DIFFERENCES IN FACULTY SELF-EFFICACY, VIEWS, AND INSTITUTIONAL SUPPORT TOWARDS TEACHING COMPETENCY-BASED EDUCATION ONLINE: A NON-EXPERIMENTAL CAUSAL COMPARATIVE STUDY

by

Randy Gale Canivel

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

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ABSTRACT

The purpose of this non-experimental quantitative study is to examine differences in perceived self-efficacy, views, and perceived levels of institutional support among nursing, business administration, or teacher education faculty who teach online competency-based education (CBE). This study employed a causal-comparative design with a sample of 51(N= 51) CBE faculty who teach at colleges and universities in the United States. During the fall semester, the CBE Views and Self-Efficacy survey (CVSE) was distributed measuring perceived self-efficacy of CBE, views on CBE, and perceived levels of institutional support on a Likert-type scale with 42 items divided into four domains. Data analysis was conducted using a Kruskal-Wallis H test to examine the effect of faculty groups on the dependent variables. Results indicated a statistically significant difference between faculty and self-efficacy but not for views and institutional support. Additionally, the p-critical value between teacher education and nursing faculty indicated a difference that concurs with the current literature recommending continued faculty training. Although the extant literature provided information on designing curriculum, developing competencies and assessments, and the changing role of the faculty, a lack of quantitative research exists about perceived self-efficacy, views, and levels of institutional support provided to faculty who teach online CBE courses, specifically in high demand workforce occupations, such as allied healthcare, teacher education, and business administration. The importance of this study will allow institutional leaders to gauge teacher attitudes, make informed decisions about faculty development, and what institutional resources are needed to augment teachers' knowledge, skills, and abilities toward CBE instruction, implementation, and integration.

Keywords: competency-based education, self-efficacy, Kruskal-Wallis, faculty, preparedness

Copyright Page (Optional)

Dedication

This dissertation is dedicated to all my colleagues in higher education, my parents, in-laws, and my wonderful wife, Lexi, for providing encouragement and extreme patience during this journey. Without their support this would not have been possible.

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List of Abbreviations

Competency-Based Education (CBE)

Institute of Medicine (IOM)

Southern New Hampshire University (SNHU)

Society of Human Resource Management (SHRM)

Western Governors University (WGU)

National Survey of Postsecondary Competency-Based Education (NSPCBE)

Nontraditional adult learner (NAL)

Prior Learning Assessments (PLA)

Faculty Development Programs (FDP)

Competency-Based Training (CBT)

Competency-Based Medical Education (CBME)

Problem-based learning (PBL)

Entrustable Professional Activities (EPA)

CBE Views and Self-Efficacy Survey (CVSE)

CHAPTER ONE: INTRODUCTION

Overview

The purpose of this quantitative, casual-comparative study is to determine the difference in perceived self-efficacy, views, and levels of institutional support among faculty who teach competency-based education online in nursing, business administration, or teacher education. Chapter One provides a background of competency-based education (CBE) implementation and faculty self-efficacy. Included in the background is an overview of the theoretical frameworks for this study. The problem statement examines the scope of the recent literature on this topic. The purpose of this study is followed by the significance of the current study. Finally, the research questions are introduced, and definitions pertinent to this study are provided.

Background

Competency-based education (CBE) solves many issues facing higher education, such as rising student loan debt, a growing nontraditional student population, expeditious completion, and proficient college graduates (Maldona, 2022; McDonald, 2018; Ramlall & Ramlall, 2020). Often called *personalized learning*, it is characterized by the application of knowledge as an outcome, a learner-driven process with shared responsibility by faculty and students (Lee & Pant, 2020; Khanna et al., 2021; Maldona, 2022; Mann et al., 2020). According to Sistermans (2020), CBE allows students to "demonstrate proficiency through their acquired knowledge, skills, and abilities on a subject; moreover, it allows students to matriculate at their own pace, which ensures completion and mastery" (p. 84-85). The reduction in student debt coupled with accelerated completion times allows for considerable savings on normal tuition and fees (Mehall, 2019). Also, budget cuts and a declining college-age population have placed financial burdens on brick-and-mortar schools. Although offering online competency-based education allows

institutions to profit, it would behoove colleges and universities to critically examine their faculty's preparedness (Cutri & Mena, 2020). For instance, CBE assessment is still a nuanced topic among faculty (Thurab-Nkoshi et al., 2018). The literature describes CBE assessments as more than just written examinations; rather, the ability to bridge theory to practice (Khanna et al., 2020; Thurab-Nkoshi et al., 2018; Sirianni et al., 2020). Williams (2018) submitted online CBE as a blockchain system, thus expanding the scope of traditional, narrow-focused degrees to authentic learning programs reinforced by artificial intelligence and data analytics. As a result, institutions choose CBE for two reasons: 1) to expand learning opportunities for adult learners, and 2) to prepare them for an ever-changing workforce ("60x30TX," 2021).

Historical Overview

The literature on CBE and postsecondary education are plentiful. For example, interpretive studies on writing curricula, developing assessments, and other best practices for implementation are available (Burnette, 2016; Kelchen 2016; Klein-Collins, 2012). Since many colleges and universities operate within their own policies, cultures, and traditions, CBE adoption continues to be a fluid discussion. A recurring theme among academicians is converting academic learning outcomes to employable proficiencies (McDonald, 2018; Selingo, 2013; Thurab-Nkoshi et al., 2018; Wongaa & Boachie, 2018). For instance, baccalaureate nursing programs align competencies with student learning outcomes by utilizing current evidence-based research on a patient's continuum of care (Hseih & Hsu, 2013; Hodges et al., 2019; Imanipour et al., 2021). Fitzgerald et al. (2016) examined graduate healthcare programs and discovered flexible assessments efficiently gauged students' competency. Similarly, Bok et al. (2018) and Richards (2014) revealed faculty should create formative and summative assessments with students' input. However, Jones et al. (2016) submitted the burden for creating proper CBE

assessments was on instructional faculty who received little training. Instructors indicated a lack of institutional support and needing additional time to develop CBE in college programs as major concerns (Jones et al., 2016; Troncoso et al., 2017). Finally, the use of CBE has demonstrable benefits in the country of India's education for adult and pediatric dentistry; however, faculty views towards their self-efficacy were missing from this study (Khanna et al., 2021; Nagda 2015)

Society-at-Large

CBE is not isolated to just improvements in higher education but has demonstrated its value in creating a thriving workforce and global economy (Abdullah et al., 2021; Mehall, 2019). The United States (U.S.) Department of Education considers CBE an innovative instructional approach that offers students flexibility and stimulates more authentic learning (Lee & Pant, 2020). Literature advocates the use of CBE for three reasons. First, adult learners comprise approximately 40% of the nontraditional student population (Crawford, 2020). Second, the advent of online competency-based education programs at schools, such as Western Governors University, Southern New Hampshire University, and Capella, has accelerated this growth (Ralmall & Ralmall, 2020; Mehall, 2019). CBE programs at the schools typically align with high-demand jobs, such as nursing, teacher education, and business administration degrees (Cates, 2020 Hosseler & James, 2021; Kaufman et al., 2019; McDonald, 2018;). Third, industries utilize CBE programs to increase employee retention and add to a more diverse and erudite workforce ("60x30TX," 2021). Most recently, states, such as Texas and Tennessee, enacted policies to assist adult learners in completing a degree or certificate. Again, the literature is vague on the faculty's view of CBE and their own perceived self-efficacy of implementing online CBE.

Faculty's rating of their self-efficacy towards migration and integration of CBE is scarce. For example, defining competencies, creating assessments (formative or summative), accreditation, and online teaching readiness are concerns voiced by most faculty (Echols et al., 2018; Lungile Nxumalo- Dlamini, 2021; Ralmall & Ralmall, 2020). The transition to CBE is not only critical for the faculty but has a direct impact on students, employers, industries, and legislative reform (Cates, 2020; Evans et al., 2020; Ralmall & Ralmall, 2020). In addition, CBE faculty must contend with their transformative role from scholar to learning facilitator (McDonald, 2018). Since adult students bring forth acquired knowledge and self-concept, their proficiency will rely on previous academic knowledge and work experience, not traditional lectures or didactics (Kelchen, 2015). It is no wonder faculty views on teacher self-efficacy towards CBE have remained perplexing.

Faculty self-efficacy towards teaching CBE is important. In addition, general views and levels of institutional support determine faculty readiness to teach (Martin et al., 2019; Prokes et al., 2021; Sangwan et al., 2020). As the burgeoning demand for online education continues, so too, the number of fully capable faculty that must be available (Martin et al., 2019b). Online faculty must receive the proper training and support to fully implement online education, such as redesign of face-to-face coursework, teaching methods, user interface, and learner support, which are critical areas towards online teaching success (Martin et al., 2019b; Vang et al., 2020). Prokes et al. (2021), in their exploratory study, examined faculty views and perceptions of institutional support. Views of CBE, for example, consisted of the appropriateness of CBE for certain vocational fields, CBE's flexibility supports the personal situations of students, and instructors have a positive attitude toward teaching CBE courses. Institutional support included faculty mentoring programs, compensation and workload, and clarity of expectations from upper

administration. Combined with self-efficacy, Prokes et al. fully examined attitudes toward readiness to teach CBE.

Sangwan et al. (2020) created a “reliable and valid scale to measure online teaching and learning for college and university faculty" (p. 187). Similarly, Florence et al. (2019) discovered a significant relationship between years of teaching online and perceptions of course design, course communications, and technical competence. They discovered online teachers with minimal online experience have lower perceptions of their abilities to implement online classes. Ventayen (2018) discovered a statistically significant difference (F (3, 97) = 5.462, p =.002) between pre-service education teachers’ experience and their readiness to teach; furthermore, a significant difference ($p < .001$) existed between teachers who had 0-10 and 11-20 years of teaching experience. Similarly, Kabatas and Yilmaz (2018) investigated the attitudes and self-efficacy of 212 teachers, discovering a significant relationship between teachers’ lifelong learning attitudes and the adoption of educational technologies (Kabatas & Yilmaz, 2018).

Theoretical Background

Despite the abundance of research on CBE, it is prudent to expound the theoretical underpinnings grounding this study. First, one must contemplate why CBE is of value to potential students. Malcolm Knowles’s theory of andragogy (1980) (i.e., adult learning theory) offers major characteristics of adult learners, such as a perceived problem to solve, the need for self-directedness and autonomy, a large amount of life experiences, and intrinsic and extrinsic motivators. In essence, online CBE fits into this construct, as it accounts for adult learners’ life experiences, self-direction, self-concept, and pace of learning. Adult learning theory will guide instructors’ curricular and assessment efforts to ensure they align with the aforementioned characteristics. Faculty must realize traditional pedagogy will not support adult learning.

Another relevant theory is Kolb's (1984 as cited in Kolb & Kolb, 2012) experiential learning theory. This theory asserts the acquisition of new knowledge begins by engaging in transformational experiences, or as Kolb stated "learning is the process whereby knowledge is created through the transformation of experience" (p.38). The theory consists of four learning styles: abstract conceptualization, active experimentation, concrete experience, and reflective observation. In essence, effective learning is a four-stage cyclical process where each stage is mutually supportive and feeds into the next. However, according to Kolb and Kolb (2012), effective learning only occurs when all four stages are demonstrated. Thus, if faculty hope to create undergraduate programs using a CBE construct, understanding how adult students learn and retain knowledge through their years of experience is critical, not to mention, how will they assimilate new information considering life's priorities of holding full-time work, family, and school (Ramlall & Ramlall, 2020).

Last, teachers' self-efficacy is paramount; it will determine their self-confidence in the classroom, their rapport with students, and how they embrace innovation (Kabatas & Yilmaz, 2018). Bandura (1977) discussed self-efficacy as a triadic model of reciprocal causation; hence, one could see human functioning as a product of intrapersonal influences, individual behaviors, and environmental forces that interplay synchronously. Faculty identify with this model as their teaching abilities are reinforced (or not) outwardly, with feedback coming from their peers and administrators. As mentioned earlier, self-efficacy views and administrative support of online education determines the adoption of new education technologies and teaching innovation (Kabatas & Yilmaz, 2018).

The corpus of CBE research lies in definitions, implementation, best practices, and overall value. Likewise, CBE is not new, as it has been used in medical-based education for

decades; however, it is seeing a wide birth in numerous postsecondary degrees, such as healthcare teacher education and business administration. Nonetheless, CBE is rooted in theoretical frameworks that steward adult learning and online education. Still, the empirical research examining the affective characteristics of online CBE instructors is mostly qualitative. Moreover, faculty self-efficacy and perceptions only examine the curricular assessment of CBE programs (Bok et al., 2018; Thurab-Nkhosi et al., 2018).

Problem Statement

Mehall (2019) provided a comprehensive report defining CBE, enrollment strata, demographics, and affordability. For instance, most CBE programs allow for the demonstration of competency through prior learning assessments (PLA) that evaluate experiences gained through military or technical experiences (Mehall, 2019). Next, Mehall discussed enrollment characteristics, which typically consist of students 25 years of age or older, complete with life's demands, and seeking flexibility in course delivery. Finally, cost savings are realized by leveraging minimal resources to conduct online courses versus face-to-face courses.

Several articles described the implementation and alignment of CBE between academic disciplines and industry standards. For instance, Likisa (2018) performed a descriptive study on CBE, technical and vocational learning within the Ethiopian Education system. Likisa asserted the need to carefully align competencies with workplace standards, the effectiveness of curriculum designers, and the technology needed to facilitate learning. Still, the need for increasing faculty self-efficacy through subject matter knowledge, pedagogical skills, and sensible actions should be assessed through the current views of CBE (Mace et al., 2018). Despite this study's quantitative design, it is a descriptive study of one population. McDonald (2018) examined CBE implementation through a qualitative design and discussed challenges,

such as credit-hour production, alignment of human resources competencies, and the unbundling of the faculty role. For example, faculty are no longer lecturers, but rather facilitators, and do not perform research duties. Although management faculty were sampled, there could be a difference with other business faculty (e.g., marketing) (Kaufman et al., 2019). Mehall (2019) emphasized the apprehension of faculty to pivot from scholar to facilitator. Vasquez et al. (2021), in their case study, suggested higher education mirrors the efforts of medical education in aligning competencies and assessments between academia and professional industry. Objections, such as increased faculty workloads, time, and alignment, are common themes among faculty (Bingham, et al., 2021).

Regarding affective measures of CBE faculty, it is well documented that faculty development programs (FDP) assist in vitality, commitment, and engagement in developing CBE programs (Echols et al., 2018; Bilal et al., 2019). Bilal et al. (2019) performed a meta-analysis that reflected a significant effect size between FDPs and faculty vitality. Orr and Sonnadara (2019) emphasized FDPs are essential for coaching students in competency-based medical education, including observation, coaching, and assessment, which are areas faculty proficiency is indispensable. However, this study was a review of the literature using inclusion and exclusion variables for articles in databases, such as PubMed or MEDLINE. In their qualitative study of CBE grading in K-12, Bingham et al. (2021) emphasized grading competencies cannot be solely cognitive. Similarly, Cates et al. (2020) determined the use of formative and summative assessments as reliable and valid for business education and CBE. Despite the qualitative nature of these studies, there is inconsistency in faculty preference for CBE assessments.

Faculty challenges, opinions, and attitudes towards CBE are documented utilizing mostly qualitative studies, reviews of literature, and some quantitative designs; however, studies

specifically observing faculty viewpoint, self-efficacy, and institutional support of online CBE programs are limited. In addition, quantitative studies express the degree of like or dislike for online CBE while moderating the years of online teaching experience (Gall et al., 2007). The problem is more research is needed to determine the differences in self-efficacy, views, and perceived institutional support of faculty who teach online CBE in nursing, business administration, or teacher education (Echols et al., 2018; Lungile Nxumalo- Dlamini, 2021; Mast et al., 2018; Ralmall & Ralmall, 2020; Wongaa & Boachie, 2018).

Purpose Statement

The purpose of this quantitative, causal-comparative study is to determine if there are differences in teacher self-efficacy, views, and institutional support among undergraduate CBE faculty in nursing, teacher education, or business administration. The dependent variables are self-efficacy, views, and levels of institutional support scores, while the independent variable is faculty divided into three groups: nursing, business administration, and teacher education. The definitions of the variables are: *Self-efficacy* – teachers 'confidence in their ability to facilitate the development of students' knowledge, abilities, and values (Hampton, et al., 2020). Self-efficacy, within CBE, is faculty's perceived abilities to teach CBE courses, translate different modalities, and utilize faculty training and development. *Views* – the overall positive or negative views towards an action or idea (Martin et al., 2019; Prokes et al., 2021). For example, do faculty feel CBE is appropriate, applicable, and flexible? *Institutional support* is the reliance on administrative and peer support for implementing CBE; for example, on-going faculty seminars, programs, and peer-to-peer networking (Prokes et al., 2021). *The faculty group* includes the following: nursing, business administration, and teacher education faculty. Faculty are content experts and teach CBE courses in their respective disciplines (Perfetto, 2019; Prokes et al., 2021;

Ventayen, 2018). The accessible population is faculty who currently teach in undergraduate CBE degree programs, such as Registered Nurse – Bachelor of Science in Nursing (RN-BSN), Early Childhood-Grade 6, and business administration, at five universities in the United States.

Significance of the Study

The current literature emphasizes the significance of CBE. The precipitous decline in state appropriations for colleges and universities concomitant with the rise in student debt is troubling. The duplicity continues with declining completion rates alongside inept graduates entering the workforce (McDonald, 2018). Interestingly, the plurality of these issues can be amended by technological innovation and educational pragmatism (Creswell & Creswell, 2018; Sistermans, 2020).

This study adds to the existing body of knowledge by elaborating on the emotional characteristics of faculty performance but with an emphasis on online CBE and specific disciplines. Again, literature measuring self-efficacy, views, and institutional support towards online CBE instruction is limited. Wongaa and Boachie (2018) examined the general perception and adoption of competency-based training (CBT) in Ghana with promising results. Mast et al. (2018) reviewed Walden University's assessment model for its graduate program in healthcare administration but did not discuss its undergraduate programs for nursing, business management, or teacher education. Another significant study by Poth et al. (2020) discussed the importance of experiential assessments for CBE, and its alignment with andragogy. As one can see, perceived self-efficacy in curricular design and assessments are mixed because of insufficient knowledge and training (Bok et al., 2018; Bingham et al., 2021; Sistermans, 2020). As a result, cohesion and collegiality among colleagues is lacking (Echols et al., 2018; Likisa, 2018). A quantitative

analysis of programmatic ratings of online self-efficacy among online undergraduate CBE degrees is deficient.

The accessibility of online CBE is accompanied by the typical qualms of online education (Mehall, 2019). Professors still face challenges in online education. For instance, technological-related concerns, such as student and teacher competence, reliability, and institutional support are noted (Martin et al., 2019; Ventayen, 2018). It is documented that prior online teaching experience predicts higher teacher self-efficacy scores and satisfaction versus those with little online teaching experience (Hampton et al., 2020).

This study will not only add to the existing knowledge of CBE but the value of continued education and training for online CBE faculty. Whether it be additional online support or CBE seminars, institutional leaders will have quantitative data to justify faculty provisions in the years ahead. Finally, as colleges and universities begin to build robust online CBE programs and services, a supply of knowledgeable workers becomes available. As a result, local and regional economies flourish with a steady pipeline of well-prepared college graduates ("60x30TX," 2021; Romgens et al., 2019).

Research Question(s)

The research questions for this study are,

RQ1: Is there a difference in the perceived *self-efficacy* of online CBE faculty who teach nursing, business, or teacher education programs?

RQ2: Is there a difference in general *views* of online CBE faculty who teach nursing, business, or teacher education?

RQ3: Is there a difference in perceived *levels of institutional support* of online CBE faculty who teach nursing, business, or teacher education?

Definitions

1. *Adult learners* – nontraditional students between the ages of 25-34 years who have some college credit or degree and are seeking additional education. They also balance life's competing priorities of work, school, and family (Rabourn et al.,2018).
2. *Analysis of variance (ANOVA)* – is used when a researcher wants to compare mean differences between two or more independent groups on one dependent variable (Warner, 2012, 2020).
3. *Andragogy* – is the science and art of adult learning that highlights basic principles, such as specificity, problem-solving, self-concept, and student-centricity (Galustyan et al., 2019).
4. *Attitude* – a measure of an individual's viewpoint or disposition toward a particular person, thing, or idea (Gall et al., 2007).
5. *Attitudes in Online Teaching and Learning for Higher Education*- a recent scale developed by Sangwan et al. (2021) that measures faculty's attitudes towards online instruction.
6. *Competency* – a realized ability or outcome; based on what students can do now with knowledge, skills, and abilities (Gervais, 2016).
7. *Competency-based education* – *"*the integration of knowledge, skills, attitudes, and interactivity as the intended outcomes of learning"(Nissila et al., 2015, p. 13).
8. *CBE Views and Self-Efficacy (CVSE)* – survey developed by Prokes et al. (2021) to measure faculty self-efficacy, views, and institutional support ratings.
9. *Entrustable professional activities (EPA)* – are statements describing work that is done by competent professionals in a specific context (Bramley et al., 2020).

10. *Faculty development programs* – activities planned to increase knowledge and skills related to the performance of faculty duties, such as teaching, administration, and research (Echols et al., 2018).
11. *Institutional Support*- the reliance on administrative and peer support (the trial and error) of implementing CBE (Prokes et al., 2021).
12. *Kruskal*-Wallis H test – a nonparametric alternative to the one-way ANOVA. This statistical technique is used when data fails to satisfy the assumptions for a one-way ANOVA.
13. *Problem-based learning* – a constructivist, student-centered approach to learning where theory and practice are facilitated concurrently. This enables learners to reach viable solutions to an ideal, real-world problem (Sistermans, 2020).
14. *Quantitative research* – inquiry grounded in the assumption that aspects of the social environment are an objective reality; as such, numerical data on observable behaviors can be collected and subjected to statistical analysis (Gall et al., 2007).
15. *Self-efficacy* – teachers' confidence in their ability to facilitate the development of students' knowledge, abilities, and values (Hampton et al., 2020).
16. *Transformational learning* – the ability to learn and demonstrate new knowledge by engaging in experiential learning methods (Kolb, 1984, as cited in Kolb & Kolb, 2012)
17. *Views* – positive or negative views, thoughts, or attitudes towards an idea or action; similarly, how one feels towards something or someone (Prokes et al., 2021; Martin et al., 2019).

CHAPTER TWO: LITERATURE REVIEW

Overview

Faculty self-efficacy, views, and levels of institutional support result in the preparedness of faculty to teach, regardless of teaching discipline. For Competency-based education (CBE), this includes aspects, such as developing competencies, writing curricula, instructional coaching, and performing assessments. The chapter opens with a theoretical framework underpinning this study. Next, relevant literature pertinent to online CBE, such as adoption, integration, and implementation, are included. The chapter ends with a thorough summary.

Theoretical Framework

A theoretical framework is imperative to provide a solid foundation and to guide the research study (Gall et al., 2007). Furthermore, theories "identify commonalities in otherwise isolated phenomena" (p. 8). This review examined how adult learning, transformational learning, and self-efficacy have evolved into competency-based education; moreover, the considerations towards changing the faculty role, designing curricula, and creating assessments. Central to this literature review is the lack of fit for traditional pedagogy and adult learning. Hence, faculty are having to reproduce their content to fit this population of nontraditional students. Nonetheless, a properly defined construct is required, as the teacher-student dynamic is still reciprocal despite this change in education delivery (Gall et al., 2007).

Adult Learning Theory

Knowles' (1980) seminal work on adult learning, or andragogy, is a major tenant of CBE. Knowles postulated four major assumptions about adult learners, and these, in turn, will impact how teachers of CBE create and implement their programs. The first major characteristic is self-concept, which describes how a person matures from being a dependent learner to a self-directed

human being. The second concept is the adult learner's experience; here, a person accumulates a growing reservoir of experiences that become a resource for learning. The third characteristic is an eagerness to overcome some social or developmental needs. Fourth is how one learns differently from the traditional student. For instance, an adult's perspective on learning shifts from pure subject-mastery to problem-centeredness.

Four principles apply to adult learning: First, adults need to be involved in the planning and evaluation of their instruction; second, experience (including mistakes) provides the basis for learning activities; third, adults are more interested in content that has relevance to their current job or personal life; fourth, adult learning is problem-centered, not content-oriented. These principles become more relevant in our modern society where global, political, social, and cultural awareness and mobility are rapidly changing through online technologies. To that effect, learning is now integrated into this construct (Foster & Jones, 2020; Galustyan et al., 2019).

Andragogy provides faculty with an understanding of adult learning versus traditional learning. Faculty teaching CBE must transform their teaching practices to students who come with previous knowledge, skills, and abilities, yet can guide adult learners toward new knowledge without conventional lectures and assessments (Ramlall & Ramlall, 2020). As such, the faculty role changes from instructor to coach (McDonald, 2018 and Mbunda & Ojwang, 2021). Therefore, this study advances the theory and importance of faculty preparedness to create a CBE curriculum for a burgeoning nontraditional student population (Cates et al., 2020).

Ramlall & Ramlall (2020) performed a case study on institutions of CBE in the United States. For example, Western Governor's University (WGU) disaggregated the traditional faculty line into three roles: course instructor, program mentor, and evaluator/assessor. The course instructor provides instruction of content and assists students on individualized study plans. The

program mentor orients students to online, student, and other auxiliary resources, for example, the use of a learning management system or online educational resources. In addition, this faculty member assists in goal setting and meeting with students. The evaluator/assessor scores and grades assessments for the program. Similarly, Orr and Sonnadara (2019), in their study of competency-based medical education (CBME), used adult learning theory as a major underpinning; specifically, the problem-centered orientation of physicians, drawing on previous knowledge, and feedback on solutions. Self-motivation and problem orientation are critical to advancing medical faculty teaching future physicians.

Kolb Experiential Learning Theory

Understanding the reason adult students pursue higher education in a CBE format is imperative. Moreover, how they learn, retain, and demonstrate knowledge is equally important. For CBE faculty, this is critical, as the development of competencies and assessment evolve within this paradigm**.** Kolb (1984, as cited in Kolb & Kolb, 2012) is a seminal work that underlines online CBE today. Experiential learning is mutually inclusive, each step flows into the other without interruption. The first step is concrete experience and is where a new experience or situation is encountered, or it is a reinterpretation of an existing experience; second, reflective observation of the new experience and any inconsistencies between experience and understanding; third, abstract conceptualization involves reflection on new idea or modification of an existing concept; fourth, active experimentation requires students to apply their ideas to the environment around them.

In addition, three learning styles were postulated by Kolb (1984, as cited in Kolb & Kolb, 2012). First are divergent learners. These students glean different perspectives or viewpoints. The second style is assimilation. This involves a concise, logical approach where ideas and

concepts are more important than people. Convergent learners solve problems by using technical skills and are less concerned with people and interpersonal qualities. The third is accommodation; here, students are tactile learners and rely on intuition rather than logic. As CBE faculty begin to create competencies and develop assessments, they must keep in mind that solving problems, dilemmas, and issues are at the heart of their learning (Knowles, 1980). How they solve problems is the concern of Kolb (1984, as cited in Kolb & Kolb, 2012).

Kgwete and Malatji (2021) discussed problem-solving as an effective teaching strategy. They concur that problem-solving brings about learning, as it encourages students to utilize present knowledge and skills to explore solutions. Nevertheless, the current educational landscape still professes lecture-based, direct methods of information delivery. Kgwete and Malatji cite Kolb's theoretical framework to establish a problem-solving teaching framework. Kgwete and Malatji, using Kolb's theory, sought to explore "the experiences of lecturers in applying a problem-solving strategy, and what are the lecturers' views and perceptions in applying this strategy" (p.18031). Similarly, Anastasiia (2019) used Kolb's (1984, as cited in Kolb & Kolb, 2012) theory, asking CBE teachers to reflect on their professional development toward CBE. In brief, teaching must go beyond memorization and repetition; rather, teachers must engage students on what they already know, what techniques are effective and allow demonstrable proficiency, is remedial development necessary, and do students feel supported and confident in their new skills (Anastasiia, 2019).

Theory of Self-Efficacy

Faculty views of their self-efficacy lie within the differences in individual teaching performance (Bandura, 2012). Often, appraising faculty performance is ambiguous since technical and affect aspects intertwine. The theory of self-efficacy was originally postulated by

Albert Bandura in 1977 to explain effort and perseverance as an expectancy mechanism toward completing intended outcomes (Bandura, 1977; Hampton et al., 2020; Schunk, 2020). Persistence in accomplishing activities that are unfamiliar or uncomfortable builds self-efficacy (Hampton, et al., 2020). The relationship between expectancy and performance is reinforced by the motivation to excel and achieve success.

Teacher self-efficacy in online CBE is critical. Teachers must have the requisite knowledge to implement online CBE and the confidence to design and implement a nontraditional way of learning. Dincer (2021) defined teacher self-efficacy as "the attitudes, values, and skills he or she must teach effectively and efficiently" (p. 3274). Teachers of all kinds must learn to persevere through this challenging process to ensure adult student success. This theory illustrated the relationship between teacher self-efficacy, satisfaction, and commitment through proper faculty development, but proves the faculty's disaggregated role has a negative relationship on teacher self-efficacy (Dincer, 2021; Hampton, et al., 2020).

The peer-reviewed literature contains investigations regarding teacher self-efficacy. In their exploratory study, Prokes et al. (2021) explored the relationship between teacher self-efficacy and support mechanisms (by the institution) toward CBE implementation. Their findings suggested CBE faculty have mixed though balanced views of CBE. Likewise, high levels of teacher self-efficacy can be accomplished through frequent training, institutional support mechanisms, and faculty collaboration. In the Prokes et al. study of developing a CBE geometry course for pre-service teachers, self-efficacy and teaching knowledge were measured on a Likert-type scale with very high reliability (0.97). Although the breadth of this study was CBE development, evaluation, and implementation, it was noted teacher self-efficacy in developing proper assessments is challenging but needed (Lee & Pant, 2020). Choi et al (2019) emphasized

a reciprocal relationship between teacher self-efficacy and classroom experiences. For example, project-based learning, or PBL, allows for students to demonstrate current knowledge in practical situations whereby teachers and students work synchronously towards the intended learning outcome. PBL allows for increased student engagement and learning versus traditional lecture approaches. Teachers observe how students are learning and directly respond to any student needs that arise (Choi et al., 2019). Choi et al. observed a significant association between teacher self-efficacy and PBL ($p < 0.01$).

Dincer (2021) examined major determinants of teacher self-efficacy in 2,542 pre-service teacher candidates in Turkey. Logistic regression analysis confirmed a significant relationship ($p < .05$) among the following variables: communication skills ($p = .000$), achievement goal ($p = .000$), academic success ($p = .000$), and department ($p = .039$). Results indicated a predictive relationship between teacher self-efficacy, goal setting, perceptions of achievement, and communication skills.

Communication Skills

Communication skills involves the process of planning, producing, transferring, and understanding information; furthermore, to effectively demonstrate the abilities necessary for communication. For those who teach in-person or online, more communication with students, results in increased levels of learning. Dincer (2021) asserted “communications skills as one of the most basic, yet critical skills of any faculty member” (p. 3275).

Goal Orientation

With goal orientation, the goal is specific: one that is focal with the intended outcome being competency or mastery. For teacher’s self-efficacy, this is usually tangible and addresses ambitions, such as worries, needs, and motives. For example, teaching college students how to

measure their target heart rate after exercise might involve practicing among fellow teachers or coaches, demonstrating to students, students repeating this process until they feel proficient, and retesting at the end of the term. This an example of performance approach, performance avoidance, and understanding.

Academic Success

The academic success of each student depends on the faculty's overall teaching process; hence, teacher self-efficacy is positively correlated with student success (Dincer, 2021). Another contributor to students' success is how well the teacher is supported through assistance, autonomous support, and frequency of help-seeking. Taken together, the amount of support is an intermediary between high levels of self-efficacy and student success.

Department

According to Dincer (2021)," the academic department can increase or decrease perceptions of teacher self-efficacy; however, the research domestically and abroad is mixed" (p. 3289). Dincer mentioned self-efficacy is contextually dependent. There are varying degrees of efficacy among subject areas, settings, and student groups. For example, this study examined pre-service primary education teachers. Future research might look at teacher self-efficacy of other disciplines, such as social studies, English, or pre-school education courses.

Related Literature

Full adoption of online CBE has its successes and challenges. The most critical is the shift in the faculty role from scholar to facilitator. For faculty, this means a complete change in their duties and workload. A thorough search of related CBE literature focused on a shift in education delivery, implementation, integration, student-centrism, faculty development, and their changing role.

A Paradigm Shift

The paradigm shift in educational delivery is a point of contention among colleges and universities. Knowles (1980) is the bedrock for CBE development and its integration in education. The pivot from self-reliant learners to self-directed learners is significant (Bylaite-Salavejiene & Garcia-Aracil, 2020). As such, students are not only affected by this shift, rather academic leaders, faculty, and staff must strive for learning and mastery excellence (Likisa, 2018). Mehall (2019) reported this shift in education delivery was attributed to the rising cost of traditional higher education (e.g., competition) and the increasing number of nontraditional students. In addition, Mehall reported the inverse relationship between the decline in state funding (increase in tuition and fees) and the increased cost burden on students. Likewise, another reason for this change in thinking is increased accountability from legislators toward completion (Anderson, 2018). Foster and Jones (2020) reported several advantages of CBE, such as savings on time, money, increased efficiency, and productivity.

As mentioned previously, the social, economic, and political landscapes continue to change rapidly; hence, many colleges and universities across the United States implement online CBE (Anderson, 2018; Mehall, 2019; Ralmall & Ralmall, 2020). For example, McDonald (2018) provided a case-study on a private, nonprofit's experience with implementing CBE. This study was performed over three years and discussed the implementation of a human resources degree using a CBE format. Despite the laborious process, this university's experience proved to be beneficial, pursuing Knowles' (1980) adult learning theory, provided an intricate framework on implementation and intertwined with the current Carnegie 3-hour unit (McDonald, 2018). Foster and Jones (2022) performed a qualitative study exploring a graduate-level program in healthcare administration using a CBE format. The apparent supply and demand dynamics of future

healthcare leaders continue to increase; thus, CBE shows promise in health information leadership by allowing personal mastery and completion of preparatory programs. As a result, students leverage their knowledge while pursuing leadership positions in the healthcare field. Similarly, competency-based medical education prefers a focus on a resident's ability to learn as the final product rather than the instructional process itself (Mann et al., 2020). However, this shift is not without its qualms. For example, Mann et al. reported implementation issues, such as logistical challenges, the tangibility of theory to practice, communication structure, and loss of collegiality and support.

Defining Competency

Defining competencies is the first step to the successful implementation of CBE. The uncertainty of what competency is, and how it could be defined and assessed, seems to be a prevailing theme among faculty. Research on this topic is embedded within articles looking at assessments of student performance and faculty preparation. Nel Nodding's (1974) article provided a foundational definition of competency. However, for competencies to be relevant and useful for curriculum development, they must demonstrate proficiency in a particular knowledge or skill, including what resources should competencies be drawn and improved upon (Mast et al., 2018; Wongaa & Boachie, 2018). The development of a competency framework, or source document, should start with various stakeholders (Keshmiri et al., 2019; Sirianni et al., 2020). Recent studies by Keshmiri et al. (2019), McDonald (2018), and Khanna et al. (2021) offered convincing methods for creating and defining competencies within university-accredited programs. This includes regular participation from stakeholders, conversion and clarification of competencies, and validity of competency-frameworks.

Domains are the first step in creating and organizing competencies. The American Association of Colleges of Nursing defines domains as all-encompassing, distinguishable areas of competence that, when aggregated, create a framework for nursing preparation (American Association of Colleges of Nursing, 2021).Domains are ways of structuring the knowledge base, whereby competencies serve as scaffolds (American Association of Colleges of Nursing, 2021; Keshmiri et al., 2019; Kahanna et al., 2021). In developing domains within CBE, literature cites an organized curriculum process that begins with coding, extracting competencies from codes, prioritizing competencies to domains, and teaching methods and assessment methods for each competency and domain. By adhering to an organized framework, integration within the institution becomes seamless (Khanna et al., 2021). The use of domains is critical in all forms of CBE programs, for example, nursing, graduate health professions education, teacher education, and business (American Association of Colleges of Nursing, 2021; Keshmiri et al., 2019; Khanna et al., 2021; Subramaniam & Jaganathan, 2021). The goal is for competencies to be characteristics that drive effective performance in a field of work (Subramaniam & Jaganathan, 2021).

Developing competencies often begins with knowledge and skills used in professional practice; yet, converting these competencies to fit traditional academic learning outcomes is still nuanced and contingent upon the discipline (American Association of Colleges of Nursing, 2021; McDonald, 2018; Subramaniam & Jaganathan, 2021). Wongaa and Boachie (2018) discussed the gap between academia and industry. Thus, the need for capabilities supplants the traditional need for qualifications. The Wongaa and Boachie study involved a cross-sectional study of 300 faculty members ($N = 300$) at a local university in Ghana. Background information indicated a concern about the knowledge, skills, and abilities for young employees in Ghana's

business sector. To that end, and to combat rising unemployment rates, this university suggested the adoption of competency-based training (CBT) to meet demand-driven outcomes creating competencies across all subject areas. A study by Foster and Jones (2022) determined competencies and outcomes for a graduate program in healthcare administration by gathering input from numerous sources, such as two accrediting bodies: the Association of University Programs in Healthcare Administration (AUPHA) and the Commission on the Accreditation of Healthcare Management Education (CAHME). Next, the faculty met with leaders from various healthcare organizations and collected input from them regarding competencies needed in a healthcare setting. After all competencies were collected and reviewed, experts were assigned to each course and charged with creating assessments that would evaluate each competency.

Another method to validate competencies is through authentic assessments. Thurab-Nkoshi et al. (2018) utilized a qualitative study to evaluate the perceptions of CBE teachers, students, and clients regarding the authenticity of assessment. Authentic assessment is an impactful moment in the educational process, not just a vehicle for evaluation. Four criteria determined authentic assessment: task orientation, physical context, social context, and criteria or standards. A small group of students ($N = 9$) participated in a study utilizing an open-ended questionnaire and focus group to review their assessments, which consisted of a portfolio matching course-related competencies with learning experiences. By bridging theory to practice, students were more engaged and gained greater confidence in their area of study. Consequently, this improves the appraisal of teaching performance and confidence.

Designing Competency-Based Education.

Upon defining competencies, the actual implementation of CBE can begin. There is a fair amount of research available. Empirical works from McDonald (2018), Tarmo and Kimaro

(2021), and Takamine (2019) provide specific insight into implementation procedures, along with successes and failures. Like McDonald (2018), Takamine (2019) performed a qualitative case study on barriers to designing and implementing competency-based curricula. This included many notable themes across research: identification of competencies, creating assessments, faculty involvement, psychometrics, learning management software, and senior level.

Tamro and Kimaro (2021) performed a qualitative, interpretive content analysis for secondary pre-service teachers in Tanzania. Thirty-three (N = 33) relevant documents were used, examining syllabi, pedagogy, general studies curricula, and curriculum frameworks. This study aimed to compare and transition pre-service teachers from content-based learning, or traditional pedagogy, to competency-based learning. Comparisons included pace of learning, program assessments, grading, instructional support, and faculty credentials. The study advocated for a blend of traditional content and CBE. This contrasts with previous studies that shifted completely to online CBE.

Current Implementations.

To this day, the implementation of CBE is nebulous at best. Sistermans (2020) performed a qualitative study to determine best practices and challenges for online problem-based, or case-based, learning online. An open-ended interview, conducted with six higher educational professionals in health sciences, was conducted. A literature review was conducted to find examples of online curriculum design and learning activities that fit problem-based or case-based learning. Results indicated that learning activities associated with CBE are intertwined. For example, CBE should ask what the learner should be able to do and map backward (Lee & Pant, 2020; Sistermans, 2020). For instance, identify the abilities of needed graduates, extrapolate into

competencies, define milestones towards progress, select assessment tools along the way, and evaluate outcomes (Lee & Pant, 2020; Sistermans, 2020)

The findings of Sistermans's article extend Wongaa and Boachie's (2018) results, whereby competencies should be based on industry or employer needs mixed with traditional learning outcomes. This conflicts with Mast et al. (2018), who expounded on the use of a student-centric, variable pacing online CBE model. Fitzgerald et al. (2016) advocated for a two-factor model of assessment for healthcare professionals: review committee and learner repository. In a related study, Evans et al. (2020) performed a systematic review of literature on K-12 implementation of CBE from 2000 to 2019, using inclusion criteria, such as peer-reviewed articles and gray literature, due to the nascence of CBE. Only U.S.-based studies were included for consistency because of the organization and structure of schools differing from other countries. Studies with a detailed research methodology, qualitative, quantitative, or mixed methods, were included. Excluded from the study were articles with no relevance on K-12, limited discussion on key features, and related to other research questions not part of this review. Findings concluded a promise of CBE and related practices to minimize equity gaps in education; however, barriers to implementation were noted throughout this review. For example, misalignment with standardized tests, determining mastery, student motivation concerns, lack of guidance on competency statements, and overall difficulty changing traditional school structures to CBE. Taken together, Evans et al. agreed with previous research on the need for frequent and intentional faculty training on CBE.

The tracking of high school and college graduates by state legislatures continues to garner interest in CBE. As such, reforms at the institutional level are ever-present. Evans et al. (2020) advocated for future research on faculty training, bridging theory to practice, and

examining stakeholders. Afterward, institutional leaders should work with state legislatures to align with educational reform; for example, how to reach marginalized students, create pathways to two-and four-year colleges, and reduce the cost of attendance (Evans et al., 2020; Northrup et al., 2021).

Healthcare Implementation

In addition to higher education, CBE is utilized in various healthcare professions, such as nursing, anesthesiology, and health professional studies (Alismail & Lopez, 2020; Charette et al., 2019; Mace & Bacon, et al., 2019; Orr & Sonnandra, 2019). Implementation success is attributed to a multitude of factors, such as professional association mandates, industry demand (accelerated completion times), and the use of evidence-based practices to drive competency or mastery. Professionals help drive competencies and define them; hence, as healthcare providers partake in CBE programs, they are well-prepared to succeed in CBE (Charette et al., 2019). However, as Charette et al. explained, the demonstration of competencies is not easy. The mismatch between academic and clinical competencies is still an issue. Solving this problem requires the entire healthcare community to come together and offer support towards development (Alismail & Lopez, 2020; Rustagi et al., 2019). With education reform top of mind, CBE offers an opportunity for better alignment and diversity between health system priorities and education programs. CBE offers increased accessibility, affordability, and completion by focusing on individual students and their innate abilities (Foster & Jones, 2022).

Medicine and dentistry have utilized CBE, or competency-based medical education (CBME) for decades. Much like allied healthcare, CBME showed promising results, such as flexibility in learning, choosing educational strategies, and adaptable assessments. However, frequent challenges are divergent learning paths, time constraints, feedback on assessments, and

staff attitudes. Additionally, the need for more training was cited repeatedly (Khanna et al., 2021; Safavi et al., 2021). Sirianni et al. (2020) performed a review of literature and identified faculty development programs as a key indicator of CBME success in medical education. The following themes were identified: the importance of direct and timely feedback on teaching and assessment skills, creating a framework to establish domains and competencies, and frequent faculty development programs (FDP).

Business Education Implementation

The adoption of CBE in business education is documented through accounting, management, and marketing (Cates et al., 2020; Rivers et al., 2018; Stewart, 2021). Because business education is a hallmark of an increasingly global society and economy, the use of competencies is not necessarily new to the fields of accounting and business management (Cates et al., 2020 and Rivers et al., 2018). The American Accounting Association and The American Institute of Certified Public Accountants (AIPA) collaborated to establish competencies that are required of all accountants pursuing a degree. These foundational competencies include communications, quantitative and analytical thinking, technological skills, and problem-solving. Newer competencies set forth by the AICPA require risk assessment, measurement analysis, and systems management (Stewart, 2021).

Management utilizes professional organizations, such as the Society of Human Resource Managers (SHRM) to create and implement competencies (Cates et al., 2020 and McDonald, 2018). Alignment of professional competencies with academic curriculum begins with the concurrence of industry leaders and faculty creating competencies that honestly prepare graduates for a dynamic business environment; not to mention, a framework for teaching and assessing competencies (Charron Vias & Rivera-Cruz, 2019). This dichotomous, conceptual

framework consists of academic and practitioner-based teaching and learning, such as education taxonomy, authentic assessment, and delivery of assessments, which are all key determinants of learner and teacher success (Cates et al., 2020).

Altogether, the research on CBE and business education vaguely discusses faculty perceptions, the need for more training and development, buy-in, as well as technological and economic resources which must be at hand (Cates et al., 2020; Charron Vias & Rivera-Cruz, 2019; McDonald, 2018). The changing landscape of technology, industry requirements, and integration of existing competencies into an academic structure is an ongoing challenge. Perceptions of teachers' disaggregated role and implementation concerns must be of top priority for institutional leaders (Charron Vias and Rivera-Cruz, 2019; Stewart, 2021).

Teacher Education Implementation

Like healthcare and business, teacher education utilizes CBE in various sub-disciplines, such as computer assisted language learning (CALL) and English as a Second Language (ESL) (Egbert & Shahrokni, 2019; Koknova et al., 2020). Teacher education, sometimes known as pre-service teachers, requires a combination of knowledge, skills, and abilities to be demonstrated simultaneously along a continuum (Egbert & Shahrokni, 2019). This active learning relies on engagement of course content. Furthermore, teachers must create, implement, and assess learning through multiple mediums. Assessment is ongoing; it requires formative and just in time feedback for students to progress. CALL teachers are especially sensitive to online CBE, since computers are an integral part of the delivery. For CBE to work, faculty must be trained continuously, provide feedback, know what resources are available, how technology can help, and what experiences with technology do teachers and students have. Nonetheless, developing competencies, creating assessments, and implementation of CBE is universal to any CBE degree.

Koknova et al. (2020) examined ESL teachers and the implementation of CBE in pre-service teachers in Ukraine. By using Bloom's Taxonomy, with a focus on CBE learning environment, alignment and integration of ESL education is feasible. For example, Koknova et al. presented a three-level model: macro-, middle-, and micro-environmental. These three phases required students to gain relevant knowledge with state agencies, related institutors, and the degree-granting university. Next, ESL faculty used their MUSIC (eMpowerment, usefulness, success, interest, and caring). These five domains consisted of competencies for students to demonstrate proficiency. ESL faculty concluded that pre-service teacher success in CBE is still a challenge, but it is trendy. Also, faculty should allow students to express their own teaching styles and personalities to fulfill competencies. Finally, frequent training is necessary for current faculty and pre-service teachers. As mentioned previously, teaching is a unique skill and must be refined often (Egbert & Shahrokni, 2019; Koknova et al., 2020).

Assessments

Assessment of competencies is equally as important as defining them. A hallmark of CBE is subjectivity and its application to the real environment (Khanna et al., 2021; Sirianni et al., 2020). There is a greater emphasis on normatively referenced assessments, direct observation, and formative assessment (Khanna et al., 2021). An accurate and reliable method of assessment must be devised by faculty to ensure competency. Bok et al. (2018) published a retrospective quantitative study to examine competency domains in healthcare professions. The study consisted of 327,974 assessment data points, 16,575 completed assessment documents, 962 students over 124 weeks (about 2 and a half years), using a mixed methods design consisting of descriptive (visualization) and inferential (inferential) analyses. For the student sample, the use of formative and summative assessments involved students demonstrating their individual

competencies and being reviewed by faculty. Results from the review of literature and student sampling indicated a linear relationship between assessment and mastering of competencies. Next, the variance in scores across studies were student-related, while the variance in performance was related to students' level of proficiency. Finally, the authors indicated formative or summative assessments are accurate for CBE; however, because students bring forth their own knowledge and skills, a consensus for how competencies are measured must be agreed upon.

An emerging strategy to address CBE assessments is the use of entrustable professional activities, or EPA (Bramley, et al., 2020). EPA is defined as "statements describing the nature of work performed by a competent individual within a specific context or discipline" (p. 149). Within the healthcare setting, EPAs demonstrate performance by assessing multiple competencies simultaneously while interacting with a patient. Once EPAs are satisfied, students are trusted to perform independently without supervision. Unlike typical assessments, such as summative or formative, EPA's use e-portfolios that allow students to take ownership of their own learning (Bramley et al., 2020; Thurab-Nkoshi et al., 2018). Advantages of EPAs include authenticity of student self-assessment, sustainability, and multi-user access. Disadvantages pertained to supervisors, including navigation issues, additional training and familiarity with e-portfolios, accessibility to technologies, and limited face-to-face training. More training and exposure to EPA e-portfolios is needed. This is consistent with research on a lack of preparedness to implement online CBE at colleges and universities.

Mast et al. (2018) provided a qualitative case study examining the implementation and assessment model of Walden University's CBE graduate program in healthcare administration. In contrast to Bok et al. (2018) and other works on assessments, Mast et al. (2019) described

their efforts towards the assessment model using a two-factor model: First, the C-BEN Quality Framework for designing competencies that align with employers, and second, faculty development and commitment by the faculty. This form of assessment modeling is beyond just developing assessments. Rather, it includes a framework for employers and faculty to address competency alignment. This allows students to matriculate at their own pace and provide the faculty full institutional support as they pivot from traditional faculty roles to CBE. In contrast, this framework of assessment contradicts Bok et al., whereby assessment was viewed from an outcome's perspective. Charette et al. (2019) reiterated the problems with misalignment of competencies between academic and clinical environments yet did not broach the importance of faculty self-efficacy and views towards this process. It would appear Walden University viewed a total quality approach to CBE assessment, and it started with their faculty.

Although current research aims to identify methods for assessments, perceived self-efficacy, views, and institutional support of CBE faculty have yet to be discussed. One notable barrier to CBE adoption is faculty may be asked to teach and assess competencies they have never learned; therefore, a steep learning curve and inaccurate competencies are developed (Sirianni et al., 2020). Most of the empirical literature incorporates self-efficacy toward assessment within the larger discussion of CBE implementation (Hsiao et al., 2020). For example, Choi et al. (2019) discussed teacher self-efficacy as an antecedent to teacher attitudes; in addition, how teachers are trained in problem-based learning (PBL) results in outward satisfaction or dissatisfaction of teaching performance. McDonald (2018) discussed the role of faculty in implementing CBE was undecided; hence, this left uncertainty in exactly how course design, facilitation, and assessment would execute. One could conclude this would leave faculty with feelings of anxiety. In their qualitative case study of K-12 students, Bingham et al. (2019)

repeated the significance of teachers' own abilities and perceptions of those abilities if students are to be successful in CBE. Again, it seems a straightforward, quantitative study of teacher views and self-efficacy on CBE is missing.

Integration

CBE implementation cannot stop at offering degrees. CBE programs integrated within the ethos of colleges or universities are important. The first step towards integration is creating a course with manageable goals (Khanna et al., 2021). Second, mapping out competencies and aligning with performance-based standards, through a qualified organization, is imperative for assessment and accreditation purposes (Lee & Pant, 2020). Third, the selection of required coursework, source materials, and exams is critical to assessing the previously mentioned goals and competencies. Fourth, consider assessment instruments aligned with competency maps. Since CBE is a personalized approach to learning, defining competencies and determining assessments, as well as deadlines, cannot be a singular approach (Holmes et al., 2021). Faculty might consider a range of submission deadlines based on the activity. In addition, Holmes et al. reported similar challenges in integrating CBE, such as lack of a standard definition and pluralistic models of implementation. Despite this study's review of literature, there is little discussion on faculty's perceived self-efficacy integration. Similarly, Wongaa and Boachie (2018) discussed faculty's perception of CBE and the need for more CBE workshops. These workshops would provide recommendations and provisions toward institutional and subject-area competencies, including learning objectives. Holmes et al. (2021) asserted CBE efficiency is achieved through mapping out competencies alongside traditional course outcomes. What is missing are perceptions of attitudes toward self-efficacy during the integration process.

Upper leadership support for CBE faculty and staff is vital to full integration and success. For example, academic deans, vice presidents, and chairs must foster a supportive climate and facilitate opportunities for faculty development programs and solicit feedback (Cutri & Mena, 2020; Khanna 2021; Sirianni et al., 2020). Takamine (2019) raised the concern of infrastructural investment to fully implement online CBE. “The budget must reflect a university’s commitment to pursuing CBE” (p. 6). If an institution embarks on offering CBE, it must ensure it fits the character and mission of the university. Hence, a school’s cultural milieu must adopt CBE at every level for it to be successful (Cutri & Mena, 2020).

Interestingly, Lescarbeau (2022) performed a qualitative study of stakeholders (faculty, administration, IT, student support, and business specialist), discovering mixed perceptions of administrators regarding CBE implementation. For example, some leaders heard about CBE through their faculty or chancellor. Similarly, community college faculty seemed agreeable towards CBE for its usefulness and fundamental approach to teaching non-traditional students. It appears reception of CBE is conflicting.

Sirianni et al. (2020) acknowledged the magnitude of change management associated with competency-based medical education. Change management strategies include faculty, students, and stakeholders coming together early in the process so each has a strong voice in proposed changes and on-going input (Lescarbeau, 2022; Sirianni et al., 2020). Last, feedback cannot be merely corrective; rather, successes and improvements should be shared among faculty and students (Sirianni et al., 2020).

Student-Centered Approach

As mentioned by Holmes et al. (2021), CBE’s attraction to adult learners is the student-centered approach. Malonda (2022) described CBE as “pedagogy based on the learner; multiple

components can be used for application: textbooks, technology, assessments, and teacher training" (p. 28). For example, Ralmall and Ralmall (2020) examined CBE programs from reputable institutions, such as Western Governors (WGU), Capella University, and Rasmussen College. These institutions combine adult learning theory, co-constructivist, and pragmatist philosophies to highlight the competencies of individuals, allowing for individual progression (Ralmall & Ralmall, 2020; Holmes et al., 2021). As such, faculty must be prepared to make curricular changes that impact didactics and communication between students and fellow colleagues. Furthermore, time constraints and alignment concerns will persist should communication channels breakdown. Mast et al. (2018), in their report of Walden University's CBE graduate program, reported overall positivity with a CBE, since adequate faculty development is required along with defined work responsibilities. Not to mention, faculty have the availability to personalize teaching and learning with each student. Takamine (2019) asserted "students' assignments are designed with the instructor's input, thus, emphasizing flexibility and personalization of learning outcomes" (p. 4). It is important to note this study examined a graduate program. A difference could exist in undergraduate programs and graduate programs.

Holistic learning

CBE allows for a more comprehensive approach to learning, especially for those who are adult learners. Again, this is a major pillar of Knowles's (1980) adult learning theory. Instead of the traditional lecture model of instruction, faculty must remember adult students come with a breadth of knowledge and experiences to form their mental organization and constructs (Knowles, 1980; Noddings, 1974). Holistic learning is akin to a constructivist-style of learning where students form their knowledge by assimilating all varieties of stimuli and information (Creswell & Creswell, 2018). With CBE, students must learn and complete assessment tasks

using a variety of modes: online sources, empirical research, and practical experience. This is a stark contrast to traditional pedagogy where demonstrable learning is predicated on lectures and summative assessments (Holmes et al., 2021).

Charrón Vías and Rivera-Cruz (2019), in their grounded theory study, utilized entrepreneurship and business education as a model to create online CBE programs. The authors view entrepreneurship as more than just starting a business; rather, a lens to gain new knowledge, and experiences, and justify life-long learning. Likewise, business education in academia and industry usually parallel one another. Consequently, competencies are easier to construct and assess compared to other disciplines. This allows students to learn standardized business acumen in an increasingly globalized society.

Variable Pace

Another unique feature of online CBE is the variable pace of learning both students and faculty undertake. To reiterate, online CBE allows for disciplined, well-organized, and technology-savvy adults to flourish within a CBE program (Hansen, 2018). Faculty must realize this changes the relational dynamic and puts the onus of learning on students. Another facet of variable pace is that students schedule their learning and monitor progress; consequently, students will be at different points in the learning continuum when they start their program (Hansen, 2018, p. 151; Hossler & James, 2021). Motivation and self-directed learning are the key behaviors of success for these students (Holmes et al., 2021). Hadullo (2021) agreed with variable pacing but emphasized the optimization of learning management systems (LMS) with online CBE. For example, students need synchronous and asynchronous access to coursework and faculty. Assessments should be tracked to identify deficiencies in progress. “Faculty should have effective and reusable content that is relevant, engaging, and appropriately difficult for the

subject matter" p. 197). Despite Hadullo's work in implementing a reliable framework for online CBE, faculty experiences and perceptions of their abilities were missing from this study.

E-Learning

As mentioned earlier, the use of the internet and online platforms are integral to online CBE and adult learners (Cates et al., 2020; Hadullo, 2021). If the student-centered approach is feasible, optimal delivery of content and assessments is germane to this methodology (Hadullo, 2021). Galustyan et al. (2019) performed an experimental study on the use of e-learning and andragogy. The sample size included 158 adult teachers ($N = 158$) with 79 in the experimental group and 78 in the control group. The experimental group used e-learning with digital services, while the control group used traditional face-to-face without e-learning. Results indicated, through comparative analysis, that e-learning provides an opportunity for a high-quality education to people of any age and various levels of knowledge. Hansen (2018) reported e-learning can offer cheaper tuition and fee rates than traditional in-person classes. For example, Southern New Hampshire University's College for America offers a flat fee rate for 3- or 6-month subscription of unlimited CBE modules. Although CBE faculty rarely address pricing, the subscription model of matriculation is something CBE faculty must be mindful of moving forward.

Faculty Development and The Evolving Role

This paper thoroughly examined CBE and the major factors allowing its proliferation (Ralmall & Ralmall, 2020). What has yet to be explored in more detail are faculty views and self-efficacy in varying disciplines. Standalone research on this topic is limited, and the research available is embedded in general CBE investigations. Unlike the student viewpoint, faculty

development, online teaching self-efficacy, and current attitudes leave much to be investigated (Echols et al., 2018; Mace & Bacon, 2018; Orr & Sonnandara, 2019; Prokes et al., 2021).

Gender Influence

The current literature offers different opinions between male and female instructors and their perceived self-efficacy of online teaching. Ventayen (2018) reported no significant differences in online teaching readiness between male and female Filipino instructors. Variables included time management, technical skills, experience teaching online, and time management. Studies by Martin et al. (2019; 2019b) failed to reveal any significant differences in the attitude of readiness between genders of U.S. and German online faculty. However, Martin et al. (2019) discovered a difference between gender and course communications, course design, and time management. These seem to conflict with Ventayen (2018) and Martin et al. (2019; 2019b). Some researchers have argued that technology-related attitudes are context-dependent (Scherer et al., 2021). For instance, time to transition is a major consideration towards adoption with significant gender differences. The pivot to online learning during the early months of COVID-19 deeply affected all faculty. Hence, Scherer et al. (2020) highly recommended future research examine gender-specific faculty's self-efficacy, perceived institutional support, and perceived online presence at a point in time. Lastly, Martin et al. (2019; 2019b) both recommended looking at faculty disciplines for additional research.

Culture and Innovation

It is well-established that cultural influences and innovation affect the rate of technological adoption and integration among faculty (Scherer et al., 2021). Underpinning these cultural norms are concepts, such as individualism-collectivism, power distance, and uncertainty avoidance (Huang et al., 2019). Together, these key determinants result in views of teacher self-

efficacy and positive or negative perceptions of teaching online. Individualism-collectivism is prioritizing group cohesion versus individual pursuits (Huang et al., 2021; Scherer et al., 2021). Next, power distance is the perception among individuals within an established structure to relate to those in control both vertically and horizontally. Uncertainty avoidance is the extent to which a society or group relies on social norms and rules to alleviate the unpredictability of future events. (Huang et al., 2021; Scherer et al., 2021; Zhao, et al., 2020). In their article, Huang et al. (2021) observed substantial differences in technology adoption between Spanish and Chinese educators in usage intent and subjective norms ($p < .001$). Huang et al. asserted the key to understanding the adoption of technology is reliant upon cultural norms. Similarly, Zhao et al. (2020), in their meta-analytic study, confirmed Huang et al. (2021) findings and affirmed a link between culture and online teaching and learning ($r = 31$). For example, cultures adopt technology more readily if levels of collectivism are high and power distance is low. Conversely, cultures with more individualism and higher power distance used technology only for its pure usefulness (Zhao, et al., 2020).

Technology

Independent of pedagogy (or andragogy) are faculty's proficiency in using instructional technologies, such as using a computer, web cameras, software, and learning management systems. Faculty are confident in their abilities to use multimedia technology (Martin et al., 2019b; Takamine, 2019; Ventayen; 2019). Current research reports that technical skills are critical to teacher self-efficacy in implementing online education (Martin et al., 2019b; Vang et al., 2020). Martin et al. (2019b), in their investigation of faculty readiness to teach online between U.S. and German online faculty, revealed that technological expertise is related to course learning outcomes. Equally, technical support is an important antecedent of motivation

for online teachers. Furthermore, a significant difference exists between U.S. and German instructors on technical skill ($p < .001$; partial $\eta^2 = .03$ (small effect). If technical ability is a barrier for teachers, imagine the impact on student success.

The technological and pedagogical content knowledge (TPACK) framework specifically examines teacher self-efficacy to implement technology for teaching and learning online. Domains consist of general and technological domains that allow teachers to learn the relationship between technology, pedagogy, and effective teaching strategies. Next, how can knowledge of the subject matter be presented via educational technologies (Scherer et al.,2021; Schmid et al., 2021)? Finally, how can instructional policies, procedures, and processes be implemented within an online course or degree program (Scherer et al., 2021; Schmid et al., 2021)? What is not discussed in more detail are teachers' perceptions of self-efficacy for online CBE in varying disciplines.

Academic Disciplines

Few studies examine the relationship between faculty's preparedness to teach online concerning academic discipline (Scherer et al., 2021). Studies that examine academic disciplines and online teaching are usually part of a larger study. However, certain academic disciplines, coupled with TPACK integration, were more likely to apply to online learning. Bolliger et al. (2019) surveyed teachers in education and engineering, which are examples of soft and hard disciplines respectively. Bolliger et al. discovered education teachers were more likely to use online learning compared to engineering teachers (Bolliger et al., 2019; Scherer et al., 2021). The confluence of academic discipline and institutional culture can sway faculty toward online teaching and learning adoption (Scherer et al., 2021). Instead of being a heterogenous group of online program faculty, Scherer et al. emphasized faculty create transformative teaching

practices that focus more on problem-solving and discovery; hence, creating a culture where online teaching and learning is ever-present (Galustyan et al.., 2019; Scherer et al., 2021).

Faculty Preparation

Considering CBE's delivery is new, programmatic faculty and their self-efficacy about CBE implementation is unknown. A quantitative study performed by Mace and Bacon (2018) examined athletic training faculty (ATF) and their knowledge and confidence about CBE. A population sample of 849 (N = 849) educators were invited to participate via email with a 19.2% response which totaled 163 respondents (n = 163). Pre-test, knowledge assessment, and post-test questionnaires were given. Nonparametric statistics were used to calculate results, such as correlation coefficients (Spearman rank) between years of experience as an ATF and knowledge scores (p = .788, r = -0.021) or years of experience as an educator only (p = .748, r = -0.025). Also, knowledge and highest degree earned showed no significant differences (p = .209), along with pretest confidence (p =. 289) and posttest confidence (p = .209). Findings confirmed there is a lack of familiarity with CBE in athletic training and a moderate level of confidence in defining competencies. At a more basic level, communication and collaboration among faculty can add or detract from faculty preparation. Echols et al. (2018) concurred with Mace and Bacon (2018) regarding the critical role of CBE faculty in implementation and oversight. This study expounded on the need for faculty development programs (FDPs) for CBE. For example, the adoption of LMS platforms for curriculum development are available at most colleges and universities but are not consistent (Echols et al., 2018). However, shrinking budgets and other institutional priorities have forced FDPs to online modules or other inexpensive means. What is needed is intensive, face-to-face training that occurs regularly. Echols et al. utilized a convenience sample of 70 (*N= 70)* faculty members who developed CBE curriculum from the CBE Network. A 15-

question survey measuring faculty members' perceptions of CBE development and execution was distributed. A nonexperimental design was used with t-test and correlation analyses were used to answer questions regarding differences in faculty competence (in CBE) between programs, the amount of faculty training, and the regularity of faculty trainings. Results indicated regular FDPs have a meaningful relationship with faculty perceptions and self-efficacy on CBE.

Similarly, Mace and Bacon (2018), Echols et al. (2018), and Zheng et al. (2018) discussed the relationship between organizational and technical support on faculty self-efficacy and perceived benefits of LMS. Their quantitative study of 379 faculty (N= 379) utilized a newly constructed survey to measure the aforesaid variables. Using structural equation modeling, discriminant analysis, reliability, and validity testing, the authors found a significant relationship. First, organizational support leads to increased technical support (p <0.01) and organizational support and LMS self-efficacy (p <0.01). Again, this seems to agree with Bandura (2012) and Hadullo (2021) who discussed the importance of faculty's perception of their own self-confidence and skills in teaching online and using an LMS.

A meta-analysis study by Bilal et al. (2019) specifically reviewed the importance of faculty vitality and satisfaction through FDPs. Inclusion criteria included articles from Pub-Med, Wiley Online Library, Taylor & Francis, and EBSCO. Other criteria included teaching, assessing, research, professionalism, and administration. A total of 37 studies explored FDPs impact on allied health faculty. A significant and positive relationship existed between FDPs and enhancing faculty's perception of preparedness and competence. As expected, teacher performance is indicative of the professional training they receive.

Studies to date corroborate the need for frequent, intentional faculty training for all faculty, independent of CBE. Based on the current literature, a positive relationship appears to

exist between professional training and faculty self-efficacy. Faculty development programs should be required to increase faculty vitality and performance.

Faculty Development Activities. Faculty development activities are intentional and should include at least three key features: the development of a conceptual model, provide timely feedback to faculty about their teaching abilities, and longitudinal programs for faculty development, not just a one-time event (Sirianni et al., 2020). In competency-based medical education, (CBME) several themes were observed. First, these activities must be intentional and connect to the overall success of competency-based education (Khanna et al., 2021; Sirianni et al., 2020; Tannenbaum et al., 2020). Without the support of teachers, online CBE will not survive. Other FDPs necessitate a more focused approach, such as learner assessments, rater training, and observation and feedback techniques. According to Tannenbaum et al. (2020) and Sirianni et al. (2020), a heavy reliance on formative assessments is encouraged to provide meaningful performance assessments, accompanied by timely feedback to guide future learning. Second, the content of FDPs must cover a skill or an area of improvement; for example, coaching was cited as a critical skill for CBME teachers. Additionally, direct observation and providing feedback are foundational to CBME coaching (Sirianni et al., 2020; Tannenbaum et al., 2020). For example, Tannenbaum et al. (2020) reiterated enough time for observation, assessment, and feedback is critical for CBME success in obstetrics and gynecology. Upon feedback, learners must practice and demonstrate their improvement. Third, is the FDP process and how training activities are delivered, or of what components comprise the activity. Offering multi-modal activities such as one-on-one, small group, observed structured teaching exercises, web-based training, peer review, and simulation are beneficial. Fourth, barriers to participation, such as lack of time, access to educational resources, planning, and faculty buy-in, were

commonly cited (Sirianni et al., 2020; Tannenbaum, et al., 2020). Fifth were considerations (enablers) that may facilitate FDP effectiveness; for example, financial incentives, academic promotion, awards, and regulatory requirements (Sirianni, et al., 2020).

Years of Online Teaching Experience

Hansen (2018) reported courses offered online are the preferred method of delivery for CBE. To that effect, it is important to examine teachers' overall attitudes and self-confidence of teaching virtually. The transition from face-to-face to online learning is multifactorial, such as use of the internet, learning management systems, and other computer-based application (Hampton et al., 2020). Historically, faculty acceptance of online education was correlated with their sustainable use of technologies (Cutri & Mena, 2020). As such, it is reported online teaching efficacy presents its own challenges which affect the quality of instruction (Martin et al., 2019; Ventayen, 2018).

Interestingly, Martin et al. (2019; 2019b) and Ventayen (2018) published works on teacher attitudes towards readiness in online learning. Both agreed abundant research exists on frameworks, roles, and requirements; however, feelings of self-efficacy in varied disciplines were hardly discussed. Cutri and Mena (2020), through their comprehensive review of literature, found four consistent themes related to online teaching readiness. The first are teacher's beliefs and identity to fully transition their courses from face-to-face to online. Second, were processes involved in the actual transition itself; for example, course re-design and transferring to an LMS platform (Martin et al., 2019b). Third were online teachers' competencies and skills in online teaching formats. Fourth are effective teaching processes; this includes incorporation of resources into the actual instructional processes (Cutri & Mena, 2020).

Emotional Complexity. The transition, development, and execution of online education elicit emotions, both positive and negative, in faculty (Naylor & Nyanjom, 2021). The pressures to transition from face-to-face courses to online courses are strong and documented (Aitchison et al., 2019; Cutri & Mena, 2020; Naylor & Nyanjom, 2021). From passion to enthusiasm, to apprehension and anxiety, research identifies three major constructs that determine online teacher affect: professional vulnerability, teacher agency, and institutional support.

Professional vulnerability is the feeling of one's professional identity being questioned through the loss of valued workplace conditions. For higher education faculty, this means individual pedagogical practices, brick-and-mortar instruction, and traditional assessment practices (Cutri & Mena, 2020; Naylor & Nyanjom, 2021). Cutri and Mena (2020) dictated professional vulnerability is relevant to both tenure-track and contingent faculty; it is the unfamiliar, the uncertainty, and unwilling that feeds vulnerability (Aitchison et al., 2019; Cutri & Mena, 2020; Naylor & Nyanjom, 2021). Cutri and Mena (2020) asserted "treating faculty and staff as interchangeable providers contrasts sharply with the cultural milieu of academia whereby faculty are considered fountains of knowledge and specialized experts" (p. 363). Aitchison et al. (2019) described the increasing shift to e-learning as product development, not people development.

Teacher agency, or commonly known as the organizational agency, is equally important. It is the sum of teachers' academic expertise, self-confidence, and commitment to professional development that inspires institutional change and academic excellence (Aitchison et al., 2019; Bellibas et al., 2020). The agency is the behavioral outcome related to faculty attitudes towards teaching online; for example, teacher self-efficacy, readiness, and motivation.

Institutional support is a major determinant of teacher vulnerability and agency (Aitchison et al., 2019; Cutri & Mena, 2020; Naylor & Nyanjom, 2021). To abate negative emotions, instructional faculty and staff should be at the center of curriculum design, assessment, and facilitation. Next, institutional support should be "at the elbow" or be readily available (Aitchison et al., 2019, p.12). Naylor and Nyanjom encouraged individualized online support services for faculty and staff. Subsequently, this personalization shows the institution's commitment to faculty success in an online enterprise.

The relationship between perceived institutional support and emotional display (positive or negative) results in distinct behavioral orientations and levels of adaptation, if at all (Naylor & Nyanjom, 2021). Futuristic educators are pioneers; they perceive change as inevitable and choose to embrace its possibilities through a positive lens. These educators feel institutional accommodations are adequate and see a vision towards success through collegiality and teamwork. Ambivalent educators accept this pivot in education but feel support is lacking from their institution. They feel a basic level of control and responsibility over course design and assessment but prefer a pragmatic approach to adoption; for example, ambivalent educators prefer to just *go and do it*. This is a tepid response in contrast to futuristic educators who are fully engaged and excited. Disillusioned educators feel supported by the institution but are saddened by the shift in educational delivery. These teachers feel frustrated and disappointed with online education. For instance, the use of an LMS platform is a restrictive attempt to replicate in-person student learning and engagement. Finally, cautious educators feel both unsupported by the institution and a strong negative inclination towards online education; for example, feelings of resentment, skepticism, and undervalued were identified. These feelings stem from a lack of control, rapid adoption of e-learning, and their inability to motivate and

engage students. These educators reported being happy with their face-to-face classes but were less confident in their abilities to learn new educational technologies. Moreover, institutional leaders did not give them time to experiment with online tools and platforms. These teachers simply could not stop comparing in-person and online teaching.

Martin et al. (2019) performed a quantitative study of 205 online teachers (N = 205) using attitude and ability as variables. After performing a MANOVA, a statistically significant difference was reported (p = .001; $\dot{\eta}^2$ = .08) between faculty's years of teaching experience and their perceptions (ability) of teaching online. For example, course design, course communications, technical proficiency, and delivery method ~~p. 110).~~ This parallel's the work of Ventayen (2018) who found a significant relationship between years of teaching online and experience teaching online ($p < .05$). A post-hoc analysis discovered a significant difference between those who have no online teaching experience and those with 11-20 years of teaching experience ($p < .05$). One can see that CBE faculty must be proficient users of online learning technologies if CBE is implemented successfully (Cates et al., 2020; Martin et al., 2019; Ventayen, 2018). In an examination of U.S. versus German teachers, Martin et al. (2019b) discovered a positive relationship between perceptions of self-efficacy and course design, course communication, and technology. U.S. Educators scored higher on perceived self-efficacy compared to their German colleagues.

Changing Role of the Faculty

If students are at the center of their own learning**,** the traditional faculty role is not viable. This change is precipitated by the burgeoning adult learner, the variable pace of CBE, student-teacher interaction, holistic learning, and assessment (McDonald, 2018). Also, the development of competencies is still nuanced, so how do faculty contribute to the process? Most

of the literature agreed dividing the traditional duties of the faculty (e.g., teaching, evaluating, and mentoring) into separate positions to reduce CBE constraints (Mast et al., 2018; McDonald, 2018). McDonald (2018) used the term *disaggregated* to describe the changing of the professoriate; additionally, this change creates separate instructor positions for curriculum development, supplemental resources, and coach for content delivery.

Bingham et al. (2020) performed a descriptive study on K-12 teachers who taught at two schools in the Rocky Mountain region. The investigators sought to understand participant experiences with CBE. Although there was one positive experience, meeting students where they are academically, the investigators identified several issues, such as time, student progress, communications, and state-level requirements.

Current Faculty Self-Efficacy and Attitudes

Research on faculty self-efficacy towards online CBE implementation is scarce; moreover, empirical studies comparing differences (if any) between academic disciplines and years of online teaching experience is lacking. To date, the only quantitative investigation examining faculty self-efficacy, views, and institutional support was published by Prokes et al. (2021). An online survey was designed to specifically measure attitudes towards the preparedness of faculty teaching CBE. A 42-item survey asked questions regarding faculty's perceived self-efficacy, perceptions (views) of CBE, and institutional support offered by the institution. Findings suggested faculty have mixed, yet sensible, views of CBE. Specifically, a collaborative environment to thrive should include opportunities for increased levels of self-efficacy, collegiality, and 360 institutional supports. Meanwhile, Hsiao et al. (2020) reported overall positive attitudes of CBE with a technological, integrated platform for assessment.

Similarly, a study published by Tannenbaum et al. (2020) examined the preparedness of medical faculty in obstetrics and gynecology. An online survey was designed to characterize faculty's understanding of competency-based medical education (CBME). For example, "understanding common trainee assessments and exploring barriers towards implementation were asked of faculty employed at obstetrics and gynecology residency programs in Canada" p. 707). A total of 284 (N = 284) responses were collected. Results indicated a positive shift to CBME; however, gaps in knowledge, work-place assessments, lack of training, and time constraints were reported. This study agrees with other similar works reporting the additional training for CBE faculty. The importance of self-efficacy and perceptions is critical for online CBE (Bingham et al., 2020; McDonald, 2018; Mast et al., 2018).

Summary

Competency-based education (CBE) requires substantial involvement and engagement from students and faculty. As the paradigm continues to shift from traditional pedagogy to a student-centric model, it is critical faculty and administrators remember the theoretical underpinnings framing CBE. Malcom Knowles's states ~~explains~~ adult learners are nontraditional students; they bring years of life experiences to their learning. Furthermore, their motivations are purely internal. For example, adults bring an eagerness to learn and solve a gap in their knowledge, skills, or abilities (Knowles, 1980).

Faculty must accurately define competencies. This is a major implementation issue for faculty; otherwise, developing curricula and assessments is futile. Faculty must realize how competencies are formed, but more importantly, how each person assimilates current and new-found knowledge differently. Thus, a personalized approach to coaching and learning is required for student success (Knowles, 1980; Orr and Sonnadara, 2019; Malonda, 2022).

Next, design and implementation of CBE rely on an institutional framework to be created, piloted, and implemented. Although such implementation is an institution-wide endeavor, faculty bear most of the workload on curriculum, delivery, assessments, alignment, and instructional support. This mode of educational delivery veers from the traditional role of the professoriate. However, as CBE becomes ubiquitous, faculty will need to examine their own knowledge, skills, and abilities on transferring a traditional 3-hour course to a CBE format (McDonald, 2018). The theory of self-efficacy reinforces the need for teachers to be trained and well-versed in online CBE (Bandura, 1977, 2012). As a result, positive attitudes, teaching satisfaction, and confidence follow with student success (Ralmall & Ralmall, 2020; Malonda, 2022).

Based on this literature review, a gap exists between different CBE faculty and their perceived level of teaching self-efficacy, views, and institutional support. Current literature is scant and only discusses factors, such as CBE grading, general design and implementation, or self-efficacy of online instruction. What is missing are the current views of faculty who teach online CBE, and their own ratings of self-efficacy. This investigation assessed the need for more CBE-related faculty development resources and added to the literature on CBE effectiveness.

CHAPTER THREE: METHODS

Overview

The purpose of this quantitative, causal comparative study is to explore perceived levels of self-efficacy, views, and institutional support among faculty who teach undergraduate online nursing, teacher education, or business administration CBE programs while controlling for years of experience. This chapter begins by introducing the design of the study, including full definitions of all variables. The research questions and null hypotheses follow. The participants and setting, instrumentation, procedures, and data analysis plans are presented.

Design

This quantitative, non-experimental study utilized a causal comparative design. Quantitative research explains phenomena by collecting detailed numerical data analyzed using numbers and logic from an objective stance (Mohajan, 2020). Nonexperimental designs observe phenomena as they occur naturally; meaning, there is an absence of a controlled intervention on the independent variable (Glasofer &Townsend, 2021). As such, this study explored the differences in the relationship between the following paired variables: perceived self-efficacy (dependent variable) and faculty types, i.e., nursing, business administration, and teacher education (independent variable); general views of CBE (dependent variable) and faculty type, i.e., nursing, business administration, and teacher education (independent variable); perceived levels of institutional support of CBE (dependent variable); and faculty type: nursing, business administration, and teacher education (independent variable). Definitions for the variables in this study are *self-efficacy*, meaning teachers' confidence in their ability to facilitate the development of students' knowledge, abilities, and values (Hampton, 2020*). Views* can be positive or negative views, thoughts, or attitudes towards an idea or action; similarly, how one feels towards

something or someone (Prokes et al., 2021). *Institutional support* is the reliance of administrative and peer support—the trial and error—of implementing CBE.

A causal-comparative design was most appropriate when exploring the differences between two or more groups. Moreover, the aim was to discover cause and effect relationships between affective dimensions of self-efficacy, perceptions (views), and perceived levels of institutional support (Apuke, 2017; Gall et al., 2007; Schunk, 2020). Previous works by Martin et al. (2019), Prokes et al. (2021), Tannenbaum et al. (2020), and Wongaa and Boachie (2018), parallel the research questions in this investigation, which examined the cause and effect between the dependent variables, self-efficacy, views, and institutional support, and the independent variable, program faculty, who teach online CBE (Gall et al., 2007; Prokes et al., 2021).

The use of a causal-comparative design is justified since the research question sought to answer the difference between perceived self-efficacy, views, and levels of institutional support of CBE faculty who teach nursing, business administration, or teacher education. To date, several empirical studies have used casual-comparative designs to specifically address affective dimensions of online instruction (De la Rama, et al., 2020; Martin et al., 2019; Ozan, 2019; Prokes et al., 2021). For example, Martin et al. (2019) examined faculty's perception of preparedness towards online education measuring two constructs. First, the significance of teacher's competencies in course design, course communications, time management, and technical skills were measured. Second, Martin et al. looked at teacher readiness through two constructs: attitudes and confidence. Data analysis included multiple analysis of variance (MANOVA). Additionally, the authors wanted to create and validate their own survey through Cronbach's alpha and confirmatory factor analysis. Mace et al. (2018) examined athletic trainer

knowledge and confidence about CBE and utilized separate Kruskal Wallis H tests and Mann Whitney *U* tests. Finally, Wongnaa and Boachie (2018) utilized a casual-comparative design to examine the faculty perception of CBE adoption in Ghana, India.

Prokes et al. (2021), in their mixed-methods study, examined the perceived inexperience of faculty teaching CBE. For example, CBE faculty must mentor students, not just on course content, but other CBE processes, such as administrative tasks, enrollment, and assessments. Differences such as these warrant a critical look into teacher self-efficacy, views, and institutional support. Part 1 of the study consisted of structured interviews asking 15 questions covering demographics, faculty's views on CBE, and how faculty rate their own self-efficacy. Results from these interviews identified emergent themes, such as compulsory participation, appropriateness to student-centered learning, and views of teaching CBE courses. In addition, self-efficacy questions identified faculty who "had variable ratings of their own confidence to implement CBE from low levels of confidence to elevated levels of confidence" p. 6). Phase 2 aggregated results from the Phase 1 (interviews), consisting of 45 items divided by demographics, views of CBE, self-efficacy, and institutional support.

Limitations of casual-comparative studies include inferencing actual causation between variables based on the data collected; therefore, caution is advised when generalizing results from the study to the larger population (Gall et al., 2007). Similarly, any results that imply a cause-and-effect relationship are mere suggestions, not a basis for causation. For example, Gall et al. provided an example of bias in teacher evaluations whereby female instructors were given lower ratings compared to their male counterparts. Yet there are several possibilities that might include "multiple dependent variables that are educationally or psychologically related, e.g., scholarship, organization/clarity, and enthusiasm" (p. 323).

Research Questions

RQ1: Is there a difference in perceived *self-efficacy* among online CBE faculty who teach in nursing, in business, or in teacher education programs?

RQ2: Is there a difference in general *views* among online CBE faculty who teach in nursing, in business, or in teacher education programs?

RQ3: Is there a difference in perceived *levels of institutional support* among online CBE faculty who teach in nursing, in business, or in teacher education programs?

Hypotheses

The null hypotheses for this study are:

$H_0$1: There is no significant difference in perceived *self-efficacy scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

$H_0$2: There is no significant difference in general *views scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

$H_0$3: There is no significant difference in perceived *levels of institutional support scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

Participants and Setting

Participants for this quantitative, causal-comparative study were drawn from undergraduate CBE programs in nursing, business administration, and teacher education. The use of a nonexperimental, causal-comparative design lends itself to collecting data that has already occurred and inferring a cause-and-effect relationship. Moreover, sampling a representative

population is not always feasible (Kohler, 2019; Sarstedt et al., 2019; Rahi et al., 2019). This study used nonprobability sampling and selected CBE faculty from United States (U.S.) institutions via two sizeable online social media platforms: LinkedIn and Facebook. These faculty taught nursing, business management, or teacher education only. A total sample size of 51 (N = 51) participated in this study.

Population

The targeted population for this study were full-and part-time faculty who taught in undergraduate CBE programs in nursing, business administration, or teacher education. To gain interest, the researcher messaged a nationally recognized CBE advocacy group, Z-Network, and a state-level CBE research group, CBEI, through LinkedIn and Facebook. The researcher provided the leadership of both groups with a formal recruitment letter to participate in this study, an official IRB consent form, and a survey link for distribution. The researcher asked the leaders of both groups to please share the materials with their faculty members.

Potential faculty participants were from one of the following online undergraduate programs: nursing (RN-BSN), early-childhood through sixth grade (EC-6), or business management programs (McDonald, 2018; Perfetto, 2019; Ventayen, 2018). In addition, faculty participants taught between 1 to 20 years online. For example, nursing faculty are responsible for teaching regular online programs and online CBE courses for adult learners (licensed registered nurses) who are seeking their bachelor's degree (White-Jefferson et al., 2020). Likewise, education instructors are experienced in teaching entry-level teachers and paraprofessionals who wish to work while pursuing their teacher's certification through an online/hybrid program and online CBE. Last, teachers will have at least a master's degree in their field of study and the requisite experience (Hansen, 2018).

Participants

The participants for this study were drawn from a convenience sample of CBE faculty currently teaching in nursing, business administration, and teacher education programs through two online social networking platforms. For this study, full- and part-time faculty are instructors only and not academic chairs or deans. Although specified in the recruitment letter, the researcher reiterated to both groups for deans and department chairs to refrain from participating in this study, as they are in leadership or managerial positions (Prokes et al., 2021). The faculty of these CBE programs ranged from residential to purely online schools and comprised a variety of online CBE programs, such as health sciences, teacher education programs, and business programs in management, marketing, information technology, and accounting.

For this study, the sample size was based on the statistic used. Therefore, a Kruskal-Wallis H test required 51 participants ($N = 51$) when assuming a large effect size, statistical power of .7 and an alpha level of .05 (Gall, et al., 2007, p. 145). The sample was selected via convenience sampling for its ease of use, readily available participants, and its low-cost (Gall et al., 2007). The sample consisted of 23 males and 27 females with one respondent choosing not to say anything. Faculty demographics are reported in Tables 1-6.

Table 1

Sex

	Frequency	Percent
Male	23	45.1
Female	27	52.9
Prefer not to say	1	2.0
Total	51	100.0

Table 1 shows the gender distribution of faculty with 23 (45%) being male,

undergraduate CBE faculty, 27 (53%) being female, and one (2%) choosing not to indicate their gender. This totaled 51 respondents. Table 2 indicates the setting of each faculty respondent. For example, six (12%) instructed in-person, 20 (39%) taught online, and 25 (49%) taught both in-person and online competency-based education. Most respondents seemed to have taught in both settings. Table 3 illustrates the years teaching in higher education of CBE faculty. For instance, 13 (26%) have taught five years or less, eight (16%) have taught 6-10 years in higher education, while the majority, 30 (59%), have taught over 11 years in higher education.

Table 2

Setting

	Frequency	Percent
Residential	6	11.8
Online	20	39.2
Both	25	49.0
Total	51	100.0

Table 3

Years Teaching in Higher Education

	Frequency	Percent
0-5 years	13	25.5
6-10 years	8	15.7
11-20+ years	30	58.8
Total	51	100.0

Table 4

Industry Experience Outside of Academic Setting

	Frequency	Percent
Yes	44	86.3
No	7	13.7
Total	51	100.0

Table 4 indicates if faculty participants had industry experience (i.e., nursing, business, or teacher education) outside of academia. Here, 44 (86%) answered yes and seven (14%) answered no. Also, many of the respondents who had experience in teaching CBE is 33 (65%) for 5 years or less, 10 (20%) with less than 10 years but more than 6 years, and eight (16%) with 11 years or more; this is shown in Table 5. Lastly, the number of faculty respondents who fit the criteria for this study is 51 (100%); this is indicated in Table 6.

Table 5

Years Involved with CBE

	Frequency	Percent
0-5 years	33	64.7
6-10 years	10	19.6
11-20+ years	8	15.7
Total	51	100.0

Table 6

Teach Undergraduate CBE Programs

	Frequency	Valid Percent
Yes	51	100.0

Fifty-one total faculty participated in this study, with n = 17 nursing, n=17 business, and n= 17 teacher education. The researcher deemed this sample size appropriate, not just for statistical power, but to align with comparable studies. Sample sizes from related studies ranged between 20 to 300 participants on average (Kabatas & Yilmaz, 2018; Mace et al., 2018; Martin et al., 2019; Prokes et al., 2021; Nikolopoulos & Kousloglou, 2020). In their quantitative study, examining online readiness and attitudes, Martin et al. (2019) sampled 205 total faculty (144 female; 56 males; 5 did not indicate gender) utilizing a nonprobability sample. Schmid et al. (2021) performed a causal comparative study of 173 pre-service teachers' technological skills for online lesson planning at a Swiss University. Yet, Nikolopoulos & Kousloglou, (2020) sampled 238 faculty in Greece. Finally, Prokes et al. (2021), in their mixed-method study sampled 40 faculty, 28 of whom had direct experience in teaching online CBE in the college setting. The disparity in sample sizes is related to the granularity of each study's research problem and methodology.

Setting

This study was performed online through LinkedIn and Facebook. Faculty who participated in this study were employed nationwide at colleges and universities, being active members with the Z-Network or CBEI. LinkedIn is the largest professional network on the internet, encompassing approximately 900 million members across different professions and trades. Facebook is a social network with approximately 3 billion users worldwide, comprised of professionals from all occupations. The Z-Network is a nationwide CBE advocacy group comprised of 30 different post-secondary institutions with several hundred faculty, staff, and professionals. The CBEI is headquartered in the southern U.S. and comprises faculty who specialize in implementation of competency-based programs in that state.

Instrumentation

The CBE views and Self-Efficacy survey (CVSE) was used for this study. See Appendix A for the instrument. Prokes et al. (2020) designed this instrument for two purposes: First, no instrument, to date, measures faculty's perceptions towards CBE usefulness and its implementation in postsecondary education. Second, exploring the relationship between self-efficacy, views, and levels of institutional support on faculty was lacking. Since the current study examined the same behavioral and emotional constructs with emphasis on faculty disposition by groups, this instrument was used entirely. The CVSE is a 42-item Likert-type scale that measures three subscales: perceived self-efficacy, views, and institutional support. Four demographic questions preceded the subscale questions. The scale ranges from 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree) and 5 (strongly agree). For each subscale, a combined mean score ranged from 3.10 to 4.59. A score of 3.10 is the lowest while 4.59 is the highest meaning that a wide range of scores on perceived self-efficacy, views, and institutional support exist. The approximate time to complete the survey is between 15-20 minutes. Approval was granted by Prokes et al. (2020). Please see Appendix B for permission to use the CVSE.

Reliability of the scale was reported using Cronbach's alpha that resulted in $\alpha = .86$. (Prokes et al., 2021). Construct validity was not ascertained in Prokes's et al. mixed-method study; however, instrument items were developed using existing scales from Albert Bandura's *Guide to Constructing Self-Efficacy Scales* (Prokes et al., 2021; Urdan & Pajares, 2006). Because of its novel approach and most recent publication, the instrument was considered new and requires additional research for its usefulness in the field (Prokes et al., 2021). Nonetheless, its pertinence to this study was invaluable and aligned with the research question, population, and sample procedures.

The survey was created in Qualtrics XM, with a shareable link for electronic distribution. For each item, participants simply check their desired response and Qualtrics sums scores for each subscale, providing an overall total. Please see Appendix A for the survey instructions and instrument. The approximate time to complete the survey is between 30-60 minutes. The researcher individually reviewed each submission for accurate scoring and completion.

Procedures

IRB approval was granted from Liberty University's Research Ethics Office. The researcher prepared the instrument for an initial study, and permission to use the instrument was granted by Prokes et al. (2021). Please see Appendix B for permission to use the CVSE instrument. Please see Appendix C for the Liberty University IRB letter of approval. The researcher compiled the survey questions into Qualtrics XM. The researcher created an electronic (see Appendix D) cover letter that provided detailed information about the purpose, confidentiality, and the anonymity of the study, sending it to all faculty. A link to the survey was also included in the letter. The consent form was sent to each faculty, which outlined the study and risks to the participant, which were minimal due to the anonymous nature of the data received by the researcher. During the first week of September, an introductory message through LinkedIn and Facebook was sent to executive leaders of both the Z-Network and CBEI seeking their interest to participate in this study. Upon agreement, the researcher sent the leaders of both groups the electronic recruitment letter and survey link for distribution. Faculty volunteers could agree or disagree with the consent form terms. Volunteers who agreed to the terms of the consent form were used as participants, while those who disagreed did not participate in the survey. After accepting the terms of the consent form, the user was directed to the survey and began answering questions. The survey started with the original four demographic questions plus two additional

questions (Please see Appendix A for the instrument). Afterwards, the survey continued with 10 questions related to general views of CBE, 15 questions over perceived idea of self-efficacy, and ended with 17 questions over institutional support. Upon completion of the survey, the participant was brought to a thank you page for completing the survey and exited. All responses were collected and scored by the Qualtrics XM platform and imported into Microsoft Excel by participant pseudonym, gender, and survey status (i.e., complete or incomplete). Participants had 30 minutes to complete the survey. The period for survey distribution and collection was 8 weeks (about 2 months).

The researcher established trust through the cover letter and purpose of the study. Emails of nursing, business administration, and teacher education faculty were obtained through each institution's program chair or dean. Faculty participants clicked on a checkbox, which indicated their consent, along with the survey submission. To increase response rate, the researcher sent email reminders every week to both organizations' leaders (Blumenberg et al., 2019). For data security, only the researcher's Personal Computer (PC) contained the Qualtrics XM platform and required a two-step authentication at login.

Data Analysis

All three null hypotheses were tested using a Kruskal-Wallis H test. A Kruskal-Wallis H test is nonparametric alternative to the one-way ANOVA. It is used when violations to normality and Levene's Equality of Variance ($p < .05$) for parametric testing are present. The researcher discovered such violations upon running a one-way analysis of variance (ANOVA). Fortunately, much like a one-way ANOVA, the research design for a Kruskal-Wallis is the same.

The Kruskal-Wallis H test has four basic requirements. The first assumption requires one dependent variable measured on a continuous scale. Accordingly, views, self-efficacy, and institutional support are all measured on a continuous, 5-point scale from strongly disagree (1) to strongly agree (5) on faculty's perceptions of CBE. The second assumption requires one independent variable that consists of two or more categorical, independent groups (Laerd Statistics, 2023). Here, faculty constitutes one variable split between nursing, business, and teacher education faculty. The third assumption requires an independence of observations, meaning each group must have its own observations and no participant is in more than one group. The fourth assumption examines the distribution and shape of scores for each group. A distribution that is the same or different across groups determines interpretation of results. For this study, views and self-efficacy had different shapes, yet institutional support was congruent across all faculty.

This study examined independent variable that consists of two or more categorical, independent groups on one dependent variable (Laerd Statistics, 2021). The survey generated data measured on a continuous scale for self-efficacy, views, and institutional support (Prokes et al., 2021). A Kruskal-Wallis H test was appropriate, since the independent variable is faculty and consists of three groups: nursing, business, and teacher education faculty. Therefore, a Kruskal-Wallis H test was conducted for perceived self-efficacy of CBE (dependent variable) and faculty type (independent variable); general views of CBE (dependent variable) and faculty type (independent variable); institutional support (dependent variable) and faculty type (independent variable). This allowed for measured differences between each faculty group and each dependent variable (Laerd Statistics, 2021; Warner, 2012, 2020).

CHAPTER FOUR: FINDINGS

Overview

The purpose of this quantitative, causal-comparative study was to determine if there was a difference in self-efficacy, views, and institutional support scores among faculty who teach undergraduate competency-based education programs in nursing, business, and teacher education. A Kruskal-Wallis H test was used to either reject or fail-to-reject the null hypotheses. This chapter includes a review of the research questions and three null hypotheses. Descriptive statistics are provided, and the results section provides an overview of the assumptions and analysis of variables using the CBE Views and Self-Efficacy Survey CVSE.

Research Questions

The following three research questions were addressed in this study:

RQ1: Is there a difference in perceived *self-efficacy* of online CBE faculty who teach nursing, business, or teacher education programs?

RQ2: Is there a difference in general *views* of online CBE faculty who teach nursing, business, or teacher education?

RQ3: Is there a difference in perceived *levels of institutional support* of online CBE faculty who teach nursing, business, or teacher education?

Null Hypotheses

The corresponding null hypotheses tested in this study were:

$H_0$1: There is no significant difference in perceived *self-efficacy scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

$H_0$2: There is no significant difference in general *views scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

$H_0$3: There is no significant difference in perceived *levels of institutional support scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

Descriptive Statistics

Descriptive statistics for the dependent variables self-efficacy, views, and institutional are found in Table 7. The researcher collected data on 51 participants using a 42-item questionnaire. The possible point total for each item had a maximum point value of five with a minimum point value one. An average score of one indicated strong disagreement with views, self-efficacy, and institutional support of CBE, while an average score of five indicated strong agreement with CBE views, self-efficacy, and institutional support.

The dependent variables in this study were self-efficacy, views, and institutional support, and the independent variable was faculty type, split into three groups: nursing, business administration, and teacher education. The dependent variables were measured on a 5-point Likert-type scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). The lower scores on this scale assert a negative perception of CBE faculty's view on CBE, their own teaching abilities (self-efficacy), and their institutions' ability to support their instructional efforts, for example, preparation, ongoing support, and workload. In contrast, the higher scores indicate a general agreement on faculty's views of CBE, positive instructional ability, and how their institutions support faculty preparedness. The reliability score for the CVSE was measured by

Cronbach's alpha (α = .86), which is reliable. Typically, 0.6-0.7 indicates an acceptable level, while 0.8 or greater is considered high (Warner, 2012, 2020.)

Table 7 provides descriptive statistics for the dependent variables. Views ranged from 3 to 5 (M = 3.88*; SD* = .475); self-efficacy ranged from 3 to 5 (M = 4.24*; SD* = .473); and institutional support ranged from 3 to 5 (M = 4.00*; SD* = .346).

Table 7

Descriptive Statistics of Study Variables

	N	Minimum	Maximum	*M*	*SD*
Views	51	3.00	5.00	3.90	.480
Self-efficacy	51	3.00	5.00	4.20	.470
Institutional support	51	3.00	5.00	4.00	.350

Results

A Kruskal-Wallis H test was conducted to determine if there were statistical differences between the dependent variables, views, self-efficacy, and institutional support scores, and the independent variable, faculty type. The following sections include descriptions of assumption testing required for the Kruskal-Wallis H test; additionally, an analysis for each null hypothesis is included in this section.

Data Screening

The results of the CVSE Survey were exported from Qualtrics to Microsoft Excel, then to the SPSS package compatible with IBM SPSS (Version 26). Originally, a total of 63 responses were collected. The data were screened by visually examining for any data errors; there were 12 unusable entries; as a result, 51 usable entries were used for this study. In addition, each participant was given a case number and grouped based on faculty type (see Appendix F).

Assumption Test

The Kruskal-Wallis H test requires four assumptions to be met. Before data analysis, the first three assumptions were met. The dependent variable was measured on an interval or ordinal scale, the independent variable consisted of two or more categorical, independent groups, and observations were independent. For example, participants had to belong to only one group. For this study, each participant belonged only to nursing, business administration, or teacher education.

The fourth assumption for a Kruskal-Wallis H test is the shape—similar or dissimilar—of the distribution of scores. If the distributions have a different shape, the Kruskal -Wallis H test is used to determine whether there are differences based on the distribution of scores. In contrast, if the distribution of scores is similar, the Kruskal-Wallis H test determines differences based on median scores of groups (Lared Statistics, 2023).

Figure 1 depicts scores among faculty group and their perceptions, or views, about CBE using a box plot. Visual examination shows the distribution of scores are not similar among faculty groups. Figure 2 illustrates the distribution of perceived self-efficacy scores among faculty groups. It would seem nursing and business education scores are similar, but teacher education scores are not; hence, the distributions here are not similar. Lastly, Figure 3 shows institutional support scores among faculty groups. This box plot shows identical shapes for nursing, business, and teacher education faculty.

Figure 1

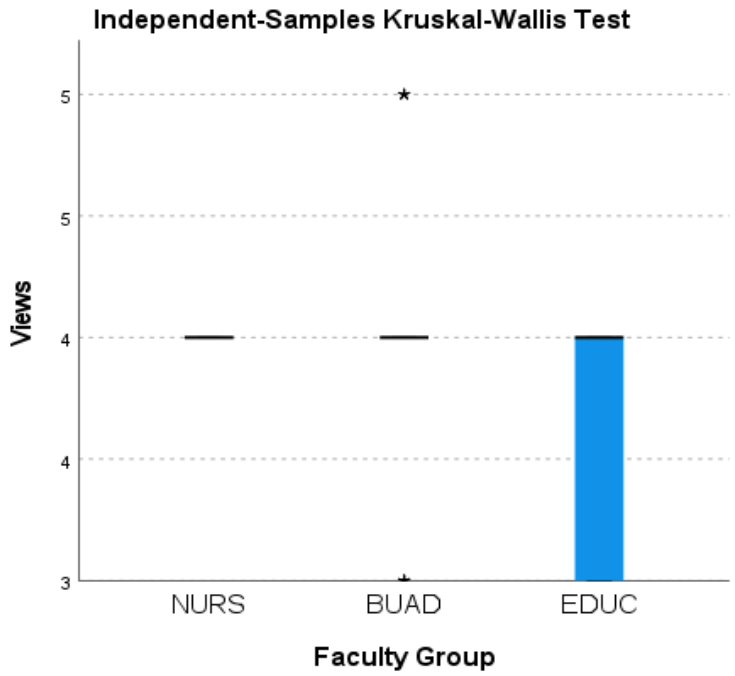

Independent-Samples Kruskal-Wallis Test
Views
5
5
4
4
3
NURS
BUAD
EDUC
Faculty Group

Figure 2

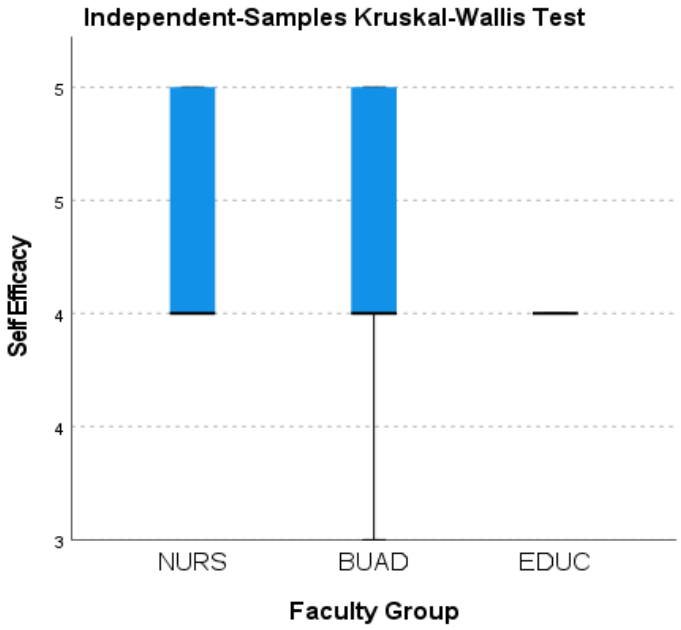
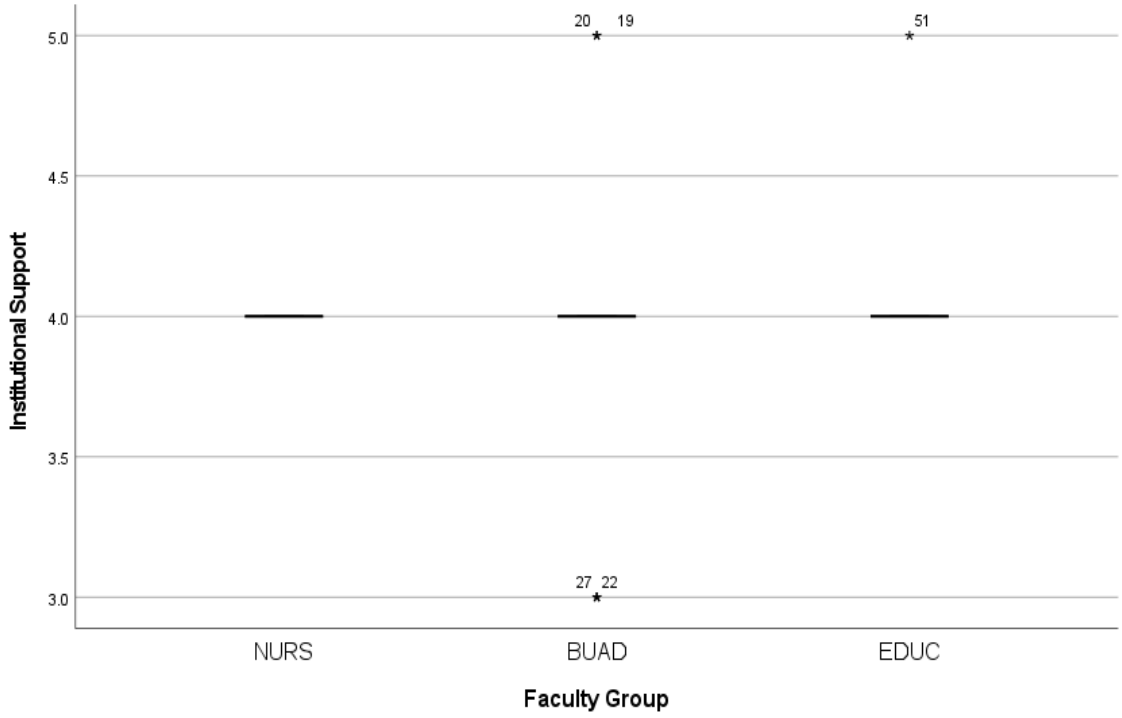

Independent-Samples Kruskal-Wallis Test
Self Efficacy
5
5
4
4
3
NURS
BUAD
EDUC
Faculty Group

Figure 3



Hypotheses

$H_0$1: There is a significant difference in perceived *self-efficacy scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

A Kruskal Wallis H test was used to test the first null hypothesis to determine a statistically significant difference between self-efficacy scores and faculty type. The independent variable is faculty type split into three groups: nursing, business administration, and teacher education. The dependent variable is general views scores.

The researcher rejected the null hypothesis at the 95% confidence interval where H (2,48) = 7.33, p = .026. Partial eta squared was used to calculate effect size (η^2 = .111). The effect size was medium. There was a statistical difference between nursing, business

administration, or teacher education faculty and their perceived self-efficacy scores to teach online CBE (M = 4.2*; SD* = .47). See Table 8 for the results of the Kruskal-Wallis H test. Because the Kruskal-Wallis H test calculated a statistically significant difference, SPSS automatically ran a pairwise comparison. Consequently, a statistical difference existed between teacher education and nursing faculty. Please see Table 9 for the pairwise comparisons. Figure 2 shows the distribution of self-efficacy scores between faculty groups. Visual inspection concluded CVSE scores were not similar, especially between nursing and teacher education. This parallels the statistically significant findings.

$H_0$2: There is no significant difference in general *views scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

A Kruskal-Wallis H test was used to test the second null hypothesis to determine if there was a statistical difference between views scores and faculty type. The independent variable is faculty type split into three groups nursing, business administration, and teacher education. The dependent variable is general views scores.

The researcher failed to reject the null hypothesis at 95% confidence interval where *H* (2,48) = 3.74, *p* = .154. Partial eta squared was used to calculate effect size (η^2 = .036). The effect size was small. There was not a statistical difference between faculty type and general views scores towards online CBE (*M*=3.9*; SD*=.48). See Table 8 for results of the Kruskal-Wallis H test. Figure 1 shows the dissimilar distribution of scores among faculty types.

$H_0$3: There is no significant difference in perceived *levels of institutional support scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

A Kruskal Wallis H test was used to test the third null hypothesis to determine if there was a statistical difference between institutional support scores and faculty type. The independent variable is faculty type split into three groups nursing, business administration, and teacher education. The dependent variable is general institutional support scores.

The researcher failed to reject the null hypothesis at 98% confidence interval where $H(2,48) = .980$, $p = .613$. Partial eta squared was used to calculate effect size ($\eta^2 = -.021$). The effect size was small. There was not a statistical difference between faculty type and institutional support scores towards online CBE *(M*=4.0*; SD*=.35). See Table 8 for results of the Kruskal-Wallis H test. Figure 3 shows great similarity among faculty distribution scores with a median value being 4.0.

Table 8

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Views is the same across categories of Faculty Group.	Independent-Samples Kruskal-Wallis Test	.154	Retain the null hypothesis.
2	The distribution of Self Efficacy is the same across categories of Faculty Group.	Independent-Samples Kruskal-Wallis Test	.026	Reject the null hypothesis.
3	The distribution of Institutional Support is the same across categories of Faculty Group.	Independent-Samples Kruskal-Wallis Test	.613	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

Table 9

Pairwise Comparisons of Faculty Group.

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.
EDUC-BUAD	7.706	3.956	1.948	.051
EDUC-NURS	10.294	3.956	2.602	.009
BUAD-NURS	2.588	3.956	.654	.513

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

CHAPTER FIVE: CONCLUSIONS

Overview

Upon completion of the data analysis, the results were reviewed and discussed in the following section. The discussion section evaluates the data from this study and how it impacts the current body of literature on CBE instructional preparedness and implementation. This section discusses how colleges and universities could augment their support of faculty who teach online CBE. Finally, the limitations of this study are presented and recommendations for future research are presented.

Discussion

The purpose of this quantitative, casual-comparative study research study was to determine if there was the difference between self-efficacy, views, and institutional support scores among faculty who teach as nursing, business administration, and teacher education faculty in CBE. This study is intended to inform college and university administrators, faculty, and staff who administer CBE programs online. Currently, the literature is replete with how to create, define, and implement CBE, however, lacking in evaluating the overall attitudes of instructional faculty.

The participants in this study were collected from two social media platforms whose memberships enlisted undergraduate CBE instructors across the United States. The criteria for this study were faculty 18 years old or older, teaching in an undergraduate CBE program in nursing, business, or teacher education at the time of the study, and not holding an administrative position, such as dean or chair. The sample comprised of 51 participants (N = 51). The sample consisted of 45% (23) males, 53% (27) females, and 2% (1) who chose not to respond. Faculty teaching both online and residential was 49% (25), solely online was 39% (20), and residential

was 12% (6). Years of higher education teaching experience was 26% (13) for 5 years or less, 16% (8) between 6-10 years, and 59% (30) between 11-20 years or more. Next, 86% (44) had industry experience outside of the academic setting and 14% (7) had no industry experience. The number of years involved with CBE resulted in the following: 65% (33) had 5 years or less, 20% (10) had 6-10 years of experience, and 16% (8) has 11-20+ years of experience. Finally, the number of undergraduate faculty who taught CBE programs was 100% (51).

The CBE Views and Self-Efficacy Survey (CVSE) comprised approximately 42 questions scored on a 5-point Likert scale. Each participant received a score between 42-210; scores were analyzed using a one-way ANOVA using IBM SPSS Statistics program software. The one-way ANOVA requires several assumptions to be met; however, since the assumptions of normality and equal variances were violated ($p <. 001$), a Kruskal-Wallis H test was conducted. The one-way ANOVA and Kruskal-Wallis follow the same assumptions except for the assumption of similar shaped distributions, which is unique to the Kruskal-Wallis H test. The distribution of scores for all three groups was compared. Only institutional support scores exhibited a similar distribution pattern; hence, median scores can be used to highlight any differences between faculty groups, while self-efficacy and views rely on the distribution only.

$H_0$1: There is no significant difference in perceived *self-efficacy scores* among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

The first hypothesis sought to determine if a significant difference exists in self-efficacy scores between nursing, business, and teacher education faculty. A difference could indicate different academic disciplines are better prepared to teach online CBE compared to others. The Kruskal Wallis H test revealed a statistically significant difference between faculty groups and

their perceived self-efficacy (p = .026); furthermore, the effect size was reported as medium (η^2 = .111). Table 8 shows a significant difference between perceived teacher self-efficacy and faculty groups. Table 9 shows pairwise comparisons, whereby teacher education and nursing faculty show a significant difference. Figure 2 shows a distributional difference in scores between CBE faculty who teach nursing and teacher education. Results clearly show CBE faculty, of various disciplines, have differing levels of teacher self-efficacy; moreover, this difference has a bearing on their abilities to perform.

In addition, a non-significant value between business and teacher education faculty (p = .051) was found; however, the p-value is one-hundredth of a point from the p – critical value of p < .05. For practical purposes, it is plausible a practical difference exists between business administration and teacher education faculty. These differences, whether statistical or practical, are demonstrated in faculty preparation and implementation. For instance, the field of nursing education and healthcare, for that matter, rely on competencies to determine proficiency (Alismail & Lopez, 2020; Charette et al., 2019; Mace & Bacon et al., 2019). Charette et al. (2019) asserted the use of evidence-based practices drives the use of CBE in nursing; not to mention, the continual refinement by industry associations. Nurse professionals and educators must come together to offer support and develop CBE for nurses (Alismail & Lopez, 2020; Rustagi et al., 2019). This would parallel the current findings of a non-significant relationship between faculty and self-efficacy.

Business education and CBE is present within accounting, management, and marketing (Cates et al., 2020; Rivers et al., 2018; Stewart, 2021). The catalyst for increasing use of CBE and these business disciplines is the expanding global economy. Accounting education is governed by two major associations that require competencies to be met to practice as a certified

public accountant (CPA) (Stewart, 2021). Human Resource Management also utilizes CBE through its professional accrediting body. The integration of CBE and human resources is reliant on the relationship between academe and professionals (Cates et al., 2020).

Pre-service teachers report using competencies. Koknova et al. (2020) in their study of ESL teachers and their use of Bloom's Taxonomy with a focus on CBE teacher training proved successful. Overall, 78% agreed with this kind of support, 83% reported using it, and 79% reported positive results. Koknova et al. (2020) connected training with teacher self-efficacy; similarly, Egbert and Shahrokni (2019) demonstrated a thorough framework of computer-assisted language learning (CALL) and benefits to CBE teachers. These articles seem to agree with the results of the current study. Perhaps the teachers who participated in this study had adequate preparation to teach online CBE. However, it is noteworthy that business and teacher education have numerous subspecialties. Thus, generalizing the results of this study to other business disciplines and pre-service teacher education programs is not tenable.

Additional data on teacher self-efficacy and online CBE is warranted. The current literature is mostly qualitative, and those that are quantitative cover CBE assessment and implementation, not emotional characteristics (Lee & Pant, 2020; Prokes et al., 2021). Choi et. al. (2019) discussed the critical nature of teacher self-efficacy and classroom experiences. For example, teachers often observe how students are learning and respond to any student deficits in learning. With CBE, it is still unclear how instructors build their confidence since they are more coaches and administers of content (McDonald, 2018). Dincer (2021) determined major predictors of teacher self-efficacy, which are like those who teach online CBE. These include communications (p = .000), achievement goals (p = .000), academic success (p = .000), and department (p = .039). A similar study by Tannenbaum et al. (2020) examined the attitudes of

medical faculty teaching competency-based medical education. This quantitative study confirmed a lack of proper training, knowledge gaps, and clear assessments left faculty feeling unsure of their abilities. This study seems to agree with Choi et al. (2019) and Dincer (2021).

A more recent study by Prokes et al. (2021) utilized a mix-methods study whereby the researchers examined views, self-efficacy, and levels of institutional support of faculty teaching CBE. Prokes et al. uncovered mostly mixed though balanced views of CBE, mostly high self-efficacy due to significance of mastering experiences, and specific support opportunities for CBE implementation. Mean for overall teaching ability was reported at $M = 4.06$, support and intervention, $M = 3.59$, and content instruction, $M = 3.59$. Since the CVSE originated with Prokes et al., this could be attributed to why a non-significant difference was reported in the current study. Prokes et al. reiterated an environment built on collaboration and support results in thriving faculty.

$H_0$2: There is no significant difference in general views scores among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

The second hypothesis sought to determine if there was a significant difference in general views' scores based on faculty discipline. The study was conducted on the assertion that nursing, business, and teacher educators viewed CBE's relevance differently. However, results showed a non-significant difference: $H(2, 48) = 3.738$, $p = .154$ and effect size $\eta^2 = .036$. The effect size indicated the impact of views of CBE and faculty type is minor at best. Figure 1 illustrates faculty score distributions appearing unalike or even mixed.

This seems to agree with Prokes et al. (2021) who found mixed views of CBE among their faculty. Again, this research question was derived from several research studies. Prokes et

al. defined views of CBE through the following constructs: theory/background, origins of CBE teaching, student focus, general tenets, and teaching and delivery. Knowles (1980) and Likisa (2018) underpinned the difference between self-reliant to self-directed learners; moreover, the actual imputed value of this change is experienced by all stakeholders, such as students, faculty, and staff. As mentioned previously, nursing had used CBE for many years, and is their form of teaching and learning. McDonald (2018) in their case study, discussed the full implementation of a management degree using CBE. Results indicated CBE was beneficial for overall learning and completion, but perceptions of the faculty role were mixed. Similarly, Foster and Jones (2020) performed a quantitative study of students' pre-and post-learning. An average of 18.4 points increase was realized between assessments. This point value asserted that students saw a significant increase in learning using a CBE model; however, best practices were unclear and warrant additional study. Thus, faculty in previous studies have varied perceptions of CBE's benefits, which parallel the findings of the present study.

$H_0$3: There is no significant difference in perceived levels of institutional support scores among faculty who teach online CBE programs in nursing, business, or teacher education as measured by the CBE Views and Self-Efficacy Survey.

The last hypothesis sought to determine if there was a difference in institutional support scores between faculty disciplines. The Kruskal-Wallis H test proved a statistically significant difference did not exist between faculty groups *(p* = .613) and with a small effect size (η^2 = -.021). The small effect size inferred a limited, practical impact between faculty type and their attitudes towards institutional support. Figure 3 shows near identical distributions; median scores are 4.0, which on the CVSE Survey indicated an agreement in institutional support and CBE implementation.

One could hypothesize the relationship between perceived levels of institutional support and faculty—as one collective group—is more important. Past studies discuss this variable as an outcome of their investigation, not a specific variable as in this study. For example, Echols et al. (2018), as part of their study, investigated the relationship between the number of institutional training hours and delivery method. The authors found a significant relationship between delivery method and level of teaching preparedness. Cutri and Mena (2020 performed an integrated literature review that examined the affective characteristics (e.g., empathy, creativity, and confidence) and their influence on online CBE teacher readiness. The authors discovered teachers' willingness to experiment and adopt new methods of teaching is incumbent upon levels of support. For example, resources for transitioning from in-person to online and offering safe spaces for faculty to express their fears are warranted. As one can see, faculty support is germane regardless of discipline. However, a quantitative study looking into institutional support and preparedness is limited except for the present study and Prokes et al. (2021).

Since institutional support is a mechanism for teacher self-confidence and success, how well-supported faculty feel is critical to implementation success (Echols et al., 2018; Mace & Bacon, 2018; Orr & Sonnandara, 2019; Prokes et al., 2021). CBE is not pedagogy, but andragogy, and is linked to defining competencies, creating assessments, and collaborating amongst faculty. Some research studies express institutional support as workload, ongoing training, and pivoting from current institutional structures to a CBE format. However, this study's foci are faculty training, course implementation, modality, and alignment with industry. Although a significant finding was not reported in this study, it only underscores the overall importance of leadership support toward faculty across all disciplines. For instance, McDonald (2018) was a 5-year study that examined a private college's implementation of CBE. Notable

themes from this study included a process to define competencies, curate accurate assessments, and describe the disaggregation of the faculty role. For example, faculty are no longer instructors, but rather coaches; faculty are no longer scholars, rather administrators; and faculty do not perform community work but are curriculum and assessments developers. (McDonald, 2018). Studies from Wongaa and Boachie (2018), Holmes et al. (2021), and Cutri and Mena (2020) affirmed the need for support from upper leadership.

Mace and Bacon (2018) found in their study that a correlation exists between athletic training faculty experience and lack of familiarity with CBE (p = .748, r = -0.025); likewise, knowledge, communication, and collaboration among faculty was lacking (p = .788, r = -0.021) Lescarbeau (2022), in their study of CBE stakeholders, such as faculty, administration, and information technologists, discovered mixed feelings regarding implementation. Miscommunication among faculty and leaders was the main culprit. Lastly, Echols et al. (2018) agreed with prior studies that faculty development programs are critical for CBE success and should be supported by executive leadership.

It is worth noting, compared to the other two hypotheses, institutional support had the smallest relationship between faculty types and self-efficacy and views. Nevertheless, the results of this section must not go unnoticed by college or university administrators. The current body of literature still accentuates the need for faculty support, especially communication, and collaboration. This results in organizational agency and citizenship (Aitchison et al., 2019; Naylor & Nyanjom, 2021)

Implications

The purpose of this study was to answer the following research questions:

RQ1: Is there a difference in perceived *self-efficacy* among online CBE faculty who teach in nursing, in business, or in teacher education programs?

RQ2: Is there a difference in general *views* among online CBE faculty who teach in nursing, in business, or in teacher education programs?

RQ3: Is there a difference in perceived *levels of institutional support* among online CBE faculty who teach in nursing, in business, or in teacher education programs?

The research questions were derived from the seminal work of Prokes et al. (2021). In contrast to their exploratory work, the results of this study looked at a heterogenous subset of faculty, finding no significant differences. The frequency of responses parallel those of Prokes et al. (2021) that views of CBE are mixed, self-efficacy is high, and faculty learning and improvement opportunities must be available.

The first hypothesis focused on differences between different faculty disciplines and their perceived levels of self-efficacy to teach CBE online. Unlike the latter hypotheses, this hypothesis has empirical literature illustrating CBE's integration in healthcare education for decades (Alismail & Lopez, 2020; Charette et al., 2019; Mace & Bacon, et al., 2019; Orr & Sonnandra, 2019). While business and teacher education have only begun using CBE more regularly, such as accounting, management, CALL, and ESL. (Cates et al., 2020; Egbert & Shahrokni, 2019; Koknova et al., 2020; Rivers et al., 2018). The statistical difference between faculty types and self-efficacy, specifically nursing and teacher education faculty, should be explored in more detail. In addition, the possible difference between business and teacher education should be studied further and with larger sample size, different sub-disciplines, and using a mixed-methods approach.

The second research hypothesis focused on the general perceptions or views of CBE, which were mixed (neither agree nor disagree) (*M* = 3.90; *SD* =.480). Prokes' et al. (2021) received similar scores (*M*= 3.68; *SD* = 1.12). This study adds literature from Bingham et al., (2020), Mast et al. (2018), and McDonald (2018), which stated the faculty role is disaggregated, faculty were pressured to teach CBE, and a relationship exists between years of teaching experience and implementing CBE (Prokes et al., 2021). It is critical that school leaders and staff see the potential to change the dialogue on CBE from mixed to positive simply by communicating with faculty before the implementation process.

The third hypothesis focused on CBE faculty's perceived levels of institutional support. Once more, the researcher in this study did not find a significant difference, yet the mean value increased *(M* = 4.00; *SD* =.350) in comparison to Prokes' et al. (2021) original study (*M* = 3.69; *SD* =.94). A score of 4, on the CVSE, signifies agreement with the item, while 3.69 would indicate a neutral to agree stance. Overall, this indicated the increasing importance of leadership support. This investigation provides inferential data on institutional support between faculty disciplines. Other than Prokes et al. and the current investigation, few studies are looking at this construct in detail. As a result, a clear nexus for supplementary studies should look at specific elements of institutional support.

Interestingly, all nursing faculty who participated in this study selected 4 (agree) on all three subscales: views, self-efficacy, and institutional support as illustrated in Figures 1-3 (i.e., boxplots). This indicated a consensus by nursing educators on the usefulness, practicality, and level of support towards CBE. This adds credence to the existing difference in implementing CBE between nursing and teacher education faculty.

In conclusion, since many subdisciplines exist under business administration and teacher education, this study provides a starting point for future investigations that would expand the results of this study. The increase in mean values from Prokes et al. (2021) to this study indicates other disciplines should be included with much larger sample size and the use of simple random sampling. This might result in a statistically significant difference that is generalizable to the broader CBE faculty population (Gall et al., 2007). This study adds to the body of knowledge that teacher self-efficacy is a major determinant of classroom success.

Limitations

This research is subject to several limitations. First, causal-comparative designs are limited in their ability to gather a true random sample. The researcher used convenience sampling to easily access the needed population. It is reasonable to assume the violations to normality and equal variances tests were the result of convenience sampling. This justified the use of Kruskal-Wallis H test, whereby the distribution of median scores versus means is used to determine statistical significance. Second, convenience sampling prevents a true representation of the total population or generalizability. Gall et al. (2007) defined generalizability as the ability to extend research results from a study to a larger population. The researcher's sample was a careful selection of faculty from undergraduate CBE programs in the United States; hence, extrapolating results to a broader population—other CBE programs and faculty—may not be tenable. Third, the reliability of responses and personal bias are additional limitations in survey research (Nayak & Narayan, 2019). This might explain why extreme outliers are present in the boxplots for views and institutional support.

Self-reported data is another limitation. The researcher asked each respondent to rate their perceived levels of self-efficacy, views, and institutional support using a Likert-type scale.

The use of self-reported data has limits to depth and accuracy. These limits are inherent in the variability among individual behaviors and emotions (Dang et al., 2020). In addition, variance is higher in behavioral measures and can attenuate reliability. Thus, respondents may not be able to assess themselves accurately or honestly, which can lead to inaccurate responses. The researcher could have asked participants open-ended questions or conducted interviews to expound on survey responses for self-efficacy, views, and institutional support.

Lastly, the researcher took measures to ensure threats to internal and external validity were minimized. For example, responses were completely anonymous, and no identifying information was recorded. Also, the survey was available to all those who taught undergraduate CBE via LinkedIn and Facebook. So, despite convenience sampling, the distribution of the survey to LinkedIn and Facebook ensured a broad sample distribution.

Recommendations for Future Research

Based on the findings of this study, further research is warranted between the variables, self-efficacy, views, and institutional support, and faculty in nursing, business administration, and teacher education. The following recommendations should be considered:

1. A mixed methods study between teacher self-efficacy and undergraduate CBE faculty in nursing, business administration, and teacher education is recommended. A mixed methods study would provide additional insight from which researchers can conclude.
2. A quantitative study looking at the differences in self-efficacy, views, and institutional support using simple random sampling and a much larger faculty sample.
3. A quantitative, experimental study using pre-and post-data collection. For example, CBE faculty attitudes towards preparedness are initially assessed, then faculty are provided formal training on implementation and reassessed for attitudes.

4. A correlational design using years of teaching experience and teacher self-efficacy might provide additional results and broaden the understanding between faculty groups, requisite training, and overall feelings of teaching preparedness.
5. Since a near significant finding was found between business administration and teacher education faculty, a future study should employ a much larger sample size, utilizing simple random sampling. Moreover, such a study could isolate for a specific discipline; for instance, marketing and early childhood through sixth-grade teachers.

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APPENDIX A

CBE Views and Self- Efficacy Survey

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https://doi.org/10.18122/td.1783.boisestate\

APPENDIX B

Permission to use CBE Views and Self-Efficacy Survey

Hi Randy,

I'm humbled you reached out. It was as you mentioned hard to find an instrument in the field. I was fortunate my committee encouraged me to develop my own and it came back with a high degree of reliability.

I would recommend too checking the actual publication of the dissertation in JCBE: https://onlinelibrary.wiley.com/doi/full/10.1002/cbe2.1263

That said, I hereby grant permission with attribution for use of the survey instrument.

Best of luck! I will look out for your final version.

Respectfully,

APPENDIX C

Institutional Review Board Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

November 9, 2022

Randy Canivel
Michelle Barthlow

Re: Modification - IRB-FY21-22-1233 DIFFERENCES IN FACULTY SELF-EFFICACY, VIEWS, AND INSTITUTIONAL SUPPORT TOWARDS TEACHING COMPETENCY-BASED EDUCATION ONLINE: A NON-EXPERIMENTAL CAUSAL COMPARATIVE STUDY

Dear Randy Canivel, Michelle Barthlow,

The Liberty University Institutional Review Board (IRB) has rendered the decision below for IRB-FY21-22-1233 DIFFERENCES IN FACULTY SELF-EFFICACY, VIEWS, AND INSTITUTIONAL SUPPORT TOWARDS TEACHING COMPETENCY-BASED EDUCATION ONLINE: A NON-EXPERIMENTAL CAUSAL COMPARATIVE STUDY.

Decision: Exempt

Your request to "distribute electronic copies of [your] official recruitment letter and stamped consent to the CBE Network [and] ask for participants via LinkedIn" has been approved.

Thank you for complying with the IRB's requirements for making changes to your approved study. Please do not hesitate to contact us with any questions.

We wish you well as you continue with your research.

APPENDIX D

Recruitment Letter

Dear CBE Faculty:

My name is Randy Canivel, and I am a graduate student in the School of Education at Liberty University. I am conducting research as part of the requirements for a Doctor of Philosophy degree. The purpose of my research is to determine differences in perceived self-efficacy, views, and institutional support of faculty teaching competency-based education online, and I am writing to invite eligible participants.

Participants must be 18 years of age or older, must be currently teaching full-or part-time in a residential or online postsecondary institution, must be currently teaching in an undergraduate competency-based education (CBE) program in either nursing, business administration, or teacher education only, and must not hold a position of leadership, such as chair or dean, in an undergraduate nursing, business administration, or teacher education program.

Participants, if willing, will be asked to complete a survey with demographic questions and a 42-item CBE Views and Self-Efficacy Survey. It should take approximately 20 minutes or less to complete the procedure listed. Participation will be completely anonymous, and no personal, identifying information will be collected.

To participate, please click here.

A consent document is provided as the first page of the survey after you click on the survey link and is attached to this email. The informed consent document contains additional information about my research. After you have read the consent form, please click on the yes, I agree to participate in this study button. Doing so will indicate that you have read the consent information and would like to take part in the survey.

APPENDIX E

Consent Form

Title of the Project: Differences in Faculty Self-Efficacy, Views, And Institutional Support Towards Teaching Competency-Based Education Online
Principal Investigator: Randy G. Canivel, Ph.D. Candidate, Liberty University

Invitation to be Part of a Research Study

You are invited to participate in a research study. To participate, you must be at least 18 years of age or older, must be currently teaching full-or part-time in a residential or online postsecondary institution, must be currently teaching in an undergraduate competency-based education (CBE) program in either nursing, business administration, or teacher education only, and must not hold a position of leadership, such as chair or dean, in an undergraduate nursing, business administration, or teacher education program. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to take part in this research.

What is the study about and why is it being done?

The purpose of this study is to determine if there are differences in teacher self-efficacy, views, and institutional support among undergraduate CBE faculty in nursing, teacher education, or business administration.

What will happen if you take part in this study?

If you agree to be in this study, I will ask you to do the following things:

1. Complete a survey, which will take approximately 20 minutes. The survey will consist of seven demographic questions, followed by a 42-item scale CBE Views and Self-Efficacy Survey.

How could you or others benefit from this study?

Participants should not expect to receive a direct benefit from taking part in this study.

Benefits to society include a better understanding of faculty's perspective in implementing and integrating CBE in higher education.

What risks might you experience from being in this study?

The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

How will personal information be protected?

The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses will be anonymous.

- Data will be stored on password protected computer and in a locked cabinet. The data may be used in future presentations. After three years, all electronic data will be deleted and all physical data shredded.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any questions or withdraw at any time prior to submitting the survey without affecting those relationships.

What should you do if you decide to withdraw from the study?

If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study is Randy G. Canivel. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact him at or You may also contact the researcher's faculty sponsor.

Whom do you contact if you have questions about your rights as a research participant?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Consent

Before agreeing to be part of the research, please be sure that you understand what the study is about. You can print a copy of this document for your records. If you have any questions about the study later, you can contact the study team using the information provided above.

APPENDIX F

Sample Data Spreadsheet

NURS	Views (Average)	Self Efficacy (Average)	Instituonal Support (Average
1101	4	4	4
1102	4	5	4
1103	4	4	4
1104	4	5	4
1105	4	4	4
1106	4	5	4
1107	4	4	4
1108	4	4	4
1109	4	4	4
1110	4	4	4
1111	4	5	4
1112	4	4	4
1113	4	5	4
1114	4	4	4
1115	4	4	4
1116	4	5	4
1117	4	5	4
BUAD	Views (Average)	Self Efficacy (Average)	Instituonal Support (Average)
1201	3	4	4
1202	4	5	5
1203	5	5	5
1024	4	4	4
1025	4	4	3
1026	3	5	4
1207	4	3	4
1208	5	4	4
1209	4	4	3
1210	3	4	3
1211	4	4	4
1212	4	4	4
1213	3	5	4
1214	4	4	4
1215	5	5	4
1216	4	5	4
1217	4	4	4
EDUC	Views (Average)	Self Efficacy (Average)	Instituonal Support (Average)
1301	3	4	4
1302	4	4	4
1303	3	4	4
1304	4	4	4
1305	4	4	4
1306	4	4	4
1307	3	4	4
1308	4	4	4
1309	4	4	4
1310	4	4	4
1311	4	4	4
1312	4	4	4
1313	4	4	4
1314	3	4	4
1315	3	4	4
1316	4	4	4
1317	4	4	5