based Education Arrives at Three Major Public Institutions," *Inside Higher Ed*. October 28, 2014. <https://www.insidehighered.com/news/2014/10/28/competency-based-education-arrives-three-major-public-institutions>
- Fain, Paul (2014c). Tugged in Two Directions. *Inside Higher Education*. September 10, 2014. <https://www.insidehighered.com/news/2014/09/10/accreditors-role-expansion-competency-based-education>
- Fain, Paul (2013). "Competency-based education's newest form creates promise and questions." *Inside Higher Ed*. April 22, 2013. <https://www.insidehighered.com/news/2013/04/22/competency-based-educations-newest-form-creates-promise-and-questions>
- Frontiers. <https://wcetfrontiers.org/2015/06/11/implementing-a-cbe-program-lessons-learned-from-community-colleges/>
- Garret, Richard (2015). *The Future of Competency-Based Education*. EDUVENTURES Summit 2015.
- Gonczi, Andrew (1996). *Reconceptualising CBE and Training*. <https://opus.lib.uts.edu.au/research/bitstream/handle/10453/20143/01front.pdf?sequence=1>
- Hart Research Associates (2013). It takes more than a major: Employer priorities for college learning and student success - An online survey among employers conducted on behalf of the Association of American Colleges and Universities. Retrieved from [https://www.aacu.org/sites/default/files/files/LEAP/2013\\_EmployerSurvey.pdf](https://www.aacu.org/sites/default/files/files/LEAP/2013_EmployerSurvey.pdf)
- Homol, Lindley, and Miller, Robert (2015). "Keeping Up With Competency-Based Education." Association of College and Research Libraries. [http://www.ala.org/acrl/publications/keeping\\_up\\_with/cbe](http://www.ala.org/acrl/publications/keeping_up_with/cbe)
- Hope, J. (2015). Consider structure, advantages of competency-based programs. *Recruiting and Retaining Adult Learners*, 17(9). <http://onlinelibrary.wiley.com/doi/10.1002/nsr.30054/epdf>
- Jaschik, S. (2016). *The Rise of Competency-Based Education*. *Inside Higher Ed*. January 26, 2016. <https://www.insidehighered.com/quicktakes/2016/01/26/rise-competency-based-education>
- Johnstone, Sally M., and Nodine, Thad (2015). "Competency-Based Education: Leadership Challenges," *Change: The Magazine of Higher Learning*. 2015. Vol. 47, no. 4, pp. 61-65. [http://www.changemag.org/Archives/Back%20Issues/2015/JulyAugust%202015/competency\\_full.html](http://www.changemag.org/Archives/Back%20Issues/2015/JulyAugust%202015/competency_full.html)
- Lacey, A. and Murray, C. (2015). *Rethinking the regulatory environment of competency-based education*. May, 2015. <https://www.luminafoundation.org/files/resources/rethinking-the-cbe-regulatory-environment.pdf>
- Kelchen, R. (2015). The landscape of competency-based education: Enrollments, demographics, and affordability. Retrieved from <https://www.aei.org/wp-content/uploads/2015/04/Competency-based-education-landscape-Kelchen-2015.pdf>
- Klein-Collins, Rebecca. (2012). Competency-based degree programs in the U.S.: Postsecondary credentials for measurable student learning and performance. Retrieved from <http://files.eric.ed.gov/fulltext/ED547416.pdf>

- Klein-Collins, Rebecca (2013). *Sharpening Our Focus on Learning: The Rise of Competency-Based Approaches to Degree Completion*. National Institute for Learning Outcomes Assessment.  
<http://www.cael.org/pdfs/occasional-paper-20>
- Krause, J., Dias, L. P., and Schedler, C. (2015). Competency-based education: A framework for measuring quality courses. *Online Journal of Distance Learning Administration*, 18(1).  
[https://www.westga.edu/~distance/ojdl/spring181/krause\\_dias\\_schedler181.html](https://www.westga.edu/~distance/ojdl/spring181/krause_dias_schedler181.html)
- Lacey, A. and Murray, C. (2015). *Rethinking the regulatory environment of competency-based education*. May, 2015. <https://www.luminafoundation.org/files/resources/rethinking-the-cbe-regulatory-environment.pdf>
- "Member Institutions." Competency-Based Education Network.  
<http://www.cbenetwork.org/about/institutional-participants/>
- Nodine, T. R. (2016). "The Next Generation Higher Education Landscape," *Technology Solutions and Analysis*. Vol 1. Ed. 1. How did we get here? A brief history of competency-based higher education in the United States (pages 5–11). *The Journal of Competency-Based Education*. Retrieved from  
<http://onlinelibrary.wiley.com/doi/10.1002/cbe2.1004/epdf>
- "Nontraditional Students: Shifting Trends in Higher Ed," *Chronicle of Higher Education*/Knowlura. 2016.
- "Online Education in 2015. Part Three: Six Cases of Innovation," *Eduventures Insights: Online and Continuing Education*. Vol 1. Ed. 1.
- Poulin, Russell "Implementing a CBE Program: Lessons Learned from Community Colleges," WCET Frontiers. <https://wcetfrontiers.org/2015/06/11/implementing-a-cbe-program-lessons-learned-from-community-colleges/>
- Public Agenda (2015a). A research brief: Survey of the shared design elements & emerging practices of competency-based education programs. Retrieved from  
[http://www.cbenetwork.org/sites/457/uploaded/files/Shared\\_Design\\_Elements\\_Emerging\\_Practices\\_of\\_CBE.pdf](http://www.cbenetwork.org/sites/457/uploaded/files/Shared_Design_Elements_Emerging_Practices_of_CBE.pdf)
- Public Agenda (2015b). The competency-based education ecosystem framework. Retrieved from  
[http://www.cbenetwork.org/sites/457/uploaded/files/CBE\\_Ecosystem\\_Report.pdf](http://www.cbenetwork.org/sites/457/uploaded/files/CBE_Ecosystem_Report.pdf)
- RPK Group (2016). Competency-based education. A study of four new models and their implications for bending the higher education cost curve. Retrieved from [http://rpkgroup.com/wp-content/uploads/2016/10/rpkgroup\\_cbe\\_business\\_model\\_report\\_20161018.pdf](http://rpkgroup.com/wp-content/uploads/2016/10/rpkgroup_cbe_business_model_report_20161018.pdf)
- Ramirez, Nelida, and Saskatchewan, Regina (2012). *The Challenges and Opportunities of Using a Competency Based Education Model in Social Work Education*.  
[http://ourspace.uregina.ca/bitstream/handle/10294/3548/Ramirez\\_Nelida\\_200256668\\_PhD\\_SW\\_Spring2012.pdf?sequence=1](http://ourspace.uregina.ca/bitstream/handle/10294/3548/Ramirez_Nelida_200256668_PhD_SW_Spring2012.pdf?sequence=1)
- "Ready for Primetime: The Competency-Based Education Marketing Opportunity," *Eduventures Insights: Online and Continuing Education*. Vol 1. Ed. 5.
- Texas Affordable Baccalaureate Program (2015)*. [http://www.cael.org/pdfs/texas\\_cbe\\_case\\_study](http://www.cael.org/pdfs/texas_cbe_case_study)
- Thomsen, J. (2015). Show, not tell. *Inside Higher Education*. June 17, 2015.  
<https://www.insidehighered.com/news/2015/06/17/new-graduate-school-education-will-be-competency-based>

USDOE (n.d.). *Competency-Based Learning or Personalized Learning*. Retrieved from <http://www.ed.gov/oii-news/competency-based-learning-or-personalized-learning>

USDOE Experimental Sites Initiative Guidance (2016). Competency-based education experiment reference guide - Complete enhanced version - (August 2016). <https://experimentalsites.ed.gov/exp/guidance.html>

Vivian, Wai Y. (2005). *Impact of CBA on Teaching and Learning of Business Subjects*.  
<http://hub.hku.hk/bitstream/10722/41344/6/FullText.pdf?accept=1>

Woodward, Kristin M. (2015). "Information Literacy in Competency-based Education: Reflections on the Flex Option at the University of Wisconsin-Milwaukee." *C&RL News*, March 2015.