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**THE ROLE OF INSTRUCTIONAL DESIGN IN COMPETENCY-BASED
EDUCATION IN THE UNITED STATES: A QUALITATIVE INQUIRY IN
THREE HIGHER EDUCATION INSTITUTIONS**

A Dissertation in
Workforce Education and Development

by
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ABSTRACT

In response to emerging needs for competency-based education (CBE), the U.S. Department of Education defined the direct assessment program on March 19, 2013 and provided guidelines in the Higher Education Act 34 CFR 668.10 for higher education institutions that planned to seek approval to offer CBE programs that met Direct Assessment regulations. However, CBE development still challenges faculty, staff, and administrators, and there is a need to shift the research focus from the regulatory environment for CBE to the operational process for CBE programming.

This research was designed to investigate the recent development of the CBE movement in the United States through the lens of instructional design and to identify the role of instructional design in CBE programs. Qualitative inquiry was utilized to offer a different perspective on three selected research sites; the researcher tried to preserve the uniqueness of each individual case and provide cross-case analysis to enrich both readers' and researchers' knowledge of the CBE movement in the United States. Study results from the three cases revealed that backward design is commonly used in CBE programs, while transforming an existing degree program and fulfilling regulatory requirements were determined to be more popular ways to reduce the impact of CBE programming. As anticipated, the role of instructional design in CBE programs is still evolving, and the role played by instructional designers in CBE vary due to different institutional settings and contexts. Hence, multiple sources of learning were recognized in CBE programs and strong connections between industry needs and CBE curricula were evident in CBE instructional design practices. Findings showed that future CBE programming should be

adapted so that: 1) instructional design staff or teams are included in higher-level planning and the decision-making process; 2) it prepares students for workforce needs; and 3) ensures strong student support so that students are retained in either CBE or traditional programs.

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Chapter 1

Introduction

Originally, competency-based education (CBE) emerged in the late 1960s; the purpose of CBE was to reform teacher education in elementary schools (Burke et al., 1975; Houston, 1980; Swanchek & Campbell, 1981; Tuxworth, 1989). Competency-based education is “an outcome-based approach to education where the emphasis is on what comes out of postsecondary education rather than what goes into the curriculum” (Soares, 2012, p. 2). Over time, the concept of CBE led to movements in vocational education, medical education, industrial training, and post-secondary education.

The U.S. Department of Education Fund for the Improvement of Postsecondary Education (FIPSE), which was introduced in the 1970s, serves as a driving force in today’s Competency-based Education (CBE) movement. Prior Learning Assessment (PLA) was one of the assessment-based approaches to recognize learning other than in classroom settings over the last four decades (Klein-Collins, 2013). In 2012, the Office of Wisconsin Governor Scott Walker announced a competency-based model to be offered by the University of Wisconsin system (UW). Through the new flexible degree program at UW, the state of Wisconsin aims to enable nearly 700,000 Wisconsin adults to complete their post-secondary degree in a flexible way, with a focus on three areas: business and management, healthcare, and information technology. Later in 2013, the Secretary of the U.S. Department of Education endorsed competency-based education, and Southern New Hampshire University became the first school to provide a direct

assessment of competency-based education in their associate degree program and Capella University offered the first direct assessment CBE in bachelor and graduate degree programs. CBE in the early 2010s seemed to align with the development of Prior Learning Assessment (PLA), which urged academia to rethink the source of learning, the meaning of the credit hour, and the rigor of assessment. In light of these events, there is a need to examine and revisit the current CBE movements, and extend understanding of the competency-based programming model for post-secondary education.

On the other hand, since the 1970s, prior learning assessment has been discussed and implemented in the United States, Canada, and Australia (Travers, 2012a, 2012b). The idea behind prior learning assessment is to recognize people's competencies as acquired from informal or non-formal learning (Stenlund, 2010). Traditionally, three types of learning can help learners build their competence: formal learning, non-formal learning, and informal learning (Joosten-Ten Brinke, Sluijsmans, Brand-Gruwl, & Jochems, 2008), and formal learning has been recognized by educational institutions as a primary and on occasion the only source of competence in higher education over the past decades.

In 2010, a cross-institution report from the Council for Adult and Experiential Learning (CAEL) indicated that PLA students have higher degree completion rates than non-PLA students across 48 institutions in the United States (Klein-Collins, 2010). In 2011, prior learning assessment was recognized in the U.S. Department of Education report, *College Completion Tool Kit*, as a strategy for helping the U.S. workforce achieve college-level credits and complete a degree.

Nowadays, many universities in the United States have implemented PLA as an alternative form of evaluation for non-traditional students, usually adult learners, during the admission process or use PLA as a way for working adults to achieve credit for their workplace-based learning (Travers, 2012a). Previous research has shown a positive relationship between college completion and students with prior learning, but many related issues and questions still need to be examined through empirical studies.

The Problem

The development of CBE has challenged faculty, staff, and administrators in several ways. The first challenge has been to ensure that competencies are both valid and reliable in practice. Second, competencies need to be uniform in order to provide the same meaning in various contexts. Third, the standardization of competencies may take more time than expected to align with current colleges and universities (U.S. Department of Education, 2002).

After ten years, federal financial aid for and accreditation of CBE programs has drawn a lot of attention and discussion (CAEL, 2013). Until today, these two challenges remain unsolved. For example, Lacey and Murray (2015) examined the recent regulatory environment of CBE programs and made three recommendations: 1) review and revise state laws to facilitate the growth of direct assessment programming; 2) create a guiding voice for CBE; and 3) develop a distinct regulatory scheme for federal financial aid programs.

In addition to these two high priority challenges, several others have been identified recently. Klein-Collins (2013) summarized several challenges in offering or developing CBE programs: 1) establishing federal financial aid eligibility; 2) building faculty support; 3) identifying principles of good practice; 4) managing expectations about degree completion; 5) developing a common language or narrative for communication purposes; 6) working with regional accrediting bodies; 7) gaining a better understanding of the kinds of assessments being used; and 8) identifying standard data collection needs so that off-the-shelf back office systems might be developed (p. 13). As anticipated, more challenges were identified on the operational side and with regard to seeking best practices.

In recent cross-institute research by the Competency-based Education Network (C-BEN), Navarre Cleary (2015) and her colleagues tried to clarify the role of support staff in CBE programs and found that faculty and staff played four primary functions in CBE programs across 32 institutes surveyed: 1) Curriculum (41%); 2) Assessments (26%); 3) Instructions (34%); and 4) Coaching/ advising/ mentoring (29%). However, this finding still reveals that the answers to some of the challenges encountered by current CBE programs have not yet been found.

Significance of the Study

The findings from this research may have several significant impacts on the development of competency-based education in higher education in the United States, both at the strategic and operational levels. Within the limited related research on the

recent CBE movement, there is a need to shift the focus from the regulatory environment for CBE to the operational process in CBE programming.

In the 1990s, prior learning assessment was seen as a powerful way to articulate workplace learning as a source of informal learning in Europe (Berglund & Andersson, 2012). However, there are still challenges in integrating workplace learning and college-level learning. The competency-based education movement brought a different view to traditional post-secondary education in the United States. Rather than using students' transcripts and seat time as educational outcomes, competencies became more transparent and measurable. In response to emerging needs for CBE programming, this research was designed to explore the current development of CBE programs for practical and theoretical uses.

In addition to the response to the CBE movement, Merrill (2007) urged proper study of instructional design since the field of instructional design (ID) or instructional system design (ISD) had been in decline. He also suggested that the PhD dissertation should be used to investigate both the science (research and theory) and the technology (tools, development, and evaluation) portions of instructional design. Thus, there is a need to conduct empirical research on instructional design in the real world.

The current study was specifically designed to investigate the CBE movement in the early 2010s through the lens of instructional design and provide recommendations on both strategic and operational aspects of future CBE development.

Research Questions

A multicasestudy research design and qualitative inquiry were used in this study to understand recent CBE movement development by identifying the role of instructional design in competency-based education and to optimize the rigor of the competency-based education model in U.S. higher education institutions. Three research questions guided this study:

1. How has the competency-based program been designed and developed in selected institutions?
2. What is the role of instructional design in competency-based programs in selected institutions?
3. What are the similarities and differences in instructional design practices between traditional and competency-based programs in selected institutions?

Limitations

Limitations are inevitable in any study—that was the case here, too. First, the current study focused on selected institutions that offer a competency-based program in the United States. Due to differing policies and developmental stages among CBE programs, this study's results may only reflect and answer the research questions according to a preset research boundary. Second, the study was conducted in the United States, so the results may not adequately represent the population outside of this country. Third, the different backgrounds and contexts of participants may lead to the gathering of

different types of information. Fourth, the assertions were based on findings and themes across studied cases, which may limit generalization in future research.

Assumptions

There were several assumptions behind this research. First, this study adopted the qualitative inquiry approach; often, qualitative research is subjective (Stake, 1995). In addition to the subjectivity inherent in the current study, the researcher also assumed that understanding of the CBE phenomenon was possible through a reading of the several cases studied (Stake, 2006). Second, the selected institutions in this research had offered or are offering CBE programs in the United States. Third, the current research assumed the presence of different CBE programs at different institutions. Fourth, the current study assumed that instructional design staff participated in the CBE programming process in selected institutions. Fifth, the researcher assumed that the individuals with whom conversations had occurred during the study process had knowledge of and experience with CBE programs.

Definitions of Key Terms

Case Studies

Stake (1995) defined a case study as “the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances” (p. xi).

Multicase Research or Multiple Case Study

Stake (2006) defined multicase research as “a research design for closely examining several case linked together. It is also a design for studying an issue or phenomenon at sites that have no programmatic link” (p. v).

Competency

One of the challenges in defining competency is that there is no common language associated with competencies (Rothwell & Lindholm, 1999). The definition of competency in industry and educational settings differs. In the workplace, competency is typically defined as job competency, which is “an underlying characteristic of an employee which results in effective and/or superior performance in job” (Boyatzis, 1982, p.20); Rothwell and Graber (2010) further defined the term competency as “any characteristics of an individual performer that lead to acceptable or outstanding performance” (p. 1). In an educational setting, similarly but also differently, competency is known as “a combination of skills, abilities, and knowledge needed to perform a specific task” (U.S. Department of Education, 2002, p. 1). Because this research was conducted in the educational settings, the definition of competency made by the U.S. Department of Education was adopted.

Competency-Based Education (CBE)

Competency-based education is “an outcome-based approach to education where the emphasis is on what comes out of postsecondary education rather than what goes into the curriculum” (Soares, 2012, p. 2). The National Center of Education Statistics (2002) defined outcomes as “a combination of skills, abilities and knowledge needed to perform a task in a specific context” (p. 7).

Direct Assessment Competency-Based Program

“A direct assessment program is an instructional program that, in lieu of credit hours or clock hours as a measure of student learning, utilizes direct assessment of student learning, or recognizes the direct assessment of student learning by others. The assessment must be consistent with the accreditation of the institution or program utilizing the results of the assessment” (Direct Assessment Programs, 2013).

Prior Learning Assessment (PLA)

Stenlund (2010) defined Prior Learning Assessment as “the process of validating adults’ prior learning in a variety of contexts, with emphasis on learning taking place outside educational institutions” (p. 784).

Instructional Design (ID)

Merrill, Drake, Lacy, Pratt, and the ID₂ Research Group (1996) defined instructional design as “a technology for the development of learning experiences and environments which promote the acquisition of specific knowledge and skill by students” (p. 6).

Instructional Designer

An instructional designer and/or technologist is a person who is involved in “developing instructional materials and products and assist[s] in the technology-based redesign of courses. Assist[s] faculty in learning about, becoming proficient in, and applying instructional technology” (O*NET, 2016).

Conceptual Framework

This study was based on several concepts: First, the stakeholder approach was selected to ensure that instructional concepts were used in investigating CBE programs according to their perceptions. The stakeholder approach, which was developed by Freeman (1984), emphasizes active management of the business environment, relationships, and promotion of shared interests. The idea of the stakeholder approach suggests ways to satisfy all and only those groups who have a stake in the business or organization. The stakeholder approach has several characteristics (Freeman, 1984). In addition, a stakeholder approach focuses on both internal and external environments.

Altschuld and Zheng (1995) pointed out that the stakeholder approach is not necessarily process-oriented, but focuses on internal and external stakeholders. The assumption of the stakeholder approach is that stakeholders evaluate effectiveness primarily from their own perceptions and definitions of the organization's functions and goals. Thus, the stakeholder approach could provide a research boundary for the current case study.

Second, the model and concept of competency also have been used in current studies. Competency is “a combination of skills, abilities, and knowledge needed to perform a specific task” (U.S. Department of Education, 2002, p. 1), and the hierarchy of postsecondary outcomes, as shown in Figure 1.1, guides understanding of competency-based education in current studies.

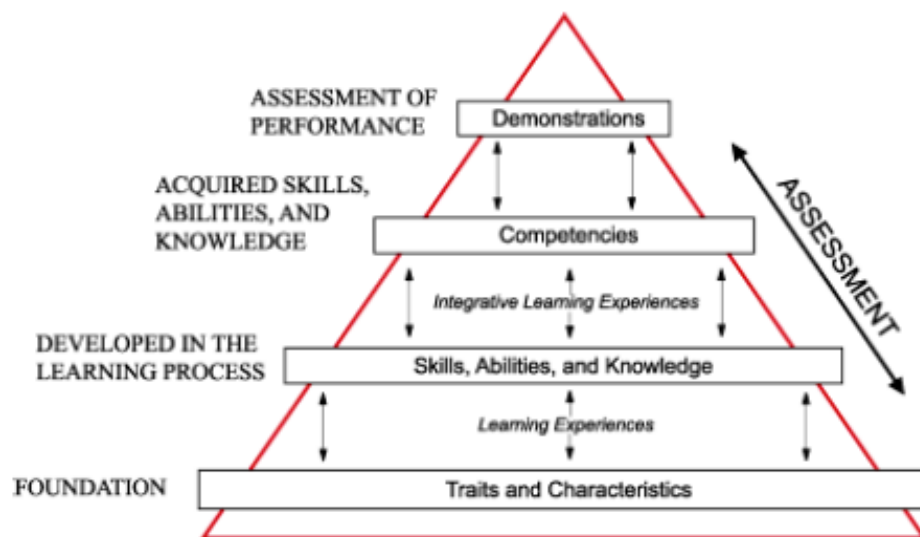


Figure 1-1. The hierarchy of postsecondary outcomes

Model used to show the relationship among traits, skills, abilities, knowledge, competencies, and demonstrations. Adapted from “*Defining and assessing learning exploring competency-based initiatives*,” by U.S. Department of Education, National

Center for Education Statistics, 2002, p.8. Copyright 2002 by the U.S. Department of Education.

Chapter 2

Review of Related Literature

The current study aimed to extend understanding of the current competency-based education movement and clarify the role of instructional design in competency-based programs in the United States. This chapter looks at the literature on: (a) the history, models, methods, and procedures of, and challenges in Prior Learning Assessment (PLA), and (b) the development and paradigms of competency-based education in the United States, and then role of instructional design in the CBE movement over the past few decades.

Prior Learning Assessment

Prior learning assessment is a process that involves activities designed to assess, validate, recognize, and transform adults' prior learning into college credits (Joosten-Ten Brinke et al., 2008; Stenlund, 2010). In different countries, different names have been attached to recognition of people's prior learning. For example, accreditation of prior (experiential) learning (APL or APEL) is used in Europe and Canada, while recognition of prior learning (RPL) is used in Australia, New Zealand, and South Africa, and prior learning assessment (PLA) is used in the United States. Even though the names differ, all terms tend to reflect the sources of prior learning, such as formal, non-formal, and informal, and to acknowledge one's competencies and skills regardless of where s/he acquired them (Stenlund, 2010).

The history of prior learning assessment in the United States can be tracked back one century. Initially, people began to recognize and value learning from prior experience after World War II; prior learning assessment brought veterans more opportunities to access higher education (Keeton, 2002). The College Entrance Examinations Board (CEEB) has been used to evaluate students' university-level learning via examination since the 1930s. The College Level Examination Program (CLEP) was later introduced in 1967 to evaluate college-level learning (Travers, 2012; Wolfson, 1996). At the same time, the American Council of Education (ACE) began to evaluate people's experiences in the military for college-level learning in 1945. In 1974, the Cooperative Assessment of Experiential Learning (CAEL) introduced the process of prior learning assessment; many institutions of higher education acknowledged the legitimacy of prior learning assessment with different approaches (Stevens, Gerber, & Hendra, 2010; Zucker, Johnson, & Flint, 1999). In 2010, a cross-institution report authored by CAEL indicated that PLA students had higher degree completion rates than non-PLA students across 48 institutions in the United States. From 2001 to 2008, more than 15,000 students had earned credit through prior learning assessment across 48 institutions in the United States; higher rates of degree completion were found among students who had earned credits through their prior learning experiences (Klein-Collins, 2010).

CAEL conducted a 48-institution study of PLA and adult student outcomes with support from the Lumina Foundation for Education. The study sought to answer three research questions: (a) do adults who earn PLA credit have better graduation rates, compared with those who do not earn PLA credit; (b) do they have greater persistence; and (c) do they earn their degrees in shorter periods of time (Klein-Collins, 2010, p. 9).

To gain access to and participation from postsecondary institutions in North America, CAEL sent out an open invitation and received 66 applications from colleges and universities. In order to select representative institutions, CAEL followed the PLA quality guideline developed by Fiddler, Marienau, and Whitaker (2006) and selected those who had enrolled a minimum of 25 PLA students in 2001–2002. Hence, diverse characteristics such as size, location, control, and level were considered to enhance the balance design in the study. Forty-eight institutions, 46 in the United States and 2 in Canada, were chosen, and the majority had more than 5,000 students—85% were four-year institutions, 54% were private schools, and 46% were located in small or mid-sized cities.

All 48 institutions were asked to participate in a survey designed to gather information on: (a) student record data, such as matriculation data, degree goal and credits needed for that degree, number of transfer credits from other institutions, number of PLA credits accepted as transfer credits, number of PLA credits earned through 2008, number of PLA credits earned through 2008 by PLA method, number of non-PLA credits earned through 2008, total and by school year, degrees earned, date degree earned, cumulative GPA, student demographics: gender, race/ethnicity, age at matriculation, financial aid status, and military status, and (b) institutional data (size of institution, control (public, private, non-profit), level (two-year, four-year), geographic region, degree of urbanization, student demographics in 2002, number of credits typically required for an associate's degree, number of credits typically required for a bachelor's degree, reasons for offering PLA, ways in which PLA can be used (e.g., to waive prerequisite requirements, meet general education requirements, meet elective requirements, etc.), level of courses to which PLA credit may be applied, fees for PLA

assessments and posting credits to transcript, how the institution informs its students about PLA, methods of advising students regarding PLA, whether/how the institution regularly analyzes the use and impact of PLA, availability of adult-focused programs and services, whether the institution has a separate program or department for adult students, and how the institution defines student success. In the data analysis, CAEL combined the collected data sets for all 48 institutions and merged them with data from the National Center for Education Statistics and Integrated Postsecondary Education Data System (IPEDS) to analyze PLA participants, academic outcomes, and institutional impact. However, CAEL's study did not evaluate the quality of the PLA program and other potential benefits of PLA, but only reflected descriptive information on PLA program development over the past few years.

With the limitation of making assertions about the quality and benefits of the PLA program, the CAEL report still offers several important findings. First, students who earned credits through PLA gained at least two and one-half months on average toward their bachelor's degree. Second, students who earned credits through PLA had higher college completion rates than traditional students. Third, students who earned credits through PLA had higher grade point averages (GPA) than other students. Fourth, students who earned credits through PLA tended to accumulate more credits and stayed in school longer than those who did not earn credits by assessing their prior experiential learning (Colvin, 2012).

Prior Learning Assessment Models

There are several different ways to recognize prior experiential learning. Butterworth (1992) claimed that there were two practical models of PLA: the competency-based credit exchange model and the developmental model. In the competency-based credit exchange model, students earn credits by providing evidence that they possess knowledge and skills that match course requirements. The competency-based credit exchange model, or course matching method, is most common and bridges existing courses and students' prior experiential learning (Lambe, 2012). However, the credit-exchange model may limit students' opportunities or under-estimate their previous achievement (Butterworth, 1992; Lambe, 2012). The developmental model, on the other hand, is a non-course matching method that assesses students' experience without existing syllabus or curricula. With students' reflections on their previous experience and associated learning outcomes, the developmental model facilitates students' development both personally and professionally (Butterworth, 2012).

Fiddler, Marienau, and Whitaker (2006) claimed that assessing learning depends on whether the learning is planned or sponsored. Sponsored learning happens in credit-bearing courses, non-credit-bearing classes, and workshops. Assessment of sponsored learning is similar to the credit-exchange model, and sometimes the credit-bearing courses may be transferred without assessment. Non-sponsored learning, which is seen as prior experiential learning, is unplanned and informal. Both sponsored and non-sponsored learning may be assessed through six steps: articulation, planning, evaluation, documentation, measurement, and transcription.

To sum up, there are two models of PLA: the credit exchange model, which is also known as course matching and sponsored learning, and the development model, which is known as non-course matching and non-sponsored learning. As Fiddler, Marienau, and Whitaker (2006) claimed, the process of assessing both sponsored and non-sponsored learning is the same, but there are differences in practice.

Procedure for Prior Learning Assessment

Since the 1970s, prior learning assessment (PLA) has been discussed and implemented in the United States, Canada, and Australia (Travers, 2012a, 2012b). The idea behind prior learning assessment is to recognize people's competencies as acquired from informal or non-formal learning (Stenlund, 2010). Traditionally, three types of learning help learners build up their competence: formal learning, non-formal learning, and informal learning (Joosten-Ten Brinke et al., 2008). Formal learning has been recognized by educational institutions as a primary and only source of competence in higher education in the past decades.

Joosten-Ten Brinke et al. (2008) defined formal learning as a structured or planned learning that results in earning competency-based certificate or credits, such as school courses. Non-formal learning, on the other hand, is also structured learning but it is not associated with a certificate or credits. Informal learning, or non-sponsored learning (Blinkhorn, 1999; Fiddler, Marienau, & Whitaker, 2006), is learning without structure and not associated with a certificate, such as volunteer experience, life experience, and self-learning (Joosten-Ten Brinke et al., 2008).

Previous research studies have suggested procedures and guidelines for assessing different types of learning, especially prior learning (Colvin, 2012; Evans, 2003; Fiddler, Marienau, & Whitaker, 2006; Joosten-Ten Brinke et al., 2008; Nyatanga, 1993). Fiddler, Marienau, and Whitaker (2006) suggested six steps for accessing prior learning experience, which have been widely recommended by CAEL: (a) identification, (b) articulation, (c) documentation, (d) measurement, (e) evaluation, and (f) transcription.

These six steps are designed from PLA assessors' viewpoint. In the first step, identification, students' experience is reviewed to identify learning that is potentially creditable or appropriate for credentialing. Then, in the articulation step, students' learning outcomes from experiences are linked to proposed credit related to academic, personal, and professional goals. After that, students are asked to prepare evidence to support claims for credit at the documentation stage—the assessors will determine the degree and level of competence students achieved in the measurement step. Later, students' learning will be evaluated to determine whether it is credit-equivalent in the evaluation step. Finally, at the transcription stage, assessors prepare a useful record of results for students and educational institutions.

In comparing this process to that suggested by Fiddler, Marienau, and Whitaker (2006), Colvin (2012) described the PLA procedure from students' perspectives. First, students need to set up their educational goal and have their goal statement ready. Second, they need to do coursework planning and apply for prior learning assessment. Third, students should document transcripts and training or start to develop a portfolio. Fourth, an evaluation is given to students. Most steps matched what was proposed by

Fiddler, Marienau, and Whitaker (2006), but Colvin (2012) gave students who were seeking to earn credit through PLA a measureable roadmap.

Most prior learning assessment procedures have seven characteristics (Evans, 2003; Joosten-Ten Brinke et al., 2008 Nyatanga, 1993): (a) different types of learning are recognized; (b) the procedures have a clear structure and time schedule; (c) the outcome of each procedure can differ; (d) the procedures are beneficial for the learner, educational institution, and the community; (e) a combination of methods is used to provide evidences of prior learning; (f) the procedures require a high level of responsibility from learners and a sufficient level of support; and (g) the procedures are usually time-consuming. Since the procedures may differ from case to case, there is a need to highlight elements of good PLA practice by providing guidelines or principles (Harris, 2000; Koenig & Wolfson, 1994; Stenlund, 2010).

CAEL and Fiddler, Marienau, and Whitaker (2006) recommended ten standards for assessing learning by adult learners:

1. Credit or its equivalent should be awarded only for learning and not for experience.
2. Assessment should be based on standards and criteria for the level of acceptable learning that are both agreed upon and made public.
3. Assessment should be treated as an integral part of learning, not separate from it, and should be based on an understanding of learning processes.
4. The determination of credit awards and competence levels must be made by appropriate subject matter and academic or credentialing experts.

5. Credit or other credentialing should be appropriate to the context in which it is awarded and accepted.
6. If awards are for credit, transcript entries should clearly describe what learning is being recognized and should be monitored to avoid giving credit twice for the same learning.
7. Policies, procedures, and criteria applied to assessment, including provision for appeal, should be fully disclosed and prominently available to all parties involved in the assessment process.
8. Fees charged for assessment should be based on the services performed in the process and not determined by the amount of credit awarded.
9. All personnel involved in the assessment of learning should pursue and receive adequate training and continuing professional development for the functions they perform.
10. Assessment programs should be regularly monitored, reviewed, evaluated, and revised as needed to reflect changes in the needs being served, the purposes being met, and the state of the assessment arts (Fiddler, Marienau, & Whitaker, 2006, p. xi).

In addition to the ten standards suggested by Fiddler, Marienau, and Whitaker (2006), Stenlund (2010) identified several principles for students or individuals who are engaging in PLA procedures and practices. First, the policy, procedure and practice should be clearly defined. Second, PLA should measure and evaluate what has been learned without regard to the source of the learning. Third, the academic institution to which students applied should be responsible for assessing prior learning. Fourth, the

assessment process should be valid and reliable. Fifth, PLA should be treated at the same level of confidence as other educational assessments. Sixth, assessors and staff involved in the PLA process should receive proper training and support students who apply for PLA. Seventh, continuous quality improvement is the key to success.

In summary, there are common procedures for prior learning assessment from students' and administrators' perspectives. However, various contexts and diverse student populations render the procedures different and complex. Even though PLA usually saves students' time in finishing their degree (Colvin, 2012; Klein-Collins, 2010), the procedure of assessing prior learning is still time-consuming (Stenlund, 2010). So CAEL, Fiddler, Marienau, and Whitaker (2006), and Stenlund (2010) suggested the main principles that students, educational institutions, and assessors should follow to maintain quality and reliability in the PLA process.

Methods in Prior Learning Assessment

Similar to other assessments in educational settings, some common methods are used in PLA procedures (Colvin, 2012). To access sponsored learning, credit by examination, transfer credit evaluation, training and certificate evaluation, and placement exams are used to validate students' learning outcomes. On the other hand, a prior learning portfolio (PLP), simulations, interviews, work sample evaluation, demonstrations, prepared speeches, and interviews are used to assess students' non-sponsored learning. Unlike the sponsored learning assessment, non-sponsored learning targets prior experiential learning which is non-formal and informal (Fiddler, Marienau,

& Whitaker, 2006; Joosten-Ten Brinke et al., 2008). Most previous research on PLA emphasized accessing non-sponsored learning (Colvin, 2012; Joosten-Ten Brinke et al., 2008; Lambe, 2011; Stenlund, 2010), and could allow for assessment of a student's experience without predefined course expectations or an internally imposed curriculum (Lambe, 2012).

Travers (2012) found that the philosophy behind accessing non-sponsored learning or prior experiential learning is to provide recognition of knowledge that cannot be acquired through traditional higher education. She believed that the methods of accessing prior learning embraced several philosophies: (1) an adult could acquire college-level learning outside of the formal learning settings; (2) an individual could have college-level learning that was not even currently taught in academia; and (3) an individual could know something that formal testing could not access. In these cases, then, a prior learning portfolio has been widely used as a major PLA method (Cameron, 2012; Steven et al., 2010; Zucker et al., 1999). In order to engage students with prior experiential learning, a three-step essay could be a starting point in PLA (Lambe, 2011): Step 1—Describing experience and accomplishment; Step 2—Bridging the experiential with the academic; and Step 3—Organizing the essay to articulate skills, competencies, and knowledge in order to support experiences and accomplishments. More than bridging experience and learning, PLP includes more components that provide more support to student learning, such as degree plans, goal statements, resumes, learning autobiographies, narrative or competency statements, and documentation supporting a student's knowledge claims (Colvin, 2012).

There are several different formats for or types of portfolios. For example, Abrami and Barrett (2005) claimed that there were three basic types of portfolios: process portfolio, showcase portfolio, and assessment portfolio. Smith and Tillema (2003) stated that:

Although all portfolios are sources of evidence, the precise type of portfolio distinguishes between what counts as evidence... Therefore, not properly distinguishing between portfolio types can lead to mismatches of practices and confusing assessment tasks, which can distort the associated and subsequent processes of selection or development. (p. 628)

Smith and Tillema defined four types of portfolios based on the degree of voluntary/mandated use and selective/developmental purpose: dossier portfolio, reflective portfolio, training portfolio, and personal development portfolio. Cameron (2012) proposed a framework based on Smith and Tillema's (2003) model for individuals interested in earning credits through PLA. They claimed that workplace recognition, self-recognition, professional accreditation, and training assessment can be determined through portfolios developed according to PLA procedures. Colvin (2012) suggested that students discover sources of learning, write prior learning narratives or competency statements, organize supporting documentation, submit their portfolios, and wait for formal results. Usually, there are five possible results from portfolio assessment: award full credits, award partial credits, award more credits than requested, deny credits, or request an addendum or interview. The criteria for award credits gained via assessment of student portfolios are: education-relevant, transferable, appropriate level, valid, authentic, specific, identified and categorized and recent, and sufficient (Brinke et al., 2008).

Overall, a portfolio is evaluated to identify whether the evidence can be accepted as credit-worthy, enable the student to receive advanced standing, or determine readiness for admission to a program or specific course (Fjortoft & Zgarrick, 2001).

Future in PLA

Previous research on PLA is mainly descriptive (Joosten-Ten Brinke et al., 2008). Stenlund (2010) examined the PLA-related research from 1990 to 2007 and categorized it as follows: (1) theoretical studies, including PLA procedures, theoretical models of PLA, and critique and quality in PLA; and (2) empirical studies, such as evaluation and experience in PLA and comparisons of PLA students and students with formal qualifications. However, the empirical studies were relatively fewer in number than theoretical studies. Travers (2012a; 2012b) also found that the research on PLA is emerging and focused on PLA's quality aspects.

Stenlund (2010) concluded that there are several emphases for future research. First, the reliability, validity, and trustworthiness of PLA need more investigation in higher education settings. Second, the experiences of students or PLA claimants with different PLA models are crucial. Third, assessor's and students' perceptions of the value and relevance of the type of competence measured may be influenced during the process of PLA. Fourth, negative consequences of PLA have rarely been discussed. Fifth, political and economic factors that may affect PLA need further identification. Joosten-Ten Brinke et al. (2008) also pointed out the need to examine perceptions of learners, assessors, and administrators in order to design high-quality PLA procedures. Moreover,

how learners can be supported in PLA procedures needs to be examined as well (Joosten-Ten Brinke et al., 2008).

PLA Challenges and Limitations

Finding challenges to and criticism of PLA in the related literature is inevitable. The overall impression is that the PLA process is time-consuming (Joosten-Ten Brinke et al., 2008) and not cost-effective. Stenlund (2010) found that the quality of the PLA process is another common critique. There has been limited research on the quality assurance aspect of PLA and a lack of empirical studies on the validity and quality of PLA, which have limited future PLA development. Thus, Colvin (2012) listed the limitations of and current challenges for PLA in the United States in response to future research needs. First, the PLA is often offered on a limited basis across different institutions. Some schools may not assess students' prior learning but recognize PLA credits from other schools, so there is no standard process or guideline for fulfilling the various needs of different colleges or universities. Also, there is a limitation on transfer credits across different schools, and students may encounter challenges when they seek to transfer PLA credits. Second, students may only obtain a certain amount of credits through the PLA process, and it is almost impossible to earn an entire degree through PLA. Third, financial aids limit the growth of PLA. Both a company's reimbursement policy and federal financial aid offer challenges to those students who seek PLA credits in today's society. Fourth, most PLA programs are limited to undergraduate degrees;

there is a need for graduate-level PLA practices and guidelines for the future. Fifth, sometimes coursework rather than earning PLA credits offers better options for students.

Competency-based Education and Training

Competency-based education (CBE) emerged in the late 1960s. Its original purpose was to reform teacher education in elementary schools (Burke et al., 1975; Houston, 1980; Swanchek & Campbell, 1981; Tuxworth, 1989). Recently, Frank, Mungroo, Ahmad, Wang, De Rossi, and Horsley (2010) qualitatively examined 173 publications in the competency-based education-related literatures and found that 95% of the definitions found there have a common theme—they characterize CBE as “an educational approach organized around competencies and fundamentally oriented to graduate outcomes” (p. 633). Over time, the concept of CBE has had some influence on vocational education, medical education, industrial training, and post-secondary education. Westera (2001) found that the reason why competencies draw attention in education is that both educators and employers can easily define students’ capabilities, qualifications, and expertise; the term, competence, offers a new paradigm in curriculum design and training and development.

Definitions of Competency

One of the challenges in defining competency is that there is no common language associated with competencies (Rothwell & Lindholm, 1999). The definition of

competency in industry and educational settings is different. In the workplace, the competency was often defined as job competency, which is “an underlying characteristic of an employee which results in effective and/or superior performance in job” (Boyatzis, 1982, p.20) and Rothwell and Graber (2010) defined the term competency as “any characteristics of an individual performer that lead to acceptable or outstanding performance” (p. 1).

The U.S. Department of Education (2001) defined competency as “a combination of skills, abilities, and knowledge needed to perform a specific task” (p. 1). However, it is not easy to differentiate competence and performance in educational settings, especially from a cognitive psychology perspective (Cohen, 1983). Chomsky (1965) found that competence is the necessary cognitive structure for performing certain tasks, while performance is the actual way to engage in certain tasks under external conditions. In other words, competence can be seen as a general ability and underlying cognitive functioning system in certain domains (Anderson, 1992), and as “mastery of relevant knowledge and skills alone is no guarantee of successful performances in complex environments” (Westera, 2001, p. 79). Moreover, scholars like Gagne (1977) and Stephenson and Weil (1992) found that competence also covers self-confidence, motivation, and persistence in performing tasks effectively. Competent people are those who possess knowledge, feel confident, and are equipped with the skills to perform tasks in certain domains (Westera, 2001). A similar claim was made by Rothwell and Graber (2010), who explained that competencies include skills, motivation, personality traits, awareness of knowledge and any other elements that can help the person to perform tasks or produce results.

The Competency-based Education Movement in the United States

The origin of the CBE movement was in the 1920s (Tuxworth, 1989), and started with an educational reform—to model specific behavioral objectives in order to fulfill industrial needs. The movement became more universal and was widely accepted in the 1960s, when it was applied to teacher education, elementary schools, minimum standards for high school graduation, and vocational education. Swancheck and Campbell (1981) found that the original CBE in teacher education was to certify competent teachers and allow them to enter the teaching profession, exerting a strong impact on higher education institutions in the 1970s. For example, McClelland (1973) responded to criticisms of the testing movement of the 1970s, and proposed a competency-based approach to traditional intelligence testing to bridge the gap between aptitude and later occupational success. The alternative approach proposed by McClelland aimed to measure and reflect changes in what the students had learned, to make intelligence tests more public and explicit, to access students' competencies as these related to clusters of life outcomes, and to involve more operant behaviors in the tests. He also pointed out several competencies not covered in traditional cognitive testing, such as communication skills, patience, moderate goal settings, and ego development.

Later, the CBE paradigm urged change and adaptation in administration, resources, and teaching methods in higher education. For example, Burke et al. (1975) proposed a series of criteria for describing and assessing competency-based programs and defined competency specifications, instructions, assessment, governance and management, and total programs. Unlike the traditional education paradigm, which seeks

evidence of retention rates, graduation rates, and placement rates, Voorhees (2002) found that CBE outcomes are not captured by transcripts or seat time measurement, but by learners' ability to demonstrate competencies in certain domains, regardless of where and how they were mastered.

CBE features several benefits to all stakeholders, such as students, faculty, administrations, and experts, during the learning process. First, CBE is more transparent with measurable assessment. Second, CBE permits students to revisit and master competencies, which have not been built, without retaking traditional courses. Third, CBE provides a clearer roadmap for learners to achieve their goals. Fourth, faculty and administrators can deliver knowledge and skills in a flexible way in CBE (Voorhees, 2002). However, CBE still offered several major challenges for faculty, staff, and administrators in educational settings. First, it is a challenge to ensure that competencies are both valid and reliable in practice. Second, competencies need to be uniform in order to provide the same meaning in various contexts. Third, the standardization of competencies may take more time than expected to align with those in current colleges and universities (U.S. Department of Education, 2001).

The U.S. Department of Education tends to provide hands-on resources for colleges and universities that seek to develop, implement, or refine their competency-based initiative a research project was conducted in 1998 to investigate the development of competency-based education in the United States. In the report, *Defining and assessing learning: Exploring competency-based initiatives*, which was funded by the U.S. Department of Education in 2001, eight organizations, including King's College, Northwest Missouri State University, Sinclair Community College, Hagerstown

Community College, Colorado Community College, Western Governors University, Proficiency-based Admission Standard System in Oregon, and Ford Motor Company, examined how competencies were used in different contexts. The study was conducted from September 1998 to October 2000; eight case study sites were selected based on the following considerations: (a) the organization introduced students/employees to the competencies to be developed, (b) the organization provided multiple opportunities for the competencies to be learned, and (c) the organization assessed students/employees through their learning experiences. In these eight cases, one group of organizations had more than 10 years of experience with competency-based initiatives, and the other set of organizations (Western Governors University, Colorado Incumbent Worker Project, Hagerstown Community College, and the Proficiency-based Admission Standard System in Oregon) were in the early stages of competency-based development and planning.

The interview was the primary data collection method in the study—in most cases, the researchers visited each site and interviewed 5 to 18 individuals, including faculty and administrators. Each interview lasted about 45 to 60 minutes. Nine interview questions were asked: (a) explain why a competency-based model had been selected, (b) describe how the competencies were being used, (c) outline how the competencies were developed, (d) identify who provided leadership in the development of these competencies; (e) address how the reliability and validity of competencies were being ensured; (f) identify how competencies were being assessed or measured; (g) highlight challenges and successes in development, implementation, and assessment of competencies, (h) determine whether the competencies were transportable; and (i) outline important advice for other college and university faculty, researchers, and administrators

who may be interested in implementing a competency-based model. In each case, the themes across interviewees' responses were analyzed and the researchers identified common themes among all eight case studies in order to highlight the most effective practices in competency-based initiatives among sites.

The results of the eight case studies indicated that the success of CBE may require several elements. First, open-minded and risk-taking senior administrators are needed. Second, support and participation from all stakeholders are important. Third, well-defined and acceptable competencies are essential. Fourth, competencies need to be assessed at a sufficient level. Fifth, multiple assessments of competencies are recommended. Sixth, participation by faculty and staff make the assessment stronger. Seventh, it is important to examine the options before deciding between commercially developed assessments and/or locally developed approaches. Eighth, CBE should be embedded within institutional planning processes. Ninth, the assessments of competency and the goals of learning experience should be linked directly. Tenth, the results for the assessment of competencies should be used to improve student learning. Eleventh, students' mastery of competencies could be used to supplement the traditional transcript.

To sum up, the eleven recommendations were made based on the case studies, which were conducted between 1998 and 2000, and most of the assertions were similar to previous findings in the CBE-related literature. The validation, rigor, and reliability of the competency assessment were the critical factors in ensuring successful CBE in both post-secondary and industry in the early 2000s.

With the emerging needs for competency-based education or training in both education and industry, Rothwell and Graber (2010) offered 10 predictions that showed the progress made after the 2001 publication of a U.S. Department of Education report:

- (1) The competency-based approach will become more acceptable because it provides more individualized learning;
- (2) The competency-based approach will focus more on differences between exemplary performer and fully successful performer;
- (3) The competency-based approach will be facilitated by technology more readily;
- (4) The competency-based approach will require learners to take more responsibility;
- (5) The competency-based approach will require more comprehensive thinking about how to build competencies;
- (6) The competency-based approach will be supplemented by growing attention to ethics and values;
- (7) The competency-based approach will require more creative thinking about all components of HR management and learning and performance;
- (8) The competency-based approach will align with the organization's balance scorecard;
- (9) The competency-based approach will necessitate new ways of thinking about evaluation; and
- (10) The competency-based approach will focus as much on functional/technical competencies as on general competencies (p. 83).

Even though the education and industry settings are quite different, needs for a competency-based approach in education and training are emerging. Seventeen years ago, Rothwell and Lindholm (1999) already anticipated the emerging of competency-based programming in education in the U.S., they forecasted that “Educators and government policymakers use competency-models as one means, along with workforce labor projections by which to clarify and link workplace requirements to educational programs and curricula” (p. 104).

In 2012, the Office of Wisconsin Governor Scott Walker announced a competency-based model that will be offered by the University of Wisconsin system (UW). In the new flexible degree at UW, the state of Wisconsin aims to provide nearly 700,000 Wisconsin adults with a flexible way to complete their post-secondary degree, with a focus on three areas: business and management, healthcare, and information technology. On March 19, 2013, the U.S. Department of Education Secretary endorsed competency-based education; Southern New Hampshire University became the first school to provide direct assessment in competency-based education for its associate degree. The new CBE movement in the early 2010s seems to align with the development of PLA, which urges academia to rethink the source of learning, the meaning of credit hour, and the rigor of assessment. As a result, there is a need to examine and revisit the current CBE movements.

Direct Assessment Competency-based Education

The U.S. Department of Education defined the direct assessment program on March 19, 2013 and provided guidelines for higher education institutions that planned to seek approval to offer CBE programs that met Direct Assessment regulations. In Higher Education Act 34 CFR 668.10, Direct Assessment CBE program is defined as,

“A direct assessment program is an instructional program that, in lieu of credit hours or clock hours as a measure of student learning, utilizes direct assessment of student learning, or recognizes the direct assessment of student learning by others. The assessment must be consistent with the accreditation of the institution or program utilizing the results of the assessment” (Direct Assessment Programs, 2013).

In response to the definition, there are at least two ways to offer CBE programs and ensure that enrolled students are still eligible for Title IV federal financial aid. First, by converting competencies to credit hours, Northern Arizona University and Western Governor University are qualified under the existing rules set by the U.S. Department of Education. Second, schools like Southern New Hampshire University and Capella University adopted the new regulation to offer Direct Assessment CBE programs. Thus, there are several different ways to start competency-based degree programs and each of them has different designs (Klein-Collins, 2013).

Klein-Collins (2013) also claimed that fundamental differences in concepts and assumptions define CBE design in today's postsecondary education system, but several unified concepts for CBE programs exist: a) a competent person is someone who does not

just know but can also do; b) defining competencies required for graduation helps ensure the quality of graduates; c) competency-based assessment validates learning; d) programs should focus on learning rather than on time spent in learning activities; and e) programs should meet students where they are.

While the direct assessment approach to CBE programs was highlighted over the past few years, several institutions still include the PLA process, which recognizes students' learning from work and life experiences within their CBE program. For example, portfolio assessment is one of the recommended methods for students enrolled in the DePaul University School for New Learning, where it is used to ensure that their prior or experiential learning is recognized (Klein-Collins, 2013). This finding aligned with PLA development described earlier.

Role of Instructional Design in Competency-based Education

The highly cited definition of instructional was offered by Merrill, Drake, Lacy, Pratt, and the ID₂ Research Group (1996). They defined instructional design as “a technology for the development of learning experiences and environments which promotes the acquisition of specific knowledge and skill by students” (p. 6), emphasizing its scientific aspects. Years later, Merrill (2007) urged proper study of instructional design since the field of instructional design (ID) or instructional system design (ISD) was declining. He also suggested that the PhD dissertation should be used to investigate both the science (research and theory) and the technology (tools, development, and evaluation) portions of instructional design. Moreover, instructional design means more

than creating instructions (Rothwell, Benscoter, King, & King, 2016), and instructional design did play a unique role over decades in various organizations. Thus, there is a need to conduct empirical research on instructional design in the real world.

The role of instructional design in competency-based education is still evolving, but the discussion has occurred over decades. In early 2000, van Merriënboer (2001) began the conversations on how instructional design should be preparing for competency-based learning. He proposed nine directions for the potential paradigm of instructional design, such as: 1) unite the world of knowledge and the world of work in learning; 2) build learner support that works; 3) promote the development of higher order skills; 4) develop web-based instruction that makes a difference; 5) defeat the transfer paradox; 6) make students work together; 7) provide meaningful feedback; 8) use tests for complex performances; and 9) assure the quality of competency-based learning (p. 14).

With emerging educational technology and online education in the early 2000s, the need to clarify the roles of online instructors arose. Later in 2003, Easton (2003) conducted a case study with 18 faculty who were engaged in online distance learning, and found that both instructional designers and facilitators are two crucial roles for online distance learning, such as understanding the course management techniques, handling virtual communication issues, redefining class time, and reassessing personal pedagogy. In addition to the discussion on the role of instructors in online learning environments, Hoogveld, Pass, and Jochems (2005) found a similar trend in the need to ensure that higher education teachers have instructional design skills in CBE. A 25-teacher experiment revealed that the training of product-oriented worked examples worked better in preparing higher education teachers to teach CBE courses.

Another important perspective was raised in medical education (CBME), where competency-based medical education has been discussed for over 50 years. Frank et al. (2010) examined the history of CBME and found four main principles of CBE in medical education: 1) focusing on outcomes; 2) emphasizing abilities; 3) de-emphasizing time-based training; and 4) promoting greater learner-centeredness. Frank and his colleagues also pointed out the importance of backward design and the alignment between competencies and assessment in CBE. In addition to it, Van Der Vleuten and Schuwirth (2005) proposed that instructional design should be seen as a key element in education programming due to the increased adoption of assessment in medical education and the need to assess professional competencies in medical education.

Neither CBE nor CBME are new to current higher education, but discussion on the role of instructional design still needs more attention. Recent research includes one cross-institution study of the role of faculty and staff in CBE programs conducted in 2015. The Competency-Based Education Network (C-BEN), a working group of regionally accredited two- and four-year public and private colleges and universities which focus on high-quality CBE programs, reached out to 30 institutions in a survey-based study to identify the roles and responsibilities of faculty and staff in designing and developing CBE programs. Navarre Cleary (2015) and her colleagues found faculty and staff played four primary functions in CBE programs across the 32 institutions surveyed: 1) Curriculum (41%); 2) Assessments (26%); 3) Instructions (34%); and 4) Coaching/ advising/ mentoring (29%). The survey results revealed several important points of information relating to the major challenges for current CBE programs, including attracting and retaining students. This finding may stem from participant positions

(mainly faculty or directors), and less so from instructional support staff, such as instructional designers.

In addition to the previous findings, the role of instructional designers may vary across different organizational settings and needs. Association for Talent Development, International Association for Continuing Education and Training, and Rothwell and Associates (2015) conducted a national-wide research to focus on instructional design competencies by analyzing qualitative data from five focus groups and quantitative data from 1381-participant survey. They found that the role of instructional designers varies across different types of organization, such as designer, facilitator, trainer, writer, innovator, evaluator, multimedia developer, editor, and project manager (p.6).

Chapter Summary

This chapter provided a review of the related literature and previous research on prior learning assessment, competency-based education, and the role of instructional design in the recent CBE movement, and defined a research boundary for current studies. Prior learning assessment evaluates students' non-sponsored, non-formal, and informal learning acquired outside of formal educational settings (Fidder, Mariebau, & Whitaker, 2006). The credit-exchange model and developmental model are used to access various sources and evidence of learning (Butterworth, 1992), which aligns with the current competency-based education movement.

Competency-based education, on the other hand, emerged in the early 1920s, and brought several waves of movements to the U.S. education system. Recently, the U.S. Department of Education and several universities have begun to align CBE and PLA to create a new path for post-secondary education. However, the challenges of CBE remain the same as those identified in previous studies in the early 2000s. Hence, the role of instructional design in CBE program is evolving (Easton, 2003; Frank et al., 2010; van Merriënboer, 2001; Van Der Vleuten & Schuwirth, 2005). This information and the literature review revealed research needs and urged current studies to explore current CBE program development, investigate the role of instructional design in CBE programs, and design a model for future competency-based education in the United States.

Chapter 3

Methodology

The research procedure for this study is illustrated as a flowchart in Figure 3.1. It included the following steps and timeframes.

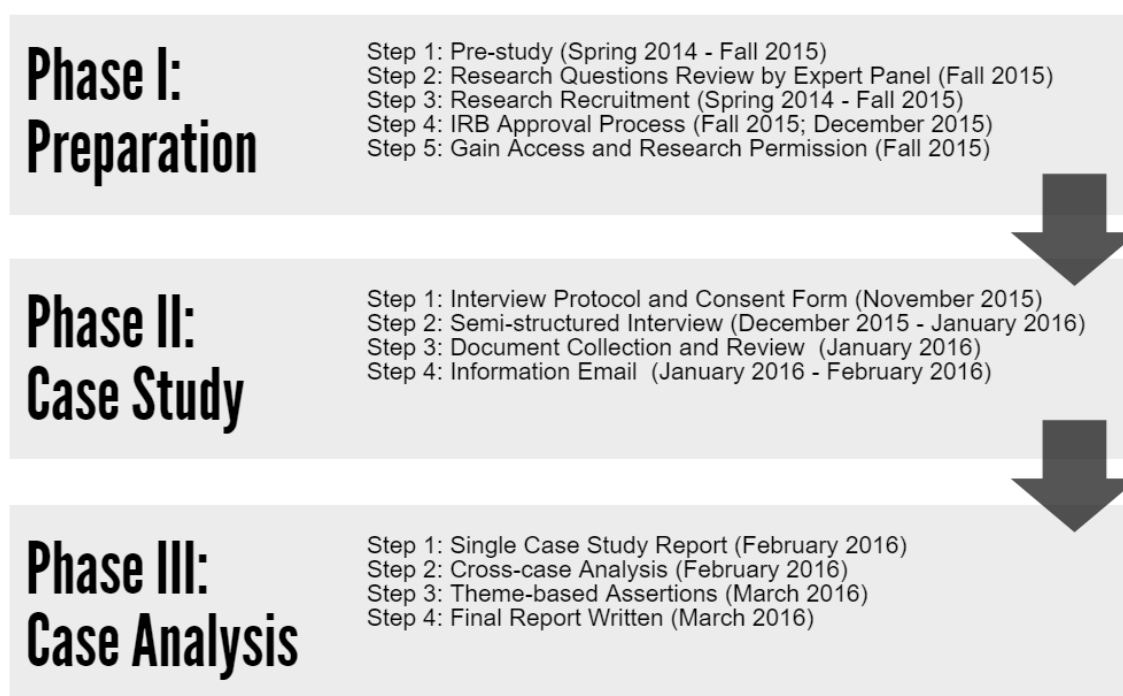


Figure 3-1. Research plan and tentative timeframe

The Problem

This study was designed to gain an understanding of recent CBE movement development by identifying the role of instructional design in competency-based education and optimizing the rigor of the competency-based education model in U.S. higher education institutions. The three research objectives were to: 1) illustrate how

competency-based education may be accomplished in selected institutions; 2) identify the role of instructional design in competency-based education in selected institutions; and 3) differentiate the difference in instructional design between traditional higher education and competency-based education in selected institutions.

The history, challenges, and criticism encountered by CBE were illustrated in the literature review; the emerging needs for developing competency-based programs, which may or may not include the Prior Learning Assessment (PLA) process in post-secondary settings, are inevitable in current socioeconomic contexts in the United States. By learning from the recent cross-institution research conducted by the Competency-Based Education Network (C-BEN) in 2015, current research aimed to bridge the gap between current practice and theory in CBE and extended the identifying the role of instructional design in this recent educational movement. As planned, this study was designed to answer the following research questions:

1. How was the competency-based program designed and developed in the selected institutions?
2. What is the role of instructional design in competency-based programs in selected institutions?
3. What are the similarities and differences in instructional design practices between traditional and competency-based programs in selected institutions?

Research Design

Case study research and qualitative research design have been adopted to answer current research questions and evaluate the target program. Stake (1995) defined a case study as “the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances” (p. xi); qualitative research, unlike the quantitative approach, heavily relies on human perception and understanding during the research process (Stake, 2010). Creswell (2009) defined qualitative design as “a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem” (p. 4).

The Researcher employed a qualitative research design in the current study in order to identify the particularity and uniqueness of selected cases that have adopted both CBE and/or PLA in their program or degree, and understand the role of instructional design within the boundary as Stake (1995) suggested. Without the exploration and understanding of the current development of CBE practices by learning from the cases, current research may not be rigorous or of sufficient quality in making assertions based on the findings.

Unlike the single-case study, which is used to understand the particular issues of situated cases, multicase study (Stake, 2006) or multiple-case study (Yin, 2013) is chosen to understand a phenomenon by identifying its commonalities and its differences. Sometimes, we call the phenomenon we are studying the “Quintain” (Stake, 2006). More specifically, the Quintain in this study is the CBE movement in the United States, and the cases are the U.S. CBE programs in higher education institutes.

Case selection strategy

The “case study is not sampling research” (Stake, 1995, p. 4). Stake (1995, 2010) recommended several criteria to follow in case study research. First, the selected cases should maximize what we can learn. Second, the case selection should be based on the purpose of the study. Third, the selected cases should be unique and in a context that will aid our learning.

This study frames a series of criteria to use in selecting appropriate cases based on findings in the related literature, especially the CAEL report on PLA and the U.S. Department of Education report on CBE: (a) the sites must be higher education institutions in the United States; (b) the sites must adopt or be adopting PLA and CBE initiatives at the program or degree level; (c) the sites should be geographically dispersed; and (d) each site should be unique. As a result, the original pool of potential cases was built by the 48-institute PLA report from CAEL (Klein-Collins, 2010), the CBE report from the U.S. Department of Education, and the recommendations from professors at the Pennsylvania State University.

Research case recruitment.

From January 2014 to September 2015, the researcher reached out to nine institutions that offer or plan to offer CBE programs via professional and personal networks, referrals, workshops and conferences. Two of the nine institutions did not respond to the research invitations sent, and one declined the invitation immediately. One

school withdrew from the recruitment process, and one was replaced successfully by another qualified institution.

Four sites agreed to participate in this study after the active recruitment and initial, frequent communications. Even though four of these institutions are qualified and reached the criteria listed in the previous section, three institutes were selected due to the uniqueness of each site and their more diverse contextual settings. These three selected cases are listed in the next section.

Selected cases.

Three institutions selected for the current study fit the above criteria. First, Institution A, a regionally accredited, fully online university, is one of the first higher education institutes that was approved by the Department of Education to adopt direct assessment programming in both the bachelor- and graduate-level degree programs since 2013. Direct assessment is the unique method of recognizing students' prior learning experiences in a competency approach, and Institute A is one of the pioneers of a Direct Assessment CBE program-offering institution. There are seven CBE degree programs at Institution A in the fields of business, information technology, nursing, and psychology being offered as of early 2016, while there are more than 36,000 students enrolled in Institution A. There are at least 52 graduates of 1,000 enrolled students from the CBE programs reported in 2015.

The second case is Institution B, which is the largest community college at a single location in one of the Midwest states. With more than 31,000 enrolled students and

11,000 online students in the 2013-14 academic year, Institution B offered 223 different degree and certificate programs. Institution B was awarded \$12 million in grants and served as the consortium lead for two other community colleges in 2012 as second round of the grant program from the U.S. Department of Labor. Western Governors University (WGU) provided consultation and technical assistance to these three community colleges to adopt the WGU CBE model.

Institution C, the third case, is a regionally-accredited, private, and not-for-profit school with 10 colleges and schools in the Midwest. With a student enrollment of over 23,000, Institution C is one of the top 20 largest private universities in the United States. Being one of the earliest CBE programming and PLA institutions, Institution C offers liberal arts-focused Bachelor of Arts programs to non-traditional students and created a framework of 50 competencies in the areas of lifelong learning, liberal learning, and focus since the 1970s.

All three selected cases offer CBE programs and adopt PLA; therefore, this research identified these three schools as research sites for case studies. These selected cases were expected to provide valuable insights and be unique enough to expand the understanding of the role of instructional design in the selected cases.

Participants.

Waiting to reach saturation in the field is generally not an option. Applied researchers are often stuck with carrying out the number of interviews they

prescribe in a proposal, for better or worse. (Guest, Bunce, & Johnson, 2006, p. 61)

In most qualitative research, there are no practical guidelines for estimating sample sizes of interviewing. Guest, Bunce, and Johnson (2006) found that saturation is the key to determining the purposive sample sizes. After conducting sixty in-depth interviews, they found that saturation could occur as early as the sixth interview. Saturation was first defined by Glaser and Strauss (1965) as theoretical saturation, which is a point that the researcher keeps seeing similar instances of and no new data are found to develop categories. Operationally, saturation can be found when “new information produces little or no changes to the code book” (Guest, Bunce, & Johnson, 2006, p. 65). The researcher in this study found a similar pattern when analyzing the interview transcripts, and the sixth interview produced little change to the coding categories. In addition to that, the expertise in a specific topic, like CBE programming, can reduce the number of participants needed in a study due to the nature of purposive sampling in qualitative research (Jette, Grover, & Keck, 2003).

This researcher recruited two participants from each site, and a total of six interviewees participated with both personal and administration permissions. In order to gather diverse and rich information from experts in each site, the researcher adopted purposive sampling, which “selects information-rich cases for in-depth study” (Patton, 1990, p.182) in each site to recruit interviewees with different roles and titles in this study. These participants were chosen because of their willingness to participate, their current roles, and their primary responsibilities in the CBE programs in the selected

cases. The most important criterion for selection was that all the participants have direct or indirect experience in instructional design in CBE programs in the selected institutes.

At Institution A, two participants were interviewed. Mr. G has a Ph.D. in Educational Psychology and has been building the foundation for direct assessment CBE programming over his 10 years of service with Institution A. The other interviewee was Mr. W, who has acted as instructional design manager over his seven years at Institution A and leads the design effort of CBE programs.

Two interviewees were recruited at Institution B. First, Ms. T has a Ph.D. in Computer Technology in Education and served as a dean for 16 years. She also leads the curriculum design and coordinates the instructional design resources in the CBE program at Institute B since its inception three years ago. The other participant at Institute B is Ms. A, who serves as project manager in the CBE program and coordinates the student services and supports.

In the third case, one instructional designer and one faculty from the CBE programs were interviewed. Ms. N is an Associate Professor who engages in CBE-related research and also serves as a member of the Competency-based Education Network (C-BEN) Program Strand Leadership Team. Ms. K has spent nine years as instructional designer and has worked for the CBE programs at Institution C as both instructional designer and instructor for four years.

Data Collection

Stake (1995) recommended considering several essential elements of data collection in case study research: definition of case, list of research questions, identification of helpers, data sources, allocation of time and expenses, and intended reporting. Most of the steps identified in Figure 3-1 form the project plan for the current study. The typical data collection methods a case study or qualitative researcher uses are: observation, interview, archived documents, and contextual analysis (Creswell, 2009; Stake, 1995; 2010). In this study, interviews, documents, and some contextual analysis were collected based on the research purpose.

Phase I: Preparation.

The data collection was divided into two phases: preparation and data collection. Gaining access to the institutions and identifying helpers was the first step in data collection in the preparation phase. In order to increase the quality of the current research, an informal pre-study was conducted to validate the research protocols, recruitment letter, and interview questions (see Appendices A & B). The reason for preparing a research protocol is to increase the reliability of case study research and help the researcher to collect data in a systematic way (Yin, 2014). In the pre-study, Dr. Kyle Peck, who is a well-known professor and research fellow in the College of Education at the Pennsylvania State University; Dr. Patricia Shope, who is the PLA Coordinator at the Pennsylvania State University; and Dr. Wesley Donahue, who is an Associate Professor

and Program Coordinator at the Pennsylvania State University, were invited to act as an expert panel to review and finalize interview questions.

After drafting the interview questions, the researcher conducted two rounds of pre-study interviews with two external experts at one public higher education institute located in the Midwest, which has been adopting Direct Assessment CBE programming for years, via phone in early 2014 and in person in 2015 to gather feedback on the interview questions and learn the contextual information regarding current CBE development. At the end of the pre-study interview, the researcher was recommended to 1) shift the research focus from the whole CBE programming process, which was suggested in the research proposal, to a more specific role of instructional design in the CBE programs; and 2) to reduce the length and the frequency of interviews in the research invitations to boost recruitment. Based on the recommendations and suggestions from both the expert panel and pre-study interviews, the final interview questions and protocols were written and ready for data collection.

By the end of preparation phase, the research protocol with interview questions and the consent form (see Appendix B), which was approved by the Institutional Review Boards (Study ID: STUDY00004022; see Appendix C) at Pennsylvania State University were sent via electronic mail (email) to the instructional designer, administrator, or faculty in each of the selected institutions to gain final permission and access. The invitation email included the obligations of the interviewer, refined the access rules during interview sections, the needs for reviewing research drafts to validate collected data, and confidentiality and protection of data protocols (Stake, 1995).

Phase II: Data Collection.

After gaining permission and access, the interviews were scheduled to fit into the research participants' schedules. The actual interviews were conducted in late December in 2015 to early February in 2016, and all interviews were recorded electronically with permissions. In each interview, the researcher began with a brief research description and reviewed the research protocol. By receiving all participants' oral consent, the 30- or 45-minute interview began. All recorded interviews were transcribed by a professional transcriber who is also familiar with instructional design practices in higher education. MovieCaptioner software was used to edit and export the transcript files. To ensure the quality of data, the researcher reviewed the transcriptions and modified the missing or incorrect parts of the interview transcripts. For example, one answer in the original transcript in Mr. W's interview said, "I mean, it was from the White House down. It was Arnie Duncan's chief of staff was even involved in some of the conversations with us," and the former U.S. Education Secretary is named Arne Duncan, not Arnie Duncan.

Artifact-gathering was also conducted or requested during the interview section, which included the processes, guidelines, assessments, forms, and relevant report documents, which were listed in the later section. Not all participating institutions provided documents, and the researcher also reviewed website, news, and other extant data sources to obtain documents needed for case analysis in later stages.

Instrument Design

This study used two set of interviews questions to help researchers to gather data and answer parts of research questions from both instructional design support staff and administrators. The interview questions were designed to answer the research questions, “How is the CBE program designed and developed in selected institutions?”; “What is the role of instructional design in CBE programs in selected institutions?”; and “What are the similarities and differences in instructional design practices between traditional and CBE programs in selected institutes?” Most of the interview questions were adopted from the interview questions conducted by the U.S. Department of Education (2002) and enhanced by the expert panel in this study. The link between interview questions and research questions are listed in Table 3.1.

Interview Questions for Faculty or Program Administrators

- A-1: Could you share a little about your background with me? (Ice-breaking)
- A-2: How many students or learners have been through the competency-based program/degree in your school? (Contextual information)
- A-3: What is the typical process to assess a student’s competencies in the program?
- A-4: What are the challenges you encounter during the process?
- A-5: How do you make sure the assessment is rigorous and of high quality?
- A-5-1: Can you describe a particular case?

- A-6: What makes you feel the CBE program is successful and fair?
- A-7: What is the role of the instructional design in the CBE program?
- A-8: What is the difference between designing traditional degree programs and CBE programs, if any?
- A-9: Do you know of any topic or subject matter expert (e.g. Instructional Designer) I should talk to during my visit? (Closing)

Interview Questions for Instructional Design Support Staffs

- I-1: Could you tell me more about your background and experience in Instructional Design? (Ice-breaking)
- I-2: Could you describe the instructional design process you have been through in the CBE program you have worked with?
- I-3: What are the challenges you encountered during the process?
- I-4: What is the role you play in the CBE program development?
- I-5: Do you have any concerns or suggestions about the CBE program you have been working on?
- I-6: Compared to the traditional degree program, what is the biggest difference you are aware of in the design of the CBE program?

Table 3-1. *The Link between the Research Question and the Interview Questions*

Research Question	Interview Question	Source(s)
How is the CBE program designed and developed in selected institutions?	A-3, A-4, A-5, A-5-1, A-6, I-2	U.S. Department of Education (2002)

What is the role of instructional design in CBE program in selected institutions?	A-7, I-2, I-4, I-5, I-6	Expert Panel
What are the similarities and differences in instructional design practices between traditional and CBE programs in selected institutions?	A-8, I-3, I-6	U.S. Department of Education (2002) and Expert Panel

As Stake (1995, 2010) suggested, the interview questionnaire should be issue-oriented since each respondent is unique, but it is important to stay in control of data-gathering and use care in asking probing questions. The pre-study and expert panel review were conducted to finalize the interview questions and protocols during the preparation stage. To answer all research questions, the interview questions and document review were conducted during the data collection, and little was said about this in this chapter due to the progressive focus of case study research. However, as Stake (1995) claimed, “The case is complex, and the time we have for examining its complexity is short” (p. 77); it is inevitable to have some weaknesses in both research questions and interview questions in exploring the actual role of the instructional design in CBE programming in the selected cases due to the limited research resources, access, and the nature of the topics.

Document Review

In addition to the interviews, a document review was used to clarify interviewees’ statements (Glaser & Strauss, 1967) and to “substitute for record or information the researcher can’t observe directly” (Stake, 1995, p. 68) as a supplemental source for this study. The documents reviewed in this study were either provided by the interviewees or

available in public domains. As Creswell (2009) suggested, the process of converging interviews and documents can be seen as “adding to the validity of the study” (p.191).

The following documents were reviewed before and after each interview in the data collection. To protect research participants’ confidentiality, all the reviewed documents in this study used pseudonyms.

1. Competency map at Institution A
2. Direct Assessment CBE program review at Institution A
3. Interim Report of CBE program at Institution B (conducted by one Policy Research Organization)
4. Year 3 Implementation Report of CBE program at Institution B (conducted by one Policy Research Organization)
5. CBE Program Overview for Internal Use at Institution B
6. Memo to Accreditor at Institution C
7. Student Learning Resource Handbook at Institution C
8. Competency map at Institution C

Data Analysis

“There is no particular moment when data analysis begins” (Stake, 1995, p. 71), and there are two major strategies when engaging in data analysis in case study research: direct interpretation and categorical aggregation. Looking at the current research design, the primary purpose of case studies is to help the researcher to understand more about CBE and the role of instructional design in the CBE movement, to probe issues beyond

the current development, and to aggregate categorical data. So, the analytic strategies in the current study should be followed as categorical aggregation in addition to direct interpretation (Stake, 1995).

The data from the current study was gathered in a number of ways and characterized as interview data and document data (Stake, 2010). There is a need to ensure that the data provide evidence at an acceptable level of confidence, which requires triangulation. For case study research like the current study, the following analysis steps are recommended (Creswell, 2009; Stake, 1995, 2010): Organizing the data, coding the data, finding patterns and relationships, triangulation, and making assertions.

The first step was to organize the raw data and separate them into parts or elements for further examination and to find the interpretive data for coding. The second step was to code the organized data; Stake (2010) defined the coding as “sorting all data sets according to topics, themes, and issues important to the study” (p. 151). Since the current study adopts the progressive focus philosophy and follows the categorical aggregation strategy in data analysis, the data that are most valuable and important were coded as themes and included in assertions. In order to develop a successful coding and storage process, Stake (2010) suggested 12 tips:

- (1) Keep a personal research log and make note of patches;
- (2) Link the document storage to data gathering and writing;
- (3) Make a mock-up of the final report, with tentative page allocation;
- (4) The writer of a topic or section should be in charge of document storage for that topic;
- (5) Avoid too few or too many files;

- (6) Prepare a statement of just-gathered data for the first draft of the report;
- (7) Researchers may choose to make their main files electronic or paper files;
- (8) Major data should be routinely duplicated and stored in more than one file;
- (9) Records and statements needing discussion should be marked;
- (10) Audio or video data should be used and transcribed only when it is clear that they are vital to the final report;
- (11) Each document should be numbered and stored with brief information;
and
- (12) Your memory will be an important storage for writing the final report
(Stake, 2010, p. 152).

Gibbs (2007) claimed that coding is one of the analytical steps and it will help the researcher to “identify patterns, make comparisons, produce explanations and build models” (p. 78). In order to have a structured process for the coding, Glesne’s (2011) suggestions guided this study as follows: first, the researcher will begin with line-by-line coding guided by the theoretical framework. Second, codes will be arranged in hierarchies and arranged into categories or sub-categories. Third, a framework of relational categories for the data will be created. Fourth, a coding scheme will be developed by creating a codebook. Yin (2014) suggested four strategies for researchers to use in analyzing case study evidence: (a) Rely on theoretical propositions (similar to what Glesne, 2011, suggested); (b) Grind up the data and find the emerging patterns and relationships; (c) Develop case descriptions to organize the collected data; and (d) Examine plausible rival explanations, which help researchers to evaluate the sorting and coding.

The transcripts were reviewed numerous times throughout the coding process. The constant comparison analysis (Glaser & Strauss, 1967) and keywords-in-context were adopted to help the researcher to reduce the sources to codes in a systematical way (Glaser & Strauss, 1967; Onwuegbuzie, Leech, & Collins, 2012). For example, “We offer direct assessment programming. It's a new way for students to move just as quickly as they can demonstrate the competencies (Mr. G Interview Transcript, 2015)” was reduced to “Direct Assessment CBE” and interpreted as an attribute of current direct assessment programming in the interpretation phase. By applying open coding, which is defined as “the analytic process through which concepts are identified and their properties and dimensions are discovered in data” (Strauss & Corbin, 1998, p.101), the researcher was able to identify the initial codes after reading the first two interview transcripts. The initial codes were: External context, internal resistance, CBE program design and development, Process, Role of Instructional Design, Competency-based Assessment, Differences, and Challenges. After finishing reading all interview transcripts, the codes were merged or modified to the codes shown in Table 3.1, which are: Program Context, Design and Development, Differences, Role of Instructional Design, and Definition of Success. In the code of Design and Development, there are four sub-categories, which are Assessment, Design Challenges, External Challenges, and Process. Sometimes, the researcher had to code the same words or sentences in the interview transcripts into two codes due to the nature of the complexity of cases.

At the end of the coding and data-sorting step, the researcher invited Dr. Steven Welch at Bloomsburg University of Pennsylvania to confirm coding categories and the codebook. To enhance the creditability and the quality of the coding, the Dr. Steven

Welch also served as a second coder and was trained to code three random interview transcripts in the current study. Dr. Welch was provided with the emerged code listed in Table 3.1 without examples, and three interview transcripts randomly in secured and shared Google Documents. He was instructed to code the three interviews independently until comfortable with the given tasks, within two weeks. After receiving the coded transcripts from Dr. Welch, the researcher imported the documents to NViVo 10 for later inter-coder reliability testing. The current researcher conducted inter-coder reliability by calculating the values of Kappa (Cohen, 1960), the values of which above 0.60 represent substantial agreement. The original result showed the average value of Kappa was 0.56 and the average percentage of the agreement was 88.72%. After reviewing the coded transcripts from the second coder, the researcher found that there were differences in coding patterns, such as single word versus whole sentence. The researcher went back and enhanced the original coded transcripts and re-calculated the inter-coder reliability. The final result showed the average value of Kappa was 0.65 and the percentage of the agreement was 90.64%, which showed the high agreement between two coders.

After coding and sorting the data, the next step was to identify the patterns and relationships among the categorized data. Stake (1995) recommended that case study researchers use a contingency table, which will identify correspondences, and a frequency table, which will identify repeated arrangements and issues. With the help of these two tools, the researcher will target the assertions easily (Stake 1995, 2010). In the current study, five emergent codes and four sub codes were identified and aggregated, and examples of the patterns were shown in Table 3.1.

Table 3-2. *Example of Emergent Codes*

Emergent Codes	Example
Program Context	...the curriculum project I worked with the chair of the CIS department. And the CIS department faculty to develop the courses... to design and develop the courses. And then we also have instructional designers who guided the faculty through the process...
Design and Development-Process (Sub)	We worked very closely with our curriculum committees on campus to ensure that the things that we do align with the way things are done if you were in the face to face class or if you were in an online class. We made sure that the way we do things is equitable and comparable.
Design and Development-External Challenges (Sub)	You know, both external agencies, like, financial aid and accreditation, and state approval.
Design and Development- Design Challenges (Sub)	I would say the main challenge is the faculty delivering their deliverables on deadline.
Design and Development-CBE Assessment (Sub)	We offer direct assessment programming. It's a new way for students to move just as quickly as they can demonstrate the competencies.
The Role of Instructional Design	I get matched with a faculty member, course author, after the proposal has been approved. And then from there we typically have about a six month development process.
The Difference between CBE and Traditional Programs	Well, and first of all, CBE is not for everyone. But there's huge issues related to the business model for developing and delivering and supporting CBE. And there's also a lot of faculty policy challenges. It's a different role for the faculty member.
Definition of Success	And I think it's certainly very successful with students. Adult students who have a lot of motivation for earning the degree.

Before making assertions and a final report, it is important to ensure the validity and reliability of the findings. Gibbs (2007) suggested taking several steps to ensure a reliable procedure for qualitative research: First, check the transcripts to be sure there are no obvious errors; second, make sure the definition of codes is consistent; and third, cross-check codes. Also, triangulation is needed to make a confident assertion.

Triangulation is a form of confirmation and validation (Stake, 2010), and can be done using several different protocols. Denzin (1984) recommended a few triangulation protocols for qualitative researchers to use in demonstrating the commonality of an assertion: First, data source triangulation, which confirms that the case remains the same in other times or spaces; second, investigator triangulation, which confirms that the interpretations and assertions remain the same by other researchers; third, theory triangulation, which confirms the assertions remain the same for some theories; and fourth, methodology triangulation, which confirms that the finding remains the same according to other research designs. In order to confirm assertions and findings for the current study, data source triangulation and investigator triangulation with self-reflection were adopted.

In addition to these strategies, the researcher also conducted peer debriefing to enhance accuracy by “involving and interpretation beyond the researcher and invested in another person adds validity to an account” (Creswell, 2009, p. 192). The researcher invited Dr. Renee Ford, who is a Senior Instructional Designer at the Pennsylvania State University to serve as a peer debriefer who reviewed and asked questions about this research. The primary communication tool between the researcher and Dr. Ford was email and phone instant message. The questions she asked were: 1) Do instructional designers play a role in mapping the curriculum for the entire program and/or in ensuring pedagogical principles, program objectives, and competencies are met for accreditation purposes?; 2) Given Institution C's longevity, it seems that they would no longer exhibit the needs that a newer program would and, therefore, be less likely to employ backward design processes. Is that the case and, if not, why not?; and 3) Does the self-paced,

largely-asynchronous CBE model create limitations on the variety of assessments that are viable? It seems that group projects and anything requiring discussion or peer collaboration would not be feasible. These questions were similar to the recommendations made by Onwuegbuzie, Leech, and Collins (2008), who suggested that the possible debriefing questions are based on possible researchers' bias such as interpretations of interview findings. By answering these questions, the researcher verbalized the interpretations and recognized his role in participants' stories as Frels and Onwuegbuzie (2012) found in the process of peer debriefing.

Single Case Study

“It is common for the individual case reports to be included in the multicase report” (Stake, 2006, p.39). In preparing the cross-case analysis, it is important to preserve the particularity of each individual case (Stake, 2006) and help the readers get familiar with each case (Eisenhardt, 1998). Single case study and findings were provided in Chapter 4. Stake (1995) recommended three different ways to develop the single case report, and this researcher adopted one of his suggestions to organize the single case study report by the researcher's view of coming to know the case (p. 127). The organization of the single case study in the current study began with: (a) An entry vignette, which helps readers get immersed in the case context; (b) Case context and boundary setup; (c) Themes, issues, and findings; (d) Theme-based assertions; and (e) A closing vignette as suggested by Stake (1995).

Cross-Case Analysis

“The [multicase] study was undertaken to understand the Quintain (i.e., the program or phenomenon), both its commonality and its differences across manifestations. Each case is studied to gain understanding of that particular entity as it is situated. The Quintain is studied in some of its situations. It is supposed that the complex meanings of the Quintain are understood differently and better because of the particular activity and contexts of each case” (Stake, 2006, p.40).

The current researcher adopted the recommended iterative process from Stake (2006) to conduct a cross-case analysis in Chapter 5. First, by reading and summarizing the single case report with case synopsis and uniqueness. Second, by emphasizing single case findings by rated importance. Third, by merging case findings and identifying special findings situated in each specific case. Fourth, by making cross-case assertions based on the previous two steps.

Researcher Positionality

As Stake (1995) said, “The case researcher plays different roles and has options as to how they will be played” (p.91). It is important to clarify the role of the researcher in case study research. In addition to serving as a case researcher in this study, I have been working as an instructional designer and have served non-traditional students for over five years in U.S. higher education institutions. I am a certified Prior Learning Assessor recognized by CAEL since 2013, and participated in experimental CBE programming projects in the College of Education at Pennsylvania State University. I came to this

research with an understanding of both instructional design practices and CBE, as well as a high curiosity for knowing more about the educational movement and trends in the United States.

Oftentimes, the researcher himself or herself is the primary instrument in qualitative research projects. In order to enrich readers' understanding of current research and its Quintain, the researcher's position in making assertions should be clear. This study relied heavily on the framework of case study research written by Stake (1995, 2006, & 2010), and I personally have known and worked with Dr. Stake since I was graduate student at the University of Illinois at Urbana-Champaign.

With professional and personal experience, I have been immersed in this research topic and recognize the value of CBE in higher education. The three selected cases were either referred or recommended by the internal expert panel or via personal contacts at conferences and professional development opportunities in the past few years. I fully disclose my past experience and my interests, which may or may not impact the objectivity of the current research.

I have chosen to act as an interpreter of this case study because of my professional background and research interests. My intended role and my position to this research is to be the agent of a new interpretation and to build new knowledge of CBE as it relates to higher education institutions in the United States.

Chapter 4

Research Findings and Data Analysis

As Stake (1995) stated, “Case studies are undertaken to make the case understandable” (p. 85). The current chapter, which consists of three individual case analyses and the cross-case analysis, was developed to identify common themes and issues across each of the three selected cases.

This study was designed to investigate the following questions [themes]:

1. To understand how competency-based education is designed and developed in selected institutions.
2. To identify the role of instructional design in competency-based education in selected institutions.
3. To differentiate instructional design practices in traditional and competency-based higher education in selected institutions.

In order to understand the selected cases, two primary data sources were collected for analysis. First, by conducting a series of semi-structured interviews, each research participant from selected institutions was invited to share and articulate their understanding and experiences with the researcher. Second, data sources were the related documents provided by the interviewees or available publicly.

Institution A

Institution A, a regional accredited, fully online university, is one of the first higher education institutions approved by the U.S. Department of Education to adopt direct assessment programming in both bachelor's and graduate-level degree programs since 2013. Seven competency-based degree programs in the fields of business, information technology, nursing, and psychology are being offered as of early 2016, while there are more than 36,000 students enrolled in Institution A and at least 52 graduates out of 1,000 enrolled students from the competency-based programs reported in 2015. Prior to offering competency-based programs, Institution A invested in outcome-based education and assessment over several decades, and these efforts did help the university to align the curriculum, criterion-reference assessment, and competencies when starting the CBE programs (Grann, 2015). After almost two years, a related smaller number of students have graduated from the competency-based program. This led us to ask: did Institution A learn any lessons from this experience? What are the roles of instructional design in the competency-based programming? What are the differences between the existing program and the competency-based programs?

To understand this case, two interviews performed at Institution A provided some insights to these questions. The two interviewees were Mr. G and Mr. W (real names are not provided in this description of findings to ensure participants' confidentiality). In addition to interviews, the official website and documents on competency-based programs at Institution A were reviewed. As the first competency-based graduate

program approved by the U.S. Department of Education, there were a lot of opportunities but also a lot of challenges internally and externally.

Theme 1: How competency-based education is designed and developed in Institution A

Vignette 1

The first question I asked Mr. G is about his background and professional experience, and he said,

I've been at [Institution A] ten years. And one of the things that I got started on there was developing criterion reference to assessments for our courses. And that was actually a big focal point of the university. There was a big project to introduce criterion reference assessments for every assignment that our students were graded on. So a lot of rubric development... (Mr. G, Interview Transcript, 2015).

Transforming Existing Programs to Competency-based Programs

In late 2015 and early 2016, I reached out to Mr. G, the academic director for assessment, and Mr. W, the manager of instructional design, who was referred to me by Mr. G after the phone interview. It was a Friday morning before holiday break at Institution A, and Mr. G had just made a short stop at his office before vacation. Our

conversation started with questions about his background, which aligned with the development of the competency-based program there.

“We offer direct assessment programming. It's a new way for students to move just as quickly as they can demonstrate the competencies. It's not based on seat time or credit hours,” he later said. The U.S. Department of Education approved Institution A’s competency-based and direct assessment graduate programs in 2013, and non-term financial aid to its direct assessment programs in 2014—both of these were huge milestones for its competency-based program.

Similar to what was found in the literature, Intuition A had put a lot of effort into ensuring that assessment aligned well with the curriculum over the past 10 years before offering competency-based programs. “Just to be frank, we literally took the same course, you know, same course, it's our credit course, and we made it a [competency-based] course,” Mr. G said. However, the development was not as simple as expected, which was confirmed in the later conversation with Mr. W, from an operational perspective on competency-based program development. Fundamentally, there is more than one way to develop competency-based programs in higher education. Mr. W, the manager of instructional design, recalled the early stage of program development in 2014 and stated that the primary reason for Institution A’s decision to choose to translate existing for-credit courses into direct assessment offerings was the well-designed assessment foundation in selected programs.

“...So, there's very different approaches, but the two that you really had to choose from was someone like [Other Institution] who basically made an entire separate entity college. And then there was the approach we took is an existing program,

like, our existing MBA program with those existing competencies and converted it into a direct assessment rather than building from the ground up.” (Mr. W, Interview Transcript, 2016).

However, there were still many things on which to work. As Mr. W said, “it is extremely rare that you can take an assessment from a credit bearing course and just plunk it into a direct assessment model and it works.” As a result, a couple of different types of assessments were included in the competency-based program.

Direct and Performance-based Assessment

Under the direct assessment model, almost every assessment (which are authentic assessments) are performance-based and highly tied to learning outcomes recognized by real-world experts in the competency-based programs. To illustrate this, Mr. G stated that, “It's [assessment] intended to, at their best, they're intended to simulate that performance conditions we expect our graduates to experience outside of the university structure,” and “So we give the learner that opportunity to demonstrate competency in context that we think they can expect to encounter outside the university. And then we have our faculty review that work and offer feedback through these rubrics that have been developed. And the student needs to obtain a certain level of performance on those rubrics to move forward in the program.” However, when the assessment is not performance-based, the tutor plays a crucial role in working with students on feedback from faculty.

Prior Learning Assessment

Besides the direct assessment pieces at the course level, other types of assessment also make Institution A's competency-based programs unique. One is the Prior Learning Assessment (PLA) process in the early stage of the program. "There are a couple different assessment processes involved and some is involved initially just around understanding the student's previous academic experience what credits they've acquired at other institutions. What certificates and what experiences they have that might position the learner to do a PLA process, a prior learning assessment..." Mr. G said.

Backward Design Model

Institution A's curricula are defined and aligned by employers and professional organizations, and later translated to learning outcomes and mapped to competencies. Mr. G confirmed this during our conversation, and stated that backward design played an important role in program development.

There's a suite of people that are trying to understand what the future is in a profession and how the degree that they're thinking of creating will fit in that space. So, anyway, that process is intended to set up the curricular structure for the offering, the outcomes, the competencies. We have something we call a sub-competency. It's a middle layer and then we have these criteria and so that's the set up. And if that's done well, then curriculum teams what they would do is they build out the details of the curriculum, articulate outcomes. They would deconstruct those. It's sort of a backwards design. Where you go from the end

goal back into, well, what are the competencies you would need to demonstrate those outcomes? And then all the way down into each of our courses (Mr. G, Interview Transcript, 2015).

Hence, a few questions were asked during the design and development phases for competency-based programs in order to align with the backward design methodology, such as “What does good look like? “What does success look like on this competency? “Where have you seen it before?” Then, the instructional designers and the course development team aligned the assessment with the defined learning outcomes. Another effort was identified during our conversation—Institution A had tried to make the competency-based program more closely aligned with the real world by reducing usage of some traditional instructional design terms in the design process. For example,

We're not a real taxonomy institution. We don't use a Blooms language with our subject matter experts directly. Because what we're trying to do is elicit the field expectations that are not informed by the educational language of instructional design” (Mr. G, Interview Transcript, 2015).

What was further found at Institution A is that the competency-based program is basically a team effort and relies on a solid internal process to make it succeed. A course development team ensures that the curriculum system is depicted in the courses. There are multiple monitoring, checking and reporting mechanisms at Institution A to manage and predict students’ performance and experience. In addition, the instructional design team plays a crucial role, as indicated in a later discussion with Mr. W.

Theme 2: The Role of Instructional Design

Similar to what was found in the reports, Institution A relies on cooperation among subject matter experts, an instructional designer, and an assessment specialist to ensure alignments between competencies and assessment. An internal instructional design team was employed to review and revise both existing programs and competency-based programs. Summarizing this, Mr. G said, “Our instructional designers work with subject matter experts (SMEs) in both traditional and competency-based program, and their works can be reviewed by assessment specialists, another role at Institution A”. Further conversations with Mr. G and Mr. W highlighted several basic roles played by instructional designers in competency-based programs.

Mapping Course Content with Competencies

The typical instructional design process at Institution A begins with the instructional design manager outlining the course contents, materials, and competencies. Then, the assigned instructional designer reviews the same course offered on the traditional path and identifies suitable assessments. Sometimes, there is a need to modify or enhance the assessments, but the next step is most critical: Finding the learning recourse for students to complete the assessments. However, the process is not always easy as Mr. W described: “...let's just say, for discussion sake, has four competencies. That's a good average number I would say for one of our courses. So, there's four competencies. And that competencies are evaluated throughout the course. “

Further, according to Mr. W.:

Each competency has a criteria that's used to evaluate individual assessments that the learners turn in. And obviously that is where the judgment is rendered whether they have achieved competence or not. So, an instructional designer will look at that credit bearing course. That initial traditional online course and find assessments that they believe are usable in a direct assessment model. And typically, they're not...it is extremely rare that you can take an assessment from a credit bearing course and just plunk it into a direct assessment model and it works. That does not happen very often. That was a huge learning for us. Because that was what we went into the whole endeavor thinking, oh, we'll just take the assessments out, we'll plunk them in here, boom and done. This is going to be great. Well, that is not at all how it turned out to be. (Mr. W, Interview Transcript, 2016)

Select Existing or Develop Suitable Assessment

Another instructional design role in competency-based program development was pointed out by Mr. W—an instructional designer will look at that traditional credit-bearing course, which will be transferred to competency-based later, and find assessments that may be used in a direct assessment model. However, it is not that easy.

“That was very naive.” Mr. W kept saying, “I guess we didn't think it would be quite that easy, but we didn't think it would be as it could be. Because one of the things, when you don't have seat time and you're allowing people to rely on professional

experience to be used as the resource, you know, the knowledge resource to complete the assessments. You know, basically being agnostic to the source of learning, we can't require them to purchase a textbook. Very fundamental with direct assessment. You really can't require a purchase for one thing in a self-paced model. They can't truly be self-paced if they're sitting there waiting for their textbook to come or whatever the case might be. Because it's typically tuition in a subscription format“. So, the biggest role of instructional designer, according to Mr. W's experience, is to support SMEs to find suitable resources for learning in competency-based courses.

Finding Learning Resources

“We can't require textbook in competency-based programs,” Mr. W said, so the result of it is to find resources for the subject matter experts during the course development phases. Often, the scenario involving the instructional designer(s) and SMEs started when the instructional designers located articles and readings, “Because, obviously, it's the subject matter expert that has to approve the resources but because that job is so much bigger, that ID [Instructional Designer] will go in and help do some of the leg work. Or look at some articles that were used in the traditional as an optional resource.” As a result, filling the resources gap by including textbooks or articles in competency-based courses is a big challenge for both instructional designers and SMEs. This also is one of the differences between traditional programs and competency-based programs.

Theme 3: Instructional design practices differences in traditional and competency-based program

Difference in Design Practices

Before the conversation with Mr. G and Mr. W, the researcher had heard a lot of discussion on differences between traditional and competency-based programs. Mr. W confirmed several differences between designing traditional courses and competency-based courses using an instructional designer's lens. This includes the design process, time and resources allocated to the design process, and learning experience.

So, that's a big piece of the instructional design role that is a little bit different than your traditional online course too is the fact that they do take that first phase at it because the content theoretically exists. They take the first phase at it. They put it in the direct assessment template. And the SMEs slice and dice and edit and verify and validate, whatever they want to do with it. And then it comes back to the instructional designer. So it's fairly iterative in that way" (Mr. W, Interview Transcript, 2016).

Hence, due to limited interactions in competency-based programs, which are usually self-paced, the time invested in writing instructions is significantly different from that expended in traditional programs. He said, "A lot of times the assessment instructions in a direct assessment model need to be beefed up. Because in a traditional online course, there's many opportunities for dialog between the instructor and the learner." Similar things were found in identifying resources for competency-based courses. Mr. W used a quantitative course, such as finance, as an example: "Say to design

a traditional online course might take a hundred hours of instructional design time, probably a 100 hours of SME time. You can double or more that when you're...it's very common to double or more than double that when you're doing a quantitative course. ”

On the other hand, Mr. G, who was more interested in assessment, thought that there was no fundamental difference between traditional and competency-based programs, but the students did have different learning experiences.

Differences in Students' Learning Experiences

Mr. G offered one example of student experiences in competency-based courses, but said, “Well, like I say, there's really no difference.” Further, “I mean, the difference is that in competency-based programs one difference in our credit courses, there are ten weeks. And each week there are discussion questions. And the students are required post weekly to those discussion questions. And our competency-based model, they do not do that. The discussion questions are posted for the student. And there is a social network discussion board where they can if they choose to answer those questions and see how other students have answered those questions. But they're not assessed, they're not required. They're just formative. They're just providing instruction and guidance to the student. And so, I think, from a student experience, that's a big difference. Like, posting to discussions every week. It's a lot of work. It can be a lot of work for adults. In competency-based program, they would not be doing that. They wouldn't be required to do that.”

Since the direct assessment approach provides a different way for adult students to achieve their learning goals and credentials, and the different learning experience described by Mr. G did reflect one of the key features of assessment-driven design in competency-based programs. In competency-based programs, the students are only assessed according to selected competencies and the social connection in traditional classrooms, missing in competency-based programs, seems not to be a big concern in competency-based programs at Institution A.

And we've tried to have non-course based social connections, but they're not required. And so I think many of our students are already quite connected socially. They may have different needs than a younger adult that is trying to build a community. So, I will just say that topic [social connection] is serious, but it hasn't emerged as a challenge for our students in the survey work that we've done. They don't profess a loneliness or a lack of community or declines in persistence through the program or anything like that (Mr. G, Interview Transcript, 2015).

Internal and External Challenges

Talking about differences between competency-based and traditional programs, internal and external challenges are an interesting angle to investigate. It is interesting to learn that the internal challenges or resistance to competency-based programs at Institution A was relatively low, and the primary reason is the firm school policy and pre-defined assessment across existing courses at Institution A. “Now it's a policy for the

university. Grades are based on competencies. Because what we did was align each of those criteria to curricular maps, curricular competencies..." Mr. G said. "So, faculty, I think, we haven't really encountered people saying, or being surprised, or like, why would you do that? It's kind of like, why haven't we done this? So, you know, and that's my perspective."

Since Institution A was one of the very first schools recognized by the U.S. Department of Education to offer competency-based program, many external challenges and questions were anticipated over the past few years. These challenges often stem from the different approaches to existing academic programming. "And that department [U.S. Department of Education] at the time was extremely supportive of what we were doing. But at the same time, they knew their risk understandably. So they kept a close eye on it. There was a lot of questions that came from the department. And almost weekly, in the beginning, it was pretty frequent." Mr. W recalled. "[It is an] understandably big points of concern for the DOE was that there's some sort of crosswalk for the learner should they not be successful or not like a direct assessment model. Even though it's not necessarily credit bearing because it's based on mastery of competencies. It's not based on credits or seat time or anything like that. But we still need to be able to make that translation."

The removal of seat time did raise questions and concerns with the U.S. Department of Education and regional accreditors. However, they were not very concerned about the differences between competency-based and traditional programming, but rather more concerned about the program itself and student outcomes. "And the faculty that we work with and the regulators that review our work, the creditors

that review, you know, they're not trying to understand what competency based education is and how it relates to some of their more process related expectations You know, some of the regulations might be based on inputs. You know, how much time was done in this module? Not expecting there to be a measure of the students learning or demonstration of a competency to base a process or regulation around.” Mr. G said.

Multiple external challenges and concerns led the institutions that offer competency-based programs to plan further for the student learning experience. Mr. G mentioned that sometimes the challenges made the institutions think proactively in some ways: “Another challenge, I don't know if it's exactly what you're thinking, but just this is in some ways it's both a very old way of doing educational instruction. It's sort of personalized to an individual learner. It's like a tutoring kind of mentorship model. But it's also really new for higher education.” Our conversation ended with several discussions on the future of higher education.

Institution B

Vignettes 2

I asked, “what is your opinion on the recent CBE movement?”

She told me,

... according to the academic press, there's over 600 colleges or universities that are developing some form of a CBE program. There are statewide CBE projects now under way in the states of Washington, Wisconsin, Ohio, and Indiana. Texas

is exploring a project as well. These programs that are really focused on helping students get into the workforce, which is how WGU [Western Governor University] was founded. That's what the governors were seeking to build: a university that was high quality, accessible, and would be responsive to workforce needs. (Johnstone, Personal Communication, January 2016)

Contextual Background

Institution B is the largest community college at a single location in one of the Midwestern states. With more than 31,000 enrolled students and 11,000 online students in 2013–14, Institution B offered 223 different degree and certificate programs. In 2011, the U.S. Department of Labor (DOL) announced a grant program called “Trade Adjustment Assistance Community College and Career Training (TAACCCT)” and President Barack Obama signed the Health Care and Education Reconciliation Act to grant \$2 billion from 2011 to 2014 to fund individual community colleges working as consortia in the TAACCCT program (U.S. Department of Labor, 2011). The purpose of this grant program is to prepare eligible community colleges to deliver education and career training programs that can be completed in two years or less. Person, Goble, and Bruch (2014) stated that the TAACCCT program has three goals:

- (1) To increase attainment of degrees, certificates, and other industry-recognized credentials that provide skills for employment in high-wage, high-growth fields;

- (2) To introduce or replicate innovative and effective curricula that improve learning that is relevant to employment; and
- (3) To improve employment outcomes for participants, especially those eligible for Trade Adjustment Assistance (TAA) and other economically dislocated and low-skilled adult workers. (p. 1)

Institution B was awarded \$12 million in grants and served as the consortium lead for two other community colleges in 2012 in the second round of the TAACCCT grant program. The three-year project titled “Adapting and Adopting Competency-base IT Instruction to Accelerate Learning for TAA-Eligible, Veterans, and Other Adult Learners”; Western Governors University (WGU) provided consultation and technical assistance to these three community colleges in adopting the WGU competency-based education model. As a result, Institution B developed three Associate of Applied Science (A.A.S) degrees in three different Information Technology (IT) areas from existing online programs.

To understand this case, two interviewees were invited to provide some insights into this study’s research questions. Ms. T and Ms. A, who were referred by the Western Governor University, engaged in a one-hour phone interview in late January 2016. In addition to the interview, official websites and documents provided by Institution B were reviewed. As one of the TAACCCT grant recipients and consortium lead, Institution B not only encountered a lot of opportunities but also a lot of challenges internally and externally as anticipated. The uniqueness of this case was illustrated by the U.S. Department of Labor and community colleges in the CBE movement, which are discussed in this case.

Theme 1: How competency-based education is designed and developed in Institution B

Accelerate and Flexible Competency-based Model in Community Colleges

In late January 2016, the researcher was able to talk with Ms. T and Ms. A via phone. This was a typical cold Thursday morning in January, and a huge snowstorm had just hit the Midwest the day before. A few days before our conversation, Ms. A, who was the project manager for the grant program, sent me a presentation that included the program overview and the competency-based model at Institution B—these documents were very helpful to the interview. The conversation started with Ms. T, who was the dean of the e-learning division and served as the project director for the competency-based project funded by the TAACCCT grant program in the U.S. Department of Labor:

... basically, we took a divide and conquer approach and we broke it up into four different functional areas; the curriculum piece, the student support piece, the delivery the piece, and then the administrative and strategic pieces. And so Ms. A led the students support and delivery piece. And I led the curriculum piece. And then we had someone else who co-led the other pieces with me. And then Ms. A is also the project manager.... (Ms. T, Interview Transcript, 2015)

In learning the three key strategies that led competency-based programs at Institution B—1) Build a college within a college; 2) Integrate into existing college departments; and 3) Retrofit back end semester-based systems—the researcher noted that

the competency-based programming in Institution B began with converting an existing AAS degree in IT areas to self-paced competency-based offering: "... [we] starting from the beginning, we had some existing AAS degrees. And the state has defined competencies for the AAS degrees. And they changed those competencies, or revised those competencies, at the same time we were beginning our project."

Ms. T further answered my question: "In the past three years, around 600 students went through the competency-based programs at Institution B, and another 3,000 students had participated in modified versions of competency-based programs." As Mr. A further explained, "...around there for that core group of online self-paced receiving the competency-based redesign curriculum. But then we tried another experiment using the curriculum, the same...so the courses were designed and rolled out and implemented the same way. But they were structured to be more traditional in terms of students received deadlines. We wanted to test to see which type of format students were more successful in". The original design of the competency-based program was online, self-paced, and accelerated—Institution B also offered the same competency-based courses in traditional formats, with specific deadlines for each deliverable. Currently, there are 30 competency-based courses in the fields of network engineering, secure system administration, software development, IT fundamentals, network security, and software testing.

Industry-driven curricula and Backward Design

To accomplish the goals of the TAACCCT grant, Institution B formed an advisory board to include strategic partners, business/industry leadership team, program

advisory committee, and public workforce agencies. Then the competency-based programming starts with the competencies and programs review by the advisory board formed before as first step. Second, competency mapping to programs and courses was conducted. Third, course development was led by faculty and instructional designers. Fourth, programs/courses delivery was scheduled. Last, the program assessment was conducted to improve quality. “So we had to realign all of our IT curriculum with those new state competencies. So, then once we had those competencies, packaged and mapped to courses, then we took each of the courses and mapped all the competencies within the course to content and assessments and modularized them into, in most cases, five or six units per course.” Mr. T went on and said.

The alignment between competencies and courses play an important role in the development phases, and course competencies were the driving forces to individual contents and assessment to ensure that the students will be assessed in appropriate levels of competencies. Mr. T further emphasized that, “Everything has to be in alignment. Everything is mapped. The competencies are mapped to the content and the learning activities. And the competencies are mapped to the assessments. So that you ensure alignment on goes with what your instruction and your assessment. Which you should be doing anyway.”

Competency Assessment and Prior Knowledge

Our conversation on the assessment was shifted to the detail of how courses were designed to align with the set of competencies. Typically, there is pre-test and post-test in

one unit, and students have to achieve 80% in order to finish the unit. "... for each unit, there would be a pretest. And if a student passed the pretest they could skip that unit. If they didn't pass the pretest, they would have to engage with the unit and take a post-test. When I say test, I really mean assessment because it's not a test. In most cases, it's a project where they have to demonstrate they can apply the competency. And then there's usually an objective test. So, there's a knowledge piece and a performance piece associated with each of the units. So the students they already know the material. You know, complete the pre-assessment successfully at 80 percent, they can skip that unit and move on," Ms. T shared. Later I found the typical course assessment in these competency-based programs includes low-stake quizzes, which allow students have unlimited attempts, high-stake exams, which students need faculty's approval to get second attempt, and the course project.

Ms. A also mentioned that the proficiency exam was provided for each course and each competency for students who may be able to apply what they already knew or learned. So, students who had prior experience or knowledge can apply to the learning in competency-based programs and accelerate their learning. "Now, many of our courses also have a proficiency exam where the student can demonstrate that they have competencies for the entire course. But in most cases, students can't proficiency out of an entire course, because they have gaps in their knowledge So, this unit approach lets them test out of individual units skipping over what they already know and then focusing on the units where they don't already know that material. ", she explained.

Theme 2: The Role of Instructional Design

When we talked about the development of Accelerate IT programs at Institution B, our conversation shifted again to the role of instructional design in the process. “Well, I think, we already have a mature and successful online program. And so the CBE flex paced model was really the next step in the evolution of our evolution. Because we have an online program, we have centrally developed single content sources with all of the assessments and content already mapped learning outcomes. So, basically our next step was just to take what we had already done and moved to the next level. ” (Ms. T, Interview, January 2016)

The TAACCCT project team utilized and modified the existing online course development model as a template to design and develop the competency-based Accelerate IT programs. Besides the competency mapping process, the weekly lessons were replaced by units and aligned with pre-defined competencies, which was mentioned in early conversation. What was found in both reports and interview with Ms. T and Ms. A, the instructional designers did play a key role in the evolution of competency-based programs. “And you know, one of the things that I've noticed is that really CBE enforces strong instructional design practices. Everything has to be in alignment. Everything is mapped,” Ms. T said.

Instructional Designer as Project Lead

Interesting comments on the role of instructional designer was made by Ms. T in our conversation, and she said “The instructional designer leads the project. And we have

templates, We have a project plan. So, faculty serve more as the subject matter expert and finds the content and learning materials are developed, the learning materials, if they can't find them, develop the assessments. But the instructional designer leads the project. We have a timely. We put them on a schedule. And we have templates. So it's fairly rigorous, and sort of standardized.” With the existing online program development resource, two to three instructors were assigned a team of instructional designers to develop the course content and instructional media if needed. Since the instructional designers serve as project lead, they were asked to edit and approve the contents developed by the faculty or the selected textbooks and learning resources.

Assessment Development and Alignment

Another interesting finding the document review is that the instructional designers contribute to the assessment development with faculty and academic coach in the competency-based accelerate IT programs at Institution B. The instructional designers participated in competency alignments early and the testing policy development in the later stage. Hence, the Quality Matters, as an external quality standards, was adopted in the course quality review, which made sure that the course and assessment align with the pre-set competencies in each topics and courses.

Theme 3: Instructional design practices differences in traditional and competency-based program

Both Ms. T and Ms. A agreed that there are differences between traditional and competency-based program. With the well-established existing online programs, the first difference they mentioned is about personal learning schedule and student experience. Ms. T said, “You know, repackage the way that we deliver and allow students to self-pace through the content. And for the adult population, many adults cannot meet somebody else's deadlines. Because of their busy lives, they need to build their own schedule and set up their own due dates. ”

Difference in Course Structure and Flexibility

It is obvious that Institution B tried to design the competency-based program to accommodate adult learner's busy schedule and enables the students to be assessed in each competency mapped in the curriculum. “Traditional uses normally 14 topics; a mid-term and a final. And students progress sequentially and in a time-based fashion. ... We're in CBE, it's packaged into units and they're allowed to test out of a unit. There's differences in the instructor role. And there's a difference in how we compensate faculty. There's differences in grading policies, etc.,” Ms. T explained. Since the changes were made in the course structure, all the supporting elements in courses or programs have to adopt to new models.

In the accelerate IT programs, students were allowed to progress as fast as they can. However, Ms. A and Ms. T found that not all students are comfortable with the

flexibility provided by the competency-based design. “We struggled with getting students to finish on time. They would come in and they would complete a lot of content in about two-week time and they would kind of burn out and drop out of the classroom for a while. And we didn't really have good policies for structures in place to address that because it was out first term,” Ms. A said. In the second iteration of the program, Institution B implemented new policies to boost 20% of the student completion rate. One is like what Ms. A described, “We started to implement several key things the first being policy. We created policies that allowed students to accelerate but did not allow them to fall behind the semester pace as a default. They could move faster than a sixteen week pace, but they could not move slower than a sixteen week pace.” The other is to ask students to create learning pace chart to plan six-week learning activities ahead in the orientation week to help students to make the learning plan fitting to their real life.

Embedded Career Advising and Student Services

During our conversation Ms. T and Ms. A told me several times that, “CBE is not for everyone.” That belief drives Institution B’s implementation of the career assessment and screening at the very beginning of the program. Students are asked whether they have field experience, prior knowledge in the field they are pursuing, and online learning experience. Ms. A said, “We do that assessment and screening very early on and try to get the student to self-select what's the best method for them versus us prescribing to them what the best method is for them.” As a result, students can choose the best path for themselves and find the best method for their busy life.

To ensure students' success during and after the program, Institution B designed a four-phase career advising model from the time students are admitted to the time of graduation. Compared to the traditional program, the competency-based programs embed career counseling throughout the students' progressions and provide on-demand online career services to students. With these student support and career services, the competency-based programs in Institution B had 81% course completion rates and 85% intern-to-hire rate.

Internal and External Challenges

The lessons learned at Institution B also include the challenges from internal policies to external agencies during the development of competency-based programs. Internally, school policies, the roles of faculty, the compensation model, and the student support model have changed. Externally, since their inception, financial aid, accreditation, and state approval have raised a series of questions and challenges to accelerate IT programs. Interestingly, it seems to be a common scenario for every competency-based program now. As Ms. T said, "But there's huge issues related to the business model for developing and delivering and supporting CBE. And there's also a lot of faculty policy challenges. It's a different role for the faculty member. And an institution that has a unionized faculty there's just huge hurdles to rolling this forward. And then the financial model In order to support a CBE student, you need both a faculty member and a student case manager. So, that's an extra expense. And so, figuring out how you're going to divide up the roles, how you're going to change the compensation for

faculty is pretty huge. And those are things that are being struggled with by anyone who's trying to scale. The state of Washington is challenged with a faculty role. And the state of Kentucky is challenged with finding model that's sustainable and scalable.”

Institution C

Institution C is a regionally accredited, private, and not-for-profit school with 10 colleges and schools in the Midwest. With over 23,000 students enrolled, Institution C is one of the 20 largest private universities in the United States. As one of the earliest competency-based programming and Prior Learning Assessment (PLA) institutions, Institution C offers liberal arts-focused Bachelor of Arts programs to non-traditional students and created a framework of 50 competencies in the areas of lifelong learning, liberal learning, and focus since the 1970s. In all, 12 competencies have been pre-defined in the lifelong learning area, 26 in liberal learning including arts & ideas, the human community and the scientific world, and 12 in the focus area. Over the decades, students enrolled in the competency-based programs at Institution C demonstrated the targeted areas of competencies and integrated their work and life experiences while gaining new knowledge in the fields. In each course, students are asked to demonstrate one or more of the predefined 50 competencies by achieving the course criteria, finishing the proficiency exams, or developing a portfolio.

To understand this case, one formal interview and one informal interview were conducted to provide some insights to the current research questions. Ms. N is an associate professor at Institution C and serves as the new program head in design and

research. Ms. K, who was referred by Ms. N, is a member of the instructional design team at Institution C and also an instructor for competency-based programs. In addition to the interviews, official websites, documents, and research articles were reviewed before and after the interviews. As one of the pioneers in early competency-based movement, the uniqueness of this case was not only evident in the 40 years of experience in the CBE movement in higher education, but also in insights from faculty and instructional designers in competency-based programs.

Theme 1: How competency-based education is designed and developed at Institution C

In December 2015, the researcher had a chance to connect with Ms. N because of a research report that she had led that had been released by Competency-based Education Network (C-BEN) in 2015. When we talked about current developments in competency-based education, she mentioned that, “Part of it is being driven because no one exactly knows what the Department of Education is going to do...To do the direct assessment is a considerable ... It's kind of a risky investment in terms of it's a lot of work and time and money and you don't know if it's going to go. It's still early days for some of these programs. Obviously, that WGU [Western Governors University] has gotten a tremendous amount of students but some of them are so extremely small.” However, at Institution C, competency-based programs have been offered for over 40 years, and are totally different from those involved in the current competency-based education movement or direct assessment model. Later, when talking with Ms. K, who was referred by Ms. N, similar claims were found.

Traditional Instructor-led Liberal Arts-Focus Programs

Ms. K explained the design of the competency-based program in early 2016:

“Every course has an instructor. Students have instructor led courses. So, students are not proceeding at their own pace. It's liberal studies. A kind of a general liberal studies program. BA program.” She went on, “So, our CBE is different, from what the current trend is competence based education, as like, none of our courses are self-paced.”

Currently, four competency-based programs are available at Institution C: 1)

Individualized Focus Area; 2) Computing; 3) Early Childhood Education; and 4) General Business. Similar to findings from the document review for this study, these competency-based programs differ from the recent development of competency-based education in the United States. “So, students take a lot of courses in the Liberal Arts and social sciences. It's not a technical program. It's not super skill based, except in the sense of liberal learning type skills, like writing, critical thinking, that kind of stuff. So, just so that you see that we're kind of an outlier as a program,” she said.

Basically, three types of courses are offered. The first is the traditional instructor-led courses delivered on evenings or weekends to accommodate working adults' schedules. The second type of course is called “Faculty Designed Independent Studies”, which can be completed outside of the classroom setting and mainly emphasizes independent work. In this type of course, students' performance is still assessed by the faculty but no regular meeting is scheduled, as with traditional courses. The third is called “Guided Independent Studies”, which is guided by the students' faculty mentor, who chooses the appropriate competencies, chooses the appropriate faculty member to teach

the selected competencies, and makes the learning contract with the faculty mentor. Since the curricula are based on competencies, students have multiple ways to demonstrate the desired competencies.

Recognizing Multiple Sources of Learning and Prior Experience

Students enrolled in the competency-based program at Institution C are not limited to taking courses as described earlier. Similar to other higher education institutions, students can transfer the credits they earned at other accredited institutions and match competencies. Credit transfers can be also done via the College Level Examination Program (CLEP) and Advanced Placement courses.

Institution C also provides a proficiency exam for selected competencies, such as writing for competencies, critical thinking, quantitative reasoning, and information technology. So, students have multiple ways to demonstrate or prove desired competencies. In addition to these sources, students also have a chance to document the experience and demonstrate the proficiency of certain competencies—via portfolio assessment in the PLA model. The acceptable evidence of the PLA process includes: essay, product/artifacts, letters of testimony, and other supporting materials suggested by the faculty.

Backward Design in Course Development

Talking about the competency-based course design at Institution C, Ms. K mentioned that the traditional ADDIE (Analysis, Design, Development, Implement, and Evaluate) model is rarely used, but backward design, on the other hand, is the primary model followed to ensure that selected competencies can be accessed in each course. She said, “And I think we loosely use kind of an ADDIE model for our process. Our course objectives obviously are dictated to the competencies that the instructor chooses to offer in the course. Each of our courses that are a full quarter long, ten weeks long, can be offered for up to four competencies. Students can only take them for two.”

Typically, at Institution C, faculty propose courses with one or more selected competencies from a list of 50 competencies. Then the proposal is reviewed by the Teaching, Learning, and Assessment Committee which approves course proposals or suggests revisions before approving the course. After approval, the instructor is assigned an instructional designer to start course development. “The instructor or the faculty member who is proposing course, chooses, you know, proposes the competencies, which the course will develop and assess. So, that's kind of the foundation for the course development” Ms. K explained. After the proposed course and the associated competencies have been approved by the committee, course development is the next step. From then, the instructional designer, like Ms. K, is assigned to the instructor to start the development process.

Course-level Competency Assessment

Similar to other competency-based programs, students are asked to demonstrate the required knowledge, skills, and attitudes related to liberal learning at Institution C. To illustrate this, Ms. K used one of her course from a previous semester to explain the student experience in the competency assessment. Ms. K had a background in Modern European History; she recently had begun to teach courses for the competency-based programs. With both experiences of designing and teaching competency-based courses, Ms. K learned how to assess students' competencies progressively. She said, "For me, over the years, I've gotten a much more nuanced understanding of the way that we define competence and the different ways to assess competencies. I teach now and when I first started I didn't teach in the program. And so I think teaching for me has opened up my eyes to some downstream effects of instructional design that I wouldn't necessarily have understood prior to...as it relates to the competencies, prior to teaching."

In her course, for example, the students only take one single competency due to the five-week duration of the course. But students can choose one or the other of the pre-defined competencies and are required to finish all learning activities on discussion boards without exception, which count toward 50% of the final grade. "There's no differentiation between the two competencies because I tried to align the objective, kind of, inter mesh the objective that tie to each competence. But then they have a differentiated final project," she explained.

Since students may choose different competencies to demonstrate in the course, they received different final projects accordingly. Then, each student received

personalized feedback on the performance in both learning activities and the final project. “What we do is the faculty write a narrative describing student’s performance on each individual competence. So, if I were teaching four and student A is taking two different competencies he or she is probably going to write or develop two different summative assessments at the end there. ... ideally there's some differentiation between the assessments for the different competencies they choose,” Ms. K said. At the end of the course, the instructor gave a separate grade for each competency in the course. So, students may receive an A in one competency and a B in another.

Theme 2: The Role of Instructional Design

The primary role of the instructional designer in competency-based programs is more traditional, focusing on collaboration with the faculty throughout the design and development process in individual courses. Four full-time and one part-time instructional designers are supervised by the instructional design director as an instructional design team for the programs. Ms. K explained the role of her team in more detail: “...our director is the person who sits on for example, the college's curriculum committee, or the school’s curriculum committee. So, she is part of that kind of, you know, she has input in that programmatic decision making. She's the director of online learning for the school. Any influence that we have trickles up through her. We don't really have direct influence not on programmatic decisions. On course level decisions, yes, but not on the big programmatic. We have pretty comprehensive traditional faculty governance structure.

So the faculty are the ones who are in the end, they're the ones who are responsible for the program.”

Traditional Course Design and Development Process

In the early discussion with Ms. K, the role of the instructional designer was primarily to support faculty in course design and development, but still have some indirect influence on curriculum and program-level development through the director. After the course proposal was approved, the instructional designers became involved in the process, which is usually a six-month timeframe. “I am matched with a faculty member, course author, after the proposal has been approved. And then from there we typically have about a six-month development process. We kick off with a face to face to meeting and we talk with the instructor about their goals for the course. We send them a way to make...we have a couple of forms that essentially where the instructors map out alignment between assessments and instructional activities and the competencies,” said Ms. K.

Due to the nature of backward design, the primary task in the course design and development process is to ensure alignment among assessment, activities, and the set of competencies. She emphasized the collaboration with faculty and highlighted continuous improvement from the beginning to the end of our conversation. Ms. K said, “We collaborate with the faculty member the whole way through. They send us...we set up a schedule and they send us separate modules and we give them feedback and it's kind of an iterative process. And once it's completed we definitely do that e-portion of the

ADDIE where we do a meeting after the first time the course runs and talk about what worked and what didn't. Look at student evaluations. If there is significant data there and make improvements based on that. So, we're always improving.” Due to her past experience with instructional design, the researcher was inclined to agree.

Competency Mapping and Alignment at the Course Level

Ms. K mentioned that one of her jobs was to promote and educate others on the importance of aligning competencies with assessment while she talked about the experience working with faculty. She said, “Ideally, the competencies are the foundation of the course. And everything should map to them. So, in that sense we start with the competencies. Some faculty ideally we start with the competencies, write the assessments, you know, do all the assessments however the assessments are and then develop everything else around them. You know, in practice, I think, it's a little more fluid. Just because it's really hard for faculty to divorce the assessments from the course content and the instructional materials sometimes. They can have a sketch of the assessment but it really doesn't get fully fleshed out until later.”

Faculty and the instructional designer review the definition and criteria for defined competencies before mapping them to the assessment. Here is one example of the required competency in the Art and Ideas Category:

Competency A-X: Can define and analyze a creative process. (REQUIRED)

1. Can define the concept of creativity.

2. Can identify, analyze, and describe the components of a creative process in one or more fields of human endeavor.
3. Can explain how engaging in a creative process affects one's perception of the world.

In order to provide more guidance to faculty who were making decisions, the contextual and suggested assessment were provided as well. For example, for the competency mentioned above, the detailed instruction was like this:

Creativity is often associated with forms of human expression in the literary, fine, and applied arts. Because it involves the development of innovative ideas and fresh approaches to problems, however, the practice of creativity is no less integral a component of the social, physical, and technological sciences. In any field of human endeavor, the creative process requires ability to question accepted and “acceptable” ways of perceiving and thinking, as well as a willingness to forge connections and refine knowledge through doubt, curiosity, and imagination. Through engagement, reflection, and analysis, this competence invites the student to understand how a creative process is born, how it functions, and how it changes our perception and experience of the world. Such insights may develop, for example, by analyzing the creative process in the writing of a poem, the production of a visual narrative, the planning of a city, the design of a web site, or the development of an innovative way of perceiving and explaining a natural phenomenon (Competency and Criteria, Institution C, 2015).

Educator and Advocate of CBE

At Institution C, it took several iterations to ensure that the assessments mapped with the selected competencies—one of several challenges faculty encountered. In most cases, faculty were prepared to align the assessments with the competencies. However, sometimes the instructional designers needed to provide more education and support to faculty who were not quite familiar with adult learners. “So, obviously we strive for a backward model and a backward approach. And describe that to faculty as well. I mean, the nice thing is that because we're talking about adult students and because we talk about pedagogy and competencies and all that kind of stuff, our faculty tend to be a little more receptive to developing quality objectives that come out of the competencies and things like that that can be a challenge in other context. More of a challenge with faculty who aren't as well versed in pedagogy and curriculum,” said Ms. K.

Similar to most of the instructional designers’ experiences, including this researcher, the biggest challenge was to ensure that faculty delivered the content materials and assessment on time. After talking about the challenges and her roles in this competency-based programs, Ms. K told me, “But the biggest is that deliverable. Getting them [faculty] to follow the schedule.” We both laughed.

Theme 3: Instructional design practices differences in traditional and competency-based program

Since the competency-based programs have been implemented for over 44 years at Institution C, it was interesting to identify differences between traditional and competency-based programs.

Backward Design and Reliance on Pre-defined Competencies

According to Ms. K., “The biggest difference that I’ve noticed is that reliance on the competencies and this set of objectives of the competencies are dictated by the program.” Due to the backward design and policy set by the curriculum committee at Institution C, reliance on the pre-set competency framework in course design and development was inevitable. The program and the faculty, on the other hand, still made the final decision on selecting the appropriate competencies: “We have pretty comprehensive traditional faculty governance structure. So the faculty are the ones who are in the end, they’re the ones who are responsible for the program.”

However, everything needed to be mapped with the competencies after these competencies had been chosen and approved by the program and committee. Ms. K shared the example of one of her courses to emphasize the reliance on competencies in instructional design practice:

I can give an example from my...I developed my own course. I have developed a history course and because of the two competencies that I chose, I actually had to change the topics that I or throw out some of the topics that I was interested in

covering because they didn't align with the competency. The particular example is I teach a course on...well, originally I wanted it to be about protests and activism in the 1960's and 1970's. What it ended up being about more with civil rights. I didn't include the environmental movement. I didn't include the anti-war movement because I chose a competence that was related to power and justice and inequality in the United States. So I had to focus more on the protests or specifically around civil rights, women's rights, gay rights, that kind of thing. That's one of the things that makes it different from a traditional program. Because in a traditional program, I could just say, okay, I'm going to do a course on protests. And I can use all the different protests. But in this case, I had to steer in a slightly different direction in order to fulfill the requirements of the competence (Ms. K, Interview Transcript, 2016).

So, designing and developing courses for competency-based programs needs to heavily rely on pre-chosen competencies. With the backward design model, the instructional designer and the instructor must choose the appropriate topics, materials, and assessments to align with competencies rather than instructor's preferences or past experiences with teaching.

Required Faculty Development and Preparation

Most courses offered in the competency-based program are online or hybrid. Even though the program has existed for decades, the need to prepare each instructor to teach online and competency-based courses is ramping up. One of the reasons is the increasing

number of adjunct faculty who may not be familiar with competency and adult learners. Again, Ms. K said, “We have a good group of full-time of resident faculty and they develop some courses with us. But we also have a large group of adjunct and adjuncts understand the competence system. Some of them understand it to a lesser extent.” As found at Institution C, efforts were being made through internal policy, a curriculum committee, and efforts of instructional designers to ensure the quality of competency-based course delivery. However, it was just not enough in some cases.

To prepare instructors for competency-based programs, Institution C designed a two-week faculty development course called “Teaching to Competence”. It was required of faculty who teach or will be teaching in online competency-based programs. Ms. K explained, “We have a course, this is for online faculty online. This does not apply to faculty who teach face to face, though we recommend they take this training. But we have a two-week online training course that's facilitated by a master instructor. A master full-time resident faculty member who facilitates this course. We call it ‘Teaching to Competence’.”

Further, “it walks faculty through doing some essentially some inter-rater reliability type activities where everybody looks at a single competence and then they evaluate the same student work and then they discuss their... how they would have if the student work meets the competence or doesn't meet the competence and why. We do have that training. Our online faculty are required to take that training prior to teaching for us online.”

When Ms. K was asked whether she had any concerns or suggestions about their competency-based programs, she said that “...our program has been in place for so long

and it's relatively well tested. And relatively mature in that sense. I think it's a really interesting well rounded program. And we give our students flexible options. All that kind of stuff. So in that sense, I don't really have concerns or suggestions,” she paused and went on, “I mean it's a really interesting program. I think it's really good for a certain kind of adult student. A student who really wants to map their own way and choose their own focus area and develop their own major. Because that's essentially what they're doing with us.”

Chapter Summary

Three cases were examined in this investigation of the competency-based education movement in the early 2010s in the United States. In this chapter, findings were presented that were based primarily on analyses of interviews and review of documents for three cases. The themes preserved the main research questions, and the findings captured the observations found in certain contextual settings of the cases studied (Stake, 2006). In order to understand how the CBE programs were designed and developed, to identify the role of instructional design in the CBE programs, and to investigate the differences between traditional and CBE programs in U.S. higher education institutions, three institutions were selected for this study: 1) Institution A, a regionally accredited, fully online university that is one of the first higher education institutions approved by the U.S. Department of Education to adopt direct assessment programming in both bachelor's- and graduate-level degree programs; 2) Institution B, the largest community college at a single location in a Midwest state and the consortium

lead for two other community colleges who received external funding from the second round of the TAACCCT grant program; and 3) Institution C, a regionally accredited, private, and not-for-profit school in the Midwest and one of the earliest competency-based programming and Prior Learning Assessment (PLA) institutions since the 1970s.

At Institution A, the CBE programs were transformed from existing credit programs due to the solid authentic assessment infrastructure built over the past ten years. The instructional design staff were responsible for mapping course content to defined competencies, chose or developed appropriate direct assessments, and found resources to replace the required textbooks in the CBE programs. The existing assessment-driven curricula for both traditional and CBE programs at Institution A provided a unique niche for the instructional design team and faculty as these responded to the CBE requirement from both the U.S. Department of Education and regional accreditor.

At Institution B, the CBE programs were designed to improve students' employability and were transformed from existing credit programs to a flexible format in order to better respond to requirements from the U.S. Department of Labor. The instructional design team served as the project lead in assisting faculty align with the competencies defined by industry leaders and state agencies throughout the CBE programs. Embedded student support and career advising at Institution B served as a unique asset in helping students finish degrees in flexible ways and transition seamlessly to the workplace.

Compared to the other two cases, Institution C offered more traditional CBE programs than the Direct Assessment CBE programs recognized by the U.S. Department of Education. However, a well-established liberal arts-focused competency framework

and backward design principle ensure the quality of CBE programs at Institution C. The role of the instructional design team was to serve as project lead and CBE advocate to help faculty in aligning competencies, contents, and assessments in a more traditional way. Hence, the unique faculty development program provided a solid foundation in CBE programs over 44 years.

Every case was unique in the current study, which sought to gain an understanding of the current CBE movement in the early 2010s through the lens of instructional design. Differences and similarities were evident across these cases. In the next chapter, the cross-case analysis is discussed and future recommendations are offered.

Chapter 5

Cross-Case Analysis

In order to investigate the role of instructional design in the recent competency-based education movement in the United States, the case study research method and multiple case study analysis served as the primary research methods in this study, which was designed to explore: 1) the uniqueness of single cases and; 2) both the similarities and differences in cross-case analysis. Each of the three cases in this research was different, but together provided a greater understanding of the early 2010s' CBE movement in higher education institutions in the U.S. from the perspective of instructional design. As Stake (2006) said, "Were we to agree completely on what we see, we would presume that we are seeing correctly- and often we are not" (p. 87). This chapter started with a cross-case analysis to converge the findings from all three cases studied.

Cross-Case Analysis

"Each case's research will have its individuality, as will its report, and some of that individuality needs to be preserved, but the analysis itself depends on considerable standardization" (Stake, 2006, p. 306).

In the previous chapter, the findings from three cases were illustrated and described according to the three major themes guiding this research. As Stake (2006) recommended, rating the findings is needed to make assertions. A short synopsis of each case was provided before offering cross-case analysis, as follows.

Synopsis of Institution A

Institution A was selected to illustrate the CBE programs situated in a regional accredited, private, for-profit, and fully online university setting. As one of the very first Direct Assessment CBE programs recognized by the U.S. Department of Education, Institution A transformed its credit-bearing courses into Direct Assessment CBE courses. Interview transcripts, reports, and documents were reviewed and analyzed to help the researcher understand how the instructional design team supported the faculty in overcoming the removal of seat time and challenges from regional accreditors and the U.S. Department of Education.

Uniqueness among other cases

As one the first Direct Assessment CBE programs in the early 2010s, this case addressed a few CBE features and challenges in practice. The set of competencies that needed to be demonstrated by students at Institution A was transformed by expectations from employers, professional organizations, and standards. The faculty used criterion-referenced scoring guides to evaluate students' performance in competency demonstrations in courses.

At the course level, selected competencies guided assessment selection or creation to ensure that learning outcomes would be evaluated in desired ways. The backward design at Institution A began with the selection of competencies and learning outcomes, and assessment development and selection came before content development due to university policy on criterion-referenced scoring guides in place since 2002.

Case Findings

The nine case findings were rated and sorted according to importance to themes, as shown in Table 5.1.

Table 5-1

Importance of Rated Findings to Themes in Institution A

Institution A	Theme 1	Theme 2	Theme 3
Finding III: <i>Backward Design Model</i>	H	H	H
Finding IV: <i>Mapping Course Contents with Competencies</i>	H	H	H
Finding VIII: <i>The Impact of Removal of Seat Time</i>	H	H	H
Finding VIII: <i>Difference in Student's Learning Experience</i>	H	M	H
Finding V: <i>Assessment Selection or Development</i>	M	H	H
Finding VII: <i>Difference in Instructional Design Practices</i>	M	H	M
Finding I: <i>Transforming Existing Programs to U.S. Department of Education-recognized CBE Programs</i>	H	M	L
Finding II: <i>Direct Assessment Foundation including PLA and Authentic Assessment</i>	M	L	H
Finding VI: <i>Finding Learning Resources</i>	L	H	L

H= High importance; M=Middling importance; L=Low importance. High importance means that the case finding is highly important to this theme.

Synopsis of Institution B

Institution B was chosen to offer insights into a CBE program developed under a TAACCCT grant awarded by the U.S. Department of Labor. Compared to the Direct

Assessment CBE programs recognized by the U.S. Department of Education, this case was situated in a public community college setting. In order to fulfill grant program requirements, the CBE programs were transformed from existing IT programs to accelerate format. The curriculum was driven by business leaders and state agencies. Embedded student services and career advising made these programs unique. The researcher did not have a chance to include voices from instructional design team members to deepen understanding of the case.

Uniqueness among other cases

This case allowed the current study to expand understanding of CBE programs from the perspective of community colleges and the U.S. Department of Labor. Strong student services and career advising were embedded to boost the student success rate and intern-to-hire rate among CBE programs at Institution B.

The set of competencies students needed to demonstrate in CBE programs was transformed and realigned from state-defined competencies, employer expectations, and professional standards. Students' performance on competency demonstrations was evaluated via proficiency exams for the knowledge piece and projects for the performance piece. At the course level, the backward design model was implemented and learning outcomes were defined by workforce/employer partners, and course contents and assessment were guided by learning outcomes mapped to competencies.

Case Findings

Eight case findings were rated and sorted according to importance to research themes, as shown in Table 5.2.

Table 5-2

Importance of Rated Findings to Themes in Institution B

Institution B	Theme 1	Theme 2	Theme 3
Finding III: <i>Backward Design Model</i>	H	H	H
Finding V: <i>Assessment Development and Alignment with Competencies</i>	H	H	H
Finding I: <i>Transforming Existing Programs to CBE Programs with U.S. Department of Labor Funding</i>	H	H	M
Finding VI: <i>Difference in Course Structure and Student Progress in Learning</i>	H	M	H
Finding II: <i>Industry-driven Curricula and Competency Assessment</i>	H	L	H
Finding VIII: <i>New Business Model needed for CBE</i>	H	L	H
Finding IV: <i>Instructional Designers as Project Leads</i>	M	H	L
Finding VII: <i>Embedded Career Advising and Student Services</i>	M	L	H

H= High importance; M=Middling importance; L=Low importance. High importance means that the case finding is highly important to this theme.

Synopsis of Institution C

Institution C had been implementing competency-based programming since the 1970s. Unlike current Direct Assessment CBE programs, the CBE program in this case seemed to be more traditional and offered according to an instructor-led format. The case was situated in private, non-for-profit, and urban university settings in the Midwest. Interview transcripts, documents, and official websites were reviewed and analyzed to help the researcher understand the case. The perspectives of administrators at Institution C were not included, and reliance on the perspectives of instructional designers and instructors in the case report may have had some limitations.

Uniqueness among other cases

This case illustrated the traditional role and challenges of instructional design in the traditional CBE program. The competency framework was defined by faculty in the early 1970s, and students' performance on the competency demonstration was evaluated by faculty using extended assessment rubrics. In courses, the backward design model was utilized to guide the development of contents and assessments. Once the competencies were chosen, the instructor and instructional designer designed and developed the contents and assessments around the competencies. Feedback and grading rubrics were provided to help students demonstrate predefined competencies.

Case Findings

Eight case findings were rated and sorted according to importance to the research themes, as shown in Table 5.3.

Table 5-3

Importance of Rated Findings to Themes in Institution C

Institution C	Theme 1	Theme 2	Theme 3
Finding III: <i>Backward Design Model</i>	H	H	H
Finding V: <i>Competency Mapping and Alignment at the Course Level</i>	H	H	H
Finding VII: <i>Reliance on Pre-defined Competencies</i>	H	H	H
Finding VI: <i>Being Educator and Advocate of CBE</i>	M	H	H
Finding VIII: <i>Required Faculty Development and Preparation</i>	H	M	H
Finding II: <i>Recognizing Multiple Sources of Learning</i>	H	L	H
Finding I: <i>Traditional Instructor-led CBE Program in Liberal Arts Studies</i>	H	M	M
Finding IV: <i>Traditional Course Design and Development Process</i>	L	H	L

H= High importance; M=Middling importance; L=Low importance. High importance means that the case finding is highly important to this theme.

Merged findings across cases

After carefully reviewing individual case findings across three sites, there was a desire to merge some of the common findings to help generalize the assertions in the later

stages of this study (Stake, 2006). This research found six merged findings and eight special findings as listed in Table 5-4.

Some levels of similarities across cases were found in the merged findings, such as: 1) Merged finding I—one of the preferred ways to start a CBE program is by transforming current credit-bearing programs into CBE offerings at both Institution A and Institution B; 2) Merged finding II—backward design serves as the primary model for designing and developing CBE programs in all three cases; 3) Merged finding III—one of the roles instructional design staff play in CBE programs is to align assessments with mapped competencies in both Direct Assessment, accelerated or traditional CBE programs; 4) Merged finding IV—students’ prior learning experience is recognized as one sources of learning in CBE programs at Institutions A and C; 5) Merged finding V—students enrolled in CBE programs have different learning experiences compared to traditional programs at Institutions A and B; and 6) Merged finding VI—in order to adopt a CBE model, Institutions A and B must make changes to existing policy, resources, and systems.

Table 5-4

Rated Merged Findings on Importance to Themes across Cases

Merged Findings	From Which Cases?	Theme 1	Theme 2	Theme 3
Merged Finding I: <i>Transforming Existing Programs to CBE Programs</i>	A-I, B-I	H	M	M
Merged Finding II: <i>Backward Design</i>	A-III, B-III, C-III	H	H	H
Merged Finding III: <i>Competency Mapping and Alignments</i>	A-IV, A-V, A-VII, B-V, C-V, C-VII	H	H	H

Merged Finding IV: <i>Recognizing Prior Learning Experience</i>	A-II, C-II	M	L	H
Merged Finding V: <i>Difference in Students' Learning Experience</i>	A-VIII, B-VI	H	M	H
Merged Finding VI: <i>Impact of CBE Programming</i>	A-VIII, B-VIII	H	M	H
Special Finding I: <i>Finding Learning Resources</i>	A-VI	L	H	L
Special Finding II: <i>Industry-driven Curricula and Competency Assessment</i>	B-II	H	L	H
Special Finding III: <i>Instructional Designers as Project Leads</i>	B-IV	M	H	L
Special Finding IV: <i>Embedded Career Advising and Student Services</i>	B-VII	M	L	H
Special Finding V: <i>Traditional Instructor-led CBE Program in Liberal Arts Studies</i>	C-I	H	M	M
Special Finding VI: <i>Traditional Course Design and Development Process</i>	C-IV	L	H	L
Special Finding VII: <i>Being Educator and Advocate of CBE</i>	C-VI	M	H	H
Special Finding VIII: <i>Required Faculty Development and Preparation</i>	C-VIII	H	M	H

H= High importance; M=Middling importance; L=Low importance. High importance means that the merged or special finding is highly important to this theme.

Special findings situated in single case context

“What multicase studies have most to offer is a collection of situated case activities in a binding of larger research questions” (Stake, 2006, p. 90).

In addition to finding similarities across studied cases in the current study, it also was important to provide particular findings situated in each individual case. In Table 5.4, eight special findings that could not be merged or removed after cross-case comparison were: 1) Special Finding I—one of the unique roles played by instructional design staff in a Direct Assessment CBE program is to find suitable learning resources to replace the

required textbooks in certain courses; 2) Special Finding II—with guidelines and expectations from the U.S. Department of Labor, the CBE curricula and assessment are highly tied with industry needs and trends; 3) Special Finding III—often times, instructional design staff in CBE programs serve as project leads who coordinate different processes and components in community college settings; 4) Special Finding IV—the uniqueness of CBE program at Institution B is the embedded student services and career advising; 5) Special Findings V and VI—at Institution C, 44-year-old CBE programs are offered in traditional ways and focus on liberal arts studies; 6) Special Finding VII—In traditional CBE programs, instructional design staff put a lot of effort into educating and advocating the CBE model to faculty; and 7) Special Finding VIII—the required faculty development program at Institution C is unique compared to the other two studied cases explored in this research.

Chapter 6

Summary, Assertions, and Recommendations

Study Summaries

Competency-based education (CBE) is not new to U.S. higher education; it emerged a few decades ago during efforts to reform teacher education in the United States. In the early 2010s, several higher education institutions were recognized by the U.S. Department of Education or the U.S. Department of Labor for providing new ways to assess students' performance through competencies rather than seat time in a degree program. This research study was designed to investigate the recent development of the CBE movement in the United States from the perspective of instructional design and to identify the role of instructional design in CBE programs. Three research questions were answered through multiple case studies across three sites:

1. How has the competency-based program been designed and developed in selected institutions?
2. What is the role of instructional design in competency-based programs in selected institutions?
3. What are the similarities and differences in instructional design practices between traditional and competency-based programs in selected institutions?

The current research was conducted through semi-structured phone interviews with individuals at three selected higher education institutions and through the review of reports, documents, and official websites. The data collection period began in December

2015 and continued through February 2016. The three selected cases were: (1) Institution A, a regional accredited, fully online university, which is one of the first higher education institutions to adopt direct assessment CBE programming at both the bachelor and graduate levels; (2) Institution B, the largest community college in one of the Midwest states and the consortium lead of the TAACCCT grant program; and (3) Institution C, a regionally accredited, private, and not-for-profit school in the Midwest with one of the earliest CBE programs in the United States.

In order to illustrate and highlight the uniqueness of each study case, single case reports were presented (see Chapter 4). As Stake (1995) claimed, “Case study reporting is not simply storytelling” (p. 127). The current study adopted one of his suggestions in writing case reports and organized the single case report according to the researcher’s view of the studied case and research themes. In addition to the single cases, a multiple-case study report was provided at the beginning of chapter 5 to help readers transition from individual and merged case findings to theme-based assertions after the cross-case analysis.

Assertions

As Stake (2006) said, “What multicase studies have most to offer is a collection of situated case activates in a binding of larger research questions” (p. 90). In this section, theme-based assertions are made to answer the three research questions in the current study. The purpose of this research was to identify the role of instructional design in CBE

programs and to provide insights that optimize the implementation of CBE programs in U.S. higher education.

Research Question 1: How has the competency-based program been designed and developed in selected institutions?

Similar to findings offered in the literature review (Frank et al., 2014), a backward design, which starts the instructional design process from identifying desired results and ensuring the competencies are mapped and aligned, is the most common model being used in either Direct Assessment CBE programs, TACCCT-awarded CBE programs, or traditional CBE programs. To reduce the impact of CBE programming on existing curricula and programs, it is common to transform the existing degree program and fulfill the requirements of accreditation, state policy, the U.S. Department of Education, or the U.S. Department of Labor. However, in more traditional CBE programs, like Institution C's, the instructor-led courses were designed and developed from scratch and tied to the predefined competency framework that has existed in liberal arts studies over decades.

The difference between CBE programs recognized by the U.S. Department of Education and the programs funded by the U.S. Department of Labor is another interesting finding in this study. Due to the current policy and guidance of Direct Assessment CBE programs and the restriction of Title IV financial aid, the CBE programs at Institution A were designed and translated to fulfill standards and regional accreditors' requests. With the solid authentic assessment infrastructure, the CBE programs at Institution A spent more time on transforming existing degree programs rather than identifying competencies, which have been fine-tuned over the past 10 years.

Under the TACCCT grant, the original purpose of the CBE programs at Institution B was to bridge the gap between industry needs and student competencies. The curriculum was highly connected with industry needs and market trends, and the backward design enabled the CBE programs to ensure students would be tested on competencies rather than seat time or grades.

As Ms. T. said in the interview, “This is not a curriculum project.” CBE programming is more than a curriculum redesign, which was apparent across all three cases. No matter what purposes or motivations the modern higher education institution had before adopting CBE programming, the backward design and competency alignment were highly valued according to the three cases in the current study. There are still some unknown challenges and issues for Direct Assessment CBE programs compared to the traditional CBE programs, like those offered by Institution C. The promising instructional design model for CBE is still meager, and the needs for more connections between higher education and the workforce are emerging with the ascending CBE movement.

Research Question 2: What is the role of instructional design in competency-based programs in selected institutions?

The role of instructional design in CBE programs is still evolving, as Frank et al. (2002) predicted. As anticipated, the primary duty of instructional design teams or staff is to ensure alignment among competencies, assessments, and content due to the highly emphasized backward design principles of the CBE world. Compared to the most recent C-BEN survey conducted in 2015, the current study did provide a new angle on CBE program development and highlighted the roles of instructional design in the process.

Most of the respondents in the C-BEN research on the role of faculty and staff were situated at the early stage of CBE programming (Navarre Cleary, 2015) and current research. On the other hand, some were focused on more developed CBE programs.

The evolving role of instructional design was also apparent while observing changes in instructional designer duties and responsibility in selected cases. The roles instructional designers play in CBE programs may vary according to different institutional settings and contexts. For example, in Direct Assessment CBE programs, instructional designers find, organize, and draft content to enrich learning resources; they perform more like editors in the publishing industry. On the other hand, many instructional designers act more like project leads, coordinating resources and ensuring project progress in course development processes. This was the case at Institution B, for example, due to the pre-defined project plan for the TACCCT grant program, and it also was evident in the evolving role of instructional designers or support staff in the CBE movement.

Another unique finding, which was only found at Institution C, is that instructional designers not only engage in course design and development, but they also serve as CBE advocates for programs to prepare faculty. Even though Institution C has been adopting CBE programming in its liberal arts studies for decades, instructional designers still need to educate and promote the ideas of CBE and backward design to adjunct faculty. In a nutshell, the primary roles instructional design plays in either CBE programs or traditional programs remain the same, but the duties and responsibilities of instructional designers in CBE programs became larger and more important in observed institutions.

Progressing from a more traditional instructional support role toward a role that has a more direct impact on CBE programming was apparent for designers across all three cases. Serving as project lead in coordinating instructional resources, educating faculty to teach in CBE programs, and participating in curriculum and assessment design were three unique roles seen in each case. Every CBE program is unique and has its contextual limitations. The role of instructional design may shift, just as Mr. W said: “I really think every three to five years we're going to see movements. It might be competency-based. It might be something else. But I really think these big, big shifts will not be stopping any time soon.” On this, we both agreed.

Research Question 3: What are the similarities and differences in instructional design practices between traditional and competency-based programs in selected institutions?

As Mr. W at Institution A said during our interview, “This is a huge transformational time in higher education.” CBE has brought some changes to current higher education. In all three cases in the current study, none of the CBE programs were developed from scratch, but there were fundamental differences between traditional and CBE programs in instructional design practices. At both Institutions A and B, the CBE programs were transformed from existing programs and used the same or similar assessments as the traditional credit-bearing courses offered at the same institution. By removing seat time, students experienced a difference in CBE programs across all three cases. Even when we looked into a more traditional CBE program, like those offered at

Institution C, the selected competencies did impact what was taught and delivered in the classroom.

The other unique component across three cases is the inclusion of multiple sources of learning at both Institutions A and B. Hence, students' prior experience could be recognized or tested at the course level at the three institutions. This finding aligned with the CBE PLA model proposed by Butterworth (1992), who claimed that there were two practical models of PLA: the competency-based credit exchange model and the developmental model. The former is similar to the typical PLA process used at both Institutions A and C, and the latter is similar to the CBE assessment at Institution B.

The strong connection to industry needs and trends is another interesting finding at Institution B. Due to the nature of community colleges and the grant from the U.S. Department of Labor, the advisory board of industry leaders and experts boosted student success rates and employability after finishing CBE programs at Institution B. The voices of industry experts did impact competency mapping at the program level and ensured that students' performance would be assessed in a practical way. In addition to the industry-driven curriculum, embedded career advising and student services provided more frequent and timely services to online CBE students. These unique findings from Institution B matched claims made by van Merriënboer (2001) about preparing CBE programs.

There are also similarities in instructional design practice between CBE and traditional programs. On the whole, the primary duties of instructional designers did not change in CBE programs; these included collaboration with faculty or SMEs, instructional media development, project management, course support, and others.

Externally, the regional accreditors or quality reviewers seek the same evidence of quality and outcomes as other higher education institutions. Hence, internal faculty are still those responsible for approving course content and assessing students' performance and competencies. In today's higher education, a comprehensive traditional faculty governance structure still exists, and while the recent CBE movement has brought some changes, the process is gradual.

While there are both similarities and differences between CBE and traditional programs, there is no correct or incorrect way. When talking with all of the interviewees and researchers in this study, I was always reminded that "CBE is not for everyone." Some students may prefer self-paced online CBE programs like those offered by Institution A; some may feel more comfortable with accelerated CBE programs, which allow students to finish early with no allowed delay; and some may seek a more traditional experience in CBE programs like those offered at Institution C. CBE programming is not a disruptive innovation; it is an alternative way to help students learn. In our short conversation, Dr. Johnstone at WGU and I agreed that the biggest difference between CBE and traditional programs is that CBE programs are trying to help students to prepare for the workforce and respond to workforce needs.

Recommendations

Even if the main assertions are clearly stated, the multicase report will say different things to different audiences, accommodating and eluding various expectations (Stake, 2006, p. 88).

The purpose of the current study was simple and straightforward—it attempted to illustrate the evolving roles of instructional design in the recent CBE movement in the United States. CBE is not new and should not be considered a disruptive innovation in higher education; however, the general lack of information in the education literature on the role of instructional design in the CBE movement needs attention. The current study utilized qualitative inquiry to offer a different look at the three selected research sites; the researcher tried to preserve the uniqueness of each individual case and provide cross-case analysis to enrich both readers’ and researchers’ knowledge of the “Quintain”.

For future researchers

The current study exemplifies a starting point for future researchers interested in the evolving roles of instructional design in future educational movements. With limited prior studies and resources, the researcher situated himself as an instructional designer for a few years while collecting research data and analyzing cases. As an insider in the profession and an outsider in the studied cases, this study was sometimes challenging. I attempted to the best of my ability to keep my value neutral. Inevitably, I put myself into the data analysis, but it was also important to remind my readers of my personal presence and subjectivity (Stake, 1995).

I faced several challenges that I did not anticipate before data collection. Gaining access to the research sites or cases was the first challenge. As found during data collection, by January 2016, over 600 institutions were offering or planning to offer some sort of CBE programs in the United States, and the number is growing. However, it

turned out that it was difficult to obtain permission to conduct research, even at the same institution the researcher was serving. The second challenge was the number of data sources. Even though the quality of the interviews did bring insightful and diverse voices into the current study, readers may benefit more if more diverse data sources are included to make theme-based assertions in a multicase study like this one. Future research may include recruiting a team of researchers to conduct a multicase study as recommended by Stake (2006). With the support of a research team, the uniqueness of individual cases can be easily preserved, and triangulation across cases can be done in a more objective way. Hence, potential challenges for future researchers still involve access to research sites, and withdrawal and rejection during the data collection phase are almost inevitable. Future researchers should start with personal connections and professional networks to professional associations, regional accrediting organizations, and state governments, and utilize referral sampling techniques to gain access to target research sites or programs. However, most important to qualitative research is the concept of saturation; the degree of sampling would not be critical if saturation was observed in the study.

Theoretically, no new instructional design model or practice was observed, but new patterns and roles of instructional design did emerge. Future researchers should investigate this topic to ensure the rigor of the design process in CBE programs. For example, the Successive Approximation Model (SAM) could be an interesting model to investigate in CBE programs. Compared to the ADDIE model, which usually has a longer processing time and is more linear, Allen, Sites, and Association for Talent Development, formerly American Society for Training and Development (2012), proposed the Successive Approximation Model as a more modern and agile instructional

design model focusing on performance needs throughout the process. It is able to perform rapid prototyping in instructional design via a series of iteration processes involving design, creation, and evaluation. Sleezer, Russ-Eft, and Gupta (2014) also suggested that SAM would be a better model to use in the case of high-level agreement on training needs and a low-cost design process. In most CBE programs, agreement on needs across stakeholders is usually high but the cost of design and development may vary. Defining the proper design process may require both instructional design theory and practice in CBE programming over the next several years.

The current research did reflect my personal and professional passion for the CBE movement. Since the related research is still meager, I hope the current study addresses some of the research community's needs and interests in the future.

For practitioners

Multicase studies are sometimes created at least partly to promote the Quintain or to advocate the spread of its policies and practices (Stake, 2006, p. 84).

Since the early 2010s, the CBE movement has grown and received a lot of national attention. For practitioners in CBE programs, or those who may be interested in this educational movement, this research offers valuable information and provides enriched experience in the CBE world.

First, instructional design plays an important role in CBE programs, directly and indirectly. Even though instructional design has begun to play an important role in the CBE programming process, the emerging needs for quality instructions and learning

experience are inevitable. It is recommended that instructional design staff or teams be included in higher-level planning and the decision-making process. With voices from the operational side, CBE programs can easily adapt different requirements or standards requested by regional accreditors or federal government organizations in a cost-effective way. More importantly, the bottom-up approach may have deeper impacts on the current education system in the United States. CBE is not new to higher education, but instructional design could make CBE programs different and unique.

Second, CBE is not for everyone, but it should prepare students for workforce needs. A similar claim was heard throughout the interviews, and CBE does hold different meanings for students, instructors, administrators, academic programs, and even institutions. Students may or may not choose CBE programs due to the lack of familiarity or uncertainty about the different pathways to a degree, and the majority of students may not be sure if the CBE fits into their busy lives even it is more flexible than traditional degree programs. Sometimes students with different self-regulated learning strategies may or may not benefit from the accelerated or flexible subscription model of learning. In that case, strong student support and career guidance may be a good way to help students who may not be ready for the competency-based model.

CBE is also not for every academic program or institution due to the nature of the CBE movement over the past few years. Both the U.S. Department of Education and the U.S. Department of Labor have advocated for CBE from different assumptions. The three selected institutions in the current study all have different ways of designing and developing CBE programs, and there is no so-called one-size-fits-all CBE design. Meanwhile, over 600 programs have adopted or plan to adopt CBE offerings in 2016, so

institutional administrators should ensure that students are the first priority rather than being followers in the movement, as educators should think before adopting CBE. There is no correct or incorrect way to design or develop CBE programs as found across these three cases, but decision makers should pay more attention to details and the hidden challenges of CBE programming and tailor programs carefully.

One of the things I learned from Institution C is that CBE is also not for every instructor or faculty member in higher education. Without proper training and support from Instructional Design support staff, it is not easy for someone who has taught for a long time in traditional classrooms, either physically or virtually. In CBE programs, instructors need to develop and teach content based on predefined competencies, and this could be a big challenge for them. Thus while CBE is not for everyone, it could be for everyone if future practitioners plan accordingly.

Third, strong student support is one of the keys to retaining students in either CBE or traditional programs. Findings from Institution B revealed that a high student success rate and high intern-to-hire rates result from both industry-driven curricula and embedded student services. More frequent contact and more meaningful feedback could reduce students' uncertainty regarding online learning spaces and the self-paced format, especially in CBE programs. Without self-regulation in learning, adult learners may find it a challenge to accelerate or finish learning modules in a flexible way. Moreover, career counseling and advising could provide more synergy to current or future CBE programs due to strong connections between industry needs and CBE curricula in most cases. In any case, future CBE practitioners should pay more attention to student services and

career guidance in CBE programs, and strive to develop a better way to serve the needs of non-traditional students in higher education.

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Appendix A

Recruitment Letter

<<Date>>

<<Name of potential participant>>

<<Address>>

<<City, State, Zip>>

Re: I-Pang Fu, M.Ed, M.B.A., PhD. Candidate, Workforce Education and Development
The Pennsylvania State University

To Mr. / Ms. Last Name of Interviewee:

I am wiring to invite you to participate in a research about the role of instructional design in Competency-Based Education Program Development in the United States. This study is being conducted by Mr. I-Pang Fu, who is PhD Candidate in Workforce Education and Development at the Pennsylvania State University and a qualified individual with knowledge of Prior Learning Assessment and Competency-based Education. Mr. Fu was certified by the Council for Adult and Experiential Learning (CAEL) as a Prior Learning Assessor.

The purpose of this study is to identify the role of instructional design in leading institutions using competency-based education in order to provide insights that optimize the implementation and ongoing use of competency-based education in higher education the U.S. Three study objectives includes but not limited to: A) To understand how competency-based education is designed and developed in selected institutions; B) To identify the role of instructional design in competency-based education in selected institutions; and C) To differentiate instructional design practices in traditional and competency-based higher education in selected institutions. These valuable information will be identified through a series of semi-structured interviews in leading institutes using competency-based education in the United States. The outcome was the identification of instructional design' role in this new era of higher education.

I am contacting you for this study through Dr. XXX, who is my advisor at the Pennsylvania State University. We believe that your professional experiences of Competency-Based Education will bring a lot of contributions to this study.

Or

I am contacting you for this study through Dr. Kyle Peck, the co-director of Center of Online Innovation in Learning (COIL) at the Pennsylvania State University, (the Competency-Based Education Network; C-BEN), or (Council of Adult and Experiential Learning; CAEL). We notices that your school/program actively adopted competency-based initiatives at program or degree level and we believe that your professional experiences of Competency-Based Education will bring a lot of contributions to this study.

If you would like to participate in this study, when will you be available for doing the semi-structured interview? And what phone number should I contact you?

Or

If you would like to participate in this study, please click this link to start the survey.
<http:XXX.XXX.XXX>

Please feel free to contact me if you have any question or would like additional information about this study; please contact I-Pang Fu, 1-217-418-8399 or izf5008@psu.edu.

Provide contact information for the study investigator or study team.

Thank you again for considering this research opportunity.

Appendix B

Consent for Research

Title of Project: THE ROLE OF INSTRUCTIONAL DESIGN IN A COMPETENCY-BASED EDUCATION IN THE UNITED STATES: A CASE STUDY RESEARCH

Principal Investigator: I-Pang Fu

Address: 6401 Offshore Dr., Apt 215, Madison, WI, 53705

Telephone Number: 217-418-8399

Advisor: Dr. Williams Rothwell

Advisor Telephone Number: 814-863-2581

We are asking you to be in a research study. This form gives you information about the research.

Whether or not you take part is up to you. You can choose not to take part. You can agree to take part and later change your mind. Your decision will not be held against you.

Please ask questions about anything that is unclear to you and take your time to make your choice.

We are asking you to be in this research because you are instructional design experts in Competency-Based Education (CBE).

This study is to identify the role of instructional design in competency-based education and optimize the rigor of the competency-based education model in U.S. higher education institutes. After you agree with participating in this research study, you will be invited to participate in a 45-minute to one-hour semi-structured interview and the conversations will be audio recorded for research purpose. Approximately 10 people will take part in semi-structured interview of this research study in United States. After you agree with participating in this research study, you will be asked to answer demographic questions and six to eight questions related to your opinions and experience in competency-based education.

Your participation in this research is confidential. All responses will be held in strictest confidence and at no time will respondents be identified by name. Only aggregated data will be reported; no individual responses will be made available to any person. No individual responses or contact information are shared with any other organization, nor are they used for any other purpose than this study. There are no known risks associated with participation, and only the researchers will have access to the data, which will be

kept in a locked file in the principle investigator's computer. Your confidentiality will be kept to the degree permitted by the technology used. No guarantees can be made regarding the interception of data sent via the internet by any third parties. In the event of any publication or presentation resulting from the research no personally identifiable information will be shared because your name is in no way linked to your responses.

The benefit of this research study is to promote post-secondary institutions in the United States that are seeking to improve the quality and rigor of their Competency-based program/degree.

Taking part in this research study is voluntary.

- You do not have to be in this research.
- If you choose to be in this research, you have the right to stop at any time.
- If you decide not to be in this research or if you decide to stop at a later date, there will be no penalty or loss of benefits to which you are entitled.

Please call the head of the research study, I-Pang Fu at 217-418-8399 if you:

- Have questions, complaints or concerns about the research.
- Believe you may have been harmed by being in the research study.

You may also contact the Office for Research Protections at (814) 865-1775, ORProtections@psu.edu if you:

- Have questions regarding your rights as a person in a research study.
- Have concerns or general questions about the research.
- You may also call this number if you cannot reach the research team or wish to talk to someone else about any concerns related to the research.

Tell the researcher your decision regarding whether or not to participate in the research.

{For verbal consent} **OR** Your participation implies your voluntary consent to participate in the research. Please keep or print a copy of this form for your records. {For implied consent}

Appendix C

IRB Approval

PENNSTATE



IRB Program
Office for Research Protections

Vice President for Research
The Pennsylvania State University
205 The 330 Building
University Park, PA 16802

Phone : (814) 865-1775
Fax: (814) 863-8699
Email : orprotections@psu.edu
Web : www.research.psu.edu/orp

EXEMPTION DETERMINATION

Date: December 22, 2015

From: Tracie Kahler, IRB Analyst

To: I-pang Fu

Type of Submission:	Initial Study
Title of Study:	THE ROLE OF INSTRUCTIONAL DESIGN IN COMPETENCY-BASED EDUCATION IN THE UNITED STATES
Principal Investigator:	I-pang Fu
Study ID:	STUDY00004022
Submission ID:	STUDY00004022
Funding:	Not Applicable
Documents Approved:	<ul style="list-style-type: none"> I-Pang's Interview_Questions_12072015.docx (0.01), Category: Data Collection Instrument Research Protocol_Fu (0.01), Category: IRB Protocol

The Office for Research Protections determined that the proposed activity, as described in the above-referenced submission, does not require formal IRB review because the research met the criteria for exempt research according to the policies of this institution and the provisions of applicable federal regulations.

Continuing Progress Reports are **not** required for exempt research. Record of this research determined to be exempt will be maintained for five years from the date of this notification. If your research will continue beyond five years, please contact the Office for Research Protections closer to the determination end date.

Changes to exempt research only need to be submitted to the Office for Research Protections in limited circumstances described in the below-referenced Investigator Manual. If changes are being considered and there are questions about whether IRB review is needed, please contact the Office for Research Protections.

Penn State researchers are required to follow the requirements listed in the Investigator Manual ([HRP-103](#)), which can be found by navigating to the IRB Library within CATS IRB (<http://irb.psu.edu>).

This correspondence should be maintained with your records.

VITA I-PANG FU

EDUCATION

The Pennsylvania State University <i>Ph.D, Workforce Education and Development</i> <i>Minor: Educational Psychology</i>	Aug 2016
University of Illinois at Urbana-Champaign <i>M.Ed., Human Resource Education</i>	Aug 2010
National Changhua University of Education <i>M.B.A., Human Resource Management and Marketing</i>	Jun 2006
National Taiwan Sport University <i>B.A., Sport Management</i>	Jun 2002

RELEVANT EXPERIENCE

Instructional Designer, Division of Continuing Studies University of Wisconsin-Madison, Madison, WI	July 2015 ~ Present
Instructional Designer, Smeal College of Business The Pennsylvania State University, University Park, PA	June 2013 ~ July 2015
Adjunct Instructor, Continuing Education The Pennsylvania State University, University Park, PA	Aug 2011 ~ July 2015
Instructional Technology Graduate Assistant, Academic Outreach The Pennsylvania State University, University Park, PA	Jan 2011 ~ Dec 2013
Web Specialist & Research Assistant, OCCRL University of Illinois at Urbana-Champaign, Champaign, IL	Jan 2010 ~ Aug 2010
Human Resource and Training Specialist Sporton International Inc. Taipei, Taiwan	Nov 2006 ~ May 2008

SELECTED PUBLICATIONS & PRESENTATIONS

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- Fu, I.-P.** (2015). Favoritism: Ethical dilemmas viewed through multiple paradigms. *The Journal of Values-Based Leadership*, 8(1), 6
- Song, J. H., Park, C. H., & **Fu, I.-P.** (2014). Investigating the research trends of learning organization studies between 1979 and 2011: An approach of the citation network research. *Learning and Performance Quarterly*, 2(2), 37-63
- Song, J. H., Park, J. H, **Fu, I.-P.** & Jung, G. S. (2013). Investigating the research trends of learning organization studies between 1979 and 2011: An approach of the citation network research. In K. M. Dirani & J. Wang (Eds.), *2013 Academy of Human Resource Development conference proceedings*, St. Paul, MN: The Academy of Human Resource Development.
- Park, C. H., **Fu, I.-P.**, & Park, T. H. (2012). Social network analysis as a needs assessment tool for team building intervention. In K. M. Dirani & J. Wang (Eds.), *2012 Academy of Human Resource Development conference proceedings*, Bowling Green, OH: The Academy of Human Resource Development.
- Su, N. F., & **Fu, I.-P.** (June, 2012). *Career monopoly: A game-based simulation tool for career decision making from an aspect of human capital*. In National Career Development Association, NCDA 2012 Global Conference in America, Atlanta, GA.
- Fu, I.-P.** (2011). The role of perceived organizational support in organizational socialization: A Proposed research framework. In M. Dirani, Khalil, & J., Wang (Eds), *Academy of Human Resource Development Conference Proceeding*. Chicago, IL.