COMPETENCY-BASED EDUCATION **MADE EASY**

A Step-By-Step Handbook for Developing and Implementing Competency-Based Education Programs in Institutions of Higher Education

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Introduction

This handbook is designed primarily for institutions of higher education (IHE) that are new to competency-based education (CBE). Its central purpose is to provide an introductory, step-by-step guide to develop and implement quality CBE academic and workforce programs in conformance with best practices and pertinent policies and regulations. The secondary purpose is to contribute to the growing body of knowledge on best practices in CBE. While developing and implementing a CBE program may seem fairly easy, the reality is often quite different. In many cases, just getting a CBE program off the ground can be a tremendously challenging undertaking. Notwithstanding the extensively documented interest, very few programs actually make it past the planning and development stages. Of those that do, the vast majority fall short of their initially projected enrollment, retention, and graduation rates. The most comprehensive and timely survey to date on post-secondary CBE programs in the United States, the 2018 National Survey of Post-Secondary Competency Based Education (NSBCBE), found that 57% of the colleges and universities in the study that had proposed the creation of a CBE program were at the planning stage, 32% had developed one or more courses, and a mere 11% had developed a full CBE program (National Survey of Postsecondary Competency-Based Education, 2018). Our intention in this handbook is to contribute to the number of IHEs that make it past the planning and development stages to fully implement a quality CBE programs.

The obstacles to fully developing and implementing a CBE program, both internal and external to IHEs, can be intimidating at times. Opposition from faculty and administrators, insufficient resources, divergent interpretations of CBE and its impact, inflexible policies and regulations, student resistance to new educational practices, and simple bureaucratic inertia are only a few of the more obvious ones that come to mind. The position adopted by this handbook and supported by overwhelming empirical evidence, however, is that most of these obstacles can be overcome or, at least, minimized, through sufficient planning and preparation. Opposition from faculty and administrators, for example, is usually a simple matter of insufficient or incorrect information about CBE that can be addressed through periodic and regularly updated information and orientation sessions.

Pursuant to the aforementioned objectives to elaborate an introductory, step-by-step guide for developing and implementing CBE programs at the postsecondary level in conformance with best practices and pertinent policies and regulations, and to contribute to the growing body of knowledge on best practices in CBE, the remainder of this handbook is divided into the basic steps that are recommended for program development and implementation. For the purpose of this handbook, basic administration of a CBE program is considered part of implementation. Please keep in mind that not all CBE programs are the same. Depending on your program's current stage of development, resources, time, and other factors, you may want to modify, combine, reorder, and/or eliminate some of these steps. Table 1 outlines these steps and may be used as a checklist in the process of program development and implementation.

Table 1

Recommended Steps to Develop and Implement a CBE Program

Program Development and Implementation Steps	Activities for Each Step in the Program Development and Implementation Plan	Check Box to Monitor Progress	
Step One	Define and operationalize the concept of competency-based education.	Complete	Incomplete
Step Two	Assess institutional perceptions and attitudes of CBE.	Complete	Incomplete
Step Three	Select a program for conversion to the CBE format.	Complete	Incomplete
Step Four	Form a program development and implementation committee.	Complete	Incomplete
Step Five	Select a CBE learning and assessment model.	Complete	Incomplete
Step Six	Identify the resources needed at each stage of program planning, development, and implementation.	Complete	Incomplete
Step	Select and Apply a Cost-Estimation Model for program development and implementation.	Complete	Incomplete
Step Eight	Devise strategies to promote program acceptance and institutional inclusion.	Complete	Incomplete
Step Nine	Schedule CBE faculty orientation and training sessions.	Complete	Incomplete
Step Ten	Develop and approve CBE courses.	Complete	Incomplete
Step Eleven	Include relevant institutional actors in the development and implementation of your CBE program.	Complete	Incomplete
Step Twelve	Schedule student information and orientation sessions.	Complete	Incomplete
Step Thirteen	Ensure continuous program compliance with pertinent institutional and external rules and regulations	Complete	Incomplete
Step Fourteen	Develop and implement a system of ongoing program evaluation and improvement.	Complete	Incomplete

Note. The elaboration of this table, and any errors or omissions, are the sole responsibility of the author of this handbook.

It is the sincere desire of our team that this handbook is helpful to you and your colleagues in developing a quality CBE program that benefits your institution, student population, and overall community. The content is not intended to be comprehensive nor does it constitute the only approach to planning, developing, and implementing a CBE program. It is, however, based on best practices that we have observed in our collaboration with other IHEs to create CBE programs over the last ten years, input from colleagues, and ongoing research. Most importantly, it emphasizes three specific criteria: it is designed for IHEs that are new to CBE, aspires to present information in a conversational, user-friendly manner, and includes the most up-to-date information on CBE theory and practice.

Step One: *Define and Operationalize the Concept of Competency-Based Education*

The first and most important step in the development of a CBE program is to define competency-based education, both conceptually and operationally. Definitions that are clear, generally accepted, and easily accessible will strengthen the probability of program success in various ways, beginning with the abatement of negative and counterproductive misunderstandings and stereotypes. As is the case with any academic/workforce program in postsecondary institutions, faculty, staff, and administrators who are supportive and work together as a team are indispensable to the success of a new CBE program and that of its students. A clear, cohesive definition of CBE and how it can benefit students goes a long way toward reducing misunderstandings and converting potential adversaries of CBE programs into advocates and, in some cases, champions.

To clarify the meaning of competency-based education in its contemporary form and use, this section is divided into five parts. The first part introduces the standard definition of CBE recommended in this handbook and that has been adopted by the majority of IHEs that have developed and/or implemented a CBE program at the postsecondary level. The second part describes the practices shared by most CBE programs that, taken together, operationally define CBE. The third part discusses recent and historic antecedents that laid the conceptual and procedural foundation for modern CBE. The fourth part reviews some of the more widespread and problematic myths about CBE that have and continue to undermine definitional clarity. And, the fifth part briefly covers the expansion of CBE in the United States at all educational levels.

1.1 Defining CBE: Before exploring the definition of CBE recommended in this handbook and adopted by the vast majority of IHEs that are developing or have developed CBE programs, there is one piece of advice that we believe is worth considering: please don't be intimidated by CBE or make it any more complicated or difficult than it has to be. Throughout our experience hosting CBE professional conferences and seminars, as well as in more long-term projects collaborating with and/or mentoring colleges and universities in the creation of CBE programs, this has been one of the most consistent and pernicious stumbling blocks. For a number of reasons, some valid and others not so much so, there is a marked tendency in academia to view CBE as a new and radically different approach to education that requires extensive, in-depth study to fully understand what it is and how to apply it. Fortunately, this perspective could not be further from the truth. In its most basic conceptual and procedural form, there is nothing particularly mysterious about CBE. It is, simply put, a different way to structure, organize, and

deliver educational materials that are already included in most traditional and online courses.

To a certain degree, the resistance to CBE and the tendency to overly complicate it is similar to the reaction elicited by the large-scale introduction of online-courses in higher education in the early 1990s. The pros and cons were debated, conferences were held, and training sessions were conducted to familiarize instructors with this strange, new approach to education, only to discover that online-courses were nothing more than a new format for organizing and delivering the same content that they had been teaching for years in their traditional classrooms. Just as the ability to present information in a clear, understandable manner, develop activities and exercises that facilitate learning, construct exams that reliably evaluate student knowledge/skills (competencies), and a host of other pedagogical practices are the building blocks of online and traditional courses, they are the same skills that are needed to develop and instruct quality CBE courses.

So then, what exactly is competency-based education? As mentioned above, CBE is one of the more frequently misunderstood concepts in modern postsecondary education and the situation doesn't seem to be getting much better, despite the expansion of CBE academic and workforce programs at all educational levels. The reasons for this confusion are manifold and, in some cases, understandable. First, there is a multitude of conceptually incompatible definitions of CBE; so much so that in 2017, the Competency-Based Education Network (C-BEN) made the formulation of a generally acceptable definition one of their key priorities. Second, the inherently dynamic nature of CBE lends itself to conceptual disorientation as it constantly generates new and innovative spin-off models that may or may not be CBE but are frequently defined as such. Third, related terminology is often difficult to conceptually disentangle from legitimate and generally accepted definitions of CBE. Prior learning assessment, direct assessment, outcome-based education, and a host of other terms are often used interchangeably with CBE without clarifying to what extent they are conceptually related. Fourth, and most ironic, there are a number of learning and assessment models that, for all intents and purposes are CBE, but that go by a different name.

While these and other reasons for definitional uncertainty of CBE are open to debate, there can be little doubt of their counterproductive effects on the expansion and acceptability of CBE programs. For the purpose of clarity and to establish common terminology, the definition of competency applied in this handbook is understood to be demonstrative proficiency of a specific task or function and/or mastery of a given body of knowledge. The following definition of competency-based education, as formulated by the Competency-Based Education Network and endorsed by over 600 schools, will also be used in this handbook.

> Competency-based education combines an intentional and transparent approach to curricular design with an academic model in which the time it takes to demonstrate competencies varies and the expectations about learning are held constant. Students acquire and demonstrate their knowledge and skills by engaging in learning exercises, activities and experiences that align with clearly defined programmatic outcomes. Students receive proactive guidance and support from faculty and staff. Learners earn credentials by demonstrating mastery through multiple forms of assessment, often at a personalized pace (Competency-Based Education Network, 2019, para. 1).

Although this and other similar definitions constitute the conceptual cornerstone of the Competency-Based (CB) programs developed by the majority of post-secondary institutions, both independently and in collaboration with other colleges and universities, it is worth noting that their intrinsically inclusive nature gives rise to and validates a wide variety of CB models.

> Competency-based education is rapidly changing, and new models are constantly emerging. In most competency-based programs, learning can occur in a wide variety of forms and settings, and students can receive regular support and encouragement along the way. Students are assessed using objective, performance-based tools that reinforce the rigor of programs. Many of these programs are designed as flexible, affordable options for students who are not served well by existing postsecondary programs. Students receive more intensive guidance and support from faculty and mentors and also have the option of accelerating their studies to save additional time and money (Competency-Based Education Network, 2019, para. 3).

1.2 Shared practices that operationally define CBE: To better understand what is meant by CBE, it's useful to go beyond these and other standard definitions and consider some of the more common practices that serve to operationally define it. The following ten practices, presented in no particular order, are shared by the vast majority of CBE programs in postsecondary education. You may want to consider incorporating some or all of them into the CBE program that you develop. First, time is no-longer the principal determinant of student learning. In traditional classroom and online courses, students are required to spend a predetermined period of time (generally a 16-week semester) taking lecture notes, working through assignments, and completing regularly scheduled exams before they receive credit. In CBE courses, time becomes irrelevant. Students are given the opportunity, under the guidance of instructors/facilitators, to access educational materials and complete assessments at their own pace and when they determine that they are ready. If, for example, a student finishes all course requirements prior to the term ending, he/she receives credit for the course and moves on. This practice eliminates the superfluous use of resources, accelerates student progress, and lowers costs for both students and IHEs.

Second, students are not required to relearn material that they have already mastered. Most CBE courses begin with a preliminary assessment of subject matter competency for all students, usually referred to as a "pretest." The course instructor/facilitator evaluates the results of the assessments and determines what competencies remain for each student to learn. Then, based on the assessment results, individualized educational plans are developed for each student to cover the competencies that they are missing. For example, let's say that Student X enrolls in a CBE welding course. He/she was previously employed as an apprentice welder and is already knowledgeable of and able to demonstrate competency of 70% of the course content. The instructor/facilitator would not require this student to relearn this material, but rather would focus on the remaining 30% of course content that the student is lacking. In traditional pedagogy, students are required to cover all subject matter, including the material that they may have previously learned. Many of the students who enroll in CBE courses have already acquired competency in part or in all of the content through previous military/professional/academic preparation. It does not make sense to require them to spend a preset period of time relearning what they already know. This only slows them down, produces apathy and disinterest, and contributes to the number of students who abandon their studies.

To further clarify the last point, consider an example provided by an economics instructor employed in one of the colleges with which we collaborated to create a CBE academic program. The CBE courses in this particular program were regularly scheduled for 7-weeks and contained five separate competency modules, each. The material in the economics course was highly rigorous and the majority of students, although progressing at their own rate, required the full amount of time allocated to complete all five competency modules. During the first week of class, one student caught the instructor's attention for the quality of his responses on the assessments. By the end of the second week, the student had successfully completed the assessments in all of the competency modules and finished the course. In a subsequent conversation--that the student authorized the instructor to disclose--it was revealed that he had been employed in the banking industry for 20-years and was already familiar with interest rates, amortization schedules, export/import policies and many of the other topics covered in the course. In effect, much of the curriculum contained in the economics course was a review of what this student had been actively doing in his professional life for the last twenty-years. Now, this may sound like an unusual case, but, in reality, it's just one of countless examples of students who have directly benefited from CBE programs that don't require them to waste time and resources sitting in a classroom relearning what they already know.

Third, student learning is individualized in CBE programs. CBE theory is heavily grounded in the premise that students learn in different ways and that, to the extent possible, instruction and assessment should be tailored accordingly. Some students prefer visual instruction, while others are auditory learners; some learn best through logical models and others through abstraction; and still other students thrive in group interaction while others are more accustomed to work alone. Developing CBE courses that adapt to the rich diversity of student learning styles is not always easy, but it has proven over and over again to promote student success and it's one of the reasons why we encourage the inclusion of trained, experienced instructional faculty in CBE course design and development. Their insights into how, when, and under what circumstances students learn best—acquired through years of classroom experience and study—is an invaluable asset in the process of crafting CBE courses that meet the individual needs of modern students.

This, of course, is not to disparage CBE courses and entire CBE programs that have been developed without the participation of trained and experienced faculty. There are many such programs that have proven to be highly successful as measured by standardized student recruitment, retention, and graduation metrics. In most cases, though, these programs have consulted with experienced instructors or duplicated existing CBE models that included their participation. In general, our experience, available literature on the topic, and the input of our colleagues' support the value added of experienced, knowledgeable instructors in the course design and development phases of a CBE program.

Fourth, student assessment in CBE is usually more formative than summative. Beginning with primary education, student assessment in the United States is almost entirely summative. In a typical elementary, junior high, or high school class, students are required to take a predetermined number of exams at regularly scheduled intervals that purportedly measure their overall understanding of the course material covered since the previous exam. The grades earned on these exams are based on the percentage of questions answered correctly, and the overall course grade is an average of the exam grades. Almost

without exception, this process is duplicated from class-to-class until a set number of courses has been completed, at which time students are expected to take another, more comprehensive summative exam (e.g. ACT, SAT, PSAT) to measure their aptitude for the next educational level.

The concern with this approach is that summative evaluations are comparatively less amenable to measuring all of the competencies that a student should master for a given academic/workforce course. For example, let's assume that an introductory English class at College X expects students to learn the following learning outcomes: pre-writing process, essay construction, critical analysis, and writing revision skills. A student who passes a summative exam of these learning outcomes with a 70% or better may not have sufficiently mastered all of them or, in a worse-case scenario, has passed the exam without demonstrating any understanding of one or more of the learning outcomes (depending upon the weight of each learning outcome in the grading rubric). On the other hand, in a series of formative exams (preferably in real-time), the English instructor/facilitator would assess student competency of each of the learning outcomes. This approach is more thorough and rigorous as the majority of CBE programs only award credit after students have passed all course competencies.

Additionally, the use of formative assessments better equips instructors/facilitators to continually evaluate and adjust learning and assessment models in accordance with the needs of diverse and dynamic student populations. This being said, it's worth noting that there is a competing school of thought in CBE that, while advocating formative exams as the primary assessment tool, recommends the inclusion of a summative exam as a supplementary assessment once all formative exams have been successfully completed.

Fifth, students learn at their own pace. There can be little doubt that students not only learn in different ways, but at different rates. CBE programs, in addition to eliminating the aforementioned expectation that students complete a course in a predetermined period of time, allow them to move through course material at their own pace. Instead of requiring students to complete an exercise, reading assignment, or exam by a specific date and time, CBE courses are configured to allow them (under the guidance of the course instructor/facilitator) to decide when they are ready to progress through course content. As professional educators, we know that giving students a little more time to learn a concept, complete an essay, or take an exam can often mean the difference between passing and failing a class. Or, that sometimes students learn a concept, complete a learning exercise, or are prepared to take an exam more quickly than anticipated. Adjusting learning and assessment expectations to accommodate these differences is a win-win for everyone. Students learning is improved, instructors are afforded the opportunity to continue refining their pedagogical skills, and IHEs achieve greater retention and graduation rates.

Sixth, the individualized teaching and learning inherent to CBE courses enables instructors/facilitators to stimulate advanced students without losing other students who do not progress as quickly. Ask any experienced teacher if he/she has struggled with this conundrum and you are likely to hear vivid stories of talented students who became bored and disinterested, or less prepared students left behind due to inflexible curriculum and schedules that they simply couldn't keep up with. CBE resolves this problem by giving advanced students the opportunity to progress through course content at an accelerated rate

(with the option of covering more rigorous material) while simultaneously allocating additional time to other students that might need it. If nothing else, this is one of the most compelling reasons to consider the adoption of a CBE model. Year after year, traditional programs lose countless students for the simple reason that they are unable or unwilling to adapt their respective learning and assessment models to the different learning styles and paces of an increasingly diverse student population.

Seventh, CBE courses tend to be more rigorous than their traditional counterparts. As CBE is subject to frequent criticism for an alleged softening of curricular content and assessment standards, this point comes as a surprise to many, both advocates and opponents of CBE, alike. Without entering into too much detail, there are three principal reasons why this is the case. First, CBE courses require students to master all course competencies before they receive credit. In traditional courses, assessment is usually summative, and a passing grade signifies that a student has mastered at least 70% of course content. Second, the individualized curriculum and instruction in CBE courses means that students generally receive more one-on-one time with the instructor/facilitator. Third, the excessive scrutiny attendant to the growing popularity of CBE has created an atmosphere in which many programs are constantly under pressure to demonstrate that they are just as rigorous, if not more, than their traditional counterparts. For example, our colleagues at University X define competency in a course as completing all work with an average grade of 90% or better; in University Y, competency means that each of the assessments in a course has been passed with a minimum grade of 80%; and University Z defines competency as "demonstrative proficiency at the level of a trained professional." In response to critics who decry the alleged mediocre standards of CBE, it could be reasonably argued that there are very few traditional programs that require students to earn an average of 90% on all coursework, pass each exam with an 80% or better, or demonstrate that they are just as proficient as experienced professionals to receive course credit.

Eighth, CBE programs are usually more dynamic and responsive to ever-changing labor market requirements and better prepare students to compete in the modern, globalized workforce. Some of the most well-known complaints expressed by employers in the private and public sectors about college and university graduates are that their reading, writing, and mathematics skills are insufficient; they are unable to apply what they learn in the classroom to "real life' situations; they have neglected their soft-skills, particularly group activity and oral communication; and they are poorly equipped to adapt to rapidly changing conditions in the workplace. Competency-based education, in many ways, has evolved as a direct response to these and other concerns, and is becoming increasing popular among employers seeking graduates with credentials that more closely align with modern labor market requirements and who have received experiential training and assessment that better prepare them to professionally apply what they have learned.

In one of the most comprehensive studies to date on how employers perceive CBE, Competency-based education: The employers' perspective of higher education, Dr. Joy Henrich, Regional Academic Dean for Rasmussen College, conducted in-depth interviews with human resource professionals and hiring managers from leading firms across varying manufacturing and service-based industries. While there was some skepticism among a minority of employers who were unfamiliar with CBE or who had not employed graduates with CBE credentials, the majority of the respondents reported a generally favorable

perception of CBE. In particular, they were optimistic of its potential to prepare students to make the crossover from the classroom to the workspace through the use of experiential learning and assessment methods that more closely replicated authentic conditions in their chosen fields (Henrich, 2016).

Ninth, CBE gives students a more realistic idea of what they will be doing in their chosen profession. One of the core premises of CBE is that learning and assessment should not be limited to traditional classrooms or online courses, but, when appropriate, occur in an environment and/or under circumstances that most closely replicate where a student is likely to be employed. The advantage to this approach, aside from documented improvements in employee performance, is that it not only helps students decide what they want to do in their careers, but, perhaps even more important, what they don't want to do. Too often, recent graduates find themselves in the unfortunate situation of discovering that the dream job for which they have invested years of preparation and no small amount of money, is not what they expected. Their choice then becomes one of remaining where they are and hoping that the situation improves on its own or seeking other professional opportunities with all of the potential complications that such a decision brings. CBE models that closely reproduce "real world" conditions in terms of the learning and assessment environment and competency content that they offer help students make a more informed decision about how and where they want to spend their professional lives.

Tenth, CBE programs generally contain stringent quality control mechanisms and emphasize ongoing program review and improvement. This point, as mentioned earlier, is often disputed by critics of CBE who tend to view it as a simplified, watered-down approach to education that prioritizes accelerated degree completion over rigorous standards. However, in order to remain viable and comply with the core mandate to prepare students for constantly evolving labor market requirements, the vast majority of CBE programs at the postsecondary level understand and take very seriously the importance of continuous review and improvement. Learning and assessment strategies, course competency content, educational technology, instructor knowledge and pedagogical proficiency, and other essential components of quality CBE programs are integral to student success and, as such, should be regularly evaluated and updated.

We cannot emphasize enough the recommendation that your CBE program contain a review and improvement process that is comprehensive, rigorous, and administered on a regular basis. This will not only contribute to its continuous quality and relevance but will make it easier in the long run to justify your program to both advocates and critics. Figure 1 below provides a simple, visual representation of the aforementioned ten characteristics that are most frequently found in quality CBE academic and workforce programs. In addition to consulting it when developing and implementing your CBE program, you might want to include it in your periodic program evaluation and improvement reference materials to better ensure compliance with CBE best practices.

Figure 1

Common Characteristics of CBE Programs

Time is no longer the determinant of student learning. CBE courses award credit based on competency mastery, not the amount of seat time completed.

Students are no longer required to relearn competencies that they have already demonstrated.

Learning and assessment are individualized to meet the unique needs of diverse students.

Student assessment is primarily formative in CBE courses.

Students progress through CBE courses at their own pace under the guidance of course instructors/facilitators.

Diversified learning and assessment in CBE courses address the problem of how to stimulate advanced students without losing students who progress less rapidly, and thus decreases apathy and attrition rates.

CBE programs tend to be more rigorous than their traditional classroom and online counterparts.

CBE courses are more responsive to changing labor market conditions and the competencies that employers prioritize.

CBE programs better prepare students to select a career that is more closely aligned with their respective skills and preferences.

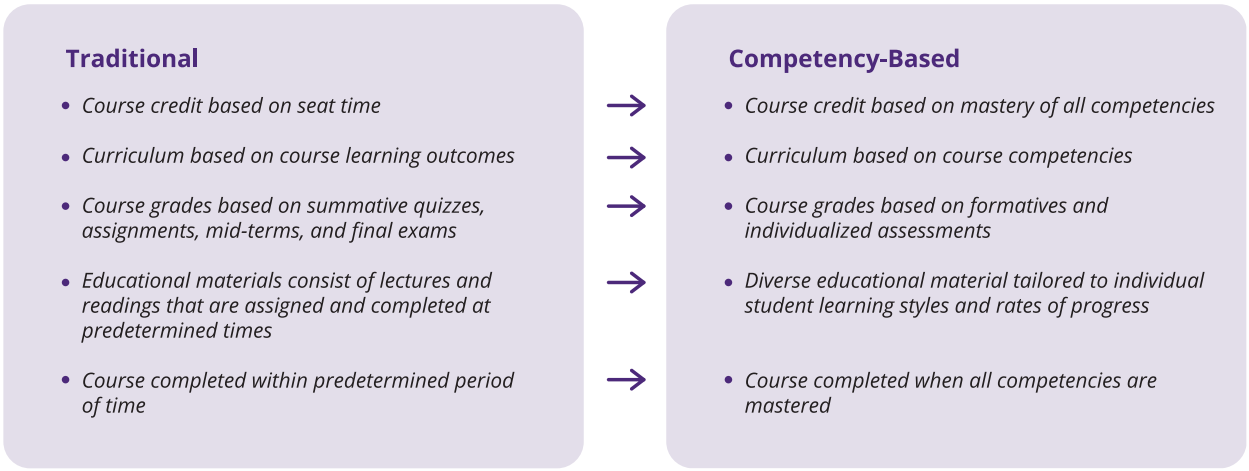
CBE programs prioritize quality control mechanism and ongoing program review and improvement.

Note. The elaboration of this figure, and any errors or omissions, are the sole responsibility of the author of this handbook.

The preceding ten characteristics are not the only ones shared by CBE programs, but they are the most common, well known, and representative of best practices that serve to define and, in many ways, differentiate CBE from traditional online and classroom courses. It is not necessary that your program contain all of these characteristics. They are some of the examples of CBE best practices that you may want to consider for inclusion. To see how they could be incorporated into your classes and how they contrast with traditional methods, please see Figure 2.

Figure 2

Examples of differences between traditional and CBE courses.



Note. The elaboration of this figure, and any errors or omissions, are the sole responsibility of the author of this handbook.

1.3 Antecedents of CBE: With the growing number of new, cutting-edge CBE programs that emerge every day, it's tempting to conclude that we have entered uncharted territory in modern learning and assessment. However, even the most cursory review of learning and assessment systems throughout history reveals innumerable theories and practices that, today, would be considered competency-based education. It could be argued that as early as the fourth century A.D., the Greek philosopher, Socrates, often referred to as the founder of Western philosophy, applied a form of CBE in the "Socratic Method" that he innovated and the didactic activities that he encouraged his followers to pursue. Similarly, the Confucius-based academies established during the Han Dynasty (206 BC – 221 AD) in China, the Upanishad system of experiential learning practiced in India during the Vedic Period (1500 – 600 BC), and the Bimaristan medical schools that predominated in the Islamic world throughout the 9th century are just a few of the better known examples of learning and assessment systems that predate modern education, but contain theoretic and procedural elements of CBE that resonate in its contemporary form.

A more detailed review of historic antecedents of modern CBE would require much more space and attention than is possible or appropriate in this section, but would largely lead to the same conclusion: CBE, as we know it today, does not exist in a conceptual and procedural vacuum nor is it exclusively tied to a particular culture or geographic region. Rather, it draws from a lengthy history of learning and assessment models applied at different times and places throughout the world. In fact, the last 60 years, alone, have produced an abundance of literature on pedagogical theories and practices from all over the world that have laid the foundation for modern CBE.

The most recent and well-known theoretic antecedents of CBE can be found in the seminal work of John Dewey (1859 -1952), often known as the Father of Experiential Learning. In his famous quote, "give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning naturally results," early traces of the emphasis of CBE on demonstrative assessment,

purposeful learning, individualized pedagogy, and the expectation of competency mastery and functional literacy can be seen (Edmondson, 2014) . The impact of John Dewey and his legacy on modern education cannot be overstated. Just ask any randomly selected group of first-year education majors to give you the name of the most influential thinker in modern pedagogy, and nine times out of ten, John Dewey will be mentioned.

It is generally recognized, by advocates and critics of CBE alike, that the core principals of Dewey's "Pragmatic" approach to learning and assessment laid much of the conceptual foundation for modern CBE and heavily influenced subsequent scholarship on the subject. So then, the inevitable question that arises is: "what happened?" How is it that this foundation did not organically lead to a modern American education system more closely aligned with CBE concepts and practices? The short answer is that, notwithstanding Dewey's enormous success, his rejection of traditional ethical values as incongruent with changing social and economic conditions and his insistence on the inclusion of a new moral paradigm as an integral component of the education system generated opposition and, in some cases, overt hostility toward him and his ideas (Edmondson, 2014). This, when combined with the increased emphasis on traditional pedagogy at all educational levels imposed by a government intent on winning the nascent "Space Race", hindered not only the development of CBE but most any other type of innovative approach to learning and assessment until well into the mid-1970s.

More recently, and closely linked to contemporary CBE, are the seminal works of William Spady, John Champlain, Kit Marshall, and Bob Marzano (Spady, 1994). In his groundbreaking theory of learning and assessment, Spady (later followed by Marshall, Marzano and Champlain) challenged the predominant instructor-centered model of higher education as not only ineffectual but counterproductive to creativity and adaptive learning. As an alternative, he advocated the implementation of a model in the 1980s that he termed "Outcome Based Education," (OBE) which, notwithstanding early opposition, would eventually gain substantial support among educational theorists and prove formative to the emergence of modern CBE. In its most basic form, OBE contends that effective leaning and assessment should include: (1) "clarity of focus", learning outcomes should be designed to give a strong sense of purpose to all student/teacher interaction; (2) "design down, deliver up," when planning curriculum, educators should start with the outcomes and work backward; (3) "specific predetermined outcomes," when planning instruction, teachers should teach what students need to learn to demonstrate outcomes; (4) "expanded opportunities", students must be permitted to demonstrate their learning in different ways and be afforded numerous opportunities to demonstrate the outcomes; and (5) high expectations (Spady, 1994).

The tendency of critics to describe CBE as either lacking empirical referents or poorly conceived, in comparison to traditional educational models, is unsustainable in the face of extensive historical evidence to the contrary. As indicated above, the theoretic and practical roots of CBE can be traced from some of the earliest known civilizations to a multitude of educational systems innovated over the last thirty years. Some of the more well-known examples of these systems may sound familiar to you and include: Mastery Learning, Objective-Referenced Learning, Performance-Based Instruction, Criterion-Referenced Instruction, and Outcome-Based Education. In short, CBE is by no means a new and radical approach to learning and assessment that is completely devoid of conceptual roots. Quite to the contrary, it draws from a rich and diverse history that continues to shape and validate its current application in higher education.

1.4 Myths of competency-based education: With the recent expansion of CBE academic and workforce programs at the postsecondary level comes no-small amount of myths and misconceptions, even among some of its most ardent supporters. Those of you with experience in the development and/or administration of CBE programs have most likely come across some of these myths and understand just how debilitating and demoralizing they can be, especially when accepted by faculty and administrators that are key to a CBE program's success. As will be covered in a later section, one of the most frequent obstacles to the development of a successful CBE programs are opponents, internal and external to an IHE. In most cases, these are good intentioned individuals who have either not been exposed to CBE on a serious level or subscribe to one or more of the negative myths and stereotypes concerning its nature and impact. For those of you considering the development of a CBE program for the first time, it's beneficial to be aware of and prepare for the negative myths that are most likely to appear. The following list is comprised of a few of the more common ones:

Myth #1, CBE is poorly defined and lacks shared theoretic premises: The vast majority of CBE programs established at the postsecondary level in the United States are based on certain shared premises: competencies should include explicit, measurable, and transferable learning objectives that facilitate learning and empower students; the mastery of competencies in a given course/program rather than time is the most effective determinant of learning; students should learn and demonstrate competencies in a logical, sequential order; and learning is maximized when it occurs on an individualized basis constitute some of the more well-known premises shared by most credible CBE programs. The notion that CBE is poorly defined and lacks shared theoretic premises is inconsistent with the practical evidence of hundreds of CBE programs, and usually results from confusion over the variety of CBE models that exist and/or incomplete understanding of the differences between them and other types of non-traditional learning and assessment models. The premises that definitively, structurally, and procedurally unify CBE programs are generally accepted and serve to distinguish them from other learning and assessment systems, at the same time that they give rise to a wide spectrum of different CBE models. If anything, it could be argued that the recent and unprecedented expansion of successful CBE programs throughout the country would not have been possible without the solidity and widespread acceptance of their shared premises.

Myth #2, CBE is only effective with a small percentage of students: This is one of the more pervasive and long-standing myths of CBE. It is grounded in the false, but widely accepted assumption of conceptual and methodological singularity in learning and assessment in CBE programs, and thus concludes that they are incompatible with the needs of diverse student populations. The irony of this argument is that it overlooks the inherent flexibility of CBE that, instead of limiting how learning and assessment occur, gives rise to constant experimentation and innovation in both areas. A more accurate assertion would be that not all CBE models are for everyone. Just as one teaching approach is not suitable for all students, not all CBE models are either. The challenge for each institution of higher learning is not to avoid CBE, but rather to select or design a CBE model that is most appropriate for the student population it serves.

Myth #3, CBE fails to ensure regular and substantive interaction (RSI) between teachers and students: Concerns over insufficient RSI are not unique to CBE. Correspondence courses, online education, outcome-based education, and a myriad of other non-traditional learning and assessment models have all been

scrutinized by the Department of Education at one time or another over alleged insufficiencies or RSI. In 2015, CBE programs became the center of this controversy when the Office of the Inspector General (OIG) issued a statement calling into question the extent to which the Higher Learning Commission regulated CBE to ensure proper RSI in the context of Title IV funding. It further "recommend that the Assistant Secretary require the Higher Learning Commission to reevaluate competency-based education programs previously proposed by schools to determine whether interaction between faculty and students will be regular and substantive, and, if not, determine whether the programs should have been classified as correspondence programs." Later, in 2017, the Inspector General initiated an investigation into allegations that Western Governor's University (WGU), the largest CBE institution in the world, failed to provide sufficient RSI to more than 83,000 students. That same year, after exhaustively investigating the case and interviewing hundreds of university employees and students, it was determined that WGU had failed to meet federal standards for ensuring sufficient RSI and should reimburse the government more than 713 million dollars in federal student aid.

Part of the problem faced by WGU and other institutions of higher education investigated by the OIG is that RSI had never been clearly defined by the Department of Education (DOE), which made it difficult to fully understand the allegations against them, much less elaborate a reasonable defense. As a result of these and other extenuating circumstances, a follow-up letter was sent to WGU by the DOE in 2019. It stated that the University had been exonerated of all charges on the basis of "the ambiguity of the law and regulations and the lack of clear guidance available at the time of the audit period," and further concluded that "the statements made and the actions taken by the institution and its accrediting agency demonstrate that the institution made a reasonable and good faith effort to comply with the definition of distance education and provide regular and substantive interaction between the students and its instructional team during this period" (Kreighbaum, 2018, para. 10).

Fortunately, the federal government's posture on what constitutes regular and sufficient interaction, while still somewhat ambiguous, has recently softened. In a press statement released in January of 2019, the DOE iterated its commitment to a more flexible policy position on innovative educational models that redress shortcomings in the current system without compromising quality and concluded by saying that, "The department is hopeful that further clarification will be part of future regulations that will help spur the growth of high-quality innovative programs" (Kreighbum, 2018, para. 10). As of the time of writing, no

further investigations have been initiated by the DOE on allegations of insufficient RSI in post-secondary CBE programs.

What is most ironic about this controversy, from our perspective in the trenches of CBE program development and implementation, is that a thorough review of CBE courses in IHEs throughout the country would most likely reveal that not only do they provide as much regular and substantive interaction as traditional courses, but that, in most cases, the individualized nature of CBE instruction and guidance leads to more quantity and quality interaction. In most traditional courses in American IHEs, particularly introductory level classes at large universities where it's not unusual to see fifty or more students crammed into a single classroom, interaction can be anything but regular and substantive. Just think back on your freshman year in college. Were most of your classmates meeting regularly with their professors for in-depth conversations on course material or were they more inclined to passively take notes and complete the same work assigned to all of their peers? In CBE courses, instructors develop individualized learning materials that require more in-depth knowledge of each student and a greater commitment of time to fully determine their unique educational needs. For these and many other reasons, the position of this handbook is that CBE programs comply with and often exceed RSI requirements. It's gratifying to see that the DOE and other relevant agencies are moving toward the same general conclusion.

Myth #4, CBE Programs lack rigor: The notion that CBE programs lack rigor is, once again, usually attributable to misunderstanding what CBE is or exposure to a particular CBE program that did not produce the desired results. In virtually any education system—local, state, or national— there will be varying degrees of rigor in instruction, student performance standards, assessments, etc. This is to be expected, particularly when the education system in question aspires to prepare a large and diverse student population for constantly changing labor market requirements. CBE programs, just like their traditional academic/workforce counterparts, produce a wide range of results. Unfortunately, critics tend to generalize CBE programs, based on limited and often isolated examples, and conveniently forget the criticisms that have been levied against most other educational models, both new and traditional. For years, the American education system has been under attack for insufficient rigor, excessive grade inflation, declining competitiveness, and a growing disconnect between the skills/knowledge that students acquire and what is needed in the "real world." Ironically, the emergence of CBE and its continuous expansion is a response to the putative lack of rigor in traditional post-secondary education (for a more detailed discussion of rigor in CBE programs, see the section on operational definitions of CBE).

Myth #5, CBE Programs are too costly: Whether it's outcome-based learning, criterion-referenced instruction, competency-based education or any of the many other innovative learning and assessment models that constitute an alternative to traditional practices, the criticism inevitably arises that they are cost prohibited and, therefore, unsustainable in the long run. To be fair, there is usually some truth to this assertion when a new learning and assessment model is first introduced. In the absence of established best practices, just figuring out what resources will be needed and how to adapt them to a particular program can be an exorbitantly costly undertaking. But, contrary to what critics allege, new educational programs tend to become more cost effective, not less, as time passes and best practices are established for improving program efficiency and reducing costs. In the case of CBE programs, we have observed a general reduction in expenditures (particularly start-up costs) at all stages of program development,

implementation, and administration over the last 15 years as more and more programs are developed and launched.

In addition to the savings that result from the elaboration and standardization of best practices and the economies of scale attendant to the expansion of CBE programs, certain characteristics inherent to CBE tend to lower costs even further. To begin with, the cost of instructional and administrative personnel per student is typically lower in CBE programs. In most public and private sector enterprises, labor commands the lion's share of the budget and IHEs are no exception to this rule. The traditional 16-week semester followed by most IHEs, where the goal is for all students to successfully begin and complete courses at the same time, requires a substantial investment in time and effort on the part of instructional faculty, staff, and administrators. In CBE programs, students have the option of demonstrating competencies and completing courses at an accelerated rate, which reduces the amount of instructional and administrative resources required per course. For example, if CBE Student A finishes a 16-week course in 4 weeks, he/she will consume significantly less institutional human and physical capital than Student B, who enrolls in a traditional version of the same course and requires the full 16-weeks of instruction, advising, tutorial services, paperwork etc. In short, IHEs save money on CBE students who require fewer resources but pay the same tuition as traditional students.

A second source of savings for IHEs that opt to develop CBE programs, and that is explored in greater depth in the section on advising, is the overall increase in student retention and graduation rates that they produce. Without entering into too much detail, most empirical studies (supported by our own experience) point to greater student retention and graduation rates in CBE programs and a consequent reduction in revenue loss. When IHEs lose students, they also lose revenues in the form of tuition and government aid. To illustrate the savings generated by the comparatively higher levels of student retention in CBE programs, let's consider the example of College X. This institution established a CBE management program that, during the first five years of its existence, has consistently maintained a retention rate of 84% with an average annual enrollment of 240 students. By applying the standard model developed by Dr. Neil Raisman for calculating revenue losses due to student attrition, we can see that this institution, when compared to the average IHE with a retention rate of 72%, generates greater direct and indirect institutional savings.

With approximately 240 students enrolled at the beginning of each academic cycle, the CBE management program at College X incurs an annual tuition loss of $79,488.00 due to student attrition. The annual tuition loss due to student attrition for a group of 240 students enrolled in a management program in a typical American IHE with an average retention rate of 72% is $139,104.00. The difference of $59,616.00 is the savings that results from lower attrition rates in the CBE program at College X (Raisman, 2013).

Annual Revenue Loss Model = [(P x A= SL) x T] *

*P represents the total program population; A is the annual attrition rate of all students; SL is students lost annually from total population; and T equals annual tuition at the school.

- Revenue loss due to student attrition in the management program at College X during academic year 2018 – 2019: (240 X 16%) X $2,070.00 = $79,488.00
- Revenue loss in a management program at a typical state IHE due to student attrition during academic year 2018 -2019: (240 X 28%) X $2,070.00 = $139,104.00

1.5 Expansion of CBE at all levels: The expansion of CBE programs at all educational levels is occurring at an accelerated rate as school administrators and government officials become more proactive in seeking educational alternatives that address existing problems and better prepare students to compete in the highly competitive and dynamic global labor market. In addition to the previously described growth of CBE programs at the post-secondary level, primary and secondary education have recently seen unprecedented and largely unexpected interest in CBE. A study published by the National Association for K-12 online learning in 2018, sheds light on the growth of CBE programs at all stages of planning, development, and implementation at the K-12 levels. At the time of writing, seventeen states are categorized as "Advanced States," meaning that there is close policy alignment and/or an "active state role to build capacity in local school systems for competency education." Thirteen states are categorized as "Developing States" that have adopted "open state policy flexibility for local school systems to transition to competency-based-education." Nineteen states are "Emerging States" with "limited flexibility in state policy—usually requiring authorization from the state—for local school systems to shift to competency-based education, for exploratory initiatives and task forces, and/or with minimal state activity to build local capacity." Finally, only one state has yet to develop enabling policies and directives for the development of CBE programs (Levine, 2019, para. 2-8).

The expansion of CBE at the K-12 levels is well documented and forms part of a larger challenge to traditional education that is creating critical mass for a paradigm shift that will eventually reach IHEs. As students, parents, and professional educators at the primary and secondary levels become more convinced of and comfortable with CBE and other innovative learning and assessment models, they increasingly expect the same flexibility in the programs offered by IHEs. So far, the introduction of CBE programs at the postsecondary level has largely been driven by colleges and universities. As more and more students graduate from K-12 with experience in CBE and other innovative educational models, we can expect that they will put pressure on IHEs to diversify the content and delivery format of their course offerings. In other words, it will no longer be a case of IHEs introducing students to CBE and hoping for a favorable response but rather the students, themselves, who will demand more CBE courses. IHEs like yours that are contemplating the development of a CBE program are well ahead of the curve and will be better prepared to meet this demand.

Step Two: *Assess Institutional Perceptions of CBE*

The expansion of CBE across the American educational landscape is indisputable to even the most ardent of critics. Its acceptance as a viable, quality alternative to traditional education is evidenced by the previously described proliferation of CBE programs and the growing credibility of their graduates in the labor market. At the same time, though, it cannot be disputed that the vast majority of CBE programs fail to make it past the planning stages. There are, undeniably, many reasons for this, but the most common is simple opposition from faculty, staff, and administrators. If your program is to be successful, it is necessary to assess the perception that your colleagues have of CBE, and develop strategies to promote acceptance and, when possible, inclusion. In most cases, changing negative attitudes about CBE is a simple matter of information. The empirical and logical evidence supporting the efficacy of CBE is overwhelmingly on your side. In fact, you might just be surprised by how many opponents become champions once they realize how much their students can benefit from CBE.

Opposition to CBE can be covert, overt, or a combination of both. To illustrate how this opposition can

manifest and its potential to undermine CBE programs at all stages, consider the following examples that we have encountered in our work with other institutions and experiences described to us by colleagues. In the early planning stages of CBE Program X, two faculty members volunteered to participate with the alleged intention of converting two existing courses to a CBE format. Within a relatively short period of time, their courses were developed, reviewed, and included in the course catalog. Little more than one year later, it was discovered in a routine course evaluation that the student attrition rate was unusually high in these courses and that less than half of the students who remained enrolled received a passing grade. Subsequent investigations revealed that the course designers had intentionally made their courses more difficult to ensure these outcomes and thus substantiate the argument that CBE was not the right approach for the college's student population. It's worth noting that during the preliminary orientation and training session, these same faculty members were two of the most vocal advocates for CBE and the development of CBE Program X.

Another example of the detrimental impact of opposition on the part of faculty, staff, and administrators occurred during the final planning stages of CBE Program Y. The root of the problem in this case was that the team responsible for developing and implementing the program had failed to investigate the level of support among key administrators. The planning and development stages had been completed over the course of nearly sixteen months, funding had been secured to support the program during its first two years of operation, and preliminary surveys indicated sufficient student interest. However, two weeks before the program was officially scheduled to be launched, the principal administrator for new programs determined that it was neither feasible nor merited, given existing circumstances.

In addition to CBE programs failing due to opposition from faculty, staff, and administrators, many others face resistance from external entities, such as school boards, local political figures, advisory boards, and even parents. Accepting a new educational model that deviates from and may challenge established practices and norms can be very difficult, particularly when it's incorrectly characterized as unproven, lacking rigor, or simply another passing educational fad. This being the case, an important first step, even before you begin working out the nuts and bolts of your CBE program, is to assess the receptivity of internal and external stakeholders to the theory and practice of CBE. The last thing you want to do is initiate development of a CBE program only to discover, after investing time, energy, and resources, that it's ultimately untenable due to insurmountable internal or external opposition.

It may be that you already have an intuitive sense of the extent to which your colleagues and external actors are familiar with, understand, and would be likely to support the development of CBE programs in your IHE and, more distinctly, in a specific program or department. In most instances, an opinion survey or other assessment device will corroborate much of what you already suspect, but in more concrete terms that allow you to elaborate a program design strategy that more effectively identifies and mitigates obstacles. Conversely, the results of your survey may surprise you. Post-secondary institutions are complex organizations consisting of innumerable and often contradictory views on learning and assessment. The level of support or opposition for CBE in your IHE may be very different from what you expect. Either way, it's prudent to begin the process of creating your CBE program with as much in-depth information as possible about the perceptions of groups and individuals that will play a role in its success. Planning, developing, implementing, and administering a CBE Program can be very costly in

terms of time, personnel, money, and other resources. Adequately assessing the level of support for your program can mean the difference between success and a return of zero on your investment.

The assessment device that you use to measure perceptions of CBE in your IHE can be as simple and non-intrusive as an informal interview or anonymous questionnaire, or it can be more detailed and in-depth. One of the most comprehensive, large-scale surveys completed, to date, on perceptions of CBE among faculty, staff, and administrators employed in private and public postsecondary schools is the *Survey of the Shared Design Elements and Emerging Practices of Competency-Based Education Programs*, conducted from July 8, 2015, to August 7, 2015, by the non-profit organization, Public Agenda. This survey was distributed to 754 faculty, staff, and administrators involved in one or more of the four stages of planning, development, implementation, and administration of 586 distinct CBE programs. The response rate was 24% and was it completed by 179 of the 324 individuals who voluntarily participated (Public Agenda, 2015). A less extensive but more practical assessment device that we recommend for individual colleges and universities was created by the Competency-Based Education Consortium at Austin Community College (hosts of the Annual Fast Track to Success Conference on best practices in CBE). It has been used extensively by IHEs throughout Texas and is vetted by the Institute for Competency-Based Education at Texas A&M University-Commerce. A copy may be requested from the CBE programs at Austin Community College.

Step Three: *Select a Program for Conversion to the CBE Format*

The development of a new CBE program or the conversion of an existing program to the CBE format have become popular options for postsecondary institutions seeking to increase student recruitment, retention, and graduation rates without compromising quality. According to the Association of Colleges and Universities, 500 post-secondary institutions are currently in the planning and development stages of CBE academic and/or workforce programs and more than 600 programs are already in existence. But, as optimistic as these statistics may seem, the reality is that for every CBE program that is successfully implemented, there are many more that never make it past the planning stages. The National Survey of Post-Secondary Competency Based Education (NSBSBE) reports that a mere 11% of all proposed CBE programs are fully developed and implemented as planned (National Survey of Postsecondary Competency-Based Education, 2018). To make it past the many obstacles that can get in the way of full program development and implementation, it's important to begin by selecting a new or existing academic/workforce program that has the greatest possibility of success in the CBE format, is appropriate for your student population, supported by key institutional and external partners, and is compatible with, and will benefit from the CBE learning and assessment model that you select.

Although this handbook is grounded in the empirically and logically substantiated premise that CBE can be an effective alternative for reducing obstacles to student success and promoting greater recruitment, retention, and graduation rates, it also recognizes the merits of other educational models. Without a doubt, some academic/workforce programs will benefit more than others from CBE, and still others are best served by a different educational model altogether. After all, the last thing you want to do is dedicate time, energy, and money to create a new CBE Program, only to discover that another program in your department, division, or overall institution would have been a better choice or, worse yet, that the

program you selected is, for any number of reasons, incompatible with the CBE learning and assessment model that you intend to use.

When deliberating upon which program to select for conversion to the CBE format, there are a number of things you can do to simplify the process and increase the possibility of making the right choice. Some of our suggestions to help you are listed below. Like most of the information in this introductory handbook, these suggestions are not intended to be comprehensive, but are based on best practices, input from colleagues in conferences and other forums, relevant literature, and extensive and ongoing research on the topic. In addition to these suggestions, if you have the time and circumstances permit, don't hesitate to contact South Texas College or our colleagues at the Texas A&M University-Commerce, Center for Competency-Based Education, for further guidance on how to select the most appropriate program for conversion to the CBE format.

Our first suggestion is to consult with external sources who are qualified to advise on the costs/benefits of converting different academic/workforce programs to the CBE format. Creating a CBE program can be a costly undertaking. Before making the decision to invest time, money, and other valuable resources, be sure that the program you select will give you the greatest return on your investment. Second, investigate current and future labor market trends to better determine which programs justify the resources that will be expended to develop a CBE option. For better or worse, in the final analysis, your program is most likely to be judged on the basis of the employability of its graduates, rather than the intrinsic value of creating better educated citizens. There is no scarcity of outstanding CBE programs that produce highly qualified graduates for professions that are disappearing or simply cannot absorb them. Third, assess the predominant characteristics of the student in your potential CBE programs. As stated earlier, certain CBE models work better for some students than others. If, after evaluating the results of the assessment, you decide that CBE is still the best option, you will be better equipped to tailor your CBE model to the specific needs of you students. Fourth, consult with faculty, staff, and mid-level administrators who are most familiar with the programs offered by your IHE. There is an unfortunate tendency in higher education, and it appears to be on the rise, to marginalize some of the very people who are most knowledgeable about academic/workforce programs. Ongoing conversations with all knowledgeable institutional representatives will give you a much broader and deeper understanding of the suitability of a given

program for conversion to CBE and its likelihood of success. As mentioned above, these suggestions are not intended to be comprehensive. They are, however, based on best practices and will help you get started on the selection of a program for conversion to the CBE format that is right for you and your students.

Suggestion #1: Consult sources external to your IHE when selecting a program. Consultation with relevant external entities in the process of selecting a program for conversion to the CBE format offers a multitude of benefits that make it well worth your while. It increases the likelihood that the program you select will be relevant to labor market demand, creates a foundation for the eventual formation of a program advisory board, offers access to a broader network of resources and expertise that are not available in your IHE, and provides insights into the viability of your program options. Some examples of external entities that you may want to consult include current employers and employees in the fields for which you are considering developing a CBE program. Among other things, their unique insights into industry demand and the competencies that students need to be competitive will help you assess to what extent different programs are viable CBE options. For example, it may be that after consulting with a group of local employers and employees, you determine that there is insufficient labor demand in a particular industry to justify developing and implementing a new CBE program that trains students for it.

In addition to employers and employees, we recommend that you reach out to other institutions that have developed and implemented a CBE program in the academic/workforce disciplines that you are considering. In the vast majority of cases, they are more than happy to share their experiences and answer questions that other IHEs have about CBE. Consulting with them can help you avoid reinventing the wheel and may be exactly what you need to determine which programs are appropriate in your IHE for conversion to the CBE format and which are not.

A third example of external entities that we recommend for consultation are alumni who have graduated from the different programs that you are considering. Too often, IHEs fail to take advantage of this invaluable and abundant source of information when making decisions about which programs would be most successful in the CBE format. Former students have unique insights that are often overlooked on issues ranging all the way from the quality of curriculum and instruction that they received to course and program improvement strategies. Obtaining their input can prove invaluable, and obtaining it is as easy as conducting post-graduation surveys or including a few graduates on exploratory committees to investigate different program options.

A fourth suggestion is to contact non-profit organizations that are dedicated exclusively to advancing the development and implementation of CBE programs. Their experience and knowledge can be an invaluable asset, and they're available free of charge. Two of the most well-known and experienced of these organizations are the Competency-Based Education Network (C-BEN) at the national level and The Institute for Competency-Based Education at Texas A&M University- Commerce at the state level.

When selecting a program for conversion to CBE, the old adage that two heads are better than one is generally true. Don't hesitate to reach out to external sources, particularly those with experience creating their own CBE programs. It may sound a little cliché, but the community of IHEs that have developed

and implemented, or tried to develop and implement, a CBE program is just that: a community of professionals dedicated to expanding quality educational models that benefit all students. One of the best opportunities to meet with colleagues from other IHEs that have worked on CBE programs is the annual C-BEN conference on competency-based education (*https://www.cbenetwork.org/*). There, you will find expert presentations, breakout sessions, and contacts that will help you determine which program is best suited to CBE.

Suggestion #2: Review labor market trends when selecting a program. Very few outcomes are more disappointing for graduates and other stakeholders in a CBE program, than to discover that labor market demand is diminishing or that CBE credentials are either not recognized or bear comparatively less weight than their traditional counterparts in a particular industry. The considerable amount of time, effort, money, and other resources invested to develop and administer a CBE program is justifiable to the extent that it improves the quality of life of its graduates, both materially and intellectually. Current and future labor demand trends in most professions can be investigated through federal agencies (e.g. Bureau of Labor Statistics), state agencies (e.g. Texas Workforce Commission and Bureau of Labor Statistics), local organizations (e.g. chambers of commerce, labor unions, workforce commissions), and direct communication with public and private sector employers. Before selecting a workforce/academic program for conversion to the CBE format, it's useful to research this information, include it in your decision-making process, and make sure that students are fully informed of their employment options once they graduate and enter the job market.

Suggestion #3: Consider student characteristics when selecting a program for conversion to CBE. There exists an extensive and growing body of research on the question of what types of students are most likely to benefit from CBE programs at the postsecondary level. The position of this handbook is that this depends largely upon the CBE learning and assessment model used. Some students, for example, are better suited to models with a high concentration of Prior Learning Assessment (PLA) and direct assessment, while others do better with a smaller number of high-stakes assessments. Some students prefer CBE learning and assessment models that sequentially progress through course content, while others are more comfortable with formats that enable them to select the order in which they cover course topics. That being said, we also acknowledge that there are certain attributes shared by most CBE learning and assessment models that are less effective and, in some cases, at variance with the learning styles, skill sets, and simple educational preferences of some students. When selecting a program for conversion to the CBE format, it's a good idea to consider the characteristics of your target student population (I know, much easier said than done).

The correlation between student characteristics and success in CBE programs has been extensively studied. Of these studies, one of the most insightful and timely, and one that we highly recommend, is *The Student Perspective on Competency-Based Education: Qualitative Research on Support, Skills, and Success* by Jennifer Wang (2015). In a clear, thoughtful manner Dr. Wang's research team documents specific student characteristics that, according to student respondents, are compatible with the logic and practice of CBE and other characteristics that may actually undermine student success in CBE programs. The findings of this study are, admittedly, based on a limited sample and omit certain key variables, but they are consistent with the majority of related qualitative and quantitative studies and are corroborated by

our own experience in creating and monitoring CBE programs. In addition to Dr. Wang's research, there is an extensive compendium of empirical, logical, and even anecdotal literature exploring the relationship between student traits and success in CBE programs that are worth looking into.

Examples of student characteristic that are frequently identified in the literature as less compatible with CBE are, first, the need for a structured course environment, be it online, traditional, or any other delivery format. CBE is, by definition, flexible and most programs are designed to allow students to progress at their own pace. The traditional educational system implicitly discourages this flexibility by forcing students to progress through course content in a systematic, predetermined manner: all students enrolled in a course begin at the same time, cover the same educational materials, take the same exams, and finish together when the course is scheduled to conclude. After twelve-years of this approach in course after course, classroom after classroom—almost always without exception—many students feel overwhelmed in a flexible CBE environment that lacks the structure they are accustomed to.

A second student characteristic that is often at odds with CBE is the preference for group interaction in the learning phases of a course. One of the salient objectives of the traditional educational system in the United States, particularly during the last 10-years, has been the development of "soft skills," which prioritize social interaction, cooperative learning, and group-based problem solving. This is not to say that CBE courses are devoid of opportunities to engage in these types of activities. There are quality CBE programs at all educational levels that are specifically designed to facilitate interaction among students. However, because students generally progress at their own pace and most educational materials are individualized in CBE programs, these opportunities are, more often than not, limited in scope and content.

A third student trait that has proven problematic in most CBE courses is the reluctance to take the initiative in educational activities. Quality CBE programs contain all of the educational resources that one would expect to find in a standard traditional course. Textbooks, notes, video lectures, quizzes, etc., are all present and easily accessible. However, because most CBE models allow students to determine when they are ready to advance through these materials, it's essential that learners are proactive and able to make knowledgeable decisions about how to organize their time. Even with faculty guidance, many students, in the absence of clearly established deadlines, will wait until the very last minute to begin coursework.

An example of this problem can be seen in a CBE program at College D who shared their experiences during a breakout session at a CBE conference. In this particular program, students had the option of covering educational materials and taking the competency assessments when they determined that they were ready. In the first annual program assessment, College D was alarmed and somewhat baffled to learn that more students were failing courses in this program than in the traditional equivalent. A closer look at the data revealed that the main cause of this substandard student performance was procrastination and a lack of time management skills. Students were simply waiting until the last minute to cover educational materials and complete the assessments.

While a more exhaustive discussion of the relationship between student characteristics and CBE is beyond

the scope of this introductory handbook, there are several points that are worth making before moving on to the next section. First, the vast majority of students with traits that are putatively incompatible with CBE learning and assessment models have been more successful in CBE courses than in their traditional counterparts. Second, many of the student characteristics that are considered at variance with CBE are more a matter of habituation than actual "student characteristics." In most cases, once students get used to the flexibility of CBE, they adapt to it and eventually prefer it to the more structured traditional courses. Third, it's important not to throw the baby out with the bathwater. If a student stands to benefit from CBE and is, for the most part, well-suited to it, he/she should not be disqualified because one or two of his/her characteristics seem incongruent with CBE. Fourth, student traits, tendencies, preferences, etc., are not etched in stone. In many cases, they are a consequence of insufficient information about and/or a lack of experience with alternatives. It's always a good idea to provide students with information about CBE (through orientation sessions, meetings with academic coaches, literature, etc.) and give them the opportunity to take a CBE course or two, before determining that their particular learning and assessment preferences and traits are or are not compatible with CBE.

Suggestion #4: Consult faculty/staff/administrators in the tentative program. Ironically, the very people who know the most about a given academic/workforce program and to what extent it's the best choice for conversion to the CBE format are often the ones who are most overlooked. This theme will be explored in more depth in the next section. But, it's worth noting here that the faculty who instruct and interact with students on a daily basis, the staff who assist in all aspects of program administration, and the mid-level administrators are usually the most qualified to comment and should be consulted on the viability of converting a particular program to the CBE format.

Step Four: *Form a CBE Program Development Committee*

After you have selected a program for conversion to CBE, the next step is the formation of a program development committee (PDC). The PDC will directly oversee all aspects of program planning, development, and implementation. A PDC that achieves targeted results while minimizing opposition and maximizing support is indispensable to the success of your program. The PDC usually includes a minimum of five components: the program chair, assistant chair, or duly appointed substitute; faculty representatives who instruct courses in the proposed program, are familiar with and, ideally, have experience in CBE, and are willing to mentor other faculty; a representative from the Distance Education Department or equivalent, especially if the CBE courses will be delivered online; representatives from the private/public sector who are familiar with labor market conditions; and at-least two experts in CBE. The characteristics of PDCs that we have found to be most conducive to successful program development and implementation are knowledge, experience, enthusiasm and an open mind to new and innovative educational alternatives.

In many IHEs, the relative newness of CBE means that it won't always be feasible to find PDC members with the first two characteristics: knowledge and experience. But, this should not be a problem, both can be acquired with adequate time, resources, and guidance. The other two characteristics, enthusiasm and an open mind, are harder to come by, but even more important. In reality, it's likely that throughout all stages of program planning, development, and implementation, you will encounter some degree of opposition, not only from the general population of your IHE, but also within the program stakeholders.

To the extent possible, your PDC should be comprised of members who support CBE or are genuinely open to it in theory and practice. This will be essential in reducing internal and external opposition and facilitating the development of a quality CBE program that is based on teamwork and mutually agreed upon goals.

Step Five: *Select a CBE Learning and Assessment Model*

In its most basic form, the term "learning and assessment model" refers to how and where learning and assessment take place. As more and more schools at all educational levels become actively involved in the development and implementation of CBE programs, there is increased awareness that not all CBE learning and assessment models are the same and not every model is right for every student. Yes, most CBE learning and assessment models contain shared elements, as described in the operational definitions of CBE presented earlier. But there are also variations that exist from one CBE model to another that can make a big difference when deliberating on which one is right for a particular program and its students. Some models, for example, require a comparatively high degree of teacher/student interaction, while others offer a more independent learning and assessment experience. Variations in CBE learning and assessment models are generally beneficial and stem from differences in institutional policies, regulations imposed by external stakeholders (e.g. government, accrediting agencies, advisory boards, etc.), program content and design preferences, and the specific needs of the student population in question. The rich diversity of learning and assessment models, when grounded in standard conceptual and procedural parameters of CBE, offers IHEs the flexibility to select the model that is most appropriate and effective for them and their students.

When deliberating upon which CBE learning and assessment model is right for your program, there are a number of preliminary steps that we recommend to help you make the right decision. Most importantly: (1) consider the specific needs and attributes of your student population; (2) review pertinent policies and regulations governing program development, implementation, and administration that apply to your IHE; (3) investigate existing CBE learning and assessment models at IHEs throughout the state and country; and (4) consult with other institutions that have successfully developed and administered one or more CBE programs. It has been our experience that IHEs and other organizations with practical experience in developing and administering CBE programs are more than happy to share their knowledge and

insights. Some examples of highly qualified and experienced organizations that we recommend include the Competency-Based Education Network (C-BEN) (*https://www.cbenetwork.org/about/*), the Institute for Competency-Based Education at Texas A&M University—Commerce (*http://www.tamuc.edu/aboutUs/IER/icbe/default.aspx*), Competency Works (*https://www.competencyworks.org*), and the CBE program development team at South Texas College (*https://ms.southtexascollege.edu/*). Their extensive knowledge and experience can be an invaluable asset in the selection or creation of an appropriate CBE learning and assessment model.

While an exhaustive review of CBE learning and assessment models is neither necessary nor appropriate in this introductory handbook, the following examples are presented to illustrate the rich diversity of options that are available and to help you begin thinking about the one that is right for your program. For a more detailed compendium of CBE learning and assessment models, the Competency-Based Education Network and Competency Works, mentioned above, are excellent sources of information. On their respective webpages, you can find an extensive network of IHEs and the CBE learning and assessment models that they have created for virtually every type of academic/workforce program in every part of the country.

The most common CBE learning and assessment models include, but are not limited to: in person course-based models, online course-based models, hybrid CBE/traditional models, CBE models that include learning and assessment in the "real world," CBE models that conduct learning and assessment through simulations, CBE models that apply direct assessment, and CBE models that allow prior learning assessment. As will be seen in the following section, each of these learning and assessment models has its own unique advantages and disadvantages. Finding the one that is right for you and your students is a crucial part of the development and implementation of a quality CBE program, and can easily make the difference between success and failure. It has been our experience that many very promising CBE programs fail to make it past the first few years of full operation for the simple reason that they did not select a learning and assessment model that was appropriately aligned to their program goals and the needs of their students.

In person course-based CBE learning and assessment models. According to the Council of Regional Accrediting Commissions, course-based CBE models are ones in which "the demonstration of competencies is embedded into a conventional curriculum comprised of courses to be completed to earn credits toward a degree or credential. Course/credit-based programs generally enroll students in traditional academic terms and award credits for courses successfully completed. Students may accelerate their learning and they receive credit for the course when they have demonstrated mastery of the competencies" (Klein & Tate, 2015, p. 2). In face-to-face course-based CBE model, all learning and assessment is conducted in a traditional classroom.

Of the varying CBE learning and assessment models available, the face-to-face course-based model is by far the most popular for institutions that are developing a CBE program for the first time. Its similarities with traditional, face-to-face courses offer certain advantages at all stages of course development, implementation, and administration. For example, in-person CBE courses fit relatively easily into most institutional infrastructures, tend to reduce opposition from internal and external critics, facilitate greater

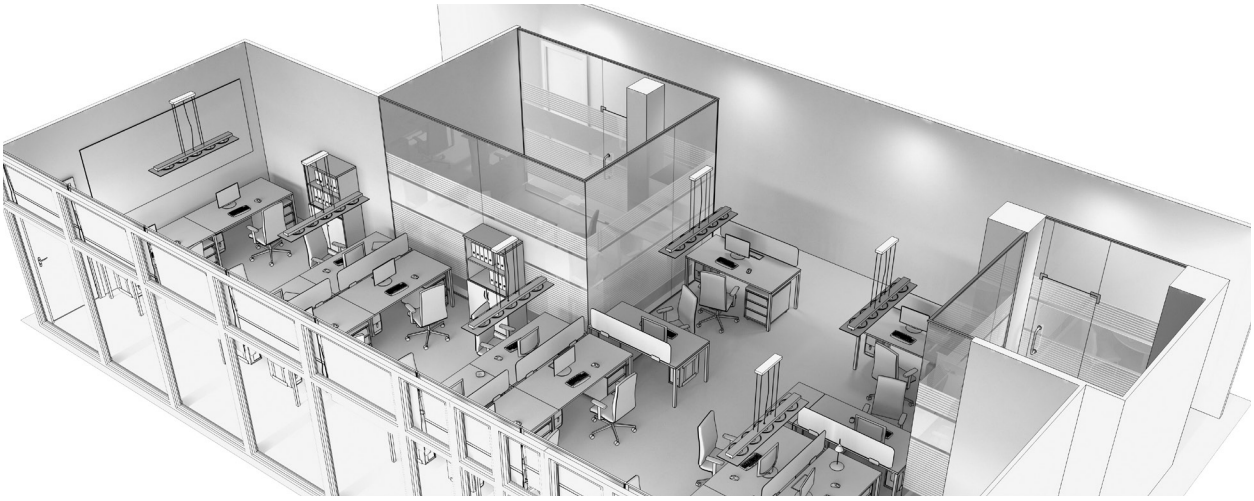
levels of student understanding and acceptance, and minimize the time required to train instructional faculty, staff, and administrators.

This being said, it's equally true that certain adjustments to your in-person courses (e.g. organizational, structural, pedagogical, etc.) will be necessary to optimize the results of your CBE learning and assessment model and, in some cases, for it to work at all. For instance, one of the core premises of most CBE programs is that students advance at their own pace under the guidance of qualified instructional faculty/facilitators. This means that in any given face-to-face CBE course, students will be at different stages. Some students might be working on the material that is normally covered in the first few chapters of an assigned textbook, while others have mastered those topics and moved on to more advanced chapters, and still others may be working on a class project or taking an exam. When hearing this for the first time, the reaction of many new and experienced faculty members is one of overt skepticism. "How can I organize an in-person CBE class and attend to all of my students when some or all of them are working on different activities?", "Is it possible for one student to take an exam while others are receiving instruction?", and "What about simple acoustic and logistical problems?" are just a few of the more common questions that arise.

Fortunately, CBE is flexible. The adjustments that you may need to make in your in-person classes to accommodate CBE learning and assessment are usually easily implemented. For example, one of the more effective solutions that we recommend for classroom management when students progress at different paces, is the use of **Active Learning Classrooms (ALC)**. If you are not already familiar with ALCs, they are usually larger classrooms comprised of spacious student tables with computer screens, whiteboards, and optional mobile room dividers. The original purpose of ALCs is to promote student interaction, but they can also be used to facilitate classroom management when students are at different stages of a given course. For instance, Table 1 might be assigned to students working on competencies normally covered at the beginning of a course, Table 2 to students working on competencies covered at the halfway point, Table 3 to more advanced students who have already mastered most of the competencies, Table 4 to students working on a course project, and Table 5 reserved for students scheduled to take an exam. The space separators and the selection of a large room reduce distractions and course instructors/facilitators are able to move from table to table addressing diverse student needs. The use of ALCs as a course management tool has recently spread throughout the CBE community as educators and administrators recognized their value.

Active learning classrooms are an excellent idea that almost seem to have been designed with CBE in mind. They are highly effective and only one of many examples of the innovative tools that you can incorporate into your in-person courses to accommodate CBE learning and assessment in ways that maximizes student potential and pave the way to success. Don't be afraid to experiment with these and other innovative ideas in your CBE courses, and share your experiences with colleagues. After all, innovation, collaboration, and shared best practices are what CBE is all about and what help make all of us better educators. Please see the Figure 3 below.

Figure 3
Active Learning Classrooms (ALC)



Online course-based CBE learning and assessment models (often referred to as web-based). The introduction of online CBE courses in higher education for the purpose of student learning and assessment originally met with a certain degree of hesitance and, in some instances, outright hostility. It was probably to be expected that the same critics of in-person CBE courses would be doubtful of expanding CBE to the online domain. What came as a surprise to many, though, was that a considerable number of CBE advocates shared their concerns, particularly in terms of the reliability and validity of online assessments of student competencies. Fortunately, with the passing of time and the refinement of online course technology, most of these concerns have been dispelled as both critics and advocates of CBE have had the opportunity to see, firsthand, the viability of offering CBE courses online and their capacity to positively impact student learning and assessment.

Online CBE courses offer advantages over the in-person CBE option that make them attractive to many educators and students, and that you may want to consider when selecting a learning and assessment model. First, they better equip instructors/facilitators to attend to the needs of students who are at different learning and assessment stages in a particular course. As mentioned earlier, one of the unique challenges of in-person CBE courses is how to ensure that each student receives quality instruction/guidance when they are all progressing at different rates. Even for experienced faculty using active learning classrooms, this can be a delicate balancing act. In an online CBE course, faculty can easily attend to each student's individual needs without the normal constraints of a physical classroom. Student A can take an exam, Student B can work on a class project, and student C can review the textbook at the same time.

Second, access to online CBE courses is much more flexible as it is not limited to the hours in which an in-person course meets. This is a tremendous advantage for working adults and other demographic groups who may not be able to attend courses during regularly scheduled dates and times. Third, the online format makes it easier for instructors/facilitators to diversify the repertoire of educational materials

included in their courses. The quantity and quality of digital textbooks, videos, lectures, etc., that can be housed in an online course and assigned to students in accordance with their respective learning and assessment needs are virtually limitless. The number of free, open-access resources (OER) that are available through organizations like Top Hat and OpenStax make these courses an attractive alternative for institutions looking to reduce expenditures on learning materials without sacrificing quality.

Hybrid CBE/traditional learning and assessment models. There are circumstances in which it may be useful, or even necessary, to include traditional, non-CBE course options in a CBE program. In most instances, the number of such courses is relatively small and limited to core or supplementary courses. For example, our colleagues in College E created a CBE program in business administration where 90% of the courses were delivered in the CBE format and the remaining 10% were divided between non-CBE traditional in-person and online courses. These "hybrid programs," notwithstanding a certain degree of unease from purists, can be just as effective as full 100% CBE programs and, in some contexts, even more so. Some very successful CBE programs that we have worked with began with a hybrid learning and assessment model, or later modified their course inventory to include traditional courses.

The reasons usually given for creating hybrid CBE/traditional programs are probably fairly predictable to those of you who have worked in IHEs for a while. The most common is the notion by some faculty and administrators that certain classes simply must be offered in the traditional format to ensure quality. The faculty of one IHE with whom we worked were adamant that their capstone courses must be administered in-person (no online or virtual options) and that students should cover all educational materials and take all exams in these classes at the same time. At first glance, it's tempting to brush this perspective off as the academic equivalent to Tevye exhorting his fellow villagers to adhere to time-honored "Traditions" in the face of new and potentially better ways of doing things. But, at the same time, it's unlikely that a CBE version of the capstone courses would have been successful with so many faculty members unconvinced of its effectiveness. Sometimes it's better to give people a little time to adapt to new ideas at their own pace. In this particular case, the capstone course was eventually converted to the CBE format after faculty and administrators had an opportunity to observe the effectiveness of the other CBE courses that they had developed.

Another common rational for the adoption of a hybrid CBE model is the need to accommodate students that, for one reason or another, prefer to take certain classes in the traditional format. For example, CBE Program F in a humanities discipline shared with us during a recent conference that many of their students feel more comfortable completing the core math requirement in the traditional format. Another program that we have worked with, CBE Program G, discovered roughly three years after launching their program that many of their students were registering for a traditional English course rather than the CBE version. When asked why, the overwhelming response was that the instructor was known for her ability to make the material more accessible and enjoyable. Given the extensive menu of course offerings and delivery formats that students are accustomed to, it should come as no surprise that many of them prefer a CBE learning and assessment model that includes traditional courses. During any given academic cycle, students have the option of selecting from online courses, mini-sessions, night classes, active-learning courses, correspondence courses, and a host of other options. There's nothing wrong with a hybrid CBE program that allows them the same flexibility. Interestingly enough, available scholarly

literature on the subject reveals that most of the hybrid programs end up being "hybrid" in name only. As students become more familiar with CBE and the advantages it offers, they tend to register all of their classes in this format.

CBE models that include learning and assessment activities that occur in authentic, "real world" conditions or simulations. There is a current of thought in CBE that contends that learning and assessment are most effective when they occur in the job environment for which students are actually preparing. In other words, if a student is studying to be an office resource specialist, a paralegal assistant, or a carpenter, then he/she should spend time learning and being assessed in an office environment, law firm, or carpenter's shop. In person and class-based CBE programs, they contend, can never fully prepare students for the circumstances, unexpected and otherwise, that arise "on the job" and should be supplemented with practical experience. In a sense, this line of thought is similar to the reasoning underlying apprenticeship programs, with the noteworthy exception that the learning and assessment occurs in the workplace from the moment a student begins a CBE program rather than towards the end as a capstone or professional project.

A similar but more feasible approach to supplementing alleged shortcomings in online and in-person CBE courses with more realistic learning and assessment activities, is to develop simulations that replicate the workplace. For example, one of our colleagues in a CBE business administration program, in collaboration with a team of CBE computer technology instructors, created a program for testing how MBA students would react in diverse and randomly occurring settings in a virtual environment. Another colleague designed a cybernetic platform for a CBE program in educational administration that enables students to interact in real time with practicing administrators.

CBE learning and assessment models that include direct assessment (DA). The distinction between course-based CBE models that measure competencies and DA can be somewhat subtle. The Council of Regional Accrediting Commissions defines DA as:

> "a subset of competency-based education that is not based on semesters (or academic terms) or credits. The direct assessment approach thus disregards conventional courses and bases both the evaluation of student achievement and the award of a degree or credential solely on the demonstration of competencies. Direct assessment programs allow students to proceed at their own pace rather than to progress through courses offered in a traditional academic term. [...] Students demonstrate the competencies while they are enrolled in the program; transfer credit or prior learning assessment is not permitted in direct assessment programs [...] Direct assessment programs establish Credit-hour equivalencies for the student learning outcomes they evaluate and may choose to provide a transcript indicating course/ credit equivalencies in addition to the competency transcript" (U.S. Department of Education, 2019, p.1).

For IHEs located in Texas, the regional accrediting agency, the Southern Association of Colleges and Schools (SACS), further defines DA to include five characteristics.

1. It does not subscribe to conventional notions of the clock hour, seat time, term length, or the

> credit hour; rather, it relies on the student's ability to demonstrate clearly defined and measurable competencies in a designated program. 2. It is designed and delivered within the framework of the program's defined knowledge, skills, and competencies as demonstrated by students, rather than in terms of prescribed courses. 3. A student may acquire the requisite competencies from multiple sources and at various times other than, or in addition to, the learning experiences provided by the institution. As such, the length of time it takes to demonstrate learning may be different for each student. 4. It often allows for alternative approaches to teaching and learning. 5. If may rely almost exclusively upon students using direct assessment testing models to demonstrate their mastery of program and degree content. (Southern Association of Colleges and Schools, 2018, p. 2)

The inclusion of DA in your CBE program can be structured in one of two ways: insertion in a CBE course or 100% DA. The first option, CBE courses that include DA, are rapidly gaining ground as they afford a degree of flexibility to students that is not otherwise available in traditional and online formats or in 100% course-based CBE models. The ability of students to progress at their own pace and demonstrate mastery of competencies when they are ready, without the temporal and procedural constraints of a traditional course, can be very attractive to the documented millions of U.S. students with extensive previous training and/or academic work. However, if you are considering a CBE course-based model that includes DA, we cannot stress enough the importance of including sufficient *regular and substantive interaction* (RSI) and educational materials for the competencies that the students are unable to demonstrate through DA. Current rules regarding federal funding, especially Title 4 rules, make it extremely difficult for students in CBE programs without educational activities and sufficient RSI to receive financial aid.

CBE learning and assessment models that include prior learning assessment (PLA). PLA is defined by the American Council of Education as "learning gained outside the college classroom in a variety of settings and through formal and non-formal means" (Commission of the States, 2014, p. 1). The fundamental difference between CBE and PLA is that CBE programs require students to actively demonstrate competencies (knowledge/skills), while PLA does not. In PLA, college credit is conferred for previously acquired competencies that are approved as equivalent to the curriculum contained in courses in an IHE's course inventory. For instance, a student enrolled in a CBE math course would be expected to demonstrate competency of certain mathematical processes and principals in order to receive credit for the class. However, if that same student had previously mastered these competencies and the IHE in question conferred credit through PLA, he/she would have the option of submitting proof of competency mastery (e.g. military, professional, and previous educational records and certificates) in exchange for credit in the math course.

Examples of PLA include but are not limited to: military training and coursework, industry recognized certificates, professional studies and training, civic and volunteer activities, and student portfolios. The demographic group that generally reports the highest credential/degree completion rate and overall level of satisfaction with CBE models that include PLA are adult learners 25 years of age and over, who enter CBE programs with some degree of previous military, professional, or civic training and/or coursework that is equivalent to the content of courses offered in post-secondary institutions. We strongly recommend the elaboration of a clear, comprehensive PLA policy in your CBE program, and that it is included in program materials, student orientations, and meetings with designated counselors,

advisors, and academic coaches that serve students interested in your CBE program.

An important point to keep in mind when developing a CBE program that includes PLA, is that credit is not conferred on the basis of a student's experience, but rather on the knowledge acquired through that experience and how it translates into specific college courses. When students submit prior experience to a college for consideration for conversion to credit, it is recommended that qualified external agencies be consulted for additional information and clarification prior to initiating formal internal evaluations. For example, military training and coursework is usually considered for conversion to college credit after it has been vetted and approved by the American Council on Education's (ACE) Military Guide. This agency compares coursework and training completed in all branches of the military to courses offered at colleges and universities. Their findings are then used to formulate recommendations about which military courses/training qualify for college credit. If, for instance, a student in a CBE Program has completed a course in mathematics while serving in the military, ACE's Military Guide would identify the equivalent to this course in higher education and provide a recommendation on its acceptability.

Despite the clear benefits of PLA for students with prior training/education/experience that align with the content of existing college courses, there remain significant impediments to its acceptance by many post-secondary institutions. The most common take the form of inadequate mechanisms to measure course and credit equivalencies, excessively narrow policies that exclude broad categories of experience that occurs outside of standard educational institutions, and an abundance of bureaucratic obstacles. To minimize these and other impediments, and to facilitate clear standards for accepting PLA, state legislatures have recently taken a more active role in guiding colleges and universities in this important area. As of December of 2017, 24 state legislatures have established policies on the acceptability of PLAs. For example, the "Idaho State Board of Education policy outlines minimum standards with which institutions must comply in order to award academic credit for prior learning;" in Illinois, "*the Credit for Prior Learning Act* requires public universities to submit policies for awarding academic credit to the Board of Higher Education for review and approval;" and in Colorado "the Student Bill of Rights requires each public institution to adopt a policy or program to award PLA credit" (Education Commission of the States, 2014, p. 1). So far, the Texas Legislature has not published a formal state-wide policy on procedures for accepting PLA in post-secondary institutions.

In summation of this section, the term "learning and assessment model" in its most basic form simply refers to how and where learning and assessment take place in a CBE program. The "how" and "where" are two of the most important questions that have to be answered before much of anything else can be done. The examples of CBE learning and assessment models presented above are not intended to be exhaustive nor mutually exclusive. Some programs, for instance, combine in person course-based models with models that incorporate simulations. They are, however, the most common types of learning and assessment models used in CBE and ones that you might want to consider as you are developing your new program. For a summary review of these models, how and where learning and assessment occurs in each one, and their respective advantages and disadvantages, please see Table 2. The information on the advantages and disadvantages are extracted from survey responses and interviews conducted with faculty who have more than one year of experience with these models.

Table 2

Review of Leading CBE Learning and Assessment Models.

Leading CBE Learning and Assessment Models	How and Where CBE Learning and Assessment Take Place	Principal Model Advantages	Principal Model Disadvantages
In person course- based models	• Where: Traditional classrooms. • How: Diversified instruction and assessments in accordance with CBE theory and practice.	• Easily fits into existing IHE infrastructures. • Students require less time to understand and adapt to this model. • Minimizes opposition from internal and external actors. • More compatible with existing faculty leaning and assessment techniques	• Comparatively moderate level of assessment reliability for workforce competencies. • Challenges associated with managing students who are at different learning and assessment stages in the same physical space.
Online course-based models	• Where: Online course. • How: Diversified instruction and assessment in accordance with CBE practice and theory.	• Improves instructor capacity to simultaneously manage students at different learning and assessment stages. • Facilitates a larger, more diverse inventory of learning and assessment materials. • Enhances individualization of student learning and assessment. • Expands access to learners with time and scheduling constraints	• Fewer opportunities to develop student soft skills. • Fewer opportunities for in-person interaction between students and instructors/facilitators. • Student preference for in-person format due to years of habituation. • Creates a sense of isolation for some students. • Higher indices of student procrastination than in CBE in person courses.
Hybrid/CBE traditional course models	• Where: Combination of CBE courses and traditional in-person and online courses as determined by student preferences • How: Students combine CBE and traditional courses.	• Students select course formats aligned with their learning and assessment skills and preferences. • Higher degree of student satisfaction and sense of control and inclusion in the educational process. • Increased student retention and completion rates. • More flexible scheduling options.	• Slower and more complicated student adaptation to CBE. • Higher level of student confusion distinguishing between different learning and assessment models. • Higher incidence of inadequate and/ or contradictory institutional advising, particularly for first-year students.
Models that include learning and assessment in the "real world."	Where: Class (in person or online) combined with an authentic employment environment. How: Assessment and/or instruction conducted in both the CBE class and an employment environment.	• Provides a more realistic learning and assessment experience. • Reinforces alignment of competencies with labor market requirements. • Improves student understanding of chosen profession.	• Often difficult to obtain placement opportunities for all students. • Liability issues associated with student activity outside of the IHE. • Complications coordinating learning activities and assessments in the workplace with students at different stages of progress
Models that include learning and assessment in simulations.	Where: Class (in person or online) combined with simulations How: Assessment and/or instruction conducted in both CBE classes and simulations.	• Offers more realistic assessment than written and performance tests. • Bypasses obstacles associated with assessments in the real world. • Allows course instructors to introduce variables that diversify assessments in real time.	• Design and development costs are often prohibitive. • Design and development require time and knowledge. • Time required for students to adapt to simulations.
Models that include direct assessment	Where: Depends upon the learning and assessment model selected How: DA can be combined with learning and assessment activities or conducted independently.	• Students acquire credit via assessments of previously acquired competencies. • Course completion is accelerated. • Reduced use of institutional resources. • Students not required to relearn competencies. • Reduced costs for students and institutions.	• DA administered without course instruction is generally ineligible for Title IV funding.
Models that allow prior learning assessment	Where: outside of the learning and assessment environment. How: Students receive credit for previously acquired competencies as approved by qualified internal and external actors.	• Degree completion is accelerated • Students not required to enroll in courses to cover competencies that they have previously learned. • Reduced costs for students and institutions. • Increased graduation rate. • Reduced time to graduation.	• Internal and external opposition to PLA. • Confusion over the process of awarding PLA. • Divergent standards for defining what qualifies as PLA.

Note. The elaboration of this table, and any errors or omissions, are the sole responsibility of the author of this handbook.

Step Six: *Identify the Resources Needed at Each Stage of Program Planning, Development and Implementation*

Once you have selected a program for conversion to the CBE format and an appropriate CBE learning and assessment model, the next step is to identify the resources you will need (e.g. personnel, infrastructure, technology etc.). Obtaining this information as early as possible is advisable as it will equip you to devise a more thorough program development plan, ensure that you have all necessary resources, and, more importantly, assess your program's overall financial viability. It's not as unusual as you might think for IHEs to spend a considerable amount of time, resources, and energy on the development of a CBE program, only to discover that they lack sufficient funds to complete, inaugurate, or administer it, or that they have left out key resources in their original cost calculations.

Pursuant to these goals, this section will proceed by identifying the resource categories (human and physical capital) that are generally required to develop, implement, and administer a CBE program, and examples of each category. The purpose is not to present an exhaustive enumeration of the resources that you will need, but rather to list the ones that are most common in CBE programs. Every program is a little different, but, in general, there are certain resource categories that most need and should be considered. They include but are not limited to: an advisory board; course design and development personnel; program staff, faculty, and administrators; student advising and counseling; other institutional resources and services; and technological and physical infrastructure.

Resource #1, advisory board. The advisory board, comprised of internal and external members, will play a key role in the evolution of your CBE program, and should be present at all stages of program planning, development, and implementation. While most of the leading cost-estimation models do not include the expenses incurred by an active advisory board, we suggest that you consider them in your overall budget. Further, to avoid time consuming delays, reduce repetitive communication, and optimize the synergy of group interaction, we also recommend that your advisory board meet on a regular basis: no less than twice every month during the planning and development stages of your new CBE program and once-per semester or quarter during the subsequent implementation and administration. The costs of these meetings will vary in accordance with location, travel, and resource use, but are usually minimal. For our purposes, an advisory board is defined as "a group of university and community stakeholders from various local or regional institutions." "In general, boards tend to have multiple labels, flexible structures and different foci. However, a well-selected board will align around common interests in active participation, shared mission, and direct influence with students, faculty, and other board members" (McElroy, 2012, p.1).

The purpose and configuration of a CBE advisory board is similar to that of typical advisory boards for academic and workforce programs that you may already be familiar with. Their duties generally draw from the following list: formulate recommendations to align the program with the competencies that employers are seeking, impartially evaluate labor market conditions and demand for program graduates, participate in assessing the efficacy and relevance of CBE instructional practices, function as intermediaries between the program and external entities, market and promote the program, recruit additional board members, assist in the process of obtaining apprenticeships and other professional opportunities, and

generally support the mission of the program.

Despite the similarities, there are also certain differences between CBE advisory boards and their traditional equivalents that should be kept in mind when selecting board members. For instance, CBE advisory boards usually include individuals who are knowledgeable of the theory and practice of CBE, prioritize program conformance with CBE best practices, and incorporate more representation from departments that, while external to your program, will be affected by it. Without entering into too much detail, we recommend that the core of your advisory board be comprised of at-least six key components.

CBE Advisory Board

- Representatives (between two and three) from the public and/or private sectors who are knowledgeable of the industry covered in your CBE program and the competencies required for your graduates to be competitive, current and future labor demand trends in this industry, and the availability of apprenticeships and other types of professional experience and training. The insights offered by these individuals, usually employers, cannot be underestimated. Most importantly, they will play an important role in ensuring that your program and its graduates are continually up to date on the competencies that employers are looking for in an ever changing and highly globalized economy.

- At least two faculty representatives from the CBE program being developed and, if possible, a program administrator (normally the program chair or assistant chair) should be included to organize and oversee the activities of the advisory board.

- Student-representatives authorized to speak on behalf of their peers and offer suggestions for program development and improvement will strengthen the quality, relevance, and responsiveness of your CBE program, and promote

greater acceptance among current and future students. For most students, CBE is a new and very different approach to education. The participation of student representatives on the advisory board helps keep the channels of communication open, gives students a sense of inclusion and ownership, and reduces potential causes of confusion and misunderstanding.

• In the early stages of program development, include Alumni who have graduated from the traditional version of your program (if one exists) and are qualified to offer recommendations to more closely align CBE content with their experience in the labor market. As your CBE program evolves and begins producing graduates, include one or more of them as regular members of your advisory board. The value of input from alumni is often overlooked to the detriment of CBE programs. In the final analysis, the success or failure of your graduates is the most valid determinant of the extent to which your CBE program is working and where it needs to be improved.

• The active participation of one or more persons who are knowledgeable of and, if possible, have experience in the theory and practice of CBE will minimize confusion and directly contribute to the effectiveness of your advisory board. It's crucial that at all stages of program development and implementation, and administration your advisory board understands what CBE is and how you intend to apply it in your new program. As iterated throughout this handbook, there is no small amount of confusion surrounding CBE, and too often, incorrect and/or contradictory interpretations have led well-intentioned advisory boards to offer recommendations that do not align with the theory or practice of CBE. Board members who are knowledgeable of CBE can provide orientation and ongoing guidance to minimize errors and better ensure the development of a quality program that is in compliance with CBE best practices.

• Include representatives from departments in your IHE that may need to modify or add to the traditional services and resources that they offer in order to accommodate your program and its students. For example, CBE programs that replace standard letter grades with "Pass/Fail" would benefit from the inclusion of someone from the Admissions Office to advise on the technical and logistical aspects of recording these grades and other related issues. Deciding which departments to invite to join your advisory board can be a little tricky for a number of reasons. You may not know yet exactly which departments will be affected by your program, you want to avoid inundating the advisory board with an unmanageable number of members, and there will inevitably be some confusion over CBE among the department representatives that you invite. Nonetheless, best practices have confirmed that including representatives from departments that will be affected by your program promote efficiency and minimize potential problems in the long run.

Resource #2, course design and development team. The process of designing and developing CBE courses for the first time can be highly challenging and time consuming. For example, two colleges with whom we consulted when researching this handbook began working together to create a collaborative CBE program in spring of 2013. Their course designers met once a month, in person, and were in ongoing communication via email, virtual portals, telephone calls, etc. Yet, despite this close and continuous collaboration, it wasn't until exactly 12 months later that their courses were fully developed, approved, and ready for delivery. Another team, at a different college interviewed for this handbook, initiated

work on a CBE program in January of 2015, with the intent of completing and approving all courses by December of the same year. As of the time of writing, they are still working on the courses. When considering the resources needed to develop your CBE courses, be cognizant of the fact that you may need additional time than originally expected and, if feasible, allow yourself a certain margin of flexibility in the deadlines that you establish.

The minimum personnel necessary to develop CBE courses (discussed in more detail in the section on Step Ten) usually includes subject matter experts; CBE experts; representatives from the Distance Learning (DL) Department, if the course will be delivered online or via another remote modality; and persons with previous experience and/or knowledge of CBE course design and development. In general, there are two standard approaches to organizing your course design and development teams. The first is to assign a course to a single subject matter expert, who will then consult with other members of the team for assistance and guidance. For example, if you are developing CBE courses in the math department, one subject matter expert might be assigned algebra, another geometry, another calculus, and so forth. Each subject matter expert would then develop the course in consultation with the aforementioned team members. The second approach is for the course development team to work together on all of the courses. Here, instead of assigning a course to a single subject matter expert, all of the subject matter experts work together on each course in collaboration with the CBE experts, representative from DL, and other team members. This approach has been popularized by Western Governors University, one of the largest and most well-known IHEs in the field of competency-based education (for more information on their design approach, consult: wgu.com).

Of these two approaches to designing and developing CBE courses, the second is usually the most effective. It capitalizes on the advantages of economies of scale, course designers become more knowledgeable and efficient as they gain experience developing multiple courses, errors are minimized because team members check one another's work, and mutually accepted quality control standards and mechanisms can be implemented. Further, it has been our experience that this approach reduces overall costs as fewer subject matter experts are required to develop new courses.

Resource #3, faculty, staff, and administrators for program implementation and administration. As your program advances through the distinct phases of design, development, implementation, and administration, it will require progressively more resources and personnel. At the beginning, you won't need more than a handful of people working on program design and development. But, once your CBE program is fully implemented, it will require as many if not more faculty, staff, and administrators as its traditional and online counterparts. A good starting point to determine your specific human resource needs is to review prior programs that your IHE has created, consult with the previously mentioned experts in CBE (e.g. Texas A&M-Commerce Institute for Competency-Based-Education, South Texas College, CBEN, and Competency Works), and meet with your advisory board. Most importantly, the cost estimation tools described in the next section provide a detailed list of the specific faculty, staff, and administrators that are required by most CBE programs and that will most likely be necessary for yours. However, each program is different. To avoid underestimating overall program costs, be sure to fully identify all personnel that will be needed at each stage and their individual costs (e.g. wages, benefits, training, etc.).

Resource #4, technological resources. Depending upon the type of CBE program that you develop, some degree of modification to your existing or acquisition of new technology may be necessary. The learning management system (LMS), student information system (SIS), customer relations management system (CRM) and other technological resources used by your IHE may not be the best, or even adequate, for your program's needs. For example, there are currently four LMSs used in the majority of CBE programs: Blackboard, Instructure Canvas, Desire2Learn and, more recently, Pearson LearningStudio. Each one has its own unique pros and cons. Some enable schools with limited data storage capacity to use the cloud as a repository, while others are better for IHEs that prefer to host their own data. Some facilitate a greater degree of asynchronous communication between instructors and students, while others are better for instructors that prefer synchronous interaction. And, some are more effective at integrating with other institutional information systems while others are more independent.

In addition to these and other standard systems, a number of new and dynamic LMSs have made their way to the market that, through design or accident, more effectively address the needs of the growing CBE community. Some of the better-known examples of these new LMSs are described in the article, Show What You Know: A landscape Analysis of Competency-Based Education and include Cortex, which offers an "Integrated platform with a focus on mastery of skills that allows for the creation of personalized learning progressions, which students can see to track their progress and teachers can use to differentiate their instruction;" Empower Learning, "a platform that supports competency-based learning models through content creation, management, and assessment reporting;" Epiphany Learning, "a platform that supports personalized, interdisciplinary, and competency-based learning;" and Motivis Learning, "a competency-based platform that supports competency-based and traditional learning. The system houses three components designed to contribute to student success—a learning management system that tracks progress across the student lifecycle combined with student information system functionality and a social community tool" (Getting Smart Staff, 2018).

The LMS that you select and other technological needs will vary in accordance with a number of factors, including the design of your CBE program, number of students enrolled, stage of program development and implementation, compatibility with existing technology, and a host of other considerations. Selecting technology that is appropriate for your program's needs and within your budget during the planning stages, will save you time and effort down the road as your program grows, improve its overall quality, and limit unexpected and potentially costly expenditures for technological resources that you hadn't anticipated or that compensate for shortcomings in your existing technology.

Resource #5, institutional resources and services. A common and frequently costly mistake made by IHEs when developing a CBE program for the first time is to overlook necessary institutional resources and services. As is the case with any academic/workforce program, CBE programs require the services of the admissions office, financial aid, tutorial staff, distance education, public relations and marketing, office of university relations, library personnel (particularly for OER educational materials), student counseling and advising, and, basically, the entire array of services and infrastructure provided by colleges and universities. In most cases, the costs of these resources are absorbed by the IHE and offset by revenues derived from increased student enrollment in the new CBE program (e.g. tuition, state funding, etc.). However, empirical evidence has shown that CBE programs, for a number of reasons, including their

relativeness newness and diversity of service offerings, tend to require the expansion and/or modification of existing institutional resources or the creation of new ones, all of which can be costly.

Examples of CBE programs falling short of their original budget and timeline projections due to overlooking institutional resource and service needs abound. One of the most recent examples that comes to mind is the case of University G that was developing a CBE program in the social sciences. From the very beginning, the work conducted by the program development team was exemplary: they included all relevant personnel in each stage of program design, development, and implementation; met on a regular basis; formed course development teams that were experienced and knowledgeable of CBE; collaborated with other departments in their institution; and formulated what appeared to be accurate and comprehensive projections of resource needs and costs. Unfortunately, after obtaining approval to implement the program, they realized that they had omitted the cost of hiring a trained academic coach. The program development team had originally agreed that an academic coach would increase recruitment, retention, and graduation rates, and that it would pay for itself in the long run through reduced funding losses caused by student attrition. The problem was that their budget did not contemplate the expense of hiring this person and, as a result, program implementation was delayed.

Creating a quality CBE program is a complex process with a lot of moving parts. It's understandable that program development teams frequently find themselves modifying their original plan and/or budget well after the program has been implemented to include institutional resources that they missed. Before fully launching your program, it's a good idea to double check all of the projected institutional resource needs, consult extensively with your program development team, and run pilot CBE courses. Even with all the preparation and planning, you may be surprised by how much your team might have overlooked.

Step Seven: *Select a Cost-Estimation Model for Your CBE Program*

After identifying the resources that you will need for your CBE program, calculate the revenues for each stage of design, development, implementation. The revenue sources for academic/workforce programs in higher education generally include government grants, contracts, and appropriations; student tuition and fees; and investments, and CBE programs are no different. It's worth noting, though, that certain attributes inherent to CBE programs tend to reduce expenses in the long-run, and thus reduce the amount of revenues needed to sustain a program. First, the average time to completion is shorter in CBE courses because students are not required to relearn competencies that they have already mastered, and they proceed through course material at their own pace. This reduces the amount of resources, instructional and otherwise, that are required per course. Second, the student retention rates in CBE programs at IHEs are higher than the national averages, which reduces losses in student tuition and government funding. By applying the standard model developed by Dr. Neil Raisman for calculating revenue losses due to student attrition, it can be seen that the average CBE program in an American postsecondary institution saves significantly more than its traditional and online counterparts (Raisman, 2013). Third, CBE programs are more inclined to employ trained academic coaches, which has been proven to reduce overall program costs as less support staff is necessary, student retention and graduation rates are higher, and overall program efficiency increases.

Select the cost-estimation model that is best for our program. After you identify the resources that you will need and calculate revenues, the next step is to determine the cost of each stage of development, implementation, and administration of your CBE program. Doing so early during the planning stage is the best idea as it will enable you to better gauge the economic viability of your proposed CBE program and which, if any, budgetary adjustments may be necessary before you get started. Fortunately, much of the footwork for calculating revenues and overall program costs has already been done for you. The National Center for Higher Education Management Systems (NCHEMS), Western Governors University (WGU), The Competency-Based Education Network (C-BEN), and other reputable public and private sector organizations have developed a number of highly reliable models to estimate the revenues and costs of developing, implementing, and administering CBE programs at the postsecondary level. The applicability of these models and their respective advantages and disadvantages vary depending on the nature and composition of the CBE Program to which they are applied. Choosing the CBE cost-estimation model that best fits your program is an important part of the planning phase and can easily make the difference between success and failure.

Having said this, it is the position of this handbook that while most nationally recognized cost-estimation models are well designed and have a proven record of success, the one created by the National Center for Higher Education Management Systems (HCHEMS) is generally considered to be the most comprehensive, precise, and user-friendly for IHEs developing a CBE program for the first time. With very few exceptions, the programs for which we have recommended this model have been impressed with the results. Some of the more representative responses that we have received from colleagues at other IHEs are that "it is easy to input, manipulate, and interpret cost data," "generates a comparatively small margin of error," and is "more comprehensive than other models."

Developed with support from the Lumina Foundation, the HCHEMS model is available free of charge to public and private institutions (*https://nchems.org/projects/cbe-cost-model/*) and offers a step-by-step method for identifying, quantifying, and inputting the costs and revenues associated with each stage of a CBE program. Further, the model's capacity to generate both short and long-term cost and revenue projections constitutes a significant advantage over most other models that are limited to start-up costs and fail to consider revenues, in that it enables CBE program development teams to better gauge the long-term viability of their proposed program. Too often, a considerable amount of time, energy, and money is invested in a program that ultimately proves to be financially unsustainable. The selection and correct application of a cost-estimation model that is appropriate for your program will enable you to determine if (a) your program design is financially feasible in its current form, (b) you need to make adjustments as indicated by the model's total cost and revenue projections, or (c) the project simply is not viable.

To illustrate how to use a cost-estimation model and how it can contribute to the accuracy of your projections, let's briefly review some of the cost and revenue tables contained in the HCHEMS model. As described above, a good starting point for measuring the financial viability of a CBE program is to calculate projected revenues. The table in Figure 4, extracted from the HCHEMS model, contains general revenue categories, each one of which is linked to a corresponding and more detailed discrete revenue table. For example, the data included in the category of "State and Local Support" is derived from another table that exclusively quantifies these revenues. Completing the general and discrete revenue tables in this model

will give you a better idea of your overall funding and, just as important, may help you identify revenue categories that you might have overlooked.

Figure 4

NCHEMS Tuition and Revenue Table

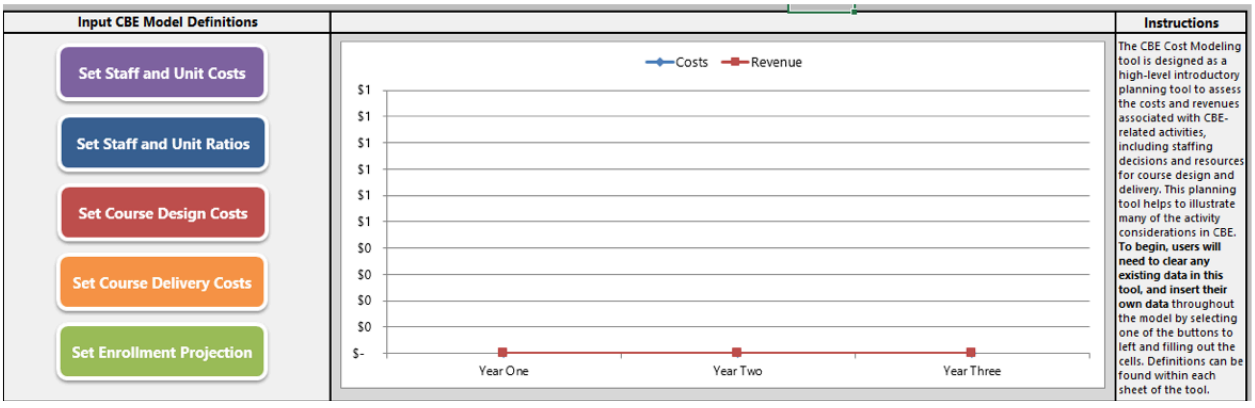
Tuition & Revenue		
Charge per Credit Hour	$	-
Revenue per FTE	$	-
Annualized Tuition Revenue	$	-
State and Local Support (FTE)	$	-
Total S&L Support	$	-
Projected Tuition Annual Increase		0%
Total Annual Revenue in Year One	$	-

Figure 4 is extracted from the "Competency-Based Education Cost Model." It was retrieved from *https://nchems.org/projects/cbe-cost-model/* with the permission of the National Center for Higher Education Management.

After calculating discrete and overall revenues for your CBE program, you would proceed to calculate discrete and overall costs in the same way by completing the general cost table seen in Figure 5. As you can see, this table includes the five standard cost categories for developing, implementing, and administering a CBE program: set staff and unit costs, set staff and unit rates, set course design rates, set course delivery costs, and set enrollment projections. The data for each cost category in Figure 4 are derived from a corresponding and more detailed discrete cost table. For example, the costs for staff, faculty, and mid-level administrators in Figure 5 are derived from the tables in Figures 6 and 7.

Figure 5

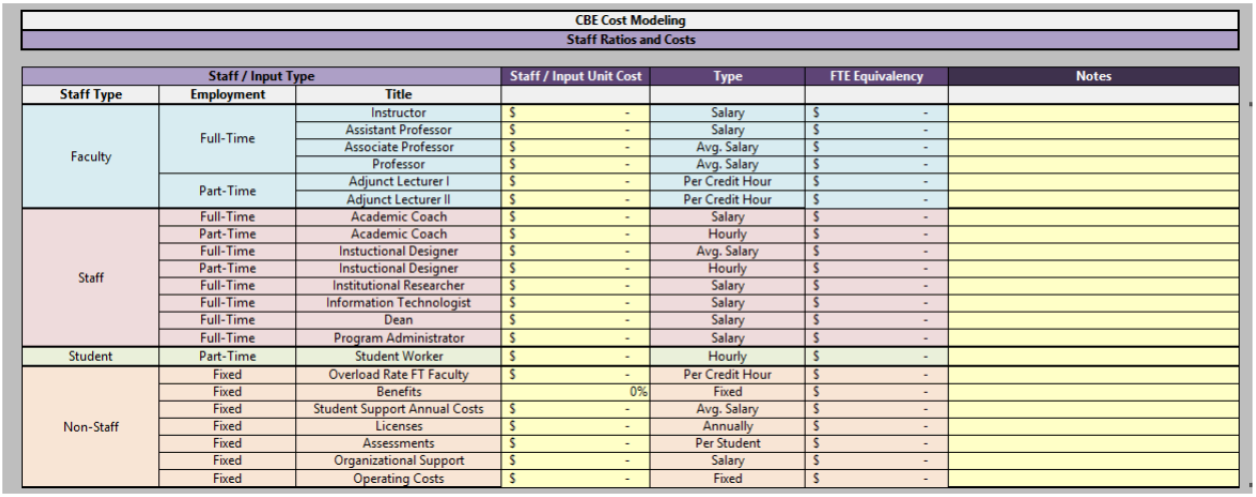
HCHEMS General CBE Cost Categories



Note. This figure is extracted from the "Competency-Based Education Cost Model." It was retrieved from *https://nchems.org/projects/cbe-cost-model/* with the permission of the National Center for Higher Education Management

Figure 6

HCHEMS CBE Staffing Costs



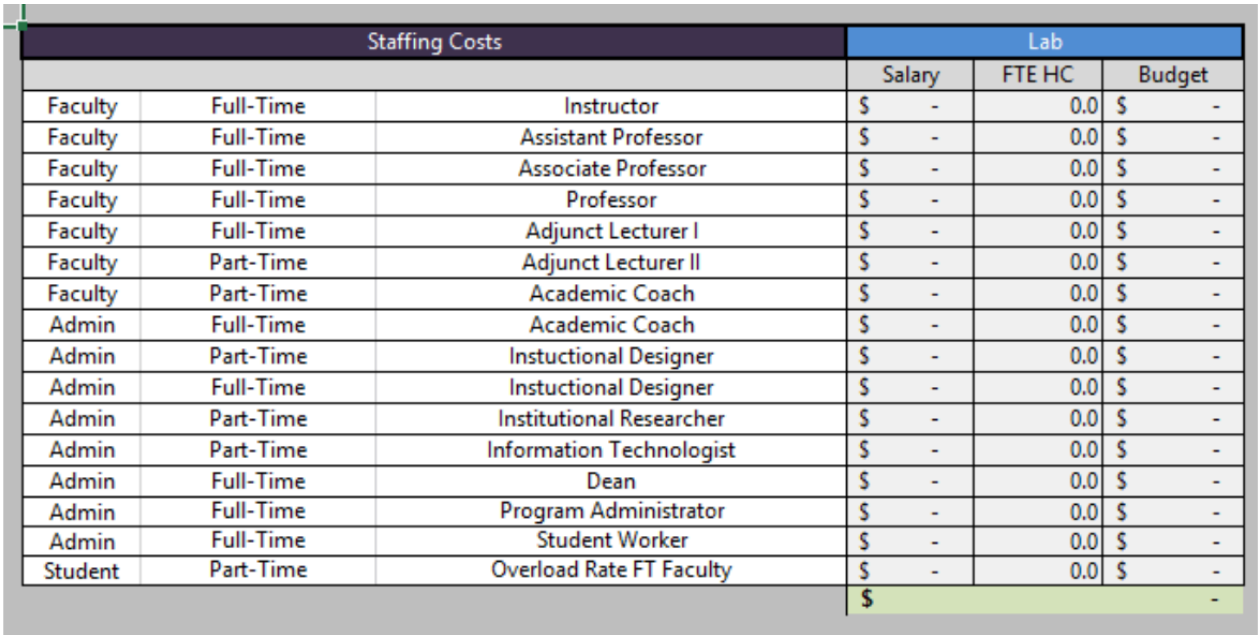
CBE Cost Modeling
Staff Ratios and Costs

Staff / Input Type			Staff / Input Unit Cost	Type	FTE Equivalency	Notes
Staff Type	Employment	Title				
Faculty	Full-Time	Instructor	$ -	Salary	$ -	
		Assistant Professor	$ -	Salary	$ -	
		Associate Professor	$ -	Avg. Salary	$ -	
		Professor	$ -	Avg. Salary	$ -	
	Part-Time	Adjunct Lecturer I	$ -	Per Credit Hour	$ -	
		Adjunct Lecturer II	$ -	Per Credit Hour	$ -	
Staff	Full-Time	Academic Coach	$ -	Salary	$ -	
	Part-Time	Academic Coach	$ -	Hourly	$ -	
	Full-Time	Instuctional Designer	$ -	Avg. Salary	$ -	
	Part-Time	Instuctional Designer	$ -	Hourly	$ -	
	Full-Time	Institutional Researcher	$ -	Salary	$ -	
	Full-Time	Information Technologist	$ -	Salary	$ -	
	Full-Time	Dean	$ -	Salary	$ -	
	Full-Time	Program Administrator	$ -	Salary	$ -	
Student	Part-Time	Student Worker	$ -	Hourly	$ -	
Non-Staff	Fixed	Overload Rate FT Faculty	$ -	Per Credit Hour	$ -	
	Fixed	Benefits	0%	Fixed	$ -	
	Fixed	Student Support Annual Costs	$ -	Avg. Salary	$ -	
	Fixed	Licenses	$ -	Annually	$ -	
	Fixed	Assessments	$ -	Per Student	$ -	
	Fixed	Organizational Support	$ -	Salary	$ -	
	Fixed	Operating Costs	$ -	Fixed	$ -	

Note. This figure is extracted from the "Competency-Based Education Cost Model." It was retrieved from *https://nchems.org/projects/cbe-cost-model/* with the permission of the National Center for Higher Education Management

Figure 7

NCHEMS CBE Faculty Costs



Staffing Costs			Lab		
			Salary	FTE HC	Budget
Faculty	Full-Time	Instructor	$ -	0.0	$ -
Faculty	Full-Time	Assistant Professor	$ -	0.0	$ -
Faculty	Full-Time	Associate Professor	$ -	0.0	$ -
Faculty	Full-Time	Professor	$ -	0.0	$ -
Faculty	Full-Time	Adjunct Lecturer I	$ -	0.0	$ -
Faculty	Part-Time	Adjunct Lecturer II	$ -	0.0	$ -
Faculty	Part-Time	Academic Coach	$ -	0.0	$ -
Admin	Full-Time	Academic Coach	$ -	0.0	$ -
Admin	Part-Time	Instuctional Designer	$ -	0.0	$ -
Admin	Full-Time	Instuctional Designer	$ -	0.0	$ -
Admin	Part-Time	Institutional Researcher	$ -	0.0	$ -
Admin	Part-Time	Information Technologist	$ -	0.0	$ -
Admin	Full-Time	Dean	$ -	0.0	$ -
Admin	Full-Time	Program Administrator	$ -	0.0	$ -
Admin	Full-Time	Student Worker	$ -	0.0	$ -
Student	Part-Time	Overload Rate FT Faculty	$ -	0.0	$ -
			$		-

Note. This Figure is extracted from the "Competency-Based Education Cost Model." It was retrieved from https://nchems.org/projects/cbe-cost-model/ with the permission of the National Center for Higher Education Management

As a final thought to conclude this section, we would encourage you to avoid worrying excessively about the affordability of your program. In the famous words of Will Rogers, "worrying is like paying on a debt that may never come due." It has been our experience that many promising and financially viable CBE programs never make it past the exploratory stage due to concerns over costs that are usually exaggerated or could be adjusted. In a recent nationwide study conducted by the American Research Institute (AIR), "perceived CBE program start-up costs" was documented as the leading cause of the decision to abort a CBE program during the planning stages in the 2018 – 2019 academic cycle. Ironically, the study also found that "56% of CBE programs cost about the same as traditional programs" and "39% of CBE programs were less expensive" (AIR, 2019, pp. 1-2).

If, after calculating your costs and revenues, you determine that your program is not financially viable in its current form, consider making adjustments to it. For instance, you may decide that it's preferable to hire more adjunct instructors, increase the number of courses offered online, or—as many institutions do—forego compensating faculty for their role in the course development process. In most instances, they are amenable to this option knowing that they will be compensated later for instructing/facilitating the new CBE courses. In short, developing, implementing, and administering a CBE program doesn't have to be any more expensive than a traditional program. It's usually just a matter of selecting the resources that best fit your budget and the willingness to make necessary and appropriate adjustments.

Step Eight: *Devise Strategies to Promote Program Acceptance and Institutional Inclusion*

If you have adopted a linear approach to reading this handbook, beginning with the introduction and advancing chronologically through the different topics, then you are aware of the emphasis we place on the possibility and consequences of opposition to your CBE program from faculty, staff, and administrators. In a perfect world, your IHE would house individuals who are knowledgeable of and actively advocate for CBE, and you would count on the support of key institutional administrators. In the real world of modern post-secondary education, where innumerable interests compete for scarce resources and new and innovative programs often face opposition from entrenched defenders of the status quo, this is more the exception than the rule.

The importance of securing the acceptance of faculty, staff, and administrators—and, even better, their possible inclusion in your CBE program—cannot be underestimated. Faculty design and teach courses; they are the subject matter experts and intermediaries between students and the institution. Staff are the glue that hold the organization together. They are responsible for the countless day-to-day operations that are essential for programs to succeed. And, administrators ultimately decide which programs will survive and which ones won't. All three components are indispensable to the success of your program. Ignoring or marginalizing any one of them can mean the difference between a program that offers new and exciting opportunities to your institution and the students it serves, and one that is eventually left in the dustbin of failed educational experiments.

As mentioned earlier, a precursory assessment of how CBE is viewed at your IHE and among external stakeholders will better equip you to determine the viability of developing a new program and its

probability of success. In particular, it will give you an idea of whether or not the investment in time, money, and other resources is justified. It may be that after considering the responses of your colleagues and other stakeholders, you reach the conclusion that circumstances are not amenable at the moment and opt to forego the creation of a CBE program or to postpone it for another date. On the other hand, you may discover that there is, generally, a favorable view of CBE among your colleagues. If past trends are any indication, the most likely scenario is that most of your colleagues simply don't know much about CBE beyond the notion that students are evaluated on the bases of their ability to demonstrate mastery of predetermined course competencies. In the 2018 National Survey of Post-Secondary Competency Based Education (NSBCBE), most of the respondents who had actively participated in creating and administering a CBE program stated that they would have benefited from a better understanding of the theory and practice of CBE at the beginning, as well as more concrete examples of how it differs from traditional approaches (NSBCE, 2018).

Without entering into more detail than is necessary in this introductory handbook, there are three recommendations that are a good starting point to increase the level of acceptance and inclusion among your colleagues. The first, and most basic, is to create a question and answer sheet that can be easily disseminated throughout your IHE. The content should include best practices in general CBE theory and practice, as well as more specific information that addresses the responses you received in the assessment device previously distributed to faculty, staff, and administrators. If circumstances and resources permit, a second recommendation is to conduct information sessions that can be as simple as an informal office visit or as detailed as a large-scale orientation. The third recommendation requires a greater commitment in time and resources but generally pays off in terms of convincing sceptics and generating champions for your cause. Consider sending a group of representatives to a local, state, or national CBE conference. The results are usually that advocates of CBE return more knowledgeable and enthusiastic; skeptics become convinced and, in some cases, actively support CBE; and hardened opponents are more willing to evaluate CBE with an open mind.

Step Nine: *Schedule CBE Faculty Orientation and Training Sessions*

A critical error made by many IHEs when undertaking the development of a new CBE program is to overlook or underestimate the amount of orientation and preparation required for instructional faculty/facilitators. In both theory and practice, CBE courses differ from their traditional and online counterparts in diverse ways. Instructional faculty who do not understand these differences and how they are applied in course development and delivery not only run the risk of undermining the quality and integrity of the courses they instruct/facilitate but can easily confuse and misdirect students. After you have conducted an assessment of faculty perceptions of CBE, as described in the previous section, we recommend that you begin planning your faculty orientation and training sessions. The information yielded in the assessment will be useful in structuring these sessions.

The content, duration, and frequency of the faculty orientation and training sessions will depend on a number of variables, including time, resources, complexity of your CBE courses, and existing levels of faculty knowledge and acceptance of CBE. Notwithstanding these variables, there are two components that are normally recommended for inclusion in the CBE faculty training and orientation sessions to

maximize their effectiveness. The first is to clearly explain the general theory and practice of CBE. One of the most recurrent and usually justified complaints that we hear from instructional faculty in CBE programs is that they have received diverse and often contradictory explanations of the theory and practice of competency-based education. Orientation and training sessions are a golden opportunity to establish standard guidelines for what CBE is and how it works, dispel some of the misconceptions that typically circulate around college campuses, and promote a greater degree of faculty acceptance and inclusion.

The second component that faculty/facilitator training and orientation sessions should include, as described by Tanya Roscorla, Managing Director for the Center for Digital Education, is to establish and communicate common "faculty competencies" for developing and instructing/facilitating courses (Roscorla, 2016). In other words, you want to clearly explain to instructional faculty/facilitators what they should know and be able to do in order to successfully develop (individually or as part of a team) and instruct/facilitate a CBE course. Examples of basic instructor/facilitator competencies contained in most CBE faculty orientation and training sessions include, but are not limited to: understanding of CBE theory and practice, understanding of and demonstrated ability to create CBE competencies, demonstrated ability to individualize educational materials within a CBE course, demonstrated ability to design assessments in accordance with CBE best practices, and demonstrated ability to develop and apply grading rubrics based on CBE best practices.

After you have established and communicated standardized competencies for developing and instructing/facilitating CBE courses, elaborate performance indicators to measure the progress of instructors/facilitators in the mastery of each of these competencies. For instance, the sample faculty performance indicators in Table 3 include three separate benchmarks for measuring faculty progress in each competency: introductory, satisfactory, and advanced. Once each benchmark is met, faculty proceed to the next level of competency mastery. In most instances, it is also advisable to devise a timeline for progression through each competency. The actual parameters of the timeline will vary, but we suggest fairly wide margins to better ensure that your faculty have enough time to master all of the skills that are necessary to develop and instruct/facilitate CBE courses.

Table 3

Sample Performance Indicators for CBE Instructional Faculty/Facilitator Competencies

Faculty Competencies	Introductory	Satisfactory	Advanced
General understanding of CBE theory.	Faculty member has received instruction on the basic principles of CBE theory.	Faculty member demonstrates understanding of the basic principles of CBE theory.	Faculty member is qualified to assess and evaluate basic principles of CBE theory and their application in the home IHE
General understanding of CBE practices.	Faculty member has received instruction on the basic principles of CBE practices.	Faculty member demonstrates understanding of the basic principles of CBE practices.	Faculty member is qualified to assess basic principles of CBE practices and their application in the home IHE
General understanding of CBE course competencies.	Faculty member has received instruction on the theory underlying CBE course competencies.	Faculty member demonstrates knowledge of the theory underlying CBE course competencies.	Faculty member is qualified to critically assess existing CBE course competencies and make recommendations.
Ability to develop CBE course competencies.	Faculty member develops course competencies in a simulated course that are approved by qualified CBE trainers.	Faculty member develops course competencies in a real CBE course that is approved by the Course Review Committee	Faculty member successfully reviews competencies in other CBE courses at the home IHE for conformance with CBE best practices.
Ability to select/ develop individualized educational materials for CBE courses	Faculty member has received instruction on best practices for individualizing educational materials in a CBE course.	Faculty member individualizes educational materials in a CBE course that is approved by the Course Review Committee.	Faculty member successfully reviews the educational materials in other CBE courses at the home IHE for conformance with CBE best practices.
Understanding of and ability to apply CBE assessment theory and practices at home PSI	Faculty member has received instruction on and demonstrated understanding of how to select/construct assessments based on CBE best practices.	Faculty member selects/ develops assessments that are based on CBE best practices in a CBE course that is approved by the Course Review Committee.	Faculty member successfully reviews assessments in other CBE courses for conformance with CBE theory and best practices.
Understanding of and ability to apply a CBE grading rubric at the home IHE	Faculty member has received instruction on and demonstrated understanding of the development of grading rubrics based on CBE best practices.	Faculty member develops grading rubrics that are based on CBE best practices in a course that is approved by the Course Review Committee.	Faculty member successfully reviews grading rubrics in other CBE courses for conformance with CBE best practices

Note. The elaboration of this table, and any errors or omissions, are the sole responsibility of the author of this handbook.

Step Ten: *Develop and Approve CBE Courses*

The majority of people who participate in the development of CBE courses for the first time find that it is not as difficult as it originally appeared. For example, the skills that professional educators acquire through years of study and classroom experience are the same ones they need to contribute to the development of CBE courses and include: the ability to select and/or create quality, individualized educational materials; articulate competencies that are tied to predetermined skills/ knowledge that students need to compete in the labor market; create and administer assessments; and provide ongoing student guidance. Unfortunately, the tendency to make CBE more difficult than it has to be too often gets in the way of developing quality CBE courses. In reality, nothing could be further from the truth. Developing a CBE course is simply taking the skills and knowledge normally required to develop traditional courses and applying them under different premises and in a modified format.

When developing CBE courses for the first time, there are a number of approaches that can be taken, almost all of which include some or all of the same basic steps and content. The approach that we recommend includes the following components: (1) develop course competencies and learning outcomes/ objectives that map back to Program Learning Outcomes (PLO) and closely correspond to the knowledge and skills that students need to be competitive in the labor market; (2) select assessment methods based on CBE best practices, the nature of the program being developed, and the characteristics of its students; (3) assemble diverse educational materials that can be adapted to the individual learning styles and preferences of the students; (4) elaborate processes and channels for providing student feedback at a more accelerated rate than is normally the case in traditional courses; and (5) devise a system for ongoing course (and program) evaluation and improvement.

Figure 8

Standard Procedural Steps for Developing CBE Courses.

STEP 1

• Develop course competencies and learning outcomes that map back to established "program learning outcomes" and closely correspond to the knowledge and skills that students will need to be competitive in the labor market.

STEP 2

• Select assessment methods that are compatible with the theory and practices of CBE, the nature of your program, and the characteristics of your students.

STEP 3

• Assemble diverse educational materials that can be adapted to the individual learning styles and preferences of students enrolled in the CBE program.

STEP 4

• Elaborate processes and channels for providing student feedback at a more accelerated rate than is normally the case in traditional courses.

STEP 5

• Devise a method for ongoing and systematic course evaluation and improvement.

Note. The elaboration of this figure, and any errors or omissions, are the sole responsibility of the author of this handbook.

The remainder of this section contains recommendations on how to develop the first three of the aforementioned components of CBE courses: competencies and learning outcomes, assessments, and individualized learning materials. The following sections cover the two remaining components. I'm probably beginning to sound a little bit like a broken record, but it's worth repeating that this information is not intended to be comprehensive nor does it constitute the only approach to developing and approving CBE courses. It is, however, one of the most effective approaches for IHEs that are new to CBE and developing courses for the first time.

A) Develop course competencies and learning outcomes: The definition of the term "competency" introduced earlier is not the only definition used in higher education nor is it significantly different than most other generally accepted definitions. It describes competency as "demonstrative proficiency at a specific task or function and/or mastery of a given body of knowledge," and presupposes the meaningful participation of discipline experts, who are uniquely qualified to determine what constitutes proficiency or mastery of a given subject and how it is demonstrated (Competency-Based Education Network, 2019, para. 1). This definition, devised by C-BEN, was selected for this handbook because it contains widely accepted definitive parameters, has been extensively vetted by a nationwide network of CBE specialists and practitioners, and is used by more than 600 existing CBE programs. Although we recommend the adoption of this definition for the purposes of clarity and to establish common terminology, there are many other definitions that are equally valid that can be applied in the development of a CBE program.

The first and most important step that we recommend in the development of your course competencies is the formation of a competency-development team (CDT). In the majority of CBE programs, instructional faculty (or facilitators, depending upon the program in question) and mid-level administrators (e.g. department chair or assistant chair) in the department where the CBE program is housed are the primary and, in some cases, only persons involved in developing course competencies. There are a number of reasons for this practice, some reasonable others not so much so, but the most common are that they are usually the most knowledgeable about the subject matter in question, departmental concerns over external intrusion in the design and content of course competencies, insufficient funds to compensate additional CDT members, and inadequate planning.

While faculty and administrators play an indispensable role in writing course competencies, the inclusion of other stakeholders in the CDT will almost always improve their overall quality and relevance. Best practices in the development of CBE competencies, with very few exceptions, encourages teamwork. Applying the "it takes a village approach" is the best way to ensure that your competencies are the same ones that employers are looking for and your graduates are prepared to compete in the modern labor market. In the words of the Competency Based Education Network, "Competencies are co-constructed with input from diverse communities such as employers, expert practitioners, subject matter experts, faculty, learners, advisory committees, recent graduates and professional or licensing bodies" (C-BEN, 2019, p. 1).

Even when resource limitations, logistics, or other factors restrict the number of members that you are able to include in the CDT, we recommend that it consist of at-least six core components. The first and most important component are subject-matter experts. They possess a unique body of knowledge that

is necessary to formulate curriculum that is linked to and enables students to demonstrate mastery of course competencies; they are familiar with internal and external policies governing mandated course content and best practices for presenting it; and their experience with student learning and assessment (acquired in the classroom, formal/informal training, office hours, etc.) qualifies them to contribute to the elaboration of competencies that are clear, relevant, and accessible to students.

The active participation of subject matter experts (usually faculty) in the development of course competencies is critical, but sometimes overlooked. In a number of projects, we have observed competencies written without their participation that were supported by individualized educational material, conformed to existing internal and external policies, and passed rigorous evaluation standards, but for which students expressed varying degrees of confusion or uncertainty. In most of these cases, the subsequent participation of experienced subject-matter experts in the revision of the competencies was sufficient to alleviate student concerns and clarify both their content and purpose.

The second component that we recommend for inclusion in your CDT are members who are familiar with CBE and, in the best-case scenario, have previous experience developing CBE course competencies. As is the case with most activities, the popular saying that "experience is the best teacher" tends to apply in virtually all aspects of CBE. CDT members who are knowledgeable of CBE contribute to the relevance and overall quality of course competencies, help avoid errors that can be costly in terms of time and resources, and serve as mentors for other CDT members. For most professional educators, the learning curve for developing CBE competencies is fairly short, given their pedagogical training and experience. Having experienced course developers on your team will help them advance more quickly and efficiently. If your institution is new to CBE and you are unable to find potential CDT members with such experience, don't hesitate to request help from external sources. For IHEs located in Texas, the Institute for Competency Based Education at Texas A&M—Commerce is an excellent source for information and assistance. They will most likely be able to answer any questions that you have and, if not, refer you to qualified CBE experts in other IHEs throughout the state. For IHEs located outside of Texas, the most comprehensive source of information and guidance on CBE is the Competency-Based Education Network (C-BEN).

The third component that we recommend for your CDT are external members who are up to date on labor market conditions and the skills that program graduates need to be competitive (e.g. employers, chambers of commerce, labor bureaus, etc.). Their inclusion is an invaluable part of any CDT as they possess expertise and insights that qualify them to evaluate the extent to which course competencies reflect the knowledge/skills that employers are seeking; insider information on existing and anticipated labor market demand in their respective fields so that students are not graduating with skillsets that may soon be obsolete; and knowledge of professional policies and licensure requirements that program graduates may be required to meet.

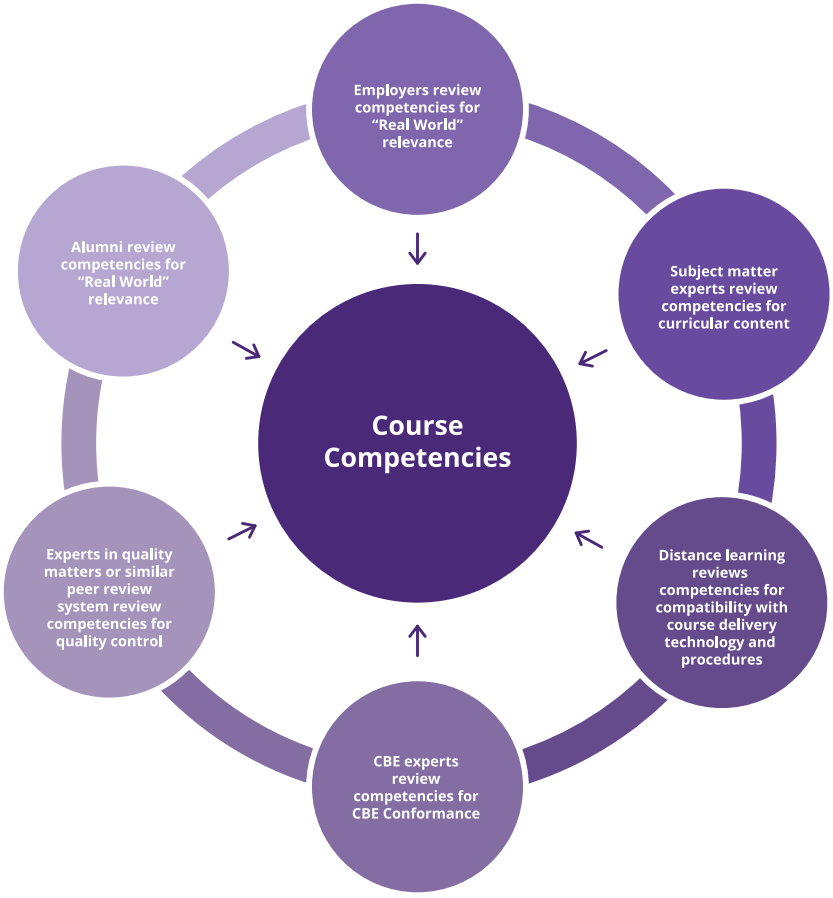
The fourth component that we recommend for inclusion in your CDT are alumni from the traditional version of the program that you are converting to a CBE format. The true litmus test of your competencies is the degree to which they prepare students to compete in the labor market. Program graduates who have first-hand experience applying and/or being hired for positions in the industry in question are one of the best sources of information on what your competencies should contain. As time goes by and your

new CBE program begins to produce graduates, it's also advisable to include one or more alumni on your CDT.

The fifth component that we recommend for your CDT are one or more members who are knowledgeable of Quality Matters or another equally valid peer review system. They can help ensure that your competencies meet acceptable content and formatting standards, yield credentials that are transferable to other IHEs, and comply with existing policies and procedures for student accessibility. Finally, if your CDT is developing CBE courses for online delivery, it's beneficial to recruit the assistance of course design specialists from the Distance Learning Department or equivalent. As is the case with standard online courses, their guidance will usually improve the quality of content formatting, facilitate the correct use of new instructional technology, ensure that the competencies are compatible with your IHEs learning management system (LMS) and, in short, minimize the possibility of technical errors that can delay course development and delivery.

Figure 9

Minimum Recommended Components of CBE Course Development Teams

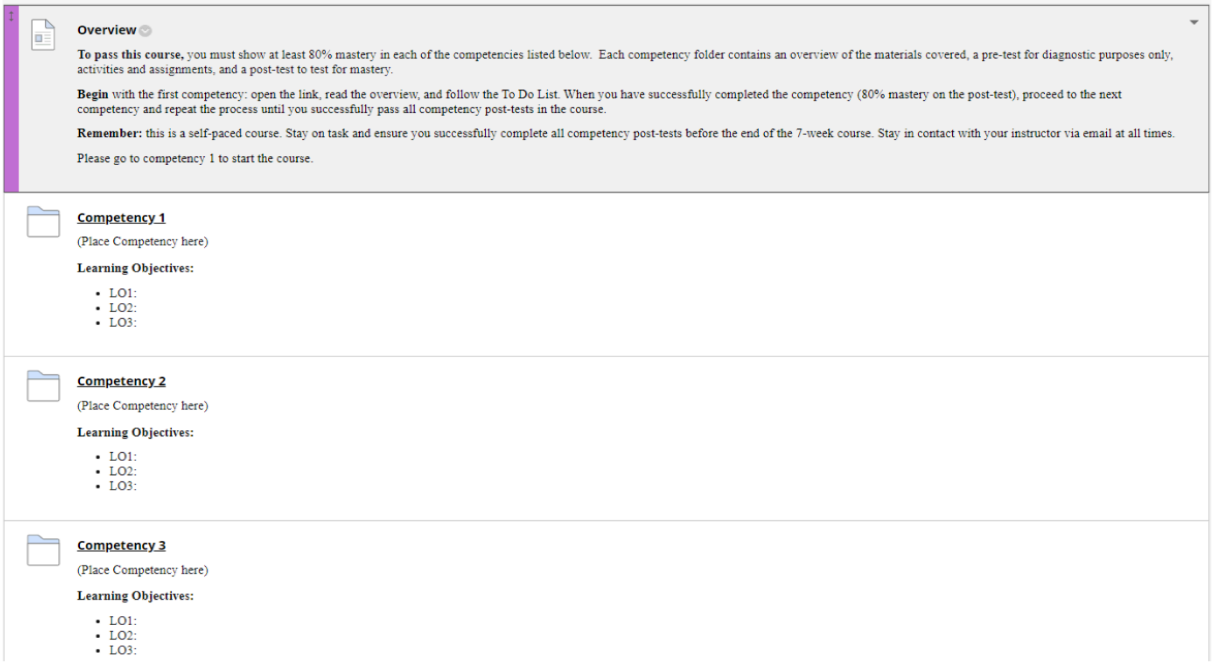


Note. The elaboration of this figure, and any errors or omissions, are the sole responsibility of the author of this handbook.

Once you are satisfied with the composition of your competency development team, begin work on the competencies and learning outcomes. For the purpose of clarity, it's important to distinguish between the two. Competencies are a broader category than learning outcomes and represent the overall knowledge, skills, and abilities that students are expected to master. Learning outcomes (often referred to as learning objectives) are explicit statements of what a student should be able to demonstrate in order to confirm competency. For example, a hypothetical competency in a driver's education course might be the ability to drive from one city block to another. The learning outcomes developed to demonstrate this competency would include starting the engine, changing gears, signaling, etc. Similarly, a competency for students in an introductory welding course might be the ability to weld pipes together. The learning outcomes would include reading and following basic blueprint instructions, performing simple joint welds, and properly maintaining equipment. Finally, the competency in an Algebra course might be the ability to solve complex equations and the learning outcomes would be a rudimentary understanding of linear equations, ratios, quadratic equations, special factorizations, and so on. Figure 10 below, used by South Texas College in its online CBE programs, illustrates the relationship between learning outcomes and competencies and how they can be organized in a CBE course.

Figure 10

Sample Template for Organizing CBE Competencies and Learning Outcomes



Note. This figure is extracted from South Texas College's CBE course templates.

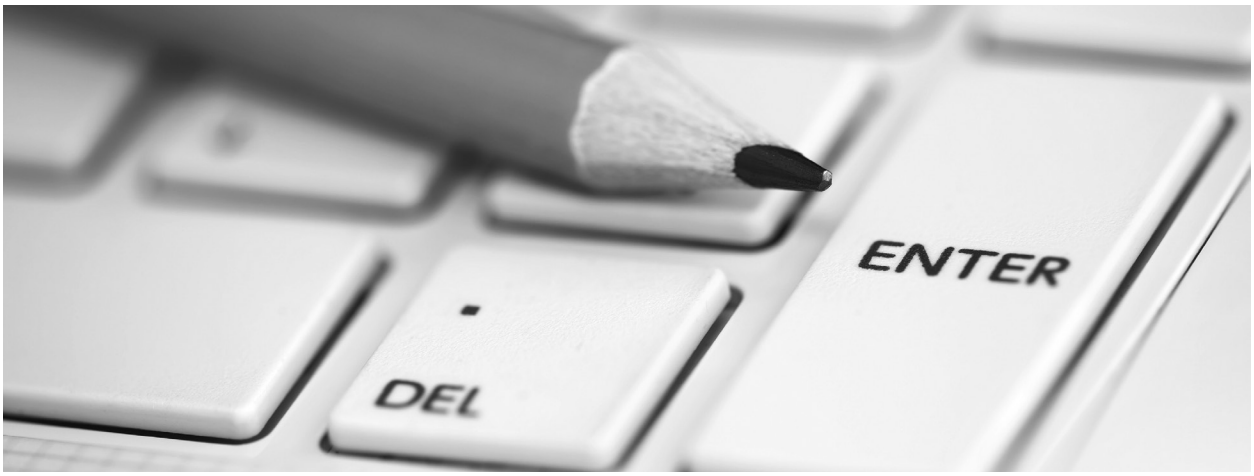
When writing CBE course competencies, we recommend that you prioritize the following criteria. *First, they should map back to established program learning outcomes (PLOs)*. For the purposes of this handbook, PLOs are understood to be "broad statements that incorporate many areas of inter-related knowledge and skills developed over the duration of the program through a wide range of courses and experiences.

They represent the big picture, describe broad aspects of behavior, and encompass multiple learning experiences" (Lewis, Kroeger, & Zende, 2009, p. 1). The CBE course competencies that you write should support PLOs in a way that is demonstrable, measurable, and reportable. In most instances, if you are converting an existing program to a CBE format, it's not necessary to modify the PLOs that are already used. For instance, introductory CBE courses in mathematics, history, and English will have the same PLOs as their traditional or online equivalents. If your program is new, it will probably be necessary to create PLOs. Under some very unusual circumstances, your competencies may not be required to map back to PLOs or their practical equivalents. However, such programs are fairly rare, and their competencies tend to target very specific and narrowly defined areas.

Second, course competencies should map back to current and projected skills/knowledge that graduates need to be competitive in the labor market. Employment requirements, both explicit and implicit, are constantly changing. One of the best ways to align your competencies with these changes is to conduct ongoing research into the industry in question and regularly consult employers, licensing and accrediting agencies, current employees in the field (alumni are an excellent source of information) and other relevant sources about what to include in your competencies and how to word them. Also, keep in mind that the rigorous and continuous evaluation and improvement of course competencies in response to changing labor market conditions is one of the key characteristics of quality CBE courses. It separates them from traditional in-person and online curricula that tend to be less responsive to labor market signals and, in some cases, obsolete.

Third, course competencies should be explicit, measurable, and transferable. The first of these criteria, writing competencies that are clear and explicit, can be more difficult than it first appears. Differences in how people interpret and process information, divergent notions about what competencies should be included in a CBE course and what they should contain, and a host of other factors can turn what originally seemed to be a fairly routine exercise for experienced educators into a conceptual and semantic headache. The second criteria, that competencies are measurable, can be equally challenging and tends to raise a succession of questions, each one more difficult than the last. What does it mean to be competent in a CBE course? What elements should be included in the grading rubric to harmonize requirements from multiple sources (e.g. PLOs, labor market, etc.)? And, what measurement mechanism is the most appropriate for our competencies? These are only some of the more common questions that arise when devising a system for measuring competencies that is acceptable to the disparate members of most CDTs. And, if all of this weren't daunting enough, making sure that your competencies are transferable to other IHEs and the workplace will require no small amount of time and effort investigating the implicit and explicit requirements of each.

Writing competencies that are explicit, measurable, and transferable is by no means easy, but its importance cannot be understated. It's one of the main reasons why we recommend that your CDT is comprised of more than just subject matter experts and department administrators. A CDT that includes other qualified internal and external stakeholders brings a greater diversity of knowledge and experience that can be channeled toward writing course competencies that are truly explicit, measurable, and transferable. Also, keep in mind that nobody gets it 100% right the first time, and that's to be expected. Just as "good writing is rewriting," quality competencies require ongoing review and revision.

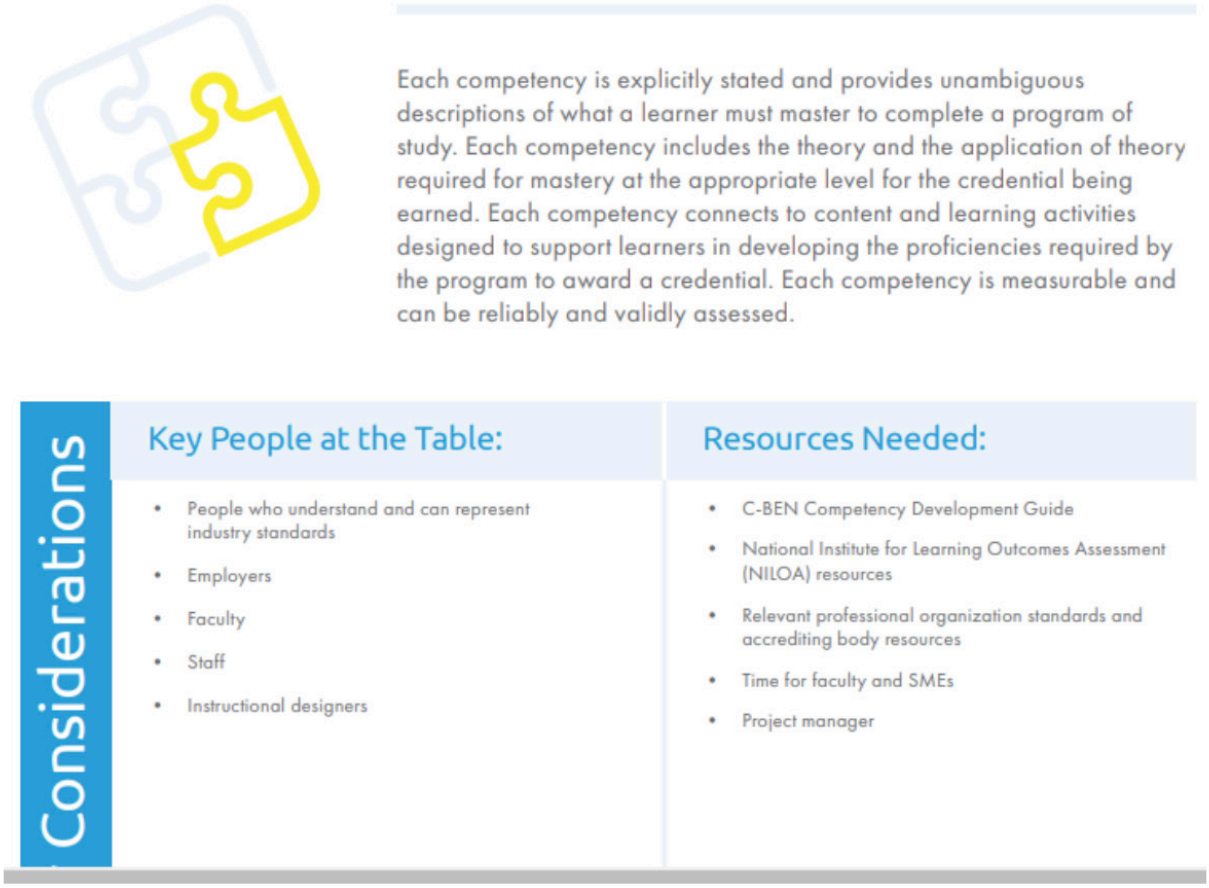


Fourth, competencies should be structured in such a way that students advance through course content by demonstrating mastery of established learning outcomes in an incremental and progressive manner. In contrast to most traditional educational models, where learning is assumed to have occurred once curriculum has been delivered and standardized exams passed (usually with a threshold of 70% or higher), CBE requires the measurable demonstration of all course competencies (usually with a score of 80% or higher). In most instances, and in accordance with CBE best practices, course competencies are incremental and progressive, meaning that they build upon each other and are progressively more challenging. As students advance through course content, each competency moves them toward deeper understanding and a more sophisticated skillset. In many ways, this approach is not as unconventional as it may seem and aligns with other pedagogical innovations that have recently become popular in higher education. The practice of "scaffolding" curriculum, for example, stems from the same premises that course content should be incremental, progressive, and clearly communicated to students.

The preceding discussion of the composition of competency development teams and the four criteria recommended for conceptualizing and writing quality competencies is not intended to be comprehensive, but it does include the most important and representative elements that are recommended by most public and private sector organizations that specialize in CBE. Figure 11, for example, is extracted from "The Quality Framework for Competency-Based Education Programs: A User's Guide," and includes C-BEN's recommendations on these topics. As can be seen, they are similar to the recommendations proffered in this handbook.

Figure 11

Quality Framework for Competency-Based Education Programs by C-BEN



Note. This figure is extracted from "A Quality Framework for Competency-Based Education Programs: A User's Guide." By the Competency-Based Education Network. It was retrieved from: *https://www.cbenetwork.org/wp-content/uploads/2018/08/Quality Framework Users Guide Final. Pdf* with the permission of the Competency-Based Education Network.

After you have completed your course competencies to the satisfaction of the course development team, begin work on the learning outcomes. As a reminder, the difference between the two is that competencies are a broader category than learning outcomes (often referred to as learning objectives) and represent the overall knowledge, skills, and abilities that students are expected to master. Learning outcomes are explicit statements of what a student should be able to demonstrate to confirm competency. Your learning outcomes should include very specific skills/knowledge that students are expected to have and be expressed in measurable terms. For instance, rather than stating that a student will "understand how soil erosion occurs" in a geology class, it would be preferable to state that a student will "measure soil erosion." A basic rule of thumb with CB learning outcomes, is that they should begin with action words that are measurable. Examples of such terminology can be found in Bloom's earlier taxonomy and include: appraise, demonstrate, evaluate, formulate, calculate, illustrate, classify, assess, diagnose, distinguish, differentiate, integrate, construct, perform, predict, determine, etc.

Developing quality CBE course competencies and learning outcomes is by no means a simple task. It requires long hours of analysis, discussion, writing, and rewriting. In the long run, it contributes to the overall effectiveness of a CBE program and the success of its students. Before moving on to the next topic, please take a moment to review Table 4. It contains a checklist with sample steps and performance metrics for developing a competency development team and course competencies. This, or a similar system, can be used to monitor your progress as you develop the competencies for your CBE courses.

Table 4

Sample steps and performance metrics for developing CBE course competencies

Course Competencies Development Steps	Beginning	Intermediate	Satisfactory	Advanced
Step One: The competency development team (CDT) understands and commits to all relevant duties and responsibilities.	Internal and external CDT members are selected and approved by the home IHE.	CDT members attend an orientation session to clarify their duties and responsibilities.	CDT members understand and commit to fulfilling their duties and responsibilities.	CDT provides feedback for improving committee member selection and orientation.
Step Two: Formulate a competency development timeline with appropriate benchmarks.	The first official CDT meeting includes preliminary discussion and planning of a competency development timeline.	CDT members begin formulating the competency development timeline.	The competency development timeline is finalized.	The timeline is approved by the home IHE
Step Three: Competencies are mapped to Program Learning Outcomes (PLOs).	The CDT has identified and analyzed applicable PLOs.	The CDT has initiated articulation of preliminary competencies in conformance with PLOs	Preliminary competencies have been drafted in conformance with PLOs.	Competency conformance with PLOs is reviewed and approved.
Step Four: Competencies are mapped to current marketable skills.	Marketable skills have been identified through appropriate analysis and consultation with relevant internal and external actors.	The CDT has begun refining preliminary competencies to reflect current marketable skills.	Preliminary competencies have been edited to measure marketable skills.	Preliminary competencies, mapped to PLOs and marketable skills, are approved by CDT.
Step Five: Competency are clear, understandable, and align with appropriate cognitive learning levels.	The CDT reviews preliminary competencies for clarity, relevance, and alignment with appropriate cognitive learning levels.	Editorial and substantive changes to the preliminary competencies are recommended by CDT members.	Preliminary competencies are edited in accordance with CDT member recommendations.	Preliminary competencies are approved by the CDT and submitted to home IHE for final approval.
Step Six: Competencies are tested in pilot courses.	Pilot courses are selected for the purpose of testing course competencies.	Results of the pilot courses are analyzed and improvements recommended.	Recommended improvements are made to the competencies in the pilot courses.	Revised competencies in the pilot courses are approved by the CDT.
Step Seven: Ongoing review of CBE course competencies.	The CDT establishes a timeline for periodic competency review.	The CDT develops competency review criteria based on best practices.	Course competencies are reviewed at least once following program implementation.	Competencies have been periodically reviewed within five years of course implementation.

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In addition to the metrics contained in this table, when appropriate, it's advisable to utilize external metrics that have been vetted by qualified sources to evaluate the structure, content, relevance, and wording of your competencies. This will reinforce their reliability and validity and, even more important, give you feedback on your own understanding of the nature and purpose of course competencies and how to write them. In the early days of CBE, there were very few such metrics and the ones that were available were either relatively unknown or lacked sufficient evidence of their efficacy. Since then, there has been a literal explosion in the innovation of metrics that are specifically designed to assess CBE competencies and others that, while created with a broader purpose in mind, are equally applicable. The following two systems are presented as examples of external metrics that we recommend for your consideration.

One of the more widely applied systems for evaluating CBE competencies, "Connecting Credentials: A Beta Credentials Framework," was created with funding by the Lumina Foundation with the express purpose of "providing common language and a unified framework for understanding the competencies associated with different credentials." The principal advantage of this system over others is in determining the degree to which your competencies align with employer standards and similar credentials offered by other institutions. According to the Lumina Foundation, "applications of the Framework can improve all of the following:

- Equity: More transparent credentials create clearly visible pathways to increase career and economic mobility for historically underserved and underrepresented populations, including African American, Latino, and Native American students.
- Credential transparency: The Framework makes it easier to understand the competencies associated with any credential.
- Comparability: It makes it possible for stakeholders to compare the value of various credentials and determine which credential best fits their needs.
- Portability: It supports the translation of learning acquired across institutions and between academic institutions and employers" (Lumina, 2015, p. 2).

A second and, perhaps, the most comprehensive system of metrics available to assess your course competencies was elaborated by the Competency-Based Education Network (C-BEN) and is embedded in their "Quality Framework for Competency-Based Education Programs." Released in September 2017, this framework is the product of unprecedented collaboration on the part of CBE experts from colleges and universities all around the United States, with the singular goal of creating standards for best practices in the development and assessment of CBE programs. In their own words, "the process of developing these standards has been inclusive of both the entire C-BEN community and the wider field. Not only did C-BEN members from 30 institutions and four state university-systems offer feedback, but over a hundred other individuals from around the country provided guidance that informed this final version. In addition, a convening of roughly 400 C-BEN members and more than a dozen national experts and regulators was held in late 2016 to finalize the standards and begin ongoing work on development" (C-BEN, 2017). The complete framework with the competency assessment metrics included can be downloaded digitally at cbenetwork.org free of charge. It's definitely worth your time to review these metrics. Not only do they better equip you to evaluate your competencies once they have been formulated, but they can also be

used in the ongoing process of course evaluation and improvement.

In addition to these and other empirically vetted metrics for evaluating CBE course competencies, we also suggest the use of more general metrics to review the structure, content, grammar, etc., of you CBE courses. This probably goes without saying, but the Quality Matters (QM) Rubric is easily one of the most comprehensive, trusted, and widely used rubrics in the development of both CBE and traditional courses. We recommend the inclusion of the QM Rubric in all phases of course development, implementation, and ongoing review.

B) Develop course assessments based on CBE best practices. At the core of CBE theory is the premise that student assessment should be frequent and administered in a variety of different formats. Just as students have differing learning styles and preferences, their performance also tends to vary depending on the type of assessment used. With this in mind, we strongly encourage you to incorporate frequent and diverse assessments into your CBE courses. At a minimum, CBE assessments should measure student proficiency in course competencies; be primarily formative rather than summative; include rubrics that clearly articulate performance criteria and that are available to students; and, in varying degrees, replicate the work environment and tasks that students would be expected to perform in the "real world." The extent to which your assessments share these and other characteristics will depend upon a variety of factors, some of which will be unique to your program and student population. In the following section, we briefly explore examples of different types of assessment formats that predominate in CBE and that you might want to consider for your program.

CBE Pretests: There are two types of pretests commonly found in CBE. The first are general pretests administered to students before they begin a CBE program. In most instances, these assessments are similar to SATs, ACTs, GREs and other standardized exams designed to measure a student's overall level of academic preparation. There are a number of reasons why an IHE may want to adopt general pretests for a new CBE program: 1) The results of the pretest can be compared to those of a follow-up (exit) exam taken by students when they graduate to measure the overall value added of the CBE program, which, among other benefits, enables the IHE to determine what is working and what isn't, fine tune curriculum, and accumulate data for institutional reporting; 2) Some institutions use pretests to screen students when there is limited space in a given CBE program to determine which students are most apt for the program and likely to benefit from it; and (3) a pretest at the beginning of a CBE program helps to better understand a particular cohort of students and how to tailor CBE learning and assessment strategies to optimize their performance.

A second type of pretest are the assessments embedded in CBE courses to determine which course competencies students have already mastered, which ones remain to be learned, and how best to individualize learning materials in accordance with each student's unique needs. Generally, each question in a course pretest is linked to one or more specific learning outcomes that support a given competency. For example, questions 1, 2, and 4 of a pretest might be linked to the first learning outcome and questions 3, 5, and 6 to the second learning outcome of the first course competency. By linking questions to specific competency learning outcomes, the pretest results indicate how much of a given competency a student has mastered. The instructor then uses this information to determine what educational materials are

most appropriate for each student to learn the competencies that he or she is missing.

When creating pretests, it's useful to keep in mind that they are not intended to be overly rigorous. Their purpose is to simply assess student knowledge to determine what competencies they have mastered, which ones remain to be learned, and what educational resources are most appropriate for them. In fact, some programs go so far as to intentionally limit the questions on the pretest to Bloom's lower levels of knowledge, comprehension, and application (or a similar model) so as to measure student learning without overwhelming them at the beginning of a class.

CBE Post-tests: Post-tests differ from pretests in that they are more rigorous and comprehensive, and are not usually intended to assess student knowledge of course competencies for the purpose of developing individualized learning strategies. Rather, they are used to determine if a student has sufficient mastery of course competencies to receive credit as defined by previously established grading rubrics. In many cases, post-tests are a kind of "high stakes" exam that determine the final grade that a student will receive for each competency in a CBE course.

Post-tests for each competency or group of competencies are administered only after students have completed the corresponding pretests and any educational materials that are assigned as determined by the pretest results. For example, let's assume that the pretests in a CBE course indicate that a student is deficient in one of the course competencies, but has already mastered the others. The instructor would then assign individualized educational materials that accord to the competency for which the student is deficient, while simultaneously authorizing him/her to proceed to the post-tests for the other competencies. Later, after the student has completed the assigned educational materials, he/she would be ready to take the post-test for the remaining competency. This process is efficient and economizes resources in that students are able to progress at an accelerated rate, are not required to relearn competencies for which they have already demonstrated mastery, and benefit from learning materials that are specific to their unique learning style and needs.

For further clarification, let's consider how a student would progress through a hypothetical CBE course in introductory sociology that uses pretests and post-tests. The first day of class or shortly thereafter, the student would take the pretest for the first competency. The instructor would then evaluate the exam results to determine how much of the first competency the student has already mastered. Based on these results, appropriate and individualized learning material would be assigned to the student that cover the parts of the competency for which he/she is deficient. For instance, if the pretest indicates that the student has already mastered 50% of the learning outcomes of the first competency through previous learning and/or experience, the instructor would select and assign appropriate educational materials that cover the remaining 50%. The student would then complete the educational materials under the guidance of instructional faculty to prepare for the posttest for the first competency. This process would be repeated until all of the competency posttests were successfully passed. If the post-tests are high stakes, the student would receive credit for the course after having passed all of the posttests. Depending upon the grading methodology, the student would receive a letter grade, percentage, or pass/fail.

CBE Progress Tests: Originating in 1974, in the Maastricht School of Medicine in Kansas City, progress

testing has been slow to gain acceptance in conventional higher education and continues to be, more or less, limited to very specific niche programs. In its purist form, progress testing is a longitudinal approach to assessment in which a cohort of students is frequently and regularly administered comprehensive exams, each of which measures their knowledge of all the competencies required to pass a course or, in some cases, to graduate. For illustrative purposes, let's consider the difference between traditional tests and progress tests in a hypothetical English composition course. In the former, the first exam might cover introductory material; the second exam, basic rules of paragraph organization; the third exam, concept development; and so forth. In an equivalent course using progress tests, each exam would cover all of these topics. The comprehensive nature of progress tests continues to be somewhat controversial in modern IHEs as it theoretically and practically diverges from most traditional assessment models.

According to proponents of progress testing with practical experience administering them in CBE courses at the postsecondary level, they offer certain advantages over most traditional assessment formats. First, progress tests continually reinforce student knowledge of and ability to apply all course competencies. Instead of studying material for a particular exam and then forgetting it, each comprehensive progress test requires students to prepare for all course competencies, including the ones that they may have passed on previous exams. There can be little doubt of the value of this approach for reinforcing student knowledge/skills. As professional educators (and former students) we are more than aware of the tendency of traditional assessment models to encourage short-term retention of information and skills that are quickly forgotten after taking an exam. Second, the sequential and incremental nature of progress tests facilitates a better understanding of how course competencies are interrelated and can be applied in different contexts. And, third, frequent progress tests enable instructional faculty to more closely and accurately monitor student progress for the purpose of individualizing educational materials, providing more up-to-date and relevant feedback and, when necessary, planning and executing interventions.

Progress testing is quickly expanding throughout the CBE community as course designers and instructional faculty become more aware of the benefits it offers. If you are considering including progress tests in your courses for the first time, please consider three brief suggestions based on our experience with IHEs who have been using them for at-least five years or more. First, integrate progress testing gradually into your courses. There is usually no reason to rush and giving yourself sufficient time to adapt to this new approach will minimize the possibility of errors and misconceptions for you and your students. Second, be careful to balance the two key requirements in progress testing that exams are comprehensive and adequately cover each competency. Despite appearances, they don't have to be mutually exclusive goals. However, getting the formula right can take time and practice. Third, be sure that your students fully understand the purpose of progress tests, how they will be administered, and what is expected of them.

CBE Written, Knowledge-Based Assessments: The most basic type of assessment administered in CBE courses are usually written, knowledge-based assessments. They are frequently found in lower-level and general education courses (e.g. history, political science, geography etc.) and can be an excellent starting point for IHEs that are developing CBE programs for the first time. For the most part, they are similar to traditional online and in-person written exams and can be highly effective when designed conscientiously and in accordance with CBE best practices.

Some of the advantages of written, knowledge-based assessments for IHEs new to CBE are that they are similar to assessment formats that they already use and are familiar with, do not require additional institutional or external resources to create and administer, can be easily replicated within and between CBE programs, are amenable to scaffolding and other pedagogical tools intrinsic to CBE, comply with pertinent IHE policies, and can be easily modified or replaced as your CBE program matures.

Performance-based assessments: Originally defined by the Office of Technology Assessment of the U.S. Congress, "performance-based assessments" are similar to written, knowledge-based assessments in that they do not attempt to recreate an authentic work environment. Rather, they are limited to assessing the ability of students to perform tasks that demonstrate mastery of course competencies within the parameters of a CBE course. Examples of performance assessments include: "demonstrations" such as welding pipes together in an introductory welding course, delivering an expository presentation in a speech course, or baking a cake in a culinary course; "group projects" that involve two or more students (often problematic in the CBE courses where they are applied due to divergent rates of student progress); "experiments" that most often assess competencies in the physical sciences; and "portfolios" that are a composite of multiple files, each one containing a product that demonstrates one or more competencies over a continuum of time.

Performance-based assessments are widely used in CBE programs as they facilitate a hands-on approach to demonstrating mastery of course competencies and can be easily adapted to the organization, structure, and content of most CBE courses. Moreover, they can be administered separately or strategically combined with written, knowledge-based exams to produce more precise assessment feedback. If you decide to integrate performance-based assessments into your CBE courses, a few suggestions to enhance their reliability and validity are to ensure that they cover the competencies targeted for your courses, require students to use an appropriate level of cognitive skills, and are appropriately varied to meet the diverse learning and assessment needs of your student population.

Authentic assessments (real world and realistic): As is the case with any educational model, CBE is not without its share of internal debate over the pros and cons of different assessment methods. There are some who argue that in order for CBE assessments to be truly valid, it's not enough that they measure student competencies in a written or performance-based exam, they must also replicate as precisely as possible the circumstances that students encounter in the "real world." Further, they contend that CBE assessments should be vetted by external sources who are qualified to evaluate the degree to which they are linked to and prepare students for the competencies they will need on the job (e.g. employers, HR specialists, etc.). In the words of Katie Larsen McClarty and Matthew N. Gaertner from the Center for College & Career Success:

> "program designers should work to clarify the links between the tasks students complete on an assessment and the competencies those tasks are designed to measure. Moreover, external-validity studies—relating performance on CBE assessments with performance in future courses or in the workplace—are crucial if CBE programs want employers to view their assessments and their competency thresholds as credible evidence of students' career readiness. External validity is the central component of our recommendation" (2017, p.11).

An assessment that measures how students perform "on the job" is known as an "authentic exam," a term coined by Grant Wiggins in his landmark study, *Educative Assessment: Designing Assessments to Inform and Improve Student Performance* (Wiggens, 1998). In most CBE programs that use them, authentic exams take one of two forms: "real world" assessments that require students to demonstrate competencies in an authentic work environment, or "realistic" assessments that simulate the work environment. While most CBE experts prefer the former, the reality is that both approaches have their own distinct advantages and disadvantages and, in most cases, are equally difficult to initiate and manage. In a "realistic assessment," for example, replicating the conditions that graduates will encounter in the workplace is no easy matter. The cost of equipment and materials, alone, can be prohibitive and the extent to which a simulation can ever truly reproduce the dynamics of an authentic work environment is open to debate. On the other hand, the same could be said about "real world" assessments, where student reactions are tempered by the knowledge that they are not actual employees and their putative colleagues often find it difficult to treat them as such (Shaw, 2019).

For these and other reasons, authentic assessments can be difficult to design and even more difficult to implement. At the same time, it's important to keep in mind that no assessment method is without its shortcomings and the advantages of authentic assessments will, in most cases, more than compensate for the disadvantages. If you decide to incorporate authentic assessments into your CBE courses, you may want to consider the following three recommendations: (1) the real or simulated work environment used in your courses should truly give students an opportunity to demonstrate competencies. It's not enough to simply place students in the work environment. Students must also be actively engaged in the competencies required to pass your courses. (2) Clearly explain to your students the competencies that you are evaluating and the corresponding grading rubric. (3) Be attentive to all of the rules, policies, paperwork, etc., that will inevitably play a part any time your students are engaged in external activities. (Shaw, 2019)

What does it mean to be competent in a CBE course? The types of assessments described above are the most common, but not the only ones used in CBE courses. As your program grows and matures, you will most likely modify the original assessments that you select or replace them with something entirely different. While doing so, you will also need to consider the question of what constitutes "competency" in a given academic/workforce program. The answer to this question is not as easy as it may sound. Does competency mean that a student has scored a 70%, 80% or 90% on an assessment? Is it necessary that students are able to demonstrate competencies in the real world to a potential employer? Should the threshold for demonstrating competencies (passing) be higher in CBE courses than in traditional courses? And, are students considered competent if they are able to correctly perform a task, but don't truly understand the underlying logic and mechanisms of what they are doing (e.g. memorizing mathematical formulas to solve problems without fully understanding them) are only some of the questions that you may have to wrestle with when defining what it means for students to be competent in your new CBE program after they have completed course assessments.

If it's any consolation, you won't be alone in your efforts. To date, one of the principal obstacles to greater acceptability of CBE at the postsecondary level has been the lack of systemically accepted standards for determining what constitutes competency in CBE courses. This probably should have been expected.

In an environment that prioritizes respect for academic freedom and diverse institutional practices, establishing criteria for what it means to be competent that are acceptable across the wide spectrum of postsecondary institutions was bound to be an uphill battle from the beginning. Further complicating the situation is the fact that even the most widely endorsed definitions of "competency" contain terminology that lends itself to conceptual uncertainty. Take, for example, the definition applied in this handbook from C-BEN: "demonstrative proficiency at a specific task or function and/or mastery of a given body of knowledge." Just tackling the question of what proficiency and mastery mean in this and similar definitions and how to measure them can open a Pandora's Box of differing and often contradictory views among the best-intentioned members of a course development team.

The lack of consensus on what it means to be competent in CBE courses not only puts each IHE in the position of having to develop its own criteria, but creates a variety of problems for the credibility of CBE programs across the country that have yet to be fully analyzed. For example, in an article published in April of 2014 in Inside Higher Education, John F. Ebersole, President of Excelsior College in Albany, N.Y., makes the argument that many IHEs who offer CBE programs have not adequately clarified for themselves or their students the differences between "competency" based programs and "mastery" based programs and that, as a consequence, they are not really sure which type of program they offer (Ebersole, 2014). Fortunately, as more time goes by, we are seeing a greater degree of convergence in how student competency is defined that will, in the long run, facilitate transparency, best practices, credential transferability, and more efficient quality control mechanisms.

C) Individualize student curriculum and instruction: One of the defining best practices of CBE courses is that curriculum and instruction are individualized and allow students to move at their own pace, under the guidance of trained and knowledgeable instructional faculty/facilitators. According to leading pedagogical theory, there are approximately five distinct but overlapping learning styles that include: visual learners who prefer pictures, images, and spatial relationships; verbal learners, who benefit more from orally transmitted instruction; physical learners who prefer hands-on activities and tend to excel in learning environments where skills/knowledge can be acquired and assessed through physical engagement; logical learners who are more successful with logic and reasoning systems; social learners, who are more comfortable collaborating with others in group settings; and solitary learners, who prefer independent learning and assessment activities. While there is some controversy over the extent to which this list, or any other one for that matter, is sufficiently comprehensive, the existence of diverse learning styles and preferences is extensively researched and documented and is the justification for individualizing instructional delivery and educational materials in CBE courses.

The process of adapting instruction and curriculum to the variant learning styles and progress rates of students is referred to in the literature as individualized instruction, diversified instruction, differentiated instruction, personalized instruction, and other terms that are usually variations on the same theme. One thing they all have in common is the conviction that traditional, homogenous educational models are inadequate to meet the needs of students who learn in different ways and progress at varying rates. When developing your courses, make it a priority to offer your students a variety of quality educational materials and delivery methods that are tailored to their unique needs. It won't be easy. After all, you will need to locate and evaluate more educational materials, develop a greater number and variety

of assessments, and elaborate more types of lectures, notes, etc., than is the case in your traditional course where you use the same textbook, notes, and exams for everyone. In the long run, though, your investment in time and energy will more than pay for itself in terms of student success.

A tip that might help you more effectively individualize curriculum and instruction in your CBE courses is the use of pretests that not only measure knowledge of course competencies, but also learning styles. As described in the section on assessments, pretests are an excellent tool for assessing what competencies students already have and which ones remain to be learned. But, they can also be used to evaluate individual learning styles. To this end, consider adding questions from reputable learning style assessments (e.g. VARK, Paragon, Grasha-Riechmann, LearningRx, etc.) in your regular pretests. The results, apart from the primary purpose of measuring student competencies, will help you determine which educational materials and delivery methods are most suitable for each student.

Another tip, if you are not already doing so, is to review the vast and expanding gamut of open access educational resources (OER) that are available free of charge to IHEs. One of the largest and most user-friendly sources for OER is OpenStax, located and curated at Rice University in Houston, Texas (*https://openstax.org/*). The inclusion of OER in your courses offers the dual benefits of curricular diversity and affordability. Under normal circumstances, variegating textbooks and ancillary educational materials can be cost prohibitive and time consuming. With OpenStax and other equally reputable OER providers, the resources are free and much of the quality control screening has already been done for you by their nationwide network of authors and contributors.

A final tip is to simply ask your students what types of learning materials and instructional delivery methods are most effective for them. This may seem overly simplistic and many students will most likely not be sure how to respond. However, you have nothing to lose by asking and you might be surprised by the quality and quantity of the feedback that you receive. Most students who enroll in CBE courses are motivated learners who are seeking alternatives to the traditional education system. It has been our experience that they usually take their courses more seriously and are more proactive in providing input than students enrolled in traditional courses.

Step Eleven: *Include Relevant Institutional Personnel and Departments in the Development and Implementation of Your CBE Program*

The participation, during the development and implementation stages, of representatives from departments likely to be affected by your new CBE program will make the process much easier and save you more time and effort down the line. CBE programs are, by nature, a form of disruptive innovation. The institutional resources and services that they require, beyond the department in which they are housed, often create new and unique logistical and administrative challenges. For example, a CBE program in College H decided that instead of using the traditional grading system that converts letters (A, B, C, D, and F) into a numeric grade point average, they would simply assign a grade of "Pass" or "Fail" to their students. At the end of the first semester, Admissions was unsure about how to calculate the value of these grades, financial aid issues were arising, and it was becoming increasingly evident that some four-year universities might be hesitant to accept the course credits.

Another example, College I, further illustrates the need to include other institutional entities or, at least, keep them informed of changes brought about by your new CBE program. Here, the program development team had neglected to inform the Distance Learning Department (DL) that the CBE content of their online courses deviated from certain institutional practices. Throughout the first semester of course delivery, DL was chronically contacting the course instructors and department chair requesting explanations for procedures and course content that were allegedly not in conformance with institutional policies as applied in traditional online courses. At College J, the student financial aid department became somewhat alarmed when they noticed that a number of students were finishing courses prior to the conclusion of the semester in a new CBE program of which they had not been informed. In particular, they were concerned about possible incompliance with credit hour requirements for the purpose of financial aid.

While these are only a few examples, they illustrate the need to include other departments in your IHE during program development and implementation. This point is particularly important, but often overlooked by course development teams developing a CBE program for the first time. Some of the most common reasons why other department representatives are not included are usually: failure to identify all of the departments that will be impacted by the new program, reluctance on the part of other departments to get involved, insufficient time and planning, and the simple territorialism that, too often, gets in the way of mutually beneficial collaboration in colleges and universities. As a detailed disquisition of this topic is, unfortunately, beyond the scope of this introductory handbook, this section will conclude with an example that just may be the most important external department to the success of your program: student advising and counseling.

CBE Student Advisement and Counseling: Advising and counseling departments in the majority of IHEs are home to qualified and caring professionals who are dedicated to the institutions and students they serve. Unfortunately, though, they are too often constrained by factors that make it difficult to adequately advise/counsel increasingly diverse student populations. The three most problematic of these factors are: a one-size-fits all approach that offers homogenous guidance to heterogeneous populations; resources, monetary and otherwise, that are insufficient to provide much more than basic student services; and student to counselor/advisor ratios that limit student access and undermine the quality of the guidance they receive. This is not to say that counseling/advising at IHEs is ineffectual nor that the entire system needs to be overhauled. The problem, however, is that we continue to use counseling/advising models that were designed at a time when the number of students enrolled in IHEs was much smaller, the demographic conditions more uniform, and the educational system less complicated than it is today. As a result, too many students become frustrated, disillusioned, and drop-out when they are unable to receive the guidance they need.

This situation is problematic for any IHE but can be particularly lethal for new CBE programs given the critical role played by counselors and advisors to their success. In most instances, counselors and advisors are the original point of contact for new CBE students and the persons to whom they turn for information and guidance throughout their college career; even more so than in traditional programs. For this and other reasons, it's advisable that before launching your CBE program, you develop a detailed orientation on CBE theory and practice for the advisors and counselors assigned to your students. You probably won't be able to do much about the counselor/advisor to student ratio or the amount of time available

for each student, but you can take steps to ensure that counselors/advisors are properly informed about your program.

CBE programs, almost by definition, diverge from many traditional policies and procedures. It's essential that the counselors and advisors are aware of these divergences to prepare them to serve your student population and avoid making mistakes. For example, we have seen advisors assigned to CBE students who, through no fault of their own and due largely to insufficient information about CBE practices and theory, consistently advised them to take the entire semester to finish a class, regardless of their level of competency. In other cases, we have observed advisors who encourage students to combine CBE courses with traditional courses without assessing their level of competency in the latter to determine if the courses were even necessary.

Academic Coaches: If pertinent college policies, your program plan, and set-up costs permit it, we highly recommend that you consider hiring fully dedicated academic coaches (AC) as a "one-stop-shop" for student counseling and advising. It may increase your budget in the beginning, but nine times out-of-ten, a fully-dedicated academic coach will pay for itself in the long-run. It has been repeatedly documented at all educational levels that academic coaches, among other benefits, increase student recruitment, retention, and graduation rates; lower program costs; and promote greater overall program efficiency. The vast majority of IHEs are still a little hesitant to employ ACs in their academic/workforce programs, usually for monetary reasons or because they are not convinced of the benefits of doing so. If your program is in a position to hire one or more academic coaches, we strongly recommend it. It's no exaggeration to affirm that academic coaches can be one of the most important, if not the most important, component of your CBE program.

The role of ACs varies from program to program, but generally goes beyond what is expected of traditional counselors and advisors. Perhaps, the best way to convey the role of ACs is through the term frequently associated with them: "intrusive advising." This title, despite its seemingly negative connotation, describes the proactive role played by ACs in helping students successfully navigate in a college setting. This can be particularly beneficial for first-generation students who may lack contacts with college experience in their family or social sphere, or students who are enrolled in a non-traditional program such as CBE. Intrusive counseling involves intensive one-on-one interaction and guidance throughout all stages of a student's educational career. Empirical studies have repeatedly demonstrated a correlation between the inclusion of a fully dedicated AC and the retention and graduation rates of first-year college students, students enrolled in non-traditional programs, and students who are designated as "at-risk" of dropping-out.

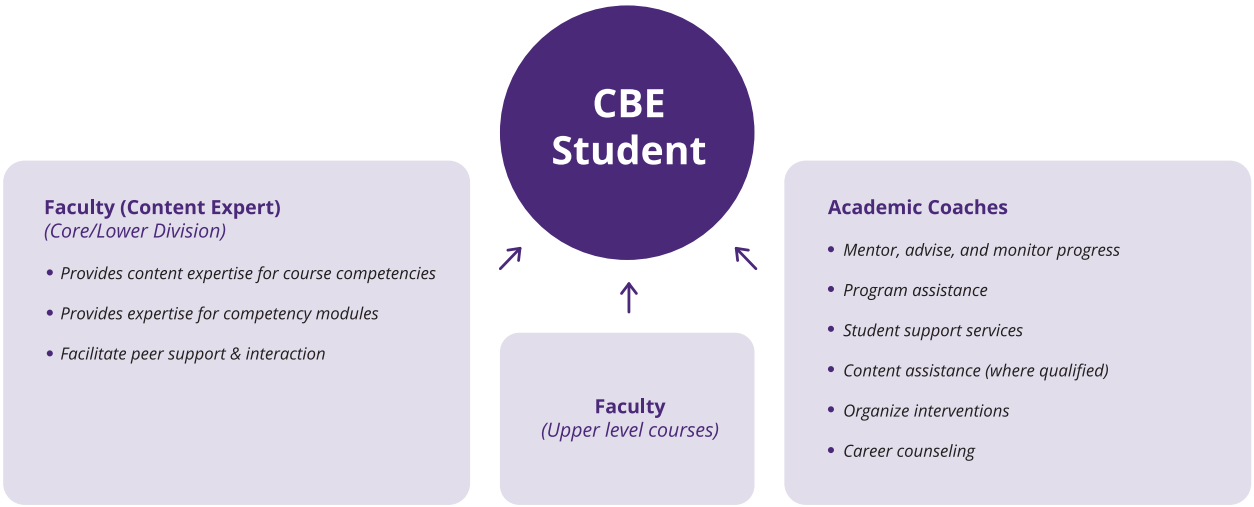
For even the best prepared students, successfully completing a non-traditional program can be a daunting experience, particularly when it's their first year or they are first-generation students. New and potentially intimidating expectations and codes of conduct common to colleges and universities but foreign to recent high-school graduates, often leave students feeling isolated and questioning their decision to pursue higher education. For first generation-students, the difficulties are frequently amplified by a lack of support networks that traditional students may take for granted and that enable them to more quickly and smoothly adapt to the unwritten norms and codes of conduct that characterize the U.S. system of higher education. Abundant qualitative and quantitative research supports the postulate

that the insertion of a dedicated academic coach at all educational levels helps new and first-generation students overcome these obstacles and positively affects retention, persistence, and graduation rates.

Despite variations in how ACs are perceived and the role they play, some of the more common functions that they perform include: assimilating students into higher education; familiarizing students with college resources and services; developing short and long-term individualized education plans; operating as intermediaries, when necessary, between students, instructional faculty, and other institutional actors; creating an environment, physical and emotional, where students feel safe and welcome; monitoring student performance through ongoing contact with instructional faculty; scheduling periodic meetings with students to evaluate their progress; and planning and executing interventions when student performance drops. Even more important than these and other duties, though, is that ACs are truly committed to student success. In a recent CBE conference, our team was asked "what characteristic most qualifies a person to be successful as an academic coach: training, knowledge, or education?" Our response was "none of the above. The most important characteristic is a big heart; that they truly care about the students they are helping." Figure 12 below illustrates some of the basic functions of ACs at South Texas College and their interaction with instructional faculty.

Figure 12

Representative Duties of Academic Coaches in CBE Programs



Note. This figure is copied from a power point presentation developed by the author.

Step Twelve: *Schedule Student Information and Orientation Sessions*

In the vast majority of colleges and universities, first year students are expected to attend an orientation session to familiarize themselves with the institution, its services and resources, and relevant rules and policies. In most instances, it lasts no more than a day or so and provides students with the basic information they need to navigate in their new educational environment. The reasoning underlying these "freshman orientations" is sound and even more compelling in the case of students who enroll in a CBE program for the first time, regardless of whether or not they have previous experience with CBE in another IHE. An orientation session can go a long way toward promoting student understanding, and it will give you an opportunity to address any questions that they might have about CBE before classes begin. At the risk of sounding redundant, it's useful to keep in mind that as practitioners of CBE, we are firmly grounded in its theory and practice. Most students, on the other hand, have passed two-thirds of their lives—day after day, week after week, month after month, and year after year—in traditional courses. The transition to CBE can be challenging, if for no other reason than that it diverges from the learning and assessment models that they are used to in their traditional courses.

The content, organization, and delivery method of CBE orientations vary, depending on a number of factors, many of which are unique to the program in question. For instance, some programs prefer an online orientation that can be accessed anytime and anywhere by their students, while others prefer that it be delivered face-to-face, to give it a more personal touch. In our experience mentoring IHEs who are organizing a CBE orientation for the first time, there are a number of questions that tend to arise. One of the first is usually when to schedule the orientation. Our suggestion, if possible, is to schedule the orientation strategically to take place after the institutional orientation and, at the most, two weeks prior to classes beginning. This will minimize student confusion over divergent institutional and program policies and procedures; give them time to adjust their schedules if they decide, after attending the CBE orientation, that it's not right for them; and allow for follow-up questions with program administrators and advisors.

A second common question that often arises is what should be included in the CBE orientation. The short answer is that it should be as comprehensive as possible without overwhelming the students. Be sure to prioritize how classes are structured and what students need to know to navigate through them so that they are not confused about the purpose of a pretest, why deadlines are not included for assignment submissions, or any number of other aspects of your course that might vary from traditional approaches. Emphasize basic premises of CBE that are applicable to them (e.g. progressing at their own rate and individualizing their learning experience) and the specific resources and services that are available to CBE

students in your program. And, most importantly, assure students that they are your priority and that you will be available to assist them at all stages of their new academic journey.

Another frequent question is whether there should be some kind of post-orientation assessment to measure student understanding of the new CBE program and what they need to be successful. This is usually a controversial topic and tends to elicit polarized responses. In most cases, the approach that we have seen produce the best results is to distribute a voluntary questionnaire on the content of the orientation with a section where students can ask questions and provide suggestions for improvement. This will help you assess their understanding of your CBE program and give you insights into how to improve future orientation sessions. As a final suggestion, you may want to consider scheduling more than one orientation session prior to classes beginning. For any number of reasons, students may not be able to attend the first session or those that do attend may not have been paying much attention. Hosting a second orientation session will improve your chances of reaching all or most of your students and reinforce their knowledge of your new CBE program.

Step Thirteen: *Ensure Continuous Program Compliance with Pertinent Institutional and External Rules and Regulations*

It probably comes as no surprise that higher education is fraught with rules and regulations at the local, state, and national levels that create a certain amount of friction and, in some cases, are entirely incompatible with the concept and practice of CBE. These rules and regulations can take many forms--subtle to overt, simple to complex--and should be carefully considered during the planning, development, and administration of any new CBE program. It's no exaggeration that with every day that passes we see more quality programs with the potential to make a significant difference in the lives of their students fail due to rules and regulations that were overlooked, marginalized, incorrectly applied or simply made the program unfeasible. To avoid delays, penalties, and other setbacks that might arise from incompliance, it's advisable to stay up to date on all pertinent institutional and external rules and regulations and how they might affect your CBE program. The following list comprises examples of some of the rules and regulations that have proven most problematic for new CBE programs and that should be adhered to at all stages of program development and administration.

Compliance with credit hour requirements: The vast majority of state and regional agencies that accredit IHEs apply rules and regulations that are, in one way or another, based on the credit hour. For the purpose of clarity, the credit hour is simply "the unit of measuring educational credit, usually based on the number of classroom hours per week throughout a term. Students are awarded credit for classes on the basis of the Carnegie unit. This defines a semester unit of credit as equal to a minimum of three hours of work per week for a semester" (U.S.Department of Education, 2009, p.1). IHEs that seek authorization to offer a new CBE academic/workforce program or to continue a program already in existence, should be aware of credit-hour requirements and how they affect the viability of their program. Graduation and retention rates, refund policies, instructional workload requirements, faculty compensation, and a host of other issues common to IHEs are traditionally based on credit-hours and should be carefully considered.

As you can imagine, CBE and, in particular, CBE programs that use direct assessment raise a number of thorny issues concerning credit-hour compliance. For example, if CBE programs characteristically offer students the opportunity to complete courses at an accelerated rate, and certain types of direct assessment bypasses much of the learning process, altogether, where does the credit-hour come into play? For critics, this apparent incongruity has become a rallying call, as they perceive deviation from the credit-hour as just another sign of the supposed reduced academic standards associated with CBE. Proponents of CBE, on the other hand, counter with the argument that learning is not, and should not, be measured by seat time, but rather by what a student knows and can demonstrate. In other words, if Student X enrolls in a 16-week introductory course with demonstrable mastery of 70% of the curriculum, it doesn't make much sense for him/her to complete the full 16 weeks relearning what he/she already knows for the exclusive purpose of ensuring that the institution complies with credit-hour standards. For them, a more logical and expeditious strategy is to provide the educational resources necessary for the student to master the 30% of the course curriculum that is lacking.

So far, a significant number of state and regional regulatory agencies—spurred on by the urgency to redress shortcomings in the traditional education system and more flexible federal directives—have been willing to "provisionally" accept this argument and accommodate CBE programs that link course completion to the credit hour, without actually requiring students to complete the normal number of credit hours expected. This "provisional" policy position has removed a formidable obstacle to the creation and implementation of CBE programs, but it's uncertain how long it will last or what might replace it. Federal and state policies governing CBE compliance with the credit hour are in a constant state of flux (exacerbated by the 2015 letter from the Office of the Inspector General questioning the role played by the Higher Learning Commission in regulating CBE programs), and it's important to keep informed of any changes that might affect your CBE program. Some steps that are recommended to better ensure compliance with credit-hour requirements in their current form are as follows:

- When planning your CBE program, fully investigate how current licensure and other requirements are related to credit hours in your IHE.
- Select a credit assessment and approval model that, to the extent possible, complies with these requirements (e.g. course content maps back to material covered in traditional courses).
- Confer with other IHEs in your state that have successfully obtained authorization to implement a CBE program for relevant recommendations.
- Stay abreast of potential and real policy changes related to the credit-hour as applied to CBE.
- Take the time necessary to elaborate a clear, detailed explanation of how your program fulfills the educational goals underlying the use of the credit-hour as a measurement of student learning. This will most likely be required at some time by your accrediting agency.

Title IV funding for course-based CBE programs in higher education: The purpose of Title IV of the Higher Education Act of 1965, is to codify and regulate the administration of student financial aid programs in the United States. Title IV funds include direct subsidized and unsubsidized loans, Direct PLUS Loans, Direct Graduate PLUS Loans, Federal Supplemental Educational Opportunity Grants (SEOG), Federal Pell Grants, and Federal Perkins Loans. They do not cover private scholarships from IHEs or other independent organizations. In order to qualify for Title IV funding, programs offered in institutions of higher learning

are traditionally required to demonstrate that students receive credit for successfully attending and completing courses based on clock hours (Tolman, 2016).

The expansion of CBE programs throughout the country has raised a number of sticky issues related to Title IV funding that have yet to be satisfactorily resolved. Fortunately, at the time of writing, Title IV funds can be applied to CBE programs providing that they have been separately accredited by an appropriate accrediting agency and meet one of two conditions: they award credit or clock hours (although the actual hours have not been completed) to students who have engaged in some type of formal educational activity, or they award credit through direct assessment of student competencies after they have engaged in some type of formal educational activity. The key component of both conditions is that some type of formal educational activity must be completed. The threshold for determining what constitutes "formal educational activity" and how much time should be dedicated to it in a given CBE program has, for the time being, been left in the hands of IHEs. The obvious problem with this approach for new and existing CBE programs is that it is subject to continuous review and modifications that effect their viability in both the short and long-term, leading many IHEs to postpone the development of new CBE programs and scale-down existing ones until more concrete policies have been implemented.

With regards to credit awarded through direct assessment of life experience or previous learning, in the absence of formal educational activity, Title IV funding is still prohibited, regardless of the level of subject matter mastery demonstrated by students. It's useful to keep all of these distinctions related to Title IV funding in mind when developing your CBE program and include them in your student and faculty orientation activities. For more information on Title IV policies and regulations and how they apply to direct assessment, see section 668.10 of Title IV.

Regular and substantive interaction: As briefly discussed in the section on CBE Myths, the question of what constitutes sufficient regular and substantive interaction (RSI) and how to provide it within the logical and structural parameters of CBE programs continues to challenge IHEs and policy makers, alike. If it means that students must interact with instructional faculty (e.g. in-person, virtually, etc.) on a predetermined number of occasions and for a set period of time before they qualify for credit, the very premise of CBE education becomes operationally untenable and hundreds of CBE programs are automatically incompliant with RSI requirements. On the other hand, if RSI signifies, as contended by proponents of CBE, that the amount of student/instructor interaction should be tailored to meet the variated educational needs of students and the nature of the CBE course in question, then CBE programs are compatible with both the spirit and the letter of RSI requirements.

There is no doubt that students are all different. Their learning styles and the amount of time and instructor interaction they need vary from student to student and class to class. Scheduling student/instructor interaction in a way that takes into consideration these differences maximizes student learning and is empirically proven to increase retention and graduation rates in IHEs. For example, if in a hypothetical introductory course, Student A needs 3 hours per week with an instructor to master a competency, Student B needs 2 hours, and Student C has already mastered it, the logic of CBE suggests that the instructor's time should be divided accordingly. The first two hours should be spent with Students A and B, the third hour with Student B, and Student C should proceed to competency assessment. This

approach saves time, reduces the superfluous use of resources, and promotes student success.

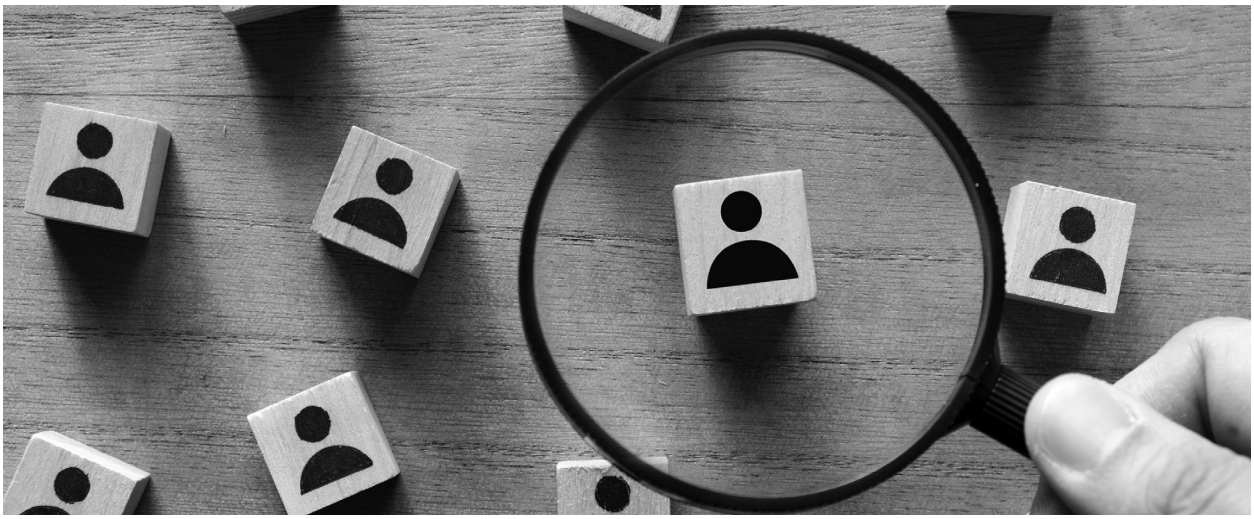
Throughout its relatively short history, the issue of RSI compliance has been a stumbling block for CBE programs as critics continually allege that they do not and cannot provide sufficient quality and quantity of RSI. In 2015, this controversy came to a head when the Office of the Inspector General (OIG) issued a statement calling into question the extent to which the Higher Learning Commission regulated CBE to ensure proper RSI in the context of Title IV funding. The Inspector General further "recommend that the assistant secretary require the Higher Learning Commission to reevaluate competency-based education programs previously proposed by schools to determine whether interaction between faculty and students will be regular and substantive and, if not, determine whether the programs should be classified as correspondence programs" (Kreighbaum, 2019, p. 2). Later, in 2017, the Inspector General opened an investigation into allegations that Western Governor's University (WGU), the largest CBE institution in the world, failed to provide adequate RSI. As described earlier, WGU was eventually exonerated of these charges, but not before its reputation had been seriously compromised.

For the time being, the federal government's posture on what constitutes regular and sufficient interaction, while still somewhat ambiguous, has softened considerably. In a press statement released in January of 2019, the Department Of Education (DOE) iterated its commitment to a more flexible policy position on innovative educational models that redress shortcomings in the current system without compromising quality and concluded by saying that, "The department is hopeful that further clarification will be part of future regulations that will help spur the growth of high-quality innovative programs" (Kreighbaum, 2019, p. 2). As of the time of writing, no further investigations have been initiated by the DOE on allegations of insufficient RSI in post-secondary CBE programs. As is the case with all of the rules and regulations that affect CBE programs, our recommendation is to continually monitor how the federal government and pertinent regulatory agencies define and enforce RSI requirements to better ensure that your program is in ongoing compliance.

Title IV funding for direct assessment in CBE programs: The topic of direct assessment (DA) invariably arises when planning a CBE program and tends to bring with it a number of very good questions. What are the pertinent regulations for CBE programs that use DA? How does DA differ from prior learning assessment (PLA)? And, is DA already part of most CBE programs are just a few of the more frequently asked questions. To clarify the position adopted by this handbook, DA is not incompatible with or necessarily a separate methodological approach to CBE. Rather, it is an assessment mechanism that can stand alone or be incorporated into structured CBE programs. According to the U.S. Department of Education, DA is:

> 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 (U.S. Department of Education, 2019, p. 1).

In other words, DA is just another term for some of the assessments that you probably already use,



or have used, in your traditional courses. Where the concept of DA often becomes a little confusing is when a "DA course" is conflated with a "CBE course that includes DA content." The former does not contain educational materials or activities, and is based 100% on student performance assessments that measure predetermined competencies. The latter includes DA, as well as educational materials and activities that are generally mapped back to course competencies. The most common question that IHEs ask when considering the development of a DA program is if it is eligible for Title IV funding.

In 2005, the Higher Education Reconciliation Act (HERA) established that credit awarded through direct assessment of life experience or previous learning, in the absence of formal educational activity, was not eligible for Title IV funding, regardless of the level of subject matter mastery demonstrated by students. More recently, in 2013, the Department of Education issued a Dear Colleague letter that, while concurring with this position, simultaneously sought to clarify what was meant by "formal educational activity" and how IHEs that offered DA programs could qualify for Title IV funding. According to this letter, an IHE, when applying for Title IV eligibility, should include the following information in their petition to the Secretary of Education.

> "A description of the educational program, including the educational credential offered (degree level or certificate) and the field of study; description of how the assessment of student learning is done; description of how the direct assessment program is structured, including information about how and when the institution determines on an individual basis what each student enrolled in the program needs to learn; description of how the institution assists students in gaining the knowledge needed to pass the assessments; the number of semester or quarter credit hours, or clock hours, that are equivalent to the amount of student learning being directly assessed for the certificate or degree; the methodology the institution uses to determine the number of credit or clock hours to which the program is equivalent; the methodology the institution uses to determine the number of credit or clock hours to which the portion of a program an individual student will need to complete is equivalent; documentation from the institution's accrediting agency indicating that the agency has evaluated the institution's offering of direct assessment programs and has included the programs in the institution's grant of accreditation; documentation from the accrediting agency or relevant state licensing body indicating agreement with the institution's claim of the direct assessment program's

equivalence in terms of credit or clock hours; and any other information the Secretary may require to determine whether to approve the institution's application" (U.S Department of Education, 2013, p. 1).

While the DOE's position on federal funding for DA programs is not entirely inflexible and a certain degree of progress has been made, the reality is that very few programs have actually received approval; two of the most well-known being Southern New Hampshire University and Capella University. Overall, it's useful to keep all of these distinctions related to Title IV funding in mind when developing your CBE program and include them in your student and faculty orientation activities. For more information on Title IV policies and regulations and how they apply to direct assessment, see section 668.10 of Title IV.

Step Fourteen: *Develop and Implement a System of Ongoing Program Evaluation and Improvement*

Academic and workforce programs in any IHE require ongoing evaluation and improvement, and CBE programs are no exception. Competencies should be regularly updated to meet evolving labor market requirements; program structures and procedures adjusted to ensure compliance with changing rules, regulations, and norms; educational resources revised for relevance, and so forth and so on. To keep up to date with the inevitable changes that will be necessary in your program, and in the interest of continuous and transparent improvement, we recommend thorough periodic evaluations. At the heart of CBE is the premise that educational institutions are preparing students with the knowledge and skills (competencies) that they need to be successful in the "real world." Perhaps now, more than at any other time in recent history, what it means to be competent is changing at an ever- accelerating rate. It's well-known that students are graduating into a labor market where their professional careers will be subject to continuous disruption caused by ongoing change and innovation. To better prepare students for this dynamic and increasingly competitive job market, it's essential that CBE programs and, in particular, course curricula, are continuously revised for quality and to make certain that they align with the most recent labor market requirements.

As might be expected, best practices in CBE program evaluation and improvement are, themselves, constantly undergoing evaluation and improvement by CBE practitioners all around the country. While there has yet to emerge a single unifying model, most approaches to program evaluation and improvement contain, more or less, the same elements. The following example, based on these elements and our own experience, is not intended to be comprehensive, but rather constitutes a starting point for the development of a CBE program evaluation and improvement process.

Sample CBE Program Evaluation and Improvement Process

- Begin by identifying the structure, procedures, and goals of each component of your CBE program. Where appropriate, they should be deliberate, clearly articulated, measurable, linked to relevant qualitative and/or quantitative performance indicators, vetted by qualified members of your CBE program, and available to program stakeholders and students.
- Decide who will be responsible for evaluating each component of your CBE program. In most

instances, this will require the participation of internal and external stakeholders. For example, the knowledge of subject matter experts who instruct/facilitate classes, the insights of employers who hire graduates, and the experience of recent graduates in the job market make all three a valuable part of the process of evaluating course competencies.

• Create a standardized and transparent system for accumulating data on the performance of each component of your CBE program. Formal student evaluations, employer feedback on the performance of current students and program graduates, input from advisory boards and other departments impacted by your program, alumni follow-up surveys, and program pre-and post-test results are all good sources of data for evaluating your CBE program.

• Apply accumulated data to evaluate the performance of each component of your CBE program and the extent to which the aforementioned goals have been met. For example, data on student recruitment, retention, and graduation rates could be used to evaluate the hypothetical goal of increasing the number of adult learners over the age of 25 with a college certificate or degree.

• Develop a system for proposing, approving, and implementing revisions to your CBE program based on a methodical and detailed analysis of its performance as reflected in accumulated data.

Conclusion

The creation of a quality CBE program, from early conceptualization and planning to implementation and administration, can be a challenging undertaking. It is our hope that this handbook contains useful information and guidance for IHEs that are interested in offering their students this dynamic, non-traditional learning and assessment option that has already proven effective in hundreds of programs at all educational levels. As a final note, we would like to reiterate our ongoing commitment to the expansion of quality CBE programs at the post-secondary level and to your program, in particular. If you have any questions at all, please don't hesitate to contact South Texas College or the Institute for Competency Based Education at Texas A&M University-Commerce. We are here to help and answer any questions that you might have about how to develop, implement, and administer a CBE program in your IHE. Thank you for taking the time to read through this introductory handbook and welcome to the growing and thriving CBE community in higher education.

References

Adams, S. (2014). The college degrees and skills employers most want. Retrieved from http://www.forbes.com/sites/susanadams/2014/04/16/the-college-degrees-and-skills-employers-most-want/

American Institute of Research-AIR. (2019). Retrieved from https://www.air.org/sites/default/files/National-Survey-of-Postsecondary-CBE-2019-Infographic-rev.pdf

Competency-Based Education Network-CBEN. (2017). Quality framework for competency-based education programs. Retrieved from https://www.cbenetwork.org/competency-based-education/

Ebersole, J. (2014). Competency vs. mastery. Inside Higher Education. Retrieved from https://www.insidehighered.com/views/2014/07/25/lets-differentiate-between-competency-and-mastery-higher-ed-essay

Education Commission of the States. (2017). Does the state or state-wide postsecondary system have a PLA policy? Retrieved from http ecs.force.com/mbdata/MBquest3RTA

Edmondson, H. (2014). *John Dewey and the Decline of American education.* New York, NY: Open Road Media.

Fain, P. (2019). Slow and steady for competency-based education. Inside Higher Education. Retrieved from https://www.insidehighered.com/news/2019/01/28/slow-growth-competency-based-education-survey-finds-interest-and-optimism-about-it

Getting Smart Staff. (2018). Show what you know: a landscape analysis of competency-based education. Retrieved from https://www.gettingsmart.com/2018/10/show-what-you-know-landscape-of-competency-based-education/

Henrich, J. (2016). *Competency-based education: The employers' perspective of higher education.* Retrieved from https://doi.org/10.1002/cbe2.1023

Kreighbaum, A. (2019). No Penalty for Western Governors. Inside Higher Education. Retrieved from https://www.insidehighered.com/news/2019/01/14/trump-administration-rejects-inspector-general-critical-audit-findings-western

Klein, R. & Tate, P. (2015). PLA and CBE on the competency continuum. Council for Adult and Experiential Learning. Retrieved from http://plaportal.org/Assets/PLA-PORTAL/CAEL-Views-on-CBE-and-PLA-Oct-2015.pdf

Levine, E. (2019). Competency-based education across America. Competency Works, Learning form the Cutting Edge. Retrieved from http://www.cometencyworks.org/resources/competency-based-education-across-america/

Lewis, M., Kroeger S., & Zende, M. (2009). Defining program-based student learning outcomes (SLOs) and translating them into a curricular structure. Retrieved from https://www.uc.edu/content/dam/uc/cetl/docs/ProgramBased_SLOmodules1.pdf

Lumina Foundation. (2015). Connecting credentials: a beta credentials framework. Retrieved from https://connectingcredentials.org/wpontent/uploads/2015/05/ConnectingCredentials-4-29-30.pdf

McClarty, K., & Mattern, K. (2017). Preparing students for college and careers: theory, measurement, and educational practice. London: Routledge.

McElroy, J. (2012). Function and Value of Advisory Boards for Academic Programs. Retrieved from https://www.ncfr.org/sites/default/files/2017-/ncfr_symposium_proposal_example_-_function_and_value_of_advisory_boards_for_academic_programs_0.pdf

National Survey of Postsecondary Competency-Based Education. (2019). Retrieved from https://www.air.org/sites/default/files/National-Survey-of-Postsec-CBE-2018-AIR-Eduventures-Jan-2019.pdf

Public Agenda. (2015). A Research Brief on the Survey of the Shared Design Elements & Emerging Practices of Competency-Based Education Programs. Retrieved from https://www.insidehighered.com/sites/default/server_files/files/Research%20Brief%20on%20Survey%20of%20the%20Shared%20Design%20Elements%20&%20Emerging%20Practices%20of%20CBE.pdf

Raisman, N. (2013). The cost of college attrition at four-year colleges and universities. Educational Policy Institute. Retrieved from ttps://files.eric.ed.gov/fulltext/ED562625.pdf

Regular and substantive interaction: background, concern, and guiding principles. (2017). Retrieved from https://www.insidehighered.com/sites/default/server_files/media/Regular-and-Substantive-Interaction.pdf

Roscorla, T. (2016). Seven keys to competency-based faculty development. Center for Digital Education. Retrieved from https://www.govtech.com/education/higher-ed/7-Keys-to-Competency-Based-Faculty-Development.html

Shapiro, D., Dundar, A., Yuan, X., Harrell, A., Wild, J., & Ziskin, M. (2014, July). *Some College, No Degree: A* National View of Students with Some College Enrollment, but No Completion. (Signature Report No. 7). Herndon, VA: National Student Clearinghouse Research Center.

Shaw, A. (2019). Authentic assessments in the online classroom. Center for Teaching and Learning. Retrieved from https://ctl.learninghouse.com/authentic-assessment-in-the-online-classroom/

Southern Association of Colleges and Schools. (2018). Direct assessment: competency-based education programs. Policy Paper. Retrieved from http://www.sacscoc.org/pdf/08750/DirectAssessmentCompetencyBased.pdf

Spady, W. (1994). Choosing Outcomes of Significance. *Educational Leadership* 51, 5: 18–23.

Spady, W., and Marshall, K. (1991). Beyond Traditional Outcome-Based Education. Educational Leadership 49, 2: 67–72.

Tolman, D. (2016). ED discusses Title IV eligibility, competency-based education at the 2016 national conference. National Association of Student Financial Aid Administrators. Retrieved from https://www.nasfaa.org/news-tem/9477/ED Discusses Title IV Eligibility Competency-Based_Education_At_2016_National_Conference

U.S. Department of Education. (2103). Applying for Title IV Eligibility for Direct Assessment Competency-Based Education Programs. Retrieved from http://igap.ed.gov/dpcletters/https://ifap.ed.gov/dpcletters/GEN1310.html

U.S. Department of Education. (2009). Program Integrity Questions and Answers Retrieved fom http:www2ed.gov/policy/highered/reg/hearuling/2009/credit.html#credit

U.S. Department of Education. (2019). Electronic code of federal regulations. Retrieved from https://www.ecfr.gov/cgi-bin/text-dx?c=ecfr&sid+c6dbf795317d4ce6c48087ad7c495d55&rgn=div8&view=text&node=34:3.1.3.1.34.1.39.10&idno=34

Wang, J. (2015). The Student Perspective on Competency-Based Education: qualitative research on support, skills, and success. Retrieved from https://younginvincibles.org/wp-content/uploads/2015/10/Young-Invincibles-CBE-Paper.pdf

Wiggins, G. (1998). Education assessment: Designing assessments to inform and improve student performance. San Francisco: Joey-Bass Publishers

Appendix A—*CBE Program Development Affordability Case Study*

University: Texas A&M University-Commerce

Program Name: Bachelor of Applied Arts and Sciences in Organizational Leadership

Program Description: Fully online degree program consisting of 99 competencies (mapped to the equivalent of 120 standard semester credit hours), delivered 100% online via a subscription model; where students may attempt as many competencies as possible in each seven-week term, with each term cost at $750 for tuition and fees. Program caters to underserved student populations such as adult-learners, working-adults, minorities, veterans, and those with partial college credits but no degree. CBE students have graduated from the program in approximately one year, with an average cost-to degree of under $6,000.

How to make a CBE program more cost effective

I • Grant Funding

The competency-based Bachelor of Applied Arts and Sciences in Organizational Leadership would not have been possible without startup funds. Texas A&M University-Commerce, in collaboration with the Texas Higher Education Coordinating Board, the College for All Texans Foundation, and South Texas College, received funding from an EDUCAUSE Next Generation Learning Challenges grant to build the first competency-based education (CBE) program in the state. Today, Texas institutions of higher education can receive grant funding to build innovative programs by submitting an application to the Texas Affordable Baccalaureate (TAB) initiative. A total of 13 TAB grants have been awarded to different institutions throughout the state. A wide range of programs have been accepted from Mechanical Engineering to Early Childhood Education. For institutions from other states, grant programs have become a common way to fund innovative programs such as CBE. Additionally, institutions should seek grant opportunities from different entities interested in supporting ground-breaking models of higher education that can impact student success such as the Lumina Foundation and Bill & Melinda Gates Foundation. Such entities are looking to increase access to higher education for underserved student populations such as adult-learners, working-adults, minorities and veterans, so make sure your program aligns to their mission.

II • Faculty & Staffing

For programs to get off the ground there needs to be strong faculty support. After all, faculty are the ones that will be teaching and guiding students through the program. Texas A&M University-Commerce used grant funding primarily for faculty stipends and travel associated with the development of the CBE core curriculum and advanced coursework for the program. Currently, two professional-track faculty positions teach in the program and provide orientation sessions to new students. The program uses existing faculty, university staff who meet SACSCOC credentialing requirements, and adjunct faculty who are paid an overload of $250 per student enrolled up to the adjunct faculty rate of $2,500. Enrollment is capped at 35 students per course. The program has one success coach at a ratio of 450 to 1. This individual is still able to deliver a personalized experience to each student since a lot of the heavy lifting happens during the first four 7-week terms when students are new to the program. Program data supports that CBE students who

stay enrolled after term six usually become more independent and complete their degree. Not surprisingly, faculty cost will rise gradually over time as program enrollment scales; however, support staff costs have remained constant over time.

III • Cross-departmental Collaboration

Implementing a new innovative program touches many areas on campus. Include operational units early in the planning stage to identify the cost and lift of launching these programs. CBE forces departments who have probably been doing the same operations for the past decade, to adapt to a completely different model. Key stakeholders should be involved early in the process, to avoid problems once the program is operational. At the very least, include the following department in initial conversations about CBE: admission, registrars, IER, IT, financial aid, and student accounts. At A&M-Commerce, financial aid has been the program's largest indirect expense due to the manual nature of disbursement for students in CBE. It will be important to continue working with campus stakeholders to build a cycle of continuous improvement and to streamline business processes as much as possible to reduce the burden on these offices.

IV • Data & Automation

Work with the departments mentioned above to build a robust data collection and analysis framework, and automate wherever possible. Most Student Information Systems (SIS) focus largely on standard terms. Workarounds to adapt current systems to CBE programs can be labor intensive. Some of the issues faced with non-standard terms include: state reporting for funding, tracking of census dates, drops for non-payment and payment plans, and tracking of veteran and military service members benefits. At A&M-Commerce, most data and metrics were being collected manually from program inception. By working directly with IER, manual intensive reporting processes have been automated to CBE reports, dashboards and metrics. Find a Business Intelligence (BI) tool that meets campus needs or leverage current tools already available on campus. Make sure to involve the right areas and that the right talent is available to turn raw data into a competitive advantage for the institution. As mentioned previously, A&M-Commerce has collaborated with different campus partners and has worked through automating business processes and streamline solutions that have allowed us to significantly reduce the burden and indirect costs to departments that serve our CBE programs. Finally, work with the financial services department to build a Profit & Loss (P&L) Analysis of the program to visualize those non-value add activities to work towards reducing or eliminating costs as the program scales.

V • Service Agreements/Third-Party

Avoid dependency on service agreements or third-party software. Service agreements for the program included contracts with vendors that provided educational resources and content for instruction embedded into the Learning Management System (LMS). Additional service agreement costs included a predictive analytics application and financial aid software. In 2018, the program began to use Open Education Resources (OER) and migrated to a new LMS. Working directly with the program faculty and a CBE consultant, the university generated additional cost savings by reducing reliance on prior services that had costs in excess of $290K. It is also important to note that our OER initiative also generated saving to students who did not have to pay for any book out-of-pocket. Work directly with the university librarian to certify faculty members in OER and to find resources to make the shift happen at your institution.

VI • Infrastructure & Scale

Although there are many different versions of CBE program delivery, it is important for institutions to realize

that subscription models rely on both economies of scale and on efficient use of time and resources by program faculty and staff to minimize costs. In the short-run, expenses will exceed revenues; however, in the long-run, revenues and expenses will gradually grow together as the program scales reaching a tipping point in which revenues will then significantly exceed expenses. Leadership teams need to recognize that while the initial years of the program might be a financial burden to the institution, early evidence shows that institutions should expect a competency-based program of this type to break-even by the fifth year of operation. At A&M-Commerce, 350 enrolled students were needed to reach the program's break-even point. Today, with close to 500 students enrolled, the CBE program is now the third largest program at the university and profitable with tuition revenue alone. In Texas and other states, it is also important to consider that due to the accelerated nature of these programs, they are high formula funding generators that bring in a significant source of additional revenue. Institutions should also consider building a CBE infrastructure they can leverage to build future programs. For example, A&M-Commerce decided to build the core curriculum from inception. While this was a huge upfront lift for the institution, the work is now paying off as the institution moves towards building new CBE programs. The university has recently launched a second program in Criminal Justice that will not only scale faster, but because all the pieces are in place from the first program, will be profitable faster as well. The plan is to build 10 new CBE programs at the A&M-Commerce campus that will operate out of the new College of Innovation and Design were the Institute for Competency-Based Education is housed. With the declining numbers of new freshmen by 2026 and the growing number of adults with partial college credits increasing in the future, CBE will allow the university to meet the demand of a changing student population. These types of programs could reinvent the way higher education is being delivered in Texas for underserved student populations by providing affordable and flexible pathways to degree completion while also providing a return on investment to the institution.

VII • CBE Resources

When A&M-Commerce and South Texas College started in this path in 2012, there were not a lot of CBE resources available at that time. The expression that is constantly used is that these institutions were building the plane while flying it. Today, there is a plethora of resources on CBE available through organizations such as the Competency-Based Education Network, the Journal of Competency-Based Education, Institute for Competency-Based Education, Fast Track to Success, Lumina Foundation and the American Institutes for Research, all supporting evidence building of the field to continue the expansion of CBE nationwide. Leverage all of these resources to build a quality and robust program.

At the Institute for Competency-Based Education we strive for collaboration and the sharing of resources to avoid duplications of efforts, and to enhance best practices in CBE. Reach out to the ICBE to build partnerships, collaborate in research, and/or answer any questions you may have. For more information, please feel free to reach out to me at *carlos.rivers@tamuc.edu.*

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Appendix B—*Sample Abbreviated Checklist for CBE Program Development.*

Program Steps	Introductory		Satisfactory		Advanced	
Step One: Form a program development committee consisting of qualified internal and external actors.	Tentative members have been invited to join the Program Development Committee (PDC)		The PDC includes members with sufficient expertise and experience in CBE and related areas.		All PDC members have received orientation, and understand and accept their duties and responsibilities.	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete
Step Two: Calculate financial viability of CBE programw	The PDC has identified and quantified the individual costs and revenues associated with program resources and services.		Cost/revenue data have been processed in a credible cost/revenue model (e.g. HCHEMS).		Data resulting from cost/revenue analysis were applied to determine program financial viability and pertinent budgetary adjustments.	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete
Step Three: Promote institutional understanding and acceptance of CBE	Perceptions of CBE among institutional actors have been measured by a survey or other appropriate assessment device.		Action has been taken to inform and orient institutional actors about CBE theory and practice.		Follow-up surveys attest a generally more favorable perception of CBE among institutional actors.	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete
Step Four: Conduct faculty and staff orientation and training sessions.	Perceptions of CBE among potential CBE program faculty have been measured via a survey or other appropriate device.		Faculty information and orientation sessions on CBE theory and practice have been conducted.		Follow-up evaluations confirm that faculty possess an appropriate level of knowledge of CBE theory and practice.	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete
Step Five: Develop CBE courses.	Course development teams (CDT) are formed and have received orientation and training on best practices in CBE course development.		CBE courses have been developed and submitted to the appropriate entity for approval.		CBE courses are approved and scheduled for delivery.	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete
Step Six: Include relevant internal actors and departments in the development and implementation of the new CBE program.	The PDC identified institutional actors and departments that will be affected by the new CBE program.		The PDC consulted with institutional actors and department representatives that will be affected by the new CBE program.		Relevant institutional actors and departments actively participate, when appropriate, in program development and implementation.	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete
Step Seven: Conduct student orientation and information sessions.	Student orientation and information sessions have been designed and developed.		Student orientation and information sessions have been conducted.		Data extracted from follow-up surveys, questionnaires etc. have been applied to improve the content and format of the student orientation and information sessions.	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete
Step Eight: Establish a system for ongoing program evaluation and improvement	The PDC, in consultation with qualified entities, has developed a tentative program evaluation and improvement system.		The tentative program evaluation and improvement system has been tested in pilot CBE courses.		Data extracted from follow-up analysis has been applied to further refine the program evaluation and improvement system.	
	Complete	Incomplete	Complete	Incomplete	Complete	Incomplete

Note. The elaboration of this table, and any errors or omissions, are the sole responsibility of the author of this handbook

Appendix C—*Frequently asked Questions (FAQ)*

Quick Reference of Frequently Asked Questions (FAQ)

The questions listed below are the ones most frequently asked by program developers in IHEs new to competency-based education (CBE). The responses are extracted from the Fourteen Step Process recommended in this handbook to develop and implement CBE academic and workforce programs in higher education. For more detailed information, consult the corresponding text in the handbook and/or contact our team at: kmpeek@southtexascollege.edu

Q&A extracted from "Introduction."

• Q - 1: Our institution of higher education (IHE) is considering the development of a new CBE program. Just how difficult is it to develop a CBE program and how different is CBE from traditional educational models that we are used to?

• A - 1: One of the core premises of this handbook is that there is an unfortunate and widespread tendency to make CBE more difficult than it actually is. The skills and knowledge that your faculty will need to develop and instruct a CBE course, for example, are the same skills and knowledge that they apply on a daily basis in their traditional in-person and online courses. More than anything else, developing and implementing a quality CBE program is simply a matter of changing how educational content is organized, delivered, and assessed.

• Q - 2: What steps are generally recommended to develop and implement a CBE program in an IHE?

• A - 2: There are numerous approaches applied in IHEs to develop CBE programs, the vast majority of which contain most or all of the fourteen steps recommended in this handbook. Depending upon you program's current stage of development, resources, time, and other factors, you may want to modify, combine, reorder, and/or eliminate some of these steps.

a. Step One: Define and operationalize the concept of competency-based education.
b. Step Two: Assess institutional perceptions and attitudes of CBE.
c. Step Three: Select a program for conversion to CBE.
d. Step Four: Form a program development and implementation team.
e. Step Five: Select a CBE learning and assessment model.
f. Step Six: Identify the resources needed at each stage of program planning, development, and implementation.
g. Step Seven: Select and apply a cost estimation model for program development and implementation.
h. Step Eight: Devise strategies to promote program acceptance and institutional inclusion.
i. Step Nine: Schedule faculty CBE orientation and training sessions.
j. Step Ten: Develop and approve CBE courses.
k. Step Eleven: Include relevant institutional actors in the implementation of your CBE program.
l. Step Twelve: Schedule student information and orientation sessions.
m. Step Thirteen: Ensure continuous program compliance with pertinent institutional and external rules and regulations.
n. Step Fourteen: Develop and implement a system of ongoing program evaluation and improvement.

Q&A extracted from "Step One: Define and Operationalize the Concept of Competency-Based Education."

• Q - 1: Is there a standard definition of competency-based education (CBE) and, if so, what is it?

• A - 1: There are many definitions of CBE that have been adopted by colleges and universities throughout the world. Most of them share certain theoretic and operational components. The most widely accepted definition was developed by the Competency-Based Education Network (C-BEN) in 2017, and is endorsed by more than 600 public and private schools. It defines CBE as "an intentional and transparent approach to curricular design with an academic model in which the time it takes to demonstrate competencies varies and the expectations about learning are held constant. Students acquire and demonstrate their knowledge and skills by engaging in learning exercises, activities and experiences that align with clearly defined programmatic outcomes. Students receive proactive guidance and support from faculty and staff. Learners earn credentials by demonstrating mastery through multiple forms of assessment, often at a personalized pace" (Competency-Based Education Network, 2019, para. 1).

• Q - 2: Are there commonly accepted characteristics that operationally define CBE and, if so, what are they?

• A - 2: The most common characteristics that operationally define CBE are:

a. Time is no longer the determinant of student learning.
b. Students are not required to relearn competencies that they have already mastered.
c. Learning and assessment are individualized to meet the unique needs of diverse student populations.
d. Student assessment is primarily formative.
e. Diversified learning and assessment in CBE addresses the problem of how to stimulate advance students without losing students who progress less rapidly.
f. CBE tends to be more rigorous than its traditional counterparts.
g. CBE is more responsive to changing labor market conditions and labor demand.
h. CBE better prepares students to select a career that is more closely aligned with their skills and preferences.
i. CBE prioritizes quality control mechanisms and ongoing program review and improvement.

Q&A extracted from "Step Two: Assess Institutional Perceptions of CBE."

• Q - 1: Are there examples of surveys or other assessment tools that we can use to evaluate perceptions and attitudes about CBE in our institution?

• A - 1: There are two commonly used surveys that we recommend at the early stages of program planning to assess the perceptions and attitudes of CBE among faculty, staff, and administrators. The first is the Survey of the Shared Design Elements and Emerging Practices of Competency-Based Education Programs. This survey was developed by Public Agenda in 2015 and has been administered to over 586 distinct CBE programs. The second, and less detailed survey, was created by the Competency-Based Education Consortium at Austin Community College. Both surveys are proven to be highly effective and are described in more detail in the handbook.

Q&A extracted from "Step Three: Select a Program for Conversion to the CBE Format."

• Q - 1: What sources should be consulted to make the best decision about which academic or workforce program to convert to CBE?

• A - 1: Some of the most useful (and frequently overlooked) sources of information to help you decide which program is most appropriate for conversion to CBE include:

a. Employers in the program areas that you are considering converting to CBE are familiar with evolving employment requirements, the competencies students need to be successful in different industries, and future labor market demand.

b. IHEs that have developed CBE programs are best equipped to provide you with invaluable information about the viability of converting different programs to CBE, which ones are most likely to be successful, and the resources you will need. Most importantly, they can help you avoid reinventing the wheel.

c. Non-profit organizations that specialize in CBE at the national level (e.g. The Competency-Based Education Network) and at the state level (e.g. The Center for Competency-Based Education at Texas A&M University-Commerce), provide advice and guidance in all aspects of CBE free of charge.

d. Alumni in the different program areas you are considering converting to CBE, who are familiar with the job market, employer expectations, and the competencies graduates need to be successful. Ideally, this will include alumni who are employed in the industries in question.

e. Organizations from the public and private sectors that collate and disseminate labor market and general industry data at the national (e.g. Bureau of Labor Statistics), state (e.g. Texas Workforce Commission), and local levels (e.g. chambers of commerce, industry consortia, and unions organizations).

f. Faculty, staff, and mid-level administrators in the different programs that you are considering for conversion to CBE. They are one of the most qualified, but frequently overlooked, sources of information.

• Q - 2: Do student characteristics matter when considering which program to convert to CBE?

• A - 2: Although most students are apt for and thrive in CBE environments, there are some student characteristics that require time to adapt to this format and, in some cases, may be incompatible with it. They include, but are not limited to:

a. The need for a structured course environment, be it in-person, online, or another format.

b. Preference for extensive group interaction in the learning phase of a CBE course.

c. Reluctance to take the initiative in educational activities.

d. Reluctance to engage with the course instructor/facilitator.

Q&A extracted from "Step Four: Form a Program Development Committee."

• Q - 1: Who should be part of the Program Development Committee?

• A - 1: This is one of the more controversial questions in CBE. In general, though, the majority of CBE programs development teams include a minimum of six key elements.

a. Program chair, assistant chair, or duly appointed substitute.
b. Faculty who instruct courses in the proposed program.
c. At least one (more is better) member that is knowledgeable of and experienced in applying CBE theory and practice.
d. Representatives from the public/private sector who are familiar with labor demand, industry conditions, and the competencies graduates need to be successful in the target employment area.
e. Representative from the Distance Learning Department or equivalent if the courses will be delivered online.
f. Representatives from IHE departments that will be impacted by the new CBE program.

Q&A extracted from "Step Five: Select a CBE Learning and Assessment Model."

• Q - 1: What is meant by the term "CBE learning and assessment model?"
• A - 1: This term is often used interchangeably with "learning and assessment infrastructure," and basically refers to how and where learning and assessment occurs in a CBE program.

• Q - 2: What are some of the most common CBE learning and assessment models?
• A - 2: The most prominent types of CBE learning and assessment models in higher education are listed below. Each one can be applied singularly or in combination with other models.

a. In-person course based learning and assessment models.
b. Online course based learning and assessment models.
c. Hybrid traditional/CBE learning and assessment models.
d. Learning and assessment models that include activities in authentic "real world" conditions.
e. Learning and assessment models that include simulations of authentic "real world" conditions.
f. Learning and assessments based on or that include direct assessment (DA).
g. Learning and assessment models that accept prior learning assessment (PLA).

Q&A extracted from "Step Six: Identify the Resources Needed at Each Stage of Program Planning, Development, and Implementation."

• Q - 1: What resources are necessary to develop and implement a CBE program in higher education?
• A - 1: On a granular level, resource needs can vary significantly from one program to another, depending upon a variety of institutional and external factors. Generally, though, the primary resources that the program development team should consider include:

a. Advisory board.
b. Course design and development teams.
c. Faculty, staff, and administrators for program implementation and continuation.
d. Standard and CBE-specific technological resources (e.g. LMS, SIS, CRM etc.)
e. Institutional resources and services.
f. Additional physical capital specific to the needs of the new CBE program.

Q&A extracted from "Step Seven: Select a Cost Estimation Model for Your CBE Program."

• Q - 1: Are there any models available to estimate the cost of developing and implementing a CBE program and, if so, which is most appropriate for out proposed program?

• A - 1: There are a variety of cost estimation models available, most of which are easily accessible and free of charge. For institutions new to CBE, this handbook recommends the model developed by The National Center for Higher Education Management System (NCHEMS) and funded by the Lumina Foundation (*https://nchems.org/projects/cbe-cost-model/*). It is user friendly, comprehensive, and generates estimations for all stages of CBE program development, implementation, and administration.

Q&A extracted from "Step Nine: Schedule Faculty Orientation and Training Sessions."

• Q - 1: Are CBE orientation and training sessions necessary for experienced faculty?

• A - 1: Orientation and training sessions are beneficial for faculty who are new to CBE regardless of their level of experience with other learning and assessment systems, and follow-up sessions are recommended to keep up-to-date on changing best practices and how they are applied in the home IHE.

• Q - 2: What general information should be included in the orientation and training session for faculty who are new to CBE?

• A - 2: General information included in most orientation and training sessions for faculty new to CBE include general CBE theory and practice, specific guidance on how to develop and instruct CBE courses, and relevant internal and external policies and regulations.

• Q - 3: What specific information should be included in the orientation and training sessions to prepare new faculty to develop and instruct CBE courses?

• A-3: In addition to material pertinent to your institution's policies and practices, the course development and instruction content of the orientation and training sessions should cover the following knowledge and skills, and metrics to measure them:

a. General understanding of CBE theory and practice.
b. General understanding of CBE competencies.
c. Knowledge of best practices in developing course competencies, in general, and in the home IHE.
d. Knowledge of best practices in selecting/developing individualized educational material for CBE courses, in general, and in the home IHE.
e. General understanding of CBE student assessment theory and practice.
f. General understanding of internal and external policies and regulations as applied to CBE courses.

Q&A extracted from "Step Ten: Develop and Approve CBE Courses."

• Q - 1: We have seen a lot of variation in the content and orga
nization of CBE courses. Are there basic structural components that most of them share?

• A - 1: The landscape of CBE programs in higher education is fairly diverse, but, at the same time, they tend to be unified around certain shared structural components that include:

a. Competencies that link back to PLOs, labor market requirements, and institutional and external policies and regulations.
b. Learning and assessment models that occur in or replicate authentic employment environments.
c. Learning objective/outcomes that support course competencies
d. Assessment methods based on CBE theory and practice, and that are appropriate to course content and student learning/assessment styles and preferences.
e. Individualized educational material.
f. Diverse and timely student feedback channels.
g. Course evaluation and improvement mechanisms.

• Q - 2: What factors should we consider when developing course competencies?
• A - 2: The most common factors to consider when developing CBE competencies are:

a. Do they map back to Program Learning Outcomes (PLO)?
b. Do they map back to skills/knowledge that graduates will need to be competitive in the industry in question?
c. Are they clear and accessible to students?
d. Are they explicit, measureable, and transferable?
e. Do they advance in an incremental and progressive manner through course curriculum?
f. Are they at an appropriate cognitive and developmental level?

Q&A extracted from "Step Thirteen: Ensure Continuous Program Compliance with Pertinent Institutional and External Rules and Regulations."

• Q - 1: We have seen CBE programs struggle with internal and external rules and regulations, many of which they were unaware of. What are your suggestions to maximize program compliance with pertinent rules and regulations?
• A - 1: The innovative and dynamic nature of CBE programs, coupled with changing institutional and external norms and policies over the last 10 years, left many CBE programs in a precarious and uncertain position. Fortunately, regulatory bodies have recently adopted a more flexible position as the need for CBE and other innovative educational models becomes increasingly clear. Some of the rules and regulations to be aware of when developing your program include:

a. Credit-Hour Requirements: The vast majority of state and regional agencies that accredit IHEs apply rules and regulations that are, in one way or another, tied to the credit hour. To better ensure compliance with credit-hour requirements, we recommend the following steps.

1. When planning your CBE program, fully investigate how current licensure and other requirements are related to credit hours in your IHE.
2. Select a credit assessment and approval model that, to the extent possible, complies with

these requirements (e.g. course content maps back to material covered in traditional courses).

3. Confer with other IHEs in your state that have successfully obtained authorization to implement a CBE program.

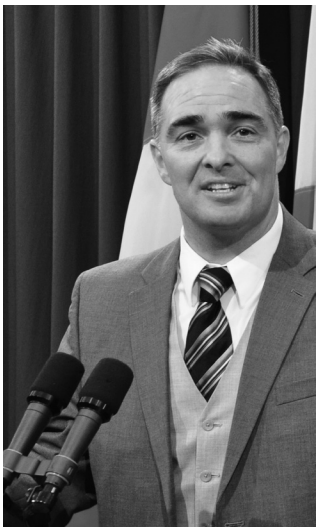
4. Stay abreast of potential and real policy changes related to the credit-hour as applied to CBE.

5. Elaborate a clear, detailed explanation of how your program fulfills the educational goals underlying the use of the credit-hour as a measurement of student learning. This will most likely be required at some time by your accrediting agency.

b. Title IV funding requirements for course-based CBE programs: The purpose of Title IV of the Higher Education Act of 1965 is to codify and regulate the administration of student financial aid programs in the United States. In order to qualify for Title IV funding, a CBE program must meet one of two conditions: it awards credit or clock hours (although the actual hours have not been completed) to students who have engaged in some type of formal educational activity, or it awards credit through direct assessment of student competencies after they have engaged in some type of formal educational activity. In both cases, the basic requirement is that some kind of educational activity as occurred.

c. Regular and Substantive Interaction (RSI) Requirements: The question of what constitutes sufficient RSI and how to provide it within the procedural and structural parameters of CBE programs continues to challenge IHEs and policy makers, alike. The federal government's current posture, while admittedly more flexible than has traditionally been the case, is still somewhat ambiguous. Our suggestion is to strive to include as much RSI as possible in your courses without compromising the value of CBE learning and assessment, stay abreast of changes in pertinent policies, emphasize the importance of appropriate amounts of RSI to your instructional faculty/facilitators, and read Section 13 in this handbook for more detailed information.

d. Title IV Funding for Direct Assessment of Prior Learning (Prior Learning Assessment -PLA): In 2005, the Higher Education Reconciliation Act (HERA) established that credit awarded through direct assessment of life experience or previous learning, in the absence of formal educational activity, was not eligible for Title IV funding, regardless of the level of subject matter mastery demonstrated by students. To qualify for federal funding under Title IV, the PLA in your program must be accompanied by some time of formal educational activity.



Dr. Kevin Peek earned his Ph.D. in May of 2000. Shortly thereafter he founded the Trade Policy Research Group (TRPG), based in San Francisco, California. His formal academic employment includes professorial and administrative positions at the University of Nevada, Vista College in Berkeley, North Western Michigan College, the Victoria College in Texas, and South Texas College (STC). His experience with competency-based education (CBE) program development and administration is extensive and includes the position of Chair of the CBE Bachelor's Program in Organizational Leadership at STC (the first 100% CBE bachelors program in the state of Texas); project director of a grant-funded project to create a CBE bachelor's program in computer information technology, in collaboration with Austin Community College; project director of a grant-funded project to create a CBE bachelor's program in medical and health service management; project director to create a CBE professional certificate program in accounting; project director of a grant funded project to create a CBE bachelor's program in technology management; and mentoring work to support the creation of CBE bachelor's programs in colleges and universities throughout the United States that include the University of Texas--Rio Grande Valley, Nichols College in Boston, and Eastfield College in Dallas. Dr. Peek is currently directing the development of four regional seminars on CBE (with funding provided by two competitive grants) that will be available to postsecondary institutions interested in creating competency-based education programs.

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SOUTH TEXAS COLLEGE

Competency-Based Education Made Easy: A Step-By-Step Handbook for Developing and Implementing Competency-Based Education Programs in Institutions of Higher Education

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