Assessment Coordinators' Perceptions of the Impact of Using Electronic Assessment Systems in Accreditation

Saoussan Maarouf

ASSESSMENT COORDINATORS' PERCEPTIONS OF THE IMPACT OF USING

ELECTRONIC ASSESSMENT SYSTEMS IN ACCREDITATION

By
Saoussan Maarouf

A Dissertation
Submitted in Partial Fulfillment
of the Requirements for
the Degree of Doctor of Education
in Curriculum and Leadership
(CURRICULUM)

Columbus State University
Columbus, GA

December 2015

www.manaraa.com

DEDICATION

To my husband, Sleiman Abdallah

Thank you for your love, encouragement, and support throughout this journey.

To my amazing children, Sarah, Noor, and Omar

Thank you for your patience and understanding.

ACKNOWLEDGMENTS

VITA

Saoussan Maarouf is an instructor of Early Childhood and the LiveText Coordinator at the College of Education and Health Professions at Columbus State University (CSU). Her educational background and certification include a Doctorate of Education in Curriculum and Leadership, a Master of Education in Early Childhood, a Reading Endorsement Certification in Early Childhood, and a Post-Baccalaureate Certification in Early Childhood from CSU. She also holds a Georgia Educator Certificate – Level 5 in Early Childhood Education. Dr. Maarouf earned her Bachelor degree in Communication with a specialty in Journalism from the Lebanese University, Beirut – Lebanon.

ABSTRACT

Systematic data collection is a fundamental requirement for the accountability of teacher preparation programs since it has been strongly associated with accreditation standards and the need to drive continuous improvement. Electronic assessment systems have become increasingly valuable for colleges of education since it provided a non-biased evaluation of competency, more reliable scoring, and scientific judgment to drive improvement. However, teacher preparation programs are having difficulties to implement effective assessment systems that are powerful enough to drive a change and to meet standards

The researcher in this study extended previous research in relation to the subject of electronic assessment systems, their users, and their ability to meet NCATE standards and explored their ability to meet CAEP standards as perceived by assessment coordinators. The impact of using different types of electronic assessment systems (commercial, hybrid, and in-house) on meeting NCATE Standard 2 and CAEP Standard 5.3 as perceived by assessment program coordinators was also investigated. Moreover, the commitment of leadership at higher education institutions to provide needed support to comply with the national standards for data requirements in education was also examined.

A survey was sent to assessment coordinators at NCATE accredited colleges of education nationwide. This opinion survey covered a range of requirements by NCATE Standard 2 and CAEP Standard 5.3 in order to identify key indicators that contributed to specific variables related to the use of electronic assessment systems at the surveyed institutions. A Likert scale was developed to answer the survey questions. A quantitative

research analysis was conducted using SPSS statistical software. SPSS runs ranging from descriptive statistics and analysis of variance (ANOVA) to Canonical Correlation were used to analyze the data.

The first finding of this research was that colleges of education are now utilizing more commercial electronic assessment systems to address their data collection and accreditation needs. Participants in this study were more likely to recommend commercial electronic assessment systems over hybrid and in-house systems. This was evident by the higher Net Promoter Score (NPS) obtained by the commercial systems.

The level of satisfaction of assessment coordinators that their system facilitated compliance with NCATE Standard 2 varied across the different requirements of the Standard. The average perception of assessment coordinators about the ability of their system to facilitate compliance with NCATE Standard 2 fell between "Well" and "Moderately Well" ratings using a 6-point Likert scale. The level of satisfaction of assessment coordinators that their system will be able to facilitate compliance with CAEP Standard 5.3 also varied across the different requirements of the Standard. Collectively for all three components of the Standard, the average perception of assessment coordinators fell between "Moderately Poor" and "Moderately Well" ratings using the 6-point Likert scale. About 53% of participants in this study indicated that they spent less than 50% of their time to data collection, management, analysis, and reporting related to program approval and accreditation efforts. The majority of participants (72%) reported minimal or inadequate personnel support by their institutions to manage their assessment systems. Finally, the results indicated two statistically significant canonical correlations between NCATE and CAEP variables.

TABLE OF CONTENTS

"Table of Contents (continued)"

LIST OF TABLES

"List of Tables (continued)"

xi

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The primary task for a teacher preparation program is to prepare future teachers to have a comprehensive understanding of the theoretical concepts of teaching. Integrating educational theories with field practices and managing the collected data, in relation to the candidate's performance and the ability of higher education institutions' personnel to drive improvements, using an effective assessment system is paramount to producing quality teachers (Crowe, 2010; Moore, 2003). A systematic data collection and management process is a vehicle that can drive the academic progress and improvement of students' performance within and across cohorts (Darling-Hammond, 2012). The data come from various sources such as rubrics, surveys, and other instruments. Assessment coordinators at colleges of education use the collected data at strategic points in programs and as a primary source for accreditation purposes (Eaton, 2011). Although higher education institutions have been using assessment practices for decades as tools to drive student learning improvements, the 2006 Spelling Commission on the Future of Higher Education made it clear that assessment should be the key driver for student learning outcomes (Commission on the Future of Higher Education, 2006). The commission recommended that colleges should start to endorse comprehensive systems for assessment by using standardized tests, engaging faculty and students, collecting useful data, reporting results to the public, and focusing on assessment outputs as well as processes. Consequently, assessment practices and activities during the last decade have flourished at higher education institutions due mainly to pressure from accreditation bodies and legislatures (Eaton, 2011).

1

When evaluating an assessment system, assessment coordinators at higher education institutions ought to examine the reliability of such system in terms of consistency across tasks, test items, and over short and long periods of time (Sandoval & Wigle, 2006). Evidence in support of the reliability of an assessment system is normally required during the accreditation process. Any discrepancy in the findings between an institution and a certifying body should be used as motivation to further investigate student learning outcomes and the need to make changes that address such discrepancy (Larkin & Robertson, 2013). There is no "one size fits all" and each institution is supposed to design and implement an assessment system that will optimize the process of providing effective feedback to faculties, students, and educational stakeholders in order to improve teaching and learning achievements (Herring & Wilson, 2010). The assessment system should also be aligned with the state's requirements and guidelines identified by a nationally recognized certifying body. In order to achieve these requirements, the system could be based on: (a) the needs of faculties, staff, and candidates, (b) accreditation standards, (c) strategic program goals and content knowledge, and (d) the conceptual framework of the teacher preparation program (Boody & Kitajima, 2012). The goals of this assessment system should be to: (a) provide a tool to generate and archive documents, reports, assessment, dispositions, feedback, and follow-up, (b) monitor candidate performance, manage and improve operations and programs, acquire and allocate resources, and (c) support data-informed decision making (Darling-Hammond, 2012).

Conceptual Framework

Systematic data collection is a fundamental requirement for the accountability of teacher preparation programs since it has been strongly associated with accreditation standards and the need to drive continuous improvement (CAEP, 2013; Crowe, 2010; NCATE, 2008). Electronic assessment systems have become increasingly valuable for colleges of education since it extended their ability of meeting accreditation standards by alleviating teacher concerns, meeting local and national reporting requirements, and collecting evidence of improvement (Larkin & Robertson, 2013). However, meeting accreditation standards should not be the mere target for teacher preparation programs to measure success. Improving program quality, promoting inquiry to enhance student learning, and creating an overall data collection framework that guides context for iterative improvement plans should be the main objective for colleges of education to meet requirements of an evidence-based accountability system (Crowe, 2010).

For electronic assessment systems to become tools to drive continuous improvement, a stronger connection is needed between national standards and the ability of teacher preparation programs to collect and analyze useful data (Keil & Haughton, 2009). Recent research has shifted the focus of assessment systems from interactions among theories, behavior, and content knowledge of pre-service teachers to discrete and observable measurements (Eaton, 2011). Moreover, the main focus of pre-service teachers is typically to offer lesson plans and instruction that would allow them to obtain the highest possible score for their work by exclusively paying attention to factors that are not necessarily critical to developing teaching skills and articulate their learning effectively (Moore, 2003). However, these factors are critical to meet accreditation

3

standards and to drive quality improvements. Unfortunately, faculty members and pre-service teachers at higher educational institutions usually get bogged down with procedural concerns rather than aligning teaching strategies with the demands of today's classrooms (Moore, 2003). For example, pre-service teachers are typically more concerned about technical issues to facilitate implementations of assignments rather than focusing on educational goals. The result is a mediocre assessment system that does not satisfy the needs of the teacher preparation programs (Moore, 2003).

Oner and Adadan (2011) argued that the use of electronic systems can provide higher education institutions an effective assessment structure for demonstrating positive impact on student learning. It can also improve the reliability of scoring, provide a valid assessment method, and enhance student learning. An electronic system is normally equipped with features to run analytical reports and, if enriched with exemplars, it can establish a compelling judgment of performance assessment (Oner & Adadan, 2011). Electronic systems can also provide a non-biased evaluation of competency, more reliable scoring, and scientific judgment to drive improvement (Ntuli, Keengwe, & Kyei-Blankson, 2009). The shift from traditional assessment systems to electronic versions has helped pre-service teachers and faculty members to improve in a number of areas. These improvements include enhancement to the quality of teaching utilizing professional development resources, providing higher order thinking techniques that are practical, and implementing research-based and proven strategies to increase student achievement (Swade et al., 2009).

Statement of the Problem

Teacher preparation programs struggle to implement effective assessment systems that are powerful enough to drive a change and to meet standards (Eaton, 2011; Keil & Haughton, 2009; Wineburg, 2006). The use of traditional assessment systems does not connect well with the many challenges in education such as accountability, dealing with students of varying abilities, diversity in the classrooms, and ability to comply with standards. Although assessment systems have been used in teacher preparation programs for a long time, most of these systems have been focused on summative assessments and typically fell short of providing enough information to develop conclusions or improvements. Moreover, institutions of higher education have not reached a consensus on what constitutes "best practice" in using assessment data to advance pre-service teacher learning. Despite the numerous educational benefits they can provide, electronic assessment systems have not been fully utilized by all colleges of education at higher institutions. Although many colleges of education across the country have already implemented the use of electronic assessment systems, not all of the colleges are using these systems to their full potential for meeting educational standards or perfecting methods for assessing student learning outcomes.

While several researchers (Kirchner, 2012; Schnackenberg et al., 2007; Mitchell, 2006) indicated a direct relation between the use of electronic assessment systems and compliance with the National Council for Accreditation of Teacher Education (NCATE) Standard 2, the recent transition from NCATE and the Teacher Education Accreditation Council (TEAC) standards to the Council for the Accreditation of Educator Preparation (CAEP) standards will have an effect on teacher education programs and the electronic

5

assessment systems used by these programs. Given that many colleges were already underutilizing their electronic assessment systems and the changes in accreditation standards, it is critically important that colleges of education begin to consider potential difficulties in meeting the new CAEP standards. To begin this process, the researcher will extend previous research in relation to the subject of electronic assessment systems, their users, and their ability to meet NCATE standards and explore their ability to meet CAEP standards as perceived by assessment coordinators.

More specifically, the researcher will examine the perceived impact of using different types of electronic assessment systems on meeting NCATE Standard 2 and CAEP Standard 5.3 as observed by assessment program coordinators. NCATE Standard 2 states that the teacher education program should have a viable assessment system that is capable of collecting, analyzing, aggregating, and disaggregating data. The system should also be able to provide multiple assessment points to evaluate candidate's progress throughout the entire program. Teacher preparation programs should assess their systems to make changes based on the collected data (NCATE, 2008). CAEP Standard 5.3 was intended to substitute NCATE Standard 2, however, the two standards are not completely aligned. CAEP Standard 5.3 included more components such as non-academic factors, test the validity and reliability of measures, innovative models of high quality practices, disaggregate completers by groups, leadership commitment for continuous improvement, cost of attendance against ED unit, and cost of attendance against similar providers.

Although several other researchers (Kirchner, 2012; Schnackenberg et al., 2007; Mitchell, 2006, Schulte, 2006; Mitchell & Yamagishi, 2005) had studied the compliance of higher education institutions with NCATE Standard 2 by surveying stakeholders, the

6

researcher's purpose of collecting similar data for NCATE Standard 2 is to form a baseline in which a valid comparison can be made between the perceived impact of electronic assessment systems on NCATE Standard 2 and CAEP Standard 5.3 using the same surveyed participants. To run a statistical analysis using analysis of variance that compares related means, it is critical to use data that is collected from the same surveyed population in order to make a statistically valid conclusion. In this study, the researcher will also explore the degree to which coordinators believe that their systems address the three CAEP Standard 5.3 components: performance appraisal, tracking results, and improving program elements and processes. As there are no other researchers that have addressed the capability of teacher preparation programs to meet program approval and accreditation demands for data by CAEP Standard 5.3, the researcher in this study will provide an opportunity to examine the use of electronic assessment systems as they relate to the new CAEP standards. The researcher will also explore any relationship between the perceived outcomes of assessment coordinators that their electronic assessment systems are capable of meeting NCATE Standard 2 and CAEP Standard 5.3. The outcomes of this study can form a solid basis for a teacher preparation program to make a sound decision on implementing a comprehensive electronic assessment system that satisfies new CAEP standards as well as to drive continuous improvement and quality education.

Delimitations of the Study

The following delimitations were imposed by the researcher:

1. The researcher surveyed only NCATE accredited colleges of education nationwide. TEAC accredited colleges of education and non-accredited colleges

of education were not included in order to make the study more manageable. These two groups might face different challenges as they transition to the newly established CAEP standards.

2. Opinions were restricted to assessment personnel at the colleges of education. Surveying other stakeholders such as IT personnel and consultants from commercial electronic assessment systems can provide different insight to the accreditation process from those provided by assessment coordinators.

3. A specific time frame of 6 weeks (mid March to end of April) was given to participants to complete the survey. Some of the participants indicated they were going through three major assessment reports at this time frame and asked for an extension. At the end of the six week period, the researcher reviewed the response rate and was satisfied that the sample size was statically representative of the entire population. Therefore, extension was not granted and the researcher analyzed the data that were received at the end of the six week period.

4. The only variables studied dealt with the NCATE Standard 2 and CAEP Standard 5.3. The perceived impact of using electronic assessment systems on other NCATE and CAEP standards was not investigated.

Limitations of the Study

The limitations of this study were:

1. A methodology of an opinion survey was used in this study. The generalizability of results is restricted by the perception of the participants.

2. Different responses might have been obtained by assessment coordinators due to their years in service, level of education, and level of experience.

3. NCATE and CAEP literature and websites were used to identify the independent variables associated with NCATE Standard 2 and CAEP Standard 5.3. Due to the ambiguity in some components of both standards, members of the Board of Examiners (BOE) team might use subjective metrics during the accreditation process. Hence, colleges of education might go through diverse experiences during an accreditation visit by the BOE.

Significance of the Study

The transition of teacher education programs throughout the United States to use electronic assessment systems was initially fueled by NCATE and Preparing Tomorrow's Teachers to use Technology (PT3) grants (Hall et al., 2006; McNabb & Vandersall, 2002). In 1999, a PT3 Catalyst grant was awarded to the International Society for Technology in Education (ISTE) to propose new technology standards for teachers. Researchers of the ISTE's project persuaded NCATE to include the new technology standards in their professional standards (McNabb & Vandersall, 2002). These technology standards were also adopted in wide-scale by states, districts, schools, and universities across America where electronic assessments have risen significantly in teacher education (He & Hartley, 2010; Miller & Morgaine, 2009; Ntuli et al., 2009; Yancey, 2009). This surge for such transition was recommended in order to give more visibility to faculty and support personnel, assess professional behaviors and dispositions, demonstrate pedagogy and knowledge, evaluate classroom management skills, and promote teacher inquiry (Schnackenberg et al., 2007). The use of traditional assessment systems in appraising pre-service teachers does not always succeed in creating a

connection between teachers' development or complying with standards (Oner & Adadan, 2011).

In their study, Oner & Adadan (2011) found that pre-service teachers often do not recognize situations in which to utilize the theoretical information they have learned as part of their coursework. Providing appropriate feedback by using a systematically structured electronic assessment system is paramount to improving teacher preparation and quality, strengthening the alignment of field experiences to the theoretical framework, and enhancing collaboration among candidate teachers, faculty, and classroom teachers (Peck, Gallucci, & Sloan, 2010). While traditional data management systems require significant resources to manage and store data, electronic systems can provide a solution to the available physical space to store and organize data. Furthermore, since computer files can be stored and retrieved easily, electronic assessment systems can facilitate self-assessment, streamline productivity by using template-based layouts, and reduce both time and resources needed to disseminate data (Noell & Burns, 2006; Sandoval & Wigle, 2006).

Teacher preparation programs in the U.S. had been struggling to demonstrate an acceptable level of accountability in relation to using integrated data management systems that comply with accreditation standards and that drive improvements within their programs (Eaton, 2011; Keil & Haughton, 2009; Wineburg, 2006). These systems are intended to monitor candidates' proficiencies and are supposed to be aligned with the requirements of the appropriate accreditation agencies (Strudler & Wetzel, 2011; Wetzel & Strudler, 2005; Wilkins, Young, & Sterner, 2009). As part of the accreditation process, NCATE Standard 2 mandated teacher education programs to create or use an

assessment system that supports data-informed decision making by monitoring candidate performance, collecting meaningful data, running reports quickly and effectively, documenting learning outcomes, and driving improvements. Evidence of student learning had become paramount to education reform and accountability. To simply provide planning for assessment is no longer sufficient (Crowe, 2010; Eaton, 2011; Evans, 2006). There had been increased pressure from the government, researchers, parents, and accreditation agencies on higher education institutions to produce solid evidence that students succeed in their education with the proper knowledge and skills to meet the challenges of the 21st century (Peck et al., 2010).

The purpose of an electronic assessment system is to assist students, faculty members, and the higher education institutions in showcasing authentic information that documents learning outcomes in addition to supporting the overall goal and mission of the institution (Eaton, 2011). Electronic assessment systems can assist students by providing them opportunities to increase their learning effectiveness and engagement, model their professionalism via concrete examples that they can share with their future employers, and enhance their technology skills. Faculty can also benefit by aligning their objectives and evaluation strategies to assess student outcomes, providing effective advising to enhance academic goals for their students, and fostering student motivation (Oner & Adadan, 2011).

 Understanding the effective use and implementation of electronic assessment systems, hence, goes hand-in-hand with other government and certifying agencies' requirements to answer requests related to accountability and accreditation. The researcher in this study provided an opportunity to study the effect of the shift in

accreditation requirements from NCATE and TEAC to CAEP as it relates to the use of electronic assessment systems. The researcher also surveyed the landscape of educational accountability in relation to the use of a data collection framework that drives continuous improvement and the commitment of leadership at higher education institutions to provide needed support to comply with the national standards for data requirements in education. Moreover, the researcher hopes to provide a solid basis for a teacher preparation program to make an educated decision on implementing an electronic assessment system that complies with CAEP standards. Finally, the researcher provided critical pieces in the data collection requirements so that colleges of education can adapt to the newly established CAEP standards as well as to drive continuous improvement and quality education.

Research Questions

Although may differ in content and structure, electronic assessment systems enable the collection of quantitative and qualitative data. In order to achieve an acceptable confidence level of using a reliable electronic system, the criteria and standards applied to each dimension and feature within the system must be sufficiently distinct and clear. To increase their usefulness, electronic assessment systems should be appraised frequently to identify specific areas for improvement. The assessment system is also used by institutions of higher education to report teacher education program performance to accreditation organizations such as NCATE and TEAC. New approval requirements of these organizations demanded assessment coordinators to use more quantifiable data than ever before. Colleges of education across the nation are using in-house, commercial, or hybrid electronic assessment systems to address the data collection

requirement. However, many of these colleges still struggle with implementation, daily use, and approval of such systems (Eaton, 2011; Keil & Haughton, 2009; Wineburg, 2006).

To address the gap in existing research, the researcher proposed the following research questions by surveying assessment coordinators, or the main person responsible for accreditation, at colleges of education nationwide:

1. To what extent do assessment coordinators perceive that their electronic assessment systems facilitated the compliance of their teacher preparation programs with the NCATE Standard 2 requirements?

2. To what extent do assessment coordinators perceive that their electronic assessment systems will be able to facilitate the compliance of the teacher preparation programs with the CAEP Standard 5.3 requirements by addressing: performance appraisal, tracking results, and improving program elements and processes?

3. To what extent does the level of support of using electronic assessment systems at higher education institutions influence the confidence level of assessment coordinators in meeting CAEP 5?

4. What relationship, if any, is there between the perceived outcomes of assessment coordinators that their electronic assessment systems are capable of meeting NCATE Standard 2 and CAEP Standard 5.3?

Summary

The researcher in this chapter discussed using systematic data collection as a tool to drive academic progress and as a primary source for accreditation purposes.

Assessment practices and activities during the last decade have flourished at higher education institutions due to pressure from accreditation bodies and legislatures. There is no "one size fits all" and each institution is supposed to design and implement an assessment system that will optimize the process of providing effective feedback to faculties, students, and educational stakeholders in order to improve teaching and learning achievements. However, teacher preparation programs are having difficulties to implement effective assessment systems that are powerful enough to drive a change and to meet standards. The use of traditional assessment systems does not connect well with the many challenges in education such as accountability, dealing with students of varying abilities, diversity in the classrooms, and ability to comply with standards. The transition from NCATE and TEAC standards to the new CAEP standards will just add more burden on teacher preparation programs to comply with the newly established standards. For electronic assessment systems to become tools to drive continuous improvement, a stronger connection is needed between national standards and the ability of teacher preparation programs to collect and analyze useful data.

The researcher in this study will examine the perceived impact of using different types of electronic assessment systems on meeting NCATE Standard 2 and CAEP Standard 5.3 as observed by assessment program coordinators. A survey was sent to assessment coordinators, or the main person responsible for accreditation, at colleges of education nationwide to answer the four research questions from this study. By doing so, the researcher hopes to provide a unique opportunity to study the effect of the shift in accreditation requirements from NCATE and TEAC to CAEP as it relates to the use of electronic assessment systems. The researcher also hopes to provide valuable

information about the commitment of leadership at higher education institutions to provide needed support to comply with the national standards for data requirements in education. Finally, teacher preparation programs can use the results from this study to make an educated decision on implementing an electronic assessment system that complies with CAEP standards.

Definition of Terms

The following terminology and definitions were used throughout this research.

Accountability system: Reliable and quantifiable measures to examine the quality of teaching provided by colleges and universities (Eaton, 2011).

Assessment system: A system that generates and archives documents, reports, assessment, dispositions, feedback, and follow-ups. It also monitors candidate performance, manages and improves operations and programs, and acquires and allocates resources (Larkin & Robertson, 2013).

Commercial electronic assessment system: An electronic assessment system designed and marketed by a commercial company to be sold and used by teacher preparation programs for data collection purposes (Kirchner, 2012).

Electronic assessment system: A system that allows data to be stored, categorized, accessed, aggregated, and disaggregated in a more efficient way to save time and effort. It also can directly track candidate field experiences and can be used to implement these experiences with school partners (Sivakumaran et al., 2010).

Hybrid electronic assessment system: An electronic assessment system that has combined elements from both an in-house developed system and a commercial electronic

15

assessment system. Both the commercial and the in-house systems are used by the

teacher preparation program for data collection purposes (Kirchner, 2012).

In-house electronic assessment system: An electronic assessment system designed

internally by colleges and universities and is used by the teacher preparation program for

data collection purposes (Kirchner, 2012).

Traditional data management system: A filing system that collects data or files and stores

them in a physical location like file cabinet, hard disk, or cd-rom (Sandoval & Wigle,

2006).

CHAPTER 2

REVIEW OF LITERATURE

The topics of accountability, accreditation, and student achievement in higher education are highly debated amongst researchers, educators and politicians (Cavanaugh, Cavanaugh, & Daniels, 2005; Eaton, 2011; Reusser, Butler, Symonds, Vetter, & Wall, 2007). The core of the debate encircles identifying reliable and quantifiable measures to examine the quality of teaching provided by colleges and universities. Teacher preparation programs are now more conscientious of the need for integrated electronic assessment systems due to the increased level and extreme scrutiny that is placed on higher education and colleges of education, in particular (Larkin & Robertson, 2013; Slavin, 2007; Wineburg, 2006). Leadership at higher education institutions is under pressure today by federal and state legislatures, educational research entities, and accreditation agencies to implement data management systems that display and manage students' information and data in a valid and reliable way to improve teaching and student learning outcomes (Eaton 2011; Kirchner 2012; Jackson, 2006; Schnackenberg, Zadoo, & Aubrey, 2007). Electronic data management systems are a key element for accountability and accreditation requirements in higher education (Kirchner 2012). National accreditation bodies such as NCATE and CAEP demand teacher preparation programs to meticulously collect and analyze data for program improvement.

In this chapter, the researcher addressed issues that teacher preparation programs have in meeting the accreditation standards and the impact of using electronic assessment systems on collaboration amongst stakeholders. More specifically, the researcher reviewed prior research related to the struggle of meeting accreditation requirements in

17

higher education institutions, the impact of electronic assessment systems on collaboration among stakeholders, the impact of using in-house electronic assessment systems on meeting NCATE Standard 2, the impact of using commercial electronic assessment systems on meeting NCATE Standard 2, and the perception of stakeholders on using electronic assessment systems. This review of literature constituted a building block to support the main purpose of this study; investigating the perceived impact of assessment coordinators that their electronic assessment systems will be able to facilitate the compliance of the teacher preparation programs with the CAEP Standard 5.3 requirements.

The National Council for Accreditation of Teacher Education (NCATE)

The National Council for Accreditation of Teacher Education (NCATE), founded in 1954, was well recognized as the leading accrediting organization for colleges and universities that offer teacher preparation programs for P-12 schools (NCATE, 2008). It was an independent non-profit, non-governmental alliance that consisted of 33 national professional education and public organizations that was an advocate for quality teaching and accountability. NCATE was also recognized by the U.S. Department of Education and the Council for Higher Education Accreditation as a leading accrediting body for colleges of education. There were five groups that played a major role in the creation of NCATE: the American Association of Colleges for Teacher Education (AACTE), the National Association of State Directors of Teacher Education and Certification (NASDTEC), the National Education Association (NEA), the Council of Chief State School Officers (CCSSO), and the National School Boards Association (NSBA). When NCATE was created, it replaced AACTE as the agency responsible for accrediting

teacher education programs. At that time, the five groups represented the most influential organizations in the field of higher education and they recognized the need for a strong, independent, quality assurance mechanism composed of all key stakeholders in education ("Quick Facts About NCATE," 2014).

Before its merger with the Teacher Education Accreditation Council (TEAC) in 2013 to form the Council for the Accreditation of Educator Preparation (CAEP), there were 670 colleges of education accredited by NCATE with 70 more colleges seeking accreditation. The six standards that institutions of higher education must have complied with in order to receive accreditation from NCATE were:

- Standard 1: Candidate Knowledge, Skills, and Professional Dispositions

- Standard 2: Assessment System and Unit Evaluation

- Standard 3: Field Experiences and Clinical Practice

- Standard 4: Diversity

- Standard 5: Faculty Qualifications, Performance, and Development

- Standard 6: Unit Governance and Resources (NCATE, 2008)

Despite the fact that the NCATE accreditation process has always been a challenge for many institutions, NCATE administrators' push during the last decade for institutions to provide evidence-based accountability and improvements has made the approval process more difficult. The rate of compliance prior to 2006 amongst education programs that applied for accreditation was only 70% (Mitchell, 2006). The rest of the institutions that did not meet all six Standards during the evaluation process struggled mostly with Standard 2, which is associated with using a systematic assessment system to collect and analyze data (Mitchell, 2006; Nowinski, 2005). NCATE Standard 2 stated that "The unit

has an assessment system that collects and analyzes data on applicant qualifications, candidate and graduate performance, and unit operations to evaluate and improve the performance of candidates, the unit, and its programs" (NCATE, 2008, p. 25). The three most common failures in complying with Standard 2 were the lack of innovative and structured thinking, the disconnect between standards and assessments, and the deficiency in utilizing an effective system for data collection and analysis (Mitchell, 2006).

The Teacher Education Accreditation Council (TEAC)

TEAC, founded in 1997, was a nonprofit organization dedicated to improving educator preparation programs by assessing these programs in order to ensure the yield of qualified professional educators. After a successful review, teacher preparation programs would receive TEAC accreditation that was recognized by the Council for Higher Education Accreditation and by the U.S. Department of Education. TEAC was also a member of the Association of Specialized and Professional Accreditation, the American Council on Education, Association of Teacher Educators, and the National Association of State Directors of Teacher Education and Certification ("About TEAC," 2014). TEAC's Standards consisted of the following three quality principles:

- Quality Principle I: Evidence of Candidate Learning

- Quality Principle II: Evidence of Faculty Learning and Inquiry

- Quality Principle III: Evidence of Institutional Commitment and Capacity for Program Quality (TEAC, 2009)

TEAC members had also developed the following seven standards of capacity for program quality:

- Curriculum

- Faculty

- Facilities, Equipment, and Supplies

- Fiscal and Administrative

- Student Support Services

- Recruiting and Admissions Practices, Academic Calendars, Catalogs,
  Publications, Grading, and Advertising

- Student Feedback (TEAC, 2009)

Although none of the TEAC Standards explicitly required the use of electronic assessment systems, program coordinators must have provided adequate evidence to assure compliance with all of the Standards. For example, the Quality Principle I, evidence of candidate learning, section 1.5 (evidence of valid assessment) of the Standard stated: "The program must provide evidence regarding the trustworthiness, reliability, and validity of the evidence produced from the assessment method or methods that it has adopted" (TEAC, 2009, p. 2). In addition, the Quality Principle II, evidence of faculty learning and inquiry, section 2.3 (influential quality control system) of the Standard stated: "The program must provide evidence, based on an internal audit conducted by the program faculty, that the quality control system functions as it was designed, that it promotes the faculty's continual improvement of the program, and that it yields the following additional and specific outcomes: 2.3.1 Curriculum …, 2.3.2 Faculty …, and 2.3.3 Candidates …" (TEAC, 2009, p. 2).

The Council for the Accreditation of Educator Preparation (CAEP)

In July 2013, the Council for the Accreditation of Educator Preparation (CAEP) was formed as the new accreditation body for educator preparation programs resulting from the consolidation of NCATE and TEAC. The press release statement that was issued on October 25, 2010 by the Executive Board of NCATE and the Board of Directors of TEAC stated that the main reasons of this merger were to enhance the value of accreditation, assure candidate quality, and motivate improvement (CAEP, 2010). CAEP's new president, James G. Cibulka said:

> The accreditation system will encourage and assist all institutions and other entities that prepare educators, even those that already exceed that bar, to go beyond it towards excellence by continuously improving the effectiveness of their completers and programs to help P-12 students reach higher levels of achievement demanded by rigorous new student standards and a global marketplace. (CAEP, 2010, p. 1)

Frank B. Murray, TEAC president, added:

> The creation of CAEP is an opportunity for us to demonstrate the value which the new accrediting body will add to quality assurance, accountability and the overall performance of the profession. We have combined the best attributes of both the NCATE and the TEAC board structures to enable CAEP to be even more inclusive of the profession and other stakeholders. (CAEP, 2010, p. 1)

The five new CAEP standards, that replaced the six standards from NCATE and the TEAC standards, constitute the essence of key areas considered when determining the success of program accreditation by CAEP. These standards are:

22

- Standard 1: Content and Pedagogical Knowledge

- Standard 2: Clinical Partnerships and Practice

- Standard 3: Candidate Quality, Recruitment, and Selectivity

- Standard 4: Program Impact

- Standard 5: Provider Quality Assurance and Continuous Improvement (CAEP, 2013)

Since the publication of the five CAEP Standards, there has been some level of concern amongst educators and researchers about the ambiguity in some components of these Standards. A letter that was sent to the President of CAEP, Dr. Cibulka, by Harvey Rude, President of Higher Education Consortium for Special Education and Vivian Correa, President of Teacher Education Division Council for Exceptional Children (personal communication, March 29, 2013) raised the following issues regarding the CAEP Standards:

1. The Standards assume accountability against teacher preparation programs on issues that they might not have control of.

2. The Standards appear to include variables that might not be associated with program improvement or effectiveness.

3. Teacher preparation programs might be asked to provide information that they do not have or are unable to collect.

4. Without detailed articulation of what is acceptable as evidence to meet different standards, it could be problematic for teacher preparation programs to provide useful feedback.

The letter included specific examples to support the argument about areas of concern for each standard. By contrast, the NCATE Standards provided more specifics and a better explanation about what constitutes an acceptable level of showing evidence of meeting the standards. For example, NCATE provided three exemplars rating levels (unacceptable, acceptable, and target) for all six Standards. For the assessment system, the target was:

> The unit, with the involvement of its professional community, is regularly evaluating the capacity and effectiveness of its assessment system, which reflects the conceptual framework and incorporates candidate proficiencies outlined in professional and state standards. The unit regularly examines the validity and utility of the data produced through assessments and makes modifications to keep abreast of changes in assessment technology and in professional standards. Decisions about candidate performance are based on multiple assessments made at multiple points before program completion and in practice after completion of programs. (NCATE, 2008, p. 25)

A survey that was conducted by NCATE in 2005, as part of its regular review cycle, showed that 85 percent of deans and NCATE coordinators that were surveyed indicated that the standard was clearly stated, rubrics clarified expectations, and the narrative that explained each standard was helpful (Mitchell & Yamagishi, 2005). Although the requirements stated in Standard 5 of CAEP are explicit, the standard itself does not provide a specific roadmap to meet these requirements nor the adequacy of establishing an assessment paradigm or a data management system. CAEP Standard 5.3 states:

The provider regularly and systematically assesses performance against its goals and relevant standards, tracks results over time, tests innovations and the effects of selection criteria on subsequent progress and completion, and uses results to improve program elements and processes. (CAEP, 2013, p. 14)

On the other hand, Standard 2 of NCATE provided detailed support explanation of the target, acceptable, and unacceptable levels for: (1) assessment system, (2) data collection, analysis, and evaluation, and (3) use of data for program improvement (NCATE, 2008).

Electronic Assessment Systems

In recent years, there has been a trend by teacher preparation programs to use electronic assessment systems to collect, aggregate, analyze, and report data as part of a comprehensive assessment strategy in order to comply with accreditation standards (Sivakumaran, Holland, Wishart, Heynig, & Flowers-Gibson, 2010). The use of electronic assessment systems allows information to be stored, categorized, accessed, aggregated, and disaggregated in a more efficient way to save time and effort. Implementing electronic systems as part of a broad assessment paradigm can provide higher education institutions an effective assessment program for demonstrating positive impact on student learning. Both faculty and students can utilize electronic systems in various ways to attain better student academic achievement (Larkin & Robertson, 2013).

Furthermore, electronic assessment systems can directly track candidate field experiences and can be used to implement these experiences with school partners so that candidates can build the knowledge and skill level necessary to help all students learn. Some colleges of education have relied on homegrown in-house electronic systems, proprietary commercial electronic systems, or hybrid electronic systems for data

collection and accreditation needs. A comprehensive list of commercial electronic

systems and their capabilities was reported by Kirchner (2012). There are many factors

that must be considered in evaluating the best electronic assessment system for a

particular institution. Some of the critical factors include cost, integration with other

existing systems, data management, interactivity with inside and outside resources,

repository capacity, and assessment ability (Strudler & Wetzel, 2011). By using

electronic assessment systems, colleges of education in the higher educational institutions

started to revamp their programs to focus on the use of technology, promote changes by

disbanding outdated practices that yield mediocrity, improve relationships between P-12

schools and higher education, and invest financial and human resources to meet

accreditation requirements (Owsiak, 2008; Sivakumaran et al., 2010; Wineburg, 2006).

Meeting Accreditation Requirements

Keil and Haughton (2009) indicated that meeting accreditation requirements was

a common dilemma for teacher preparation programs since the established directives by

certifying bodies require compliance but provide little or no specifics about the minimum

acceptable structure to pass the standards. They concluded that if the goal of educators is

to advance the concept of teachers and teaching as a model equivalent to those in highly

specialized fields such as medicine and engineering, then just meeting the standards

should not be our objective. Crowe (2010) argued that the current U.S. teacher

preparation programs do not assure quality education by focusing on issues such as

selective recruitment using higher standards, careful monitoring of clinical experiences of

candidates, and providing overall program assessment based on critical outcomes. Crowe

suggested the use of data systems to assess student achievement, graduation rate, and to drive continuous improvements.

There was strong evidence in the literature that the use of electronic data management systems in higher education was exponentially expanding (Barrett, 2007; Means, 2010; Wetzel, Strudler, Addis, & Luz, 2009). However, more clarification was needed by federal and state governments, educational policy makers, and accreditation bodies to clear some of the fog surrounding the use of such systems (Wetzel & Strudler, 2005). For example, it appeared that there was a disconnect between the available tools to colleges of education and the requirements for a program to meet the accreditation threshold (Eaton, 2011). A number of researchers have argued that the use of electronic assessment systems to achieve improved student learning and program accreditation might not be compatible (Barrett, 2004; Buckridge, 2008; Crowe, 2010).

Strudler and Wetzel (2011) investigated the use of electronic assessment systems in regard to current changes in the accreditation of teacher preparation programs. The authors addressed the concerns noted by prior research by investigating the theoretical viewpoints of the different methods used in implementing electronic assessment systems. They also examined the cost and benefit of such systems as viewed by the stakeholders, the effect of the systems on student engagement and learning, and the strategies followed to collect and analyze data related to candidate performance in order to drive program improvements and meet accreditation standards. The authors stated that the perception of both students and faculty members about the use of electronic assessment systems is influenced by factors such as clear instructions about the system, faculty feedback in a timely manner, and time and effort involved in performing certain tasks. They also

27

presented the benefits of using electronic assessment systems in higher education such as providing an opportunity to stakeholders to contemplate and understand the teaching standards in a more effective way. Other benefits included increased technology skills for candidates, easier access to professional documents, better faculty communication with their students, and improved tracking of student performance for accreditation and program improvement. The authors' final recommendations were for institutions to clarify the purpose of such systems, seek user satisfaction, use professional standards at the top level to guide system development, and consider having few assignments with rubrics that are common within areas of specialization. Other recommendations were to enforce faculty to provide feedback that coincides with the framework of student assignments, select tools and features that satisfy the specific individual needs of stakeholders, and simplify the process to encourage greater use of the system (Strudler & Wetzel, 2011; see Table 1).

The Impact of Electronic Assessment Systems on Collaboration among Stakeholders

Prior researchers have shown that the use of electronic assessment systems have positive results on collaboration and communication among stakeholders (Hall, Fisher, Musanti, & Halquist, 2006; Whipp, 2003). Some Web-based assessment systems, such as LiveText® and TaskStream®, offer tools that allow administrators and reviewers to analyze and provide feedback to certain sections contained within the user's e-portfolio. These systems can also provide live interaction where reviewers can leave comments, hyperlinks, blogs, and track progress among teachers, students, and support personnel.

Love and Cooper (2004) conducted an exploratory investigation to study the impact of key factors that contributed to the design of an online portfolio system used for

assessment purposes in education. The researchers focused on the educational benefits of such systems and the maximization of value for all stakeholders. The researchers paid special attention to the added value of electronic assessment systems from automation and interaction of online activities. The authors reviewed prior and current practices associated with online portfolios and explored issues related to identifying all stakeholders, automation of administrative functions, quality assurance, equity issues, plagiarism, fraud, graduate attributes, appropriate interfaces for stakeholders, information storage, hardware and software technology decisions, discipline related factors and technology choice, and cognitive and information artifacts. The researchers discovered certain weaknesses in most of the design approaches for online portfolio assessment systems, such as the focus on identifying technical means and neglecting most of the educational goals. The authors concluded that the proper design of online portfolio assessment systems can maximize value across all stakeholders by minimizing time consuming routine administrative tasks and focusing on tasks related to education and assessment. This wide range of benefits to stakeholders is superior to other solutions, including paper-based portfolios (Love & Cooper, 2004; see Table 1).

Shoffner (2009) concluded that pre-service teachers had also benefited from utilizing electronic assessment systems by enhancing their technology skills and providing them opportunities to experiment and apply computer technology as they create artifacts and assess their merit (Shoffner, 2009; see Table 1). This type of improvement lies within the heart of CAEP Standard 5.1 which states: "The provider's quality assurance system is comprised of multiple measures that can monitor candidate

29

progress, completer achievements, and provider operational effectiveness. Evidence demonstrates that the provider satisfies all CAEP standards" (CAEP, 2013, p. 15)

Using In-House Electronic Assessment Systems

The focus on accountability, student achievement, and continuous performance improvement was part of accreditation in addition to public expectations (Council for the Accreditation of Educator Preparation, 2013). Herring and Wilson (2010) utilized the availability of an in-house data management system called UNITED (University of Northern Iowa Teacher Education Data) at the University of Northern Iowa to develop procedures for continuous improvements based on careful program assessment. The researchers portrayed their effort in moving the data management system from mere collection and reporting of data to the use of the data to drive program improvements. The UNITED system was created in 2003 and candidates were enrolled in the system when they joined the program. Faculty members, candidates, administrators, and various stakeholders have controlled access to the system. Various critical data such as assignments, Teacher Work Sample, GPAs, clinical experience, and aggregation of key assessment data are entered and reported by the system. However, the availability of this remarkable amount of data was utilized only for reporting purposes because the assessment program was not structured well and the courses that were part of this program were not well connected. The authors re-evaluated the use of the UNITED system and established processes and procedures to move from simple assessment to identifying program weaknesses and taking actions to address them. The authors concluded that by developing a series of assessment and data management projects, their efforts were successful to drive improvements in the teacher preparation program and to

support positive change. By conducting the curriculum mapping project, the researchers showed that the program did not only address the Iowa Renaissance Standards but also the level it was attained and the method it was assessed. The researchers addressed gaps and unneeded redundancies to improve internal and external communication (Herring & Wilson, 2010; see Table 1).

Swade et al. (2009) discussed the implementation of an electronic assessment system for the teacher preparation program at Saint Leo University, a Catholic liberal arts-based college located in Florida with regional campuses in five other states. Prior to 2009, the university faculty members used a paper-based assessment system in which selected artifacts were used to meet the required standards. The university personnel then developed an electronic assessment system called IAPAS (Individual Accomplished Practices Assessment System) in order to meet state expectations for certifying pre-service teachers and to comply with national accreditation standards such as NCATE. A full-time analyst was hired by the university to manage, maintain, and analyze data entered by end users. The collected data were disaggregated by course to determine progression of students towards mastery, change curriculum, and identify areas of strengths and areas of weaknesses to drive continuous improvement. The authors stated that although the IAPAS was created to meet certification and standards requirements, the system can be used as a foundation to go from good to better by performing continuous assessments, supporting development efforts, making data-informed decisions, and managing and improving operations of the teacher preparation program. The authors noted that implementing the electronic assessment system IAPAS was initially impeded by several hurdles. Both faculty and students required training, and

students initially resisted paying access fees for the system. Moreover, technical glitches such as grading and uploading data to the system needed to be addressed. Instructions that included screen shots, PowerPoint presentations, and roadmaps were created to deal with these challenges. A survey was sent to end users to solicit their feedback on system improvements. The authors concluded that implementing the electronic assessment system IAPAS should help the teacher preparation program at Saint Leo University to track student progress, enhance learning, and produce favorable results to meet the certification and accreditation needs of the program (Swade et al., 2009, see Table 1).

Schulte, Danielson, Conway, and Clark (2006) discussed the use of a comprehensive approach to develop and document the assessment system used at the University of Nebraska at Omaha (UNO) and the methods they followed to avoid the pitfalls in meeting NCATE Standard 2. The College of Education's leaders at UNO formed committees and subcommittees to address the required activities and assessments in the teacher preparation program. The team members of these committees used innovative thinking to establish best practices for assessment. These practices included the use of an electronic system to solicit feedback from pre-service teachers, providing opportunities for candidates to reflect on their performance, and investigating the impact of the electronic system on student learning. Over a period of five years, committee members engaged in intensive brainstorming sessions to align their assessment practices with the applied standards. The College of Education committee members created electronic portfolios and databases to collect information, conducted program evaluation and improvement activities based on the collected data, and appointed an assessment coordinator whose job was to disaggregate and analyze the data. Finally, the committee

members established training sessions for stakeholders to raise awareness about the electronic assessment system and created matrices and summary sheets to track content knowledge and dispositions (Schulte et al., 2006; see Table 1).

Using Commercial Electronic Assessment Systems

Wetzel et al. (2009) examined the reports issued to fifty-two institutions by the National Council for the Accreditation of Teacher Education (NCATE) Board of Examiners (BOE) over several years and noted the greater use of electronic assessment systems, especially commercial products, to address NCATE standards. The researchers uncovered a migration from off-the-shelf programs such as Microsoft Word® and Excel® to the use of large-scale systems such as LiveText® and TaskStream®. The authors compared their findings with 2004 baseline data from BOE reports that were summarized by Mitchell et al. (2006). During their review of the BOE reports, the authors collected information that would help to associate the use of an electronic assessment system by institutions for the purpose of meeting NCATE accreditation. They also investigated the frequency with which such systems were used and the Areas For Improvement (AFIs) in relation to the use, or non-use, of electronic data systems to comply with NCATE standards requirements, as cited by the reports. One finding from this study was a remarkable increase in the use of electronic assessment systems from what was reported earlier by Mitchell et al. (2006). Out of the 52 BOE reports, 37 institutions (71%) reported the use of electronic systems; LiveText® contributed to the most use at 31% followed by TaskStream® at 25%. Another finding from this study was that only 64% of the 52 institutions met NCATE Standard 2. The AFIs from the reports indicated failure to use an assessment system, to collect data and use it for program improvement, and to

track progress for continuous improvement. The researchers concluded that there are considerable limitations in using off-the-shelf or smaller scale electronic assessment systems to meet key contextual factors. Also, the implementation of a large-scale electronic system required good planning from the assessment coordinators to aggregate the data, commitment from leadership over time, and buy-in from stakeholders (Wetzel et al., 2009; see Table 1).

McPherson (2010) investigated the use of TaskStream® as the electronic assessment system at the New York Institute of Technology (NYIT). The system was implemented in 2005 as a commercial web-based resource to collect and manage data in the teacher preparation program at the College of Education of NYIT. The selection process of TaskStream® included the review of several other commercial products, analyzing their capabilities, features, ease of use, cost, as well as multiple other factors. The e-portfolio feature within TaskStream® offers individual design for standards-based assessments, extensive options for lesson planning and creating rubrics, and advanced tools to enhance communication between faculty and candidates. The directed response Folio (DRF) and the report-management feature of TaskStream® helped the teacher preparation program at NYIT to comply with NCATE standards from the time the system was implemented in 2005. The adoption of this new electronic assessment system was met with initial discontent from both faculty and candidates. However, after conducting face-to-face and hands-on training sessions to facilitate the use of the system, stakeholders adopted the system and learned more about its capabilities in providing continuous improvements to the program. Finally, a faculty focus group was formed for

continual monitoring of implementation and to keep other faculties up-to-date on changes (McPherson, 2010; see Table 1).

Perception of Stakeholders on Using Electronic Assessment Systems

Yao et al. (2009) conducted a qualitative study to investigate the perception of pre-service teachers regarding the use of an electronic assessment system and the effect of the system on promoting reflective skills and teaching competencies for candidates. The impact of the assessment system on teacher certification and program accreditation was also discussed. Eight pre-service teachers attending the early childhood, elementary, and middle school (ECEM) education program at the University of Central Missouri participated in the interviews. The process of open coding was used to create four themes and sub-themes utilizing the collected data from the interviews. The four themes were assessment portfolio utility, portfolio design, faculty consistency, and need for support. The researchers found that pre-service teachers perceived the electronic assessment system as helpful in developing their reflective skills and provided them an opportunity to review the compliance of their work with established rubrics. The interviewed candidates also expressed that the electronic system provided them a record of their work that they can review in the future. It also helped them to monitor their field experience and to facilitate improvements during their developmental process. However, the candidates did not deem that the electronic system effectively documented their competencies of teaching. Some of the candidates also reported that the electronic assessment system lacked adequate instructions, timely feedback from faculty members, and limited access to the portfolio server. The authors concluded by describing the need for an effective electronic portfolio that provides pre-service teachers with an opportunity

to apply their knowledge and skills, impact their learning process in a meaningful way, and promote teaching competencies as part of the certification process (Yao et al., 2009; see Table 1).

Sivakumaran et al. (2010) presented case studies from three universities (The University of Tennessee, The University of Louisiana Monroe, and The University of Wisconsin Whitewater) regarding the implementation, maintenance, and support of electronic assessment systems. The authors argued that the accreditation process was the driving force for institutions to adopt the use of electronic assessment systems that allow teacher preparation programs to collect, organize, analyze, and disaggregate data. The authors cited the requirement by several specialized professional agencies, such as the National Council for Accreditation of Teacher Education (NCATE), to have an assessment system that collects and analyzes data as part of the standards. The collected information is intended to help administrators, faculty members, institutions' leadership, and stakeholders to collect key pieces of information that drive continuous improvement and impact program outcomes. The researchers found that although the three institutions followed different implementation methods of their system, similar experiences were noticed. The authors concluded that administrative support was very critical to the success of implementing an effective electronic data assessment system. Spending appropriate time researching and designing how the system should work before entering data online was also essential to the system's success. The authors recommended that only one person should take control and ownership of the system in order to ensure successful implementation and maintenance. That person would become knowledgeable

in all areas of the system and could effectively meet the needs and requirements for both the system and the end users (Sivakumaran et al., 2010; see Table 1).

Larkin and Robertson (2013) investigated the use of electronic assessment system at Walden University, one of the largest online universities of over 50,000 students. The university personnel used significant resources to decode an existing complex assessment program into a more resourceful and efficient electronic data management system that focused on continuous improvement to meet national accreditation programs. The decision by the university leadership personnel to pursue national accreditation in 2008 highlighted a need to evaluate the existing assessment program and to implement an electronic assessment system that appraises and validates key program metrics and outcomes such as the candidate's academic performance. The university personnel ended up using a commercial web-based program called TaskStream® as the electronic data management system. A new assessment process was created to utilize the use of TaskStream® to its full potential. The process consisted of preparation through a structured curriculum, submission by candidates and evaluation by faculty members, data collection, data analysis, data dissemination, and finally use of data to drive program improvement. Several committees consisting of various academic, leadership, candidates, and community representatives were formed to implement the new system and to make it operational. The authors concluded that the implemented program was still in its infancy and more time is needed to identify efficiencies in data entry and analysis. After four academic semesters of using the electronic assessment program, the system was still maturing and its success, according to the authors, depends on various

www.manaraa.com

indicators such as the quantity and the quality of the collected data (Larkin & Robertson, 2013; see Table 1).

Kirchner (2012) conducted a study to investigate the types of electronic assessment systems currently used at 225 higher education institutions and the impact of these systems in complying with NCATE Standard 2. Other objectives of this study were to explore the level of satisfaction NCATE coordinators have with their electronic assessment systems and the importance of certain features in these systems that would improve data collection methods. The author also examined the compliance of NCATE institutions to the six standards as they relate to the main aspects of NCATE Standard 2. The author used descriptive and inferential statistics, such as *t*-tests for significance testing of correlations and one-way ANOVA, to report the results. Most participants indicated that their system was able to meet NCATE Standard 2 for data collection; however, participants were dissatisfied with certain elements of the system that are associated with components that are considered key to complying with accreditation requirements. One finding of this study was that participants perceived greater ability by commercial systems to collect and manage data than those of in-house or hybrid systems (Kirchner, 2012; see Table 1).

Corbin, Carpenter, and Nickles (2013) investigated the ability of higher education institutions in North Carolina to meet demands related to data management requirements for programs approval and accreditation at the state and national level. The researchers of this study surveyed 46 (29 responded) higher education institutions in North Carolina that offer teacher education programs approved by the State. The contact personnel for data management purposes at these institutions were mainly technology managers that

38

were not necessarily affiliated with the colleges of education. However, these technology managers had important role in the assessment process at their respected institutions. The survey was divided into three sections to address the nature of the institution, roles and commitment of the personnel and resources involved with the assessment systems, and capabilities of the systems to collect and manage data. The researchers concluded that higher education institutions in North Carolina had minimal adequacy in system infrastructure to meet data demands. Both private and public institutions indicated a high need for personnel need but low need for better software. However, public and private institutions differed in some ways in their needs for hardware and support from faculty. While public institutions expressed more need from faculty, private institutions expressed more need for better hardware (Corbin et al., 2013; see Table 1)

Thus, as evident by the literature review, researchers have shown the importance of using a data collection system that provides teacher preparation programs the ability to stimulate reflection regarding alignment or disparities between student learning and accreditation requirements. Moreover, the use of electronic systems allow higher education institutions to collect, analyze, and disseminate data using a systematic approach to drive improvements. Leaders at these institutions are challenged today to make data driven decisions that could strengthen and enhance the quality and accountability of their programs during the accreditation process. Researchers have also indicated that the use of a comprehensive electronic assessment system is a crucial element to fostering excellence in learning and teaching. Studies reported in the following table are perceived important by the researcher.

Table 1

Literature Review – Concept Analysis Chart

STUDY	PURPOSE	PARTICIPANTS	DESIGN / ANALYSIS	OUTCOMES
Corbin et al. (2013)	Investigate the ability of higher education institutions in North Carolina to meet demands related to data management requirements for programs approval and accreditation at the state and national level	29 higher education institutions in North Carolina that offer teacher education programs approved by the State	Descriptive design with quantitative survey methodology	Higher education institutions in North Carolina had minimal adequacy in system infrastructure to meet data demands. Both private and public institutions indicated a high need for personnel but low need for better software

While public institutions expressed more need from faculty, private institutions expressed more need for better hardware |

Larkin & Robertson (2013)	Evaluate the existing assessment program and implement an electronic assessment system that appraises and validates key program metrics and outcomes such as the candidate's academic performance	Several committees consisting of various academic, leadership, candidates, and community representatives	Qualitative: formative approaches to the developmental methodology The overall design was to explore, explain, and design an assessment system and e-portfolio template that is specific to the institution's needs and outcomes	Data revealed that candidates had difficulty with rubric criteria related to applying concepts of valid and reliable assessment Time and effort can be saved by using export features to benefit systems outside of the electronic assessment system The maturity of the assessment system is dependent on various indicators rather than a completed project or deliverable
Kirchner (2012)	Investigate the types of electronic assessment systems currently used at higher education institutions and the impact of these systems in complying with NCATE Standard 2 Explore the level of satisfaction NCATE coordinators have with their	225 NCATE assessment coordinators at higher education institutions Survey was sent to 775 but only 225 responded	Descriptive design with quantitative survey methodology Inferential statistics, such as significance testing of correlations, t-tests, and one-way ANOVAs	Most participants indicated that their system was able to meet NCATE Standard 2 for data collection Participants were dissatisfied with certain elements of the system that are associated with components that are considered key to complying with accreditation requirement Participants perceived greater ability by commercial

41

	electronic assessment systems and the importance of certain features in these systems that would improve data collection methods Examine the compliance of NCATE institutions to the six standards as they relate to the main aspects of NCATE Standard 2			systems to collect and manage data than those of in-house or hybrid systems
Strudler & Wetzel (2011)	Use of electronic system assessments in regard to current changes in the accreditation of teacher education programs Investigate the theoretical viewpoints of the different methods used in implementing electronic assessment systems	Institutions of higher education	Qualitative: exploratory by investigating the theoretical viewpoints of the different methods used in implementing electronic assessment systems Provide recommendations that support current adoption and implementation decisions	The perception of both students and faculty members about the use of electronic assessment systems is influenced by factors such as clear instructions about the system, faculty feedback in a timely manner, and time and effort involved in performing certain tasks Benefits of using electronic assessment systems: Providing an opportunity to

	Examine the cost and benefit of such systems as viewed by the stakeholders, the effect of the systems on student engagement and learning, and the strategies followed to collect and analyze data related to candidate performance in order to drive program improvements and meet accreditation standards			stakeholders to contemplate and understand the teaching standards in a more effective way

Increase technology skills for candidates, easier access to professional documents, better faculty communication with their students, and improved tracking of student performance for accreditation and program improvement |
| Herring & Wilson (2010) | Use of an in-house data management system (UNITED) to develop procedures for continuous improvements based on careful program assessment

Moving the data management system from mere collection and reporting of data to the | Faculties (48 and 29 separate entries) in the teacher education program at the University of Northern Iowa

Alumni and student teachers (40 responses) | Quantitative: survey | Developed a series of assessment and data management projects

Drive improvements in the teacher preparation program and support positive change

The curriculum mapping project addressed gaps and unneeded redundancies to improve internal and external communication |

43

	use of the data to drive program improvements			
McPherson (2010)	Investigate the use of TaskStream™ as the electronic assessment system at the New York Institute of Technology (NYIT) to collect and manage data in the teacher preparation program at the College of Education Review of several other commercial products by analyzing their capabilities, features, ease of use, cost, as well as multiple other factors to comply with NCATE standards.	250 student teachers at the New York Institute of Technology Faculties in the School of Education	Quantitative: survey Qualitative: faculty interviews	Most faculty members believe that using TaskStream could help them and the candidates to become more aware of the program objectives and AECT standards (82% agree or strongly agree), collect assignments in various formats (73% agree or strongly agree), facilitate submission of assignments (92% agree or strongly agree), encourage candidates to be more self-regulated and organized (43% agree or strongly agree), acquaint candidates with curriculum standards (73% agree or strongly agree) and facilitate communication (73% agree or strongly agree)
Sivakumaran et al. (2010)	Study the processes utilized by three higher education institutions implementing,	The University of Tennessee, the University of Louisiana Monroe, and the University of Wisconsin	Qualitative: a case study methodology	Although the three institutions followed different implementation methods of their system, similar

	maintaining, and supporting electronic assessment systems	Whitewater participated in this study		experiences were noticed Administrative support was very critical to the success of implementing an effective electronic data assessment system
Shoffner (2009)	Examined the role pre-service teachers' attitudes toward technology played in their use of weblogs for voluntary reflective practice	9 pre-service teachers attending Master's program in secondary education	Qualitative: interviews content and ethnographic analysis during a period of 8 months	Pre-service teachers' attitudes toward technology have implications for their use of technology. This can impact responsiveness and experiences that pre-service teachers bring to their preparation For pre-service teachers to integrate technology into their personal professional practice, educator programs must consider the preferences pre-service teachers express regarding reflection Integration into daily life and connection with others are seen as positive features of technology and reflection

Swade et al. (2009)	Investigate the implementation of an electronic assessment system for the teacher preparation program at Saint Leo University to replace a paper-based assessment system	Student teachers and faculty at Saint Leo University	Quantitative: survey	Implementing the electronic assessment system will enable the teacher preparation program to track student progress, enhance learning, and produce favorable results to meet the certification and accreditation needs of the program
Wetzel et al. (2009)	Analyzed 52 Board of Examiner (BOE) reports submitted to NCATE in 2007 to reveal trends in the use of electronic portfolios (EPs) for accreditation purposes	Colleges of Education that are part of NCATE accreditation	Quantitative: exploratory	The study uncovered a migration from off-the-shelf programs such as Microsoft Word and Excel to the use of large-scale systems such as LiveText and TaskStream Out of the 52 BOE reports, 37 institutions reported the use of electronic systems
Yao et al. (2009)	Investigate the perception of pre-service teachers regarding the use of an electronic assessment system and the effect of the system on promoting reflective skills and teaching	8 pre-service teachers attending the early childhood, elementary, and middle school education program at the University of Central Missouri participated in the interviews	Qualitative: process of open coding was used to create four themes and sub-themes utilizing the collected data from the interviews	Pre-service teachers perceived the electronic assessment system as helpful in developing their reflective skills and provided them an opportunity to review the compliance of their work with established rubrics

	competencies for candidates			Candidates expressed that the electronic system provided a record of their work that they can review in the future. It also helped them to monitor their field experience and to facilitate improvements during their developmental process Some candidates reported that the electronic assessment system lacked adequate instructions, timely feedback from faculty members, and limited access to the portfolio server
Schulte et al. (2006)	The use of a comprehensive approach to develop and document the assessment system used at the University of Nebraska at Omaha and the methods followed to avoid the pitfalls in meeting NCATE Standard 2	Faculty, staff, and student teachers at the University of Nebraska at Omaha	Quantitative: exploratory	Developed an assessment system that is comprehensive and integrated by programmatic thinking, alignment between assessments and standards, and data collection and analysis

Love & Cooper (2004)	Study the impact of key factors that contribute to the design of an online portfolio system used for assessment purposes in education. The research focused on the educational benefits of such systems and the maximization of value for all stakeholders	The research was exploratory in nature using a mixture of broad scans across the web and literature and focused investigation into exemplar online portfolio assessment systems	Qualitative: exploratory The primary themes investigated were integrity of course design and benefits for all stakeholders	The study discovered certain weaknesses in most of the design approaches for online portfolio assessment systems The proper design of online portfolio assessment systems can maximize value across all stakeholders by minimizing time consuming routine administrative tasks and focusing on tasks related to education and assessment

Summary

In this chapter, the researcher addressed issues that teacher preparation programs have in meeting the accreditation standards and the impact of using electronic assessment systems on collaboration amongst stakeholders. Since there has not been any research conducted yet to study the impact of using electronic assessment systems to meet the newly established CAEP Standards, the researcher reviewed prior research related to the struggle of meeting accreditation requirements in higher education institutions, the impact of electronic assessment systems on collaboration among stakeholders, the impact of using in-house electronic assessment systems on meeting NCATE Standard 2, the impact of using commercial electronic assessment systems on meeting NCATE Standard 2, and the perception of stakeholders on using electronic assessment systems. This review of literature constituted a building block to support the main purpose of this study;

48

investigating the impact of using electronic assessment systems on meeting performance appraisal, tracking results, and improving program elements and processes to comply with CAEP Standard 5.3.

Based on prior research findings, as cited in the literature review, the researcher focused on investigating the impact of using electronic assessment systems on meeting the data collection requirements of CAEP Standard 5.3 as perceived by the assessment coordinator or the person most familiar with the system. The researcher explored if the electronic systems used by the surveyed institutions are capable of: (1) collecting useful data to the institution, (2) providing valid and reliable information to drive future improvement, (3) enhancing teaching and student learning outcomes, and (4) assisting institutions to comply with accreditation standards. The researcher also addressed any variation in the outcomes due to system type (commercial, in-house, or hybrid). Furthermore, the commitment of leadership at higher education institutions to provide needed support, human and financial resources, to comply with the national standards for data requirements in education was also investigated. The outcome of this research can help colleges of education at higher education institutions to efficiently adapt to the new CAEP standards in regard to data collection requirements. To the best knowledge of the author, no other researcher has yet addressed the satisfaction levels and the user's perceptions of their electronic assessment systems and the ability of such systems to meet the data collection requirements of CAEP Standard 5.3.

49

CHAPTER 3

METHODOLOGY

Implementing a comprehensive electronic assessment system requires expertise in
the field of assessment and standards as well as commitment from all stakeholders. Due
diligence is also needed during the process of choosing a system that will fit the specific
needs of each institution (Darling-Hammond, 2012; Strudler & Wetzel, 2011; Swade et
al., 2009). Problems such as vague or fuzzy program goals, misalignment with standards,
and writing inept evaluation criteria can hinder the effectiveness of using such systems to
assess student learning (Larkin & Robertson, 2013). Another drawback is the lack of
consensus amongst educators, researchers, and legislatures to define a best practice
model for an assessment system that will yield a valid and reliable method to assess
student learning and measure performance (Reusser et al., 2007). This controversy over
the validity and reliability of the use of electronic assessment systems in meeting
standards has led to resistance by some institutions from spending capital resources and
committing to such systems (Mitchell, 2006).

Due to the recent transition from NCATE and TEAC to CAEP, the researcher of
this study analyzed the impact of the major shift in accreditation requirements as it relates
to the use of electronic assessment systems and compared the ability of such systems to
meet NCATE Standard 2 and CAEP Standard 5.3. As was explained in chapter 1 of this
study, CAEP Standard 5.3 was intended to substitute NCATE Standard 2. The researcher
more specifically studied the perception of assessment coordinators in regard to the
ability and readiness of colleges of education across the country to meet the newly
established CAEP Standard 5.3. The results of this analysis are intended to be used by

50

teacher preparation programs as a solid basis to make educated decisions on implementing electronic assessment systems that provide critical pieces in the data collection puzzle to comply with the CAEP standards. Furthermore, institutions of higher education can utilize the results of this study to help them adapt to the new and revised standards, as well as to drive continuous improvement and quality education.

An e-mail survey was sent to assessment coordinators, or the main person responsible for accreditation, at colleges of education nationwide to collect data to answer the following research questions:

1. To what extent do assessment coordinators perceive that their electronic assessment systems facilitated the compliance of their teacher preparation programs with the NCATE Standard 2 requirements?

2. To what extent do assessment coordinators perceive that their electronic assessment systems will be able to facilitate the compliance of the teacher preparation programs with the CAEP Standard 5.3 requirements by addressing: performance appraisal, tracking results, and improving program elements and processes?

3. To what extent does the level of support of using electronic assessment systems at higher education institutions influence the confidence level of assessment coordinators in meeting CAEP 5?

4. What relationship, if any, is there between the perceived outcomes of assessment coordinators that their electronic assessment systems are capable of meeting NCATE Standard 2 and CAEP Standard 5.3?

Research Design

The researcher used quantitative methods to analyze the collected data from surveying assessment coordinators at NCATE accredited higher education institutions. Exploratory research was used to identify key indicators that contributed to the measurement of specific variables related to the use of electronic assessment systems at the surveyed institutions. A descriptive analysis was conducted to accurately measure the perception of assessment coordinators at colleges of education related to the ability of their electronic assessment systems in meeting certain accreditation standards.

This research was also correlational in nature since it attempted to establish relationships between research components as they relate to importance and satisfaction. Canonical Correlation analysis was used to examine the relationship between assessment systems and compliance with NCATE Standard 2 and CAEP Standard 5.3. As such, the researcher was interested in determining how a set of NCATE Standard 2 compliance variables (systematically collect data, faculty access, aggregate data, disaggregate data, admission data, student dispositions, multiple assessments, standards based data, clinical practice, teacher certification, exit information, and data after graduation) related to CAEP Standard 5.3 compliance variables (goals and standards, multiple assessments, standards based data, leadership commitment, hiring completers, cost of attendance against goals, cost of attendance against similar providers, admission criteria, systematically collect data, aggregate data, disaggregate data, student dispositions, clinical practice, exit information, completers salaries, admission data, non-academic factors, disaggregate by target groups, teacher certification, after graduation, locations of completers, field experiences, develop innovative models, share data, and test the validity

52

and reliability of measures). Canonical Correlation analysis is an exploratory statistical method to see if two sets of variables are related. It is one of the most general multivariate forms where it maximizes the correlation between the linear combination of variables. If implemented correctly, it can provide the best linear combinations of predictors related to the best linear combinations of the dependent variables (Tabachnick & Fidell, 2012). Researchers should consider the following during Canonical Correlation analysis: Loadings between independent or dependent variables and their canonical variates, adequacy, communalities, redundancy between independent or dependent variables and canonical variates, and importance of canonical variates (Tabachnick & Fidell, 2012).

Furthermore, inferential statistics were used to analyze the survey responses. Significance testing of correlations, such as one-way ANOVAs and multi-regression, were used to analyze responses for research questions 1, 2, and 4. Additional exploration using Bonferroni's post hoc test was conducted on the statistically significant components to determine which means are significantly different from each other among the three types of the electronic assessment systems (commercial, in-house, hybrid).

Population and Sampling

The population for this study consisted of assessment coordinators at NCATE accredited colleges of education. A listing of accredited higher education institutions posted on the NCATE website was used to identify colleges of education to participate in this study. Higher education institutions' websites were used to find the contact information of assessment coordinators. The associate deans or deans of colleges of education were contacted directly only if the contact information for assessment

53

coordinators was not accessible. The researcher sent the survey to 654 public and private

teacher preparation programs at higher education institutions that were accredited by

NCATE. Assessment coordinators are most likely the most knowledgeable personnel at

these institutions to be able to respond to the survey questions accurately. Additional

help in responding to the survey questions was solicited from other personnel at the

surveyed institutions, such as deans, on an as needed basis.

Instrumentation

The 57-question survey instrument entitled "Assessment Coordinators

Perceptions of the Impact of Electronic Assessment Systems on Meeting NCATE and

CAEP Standards Survey" was developed predominately as a cross-sectional opinion

survey (see Appendix A). The survey was partially adapted from Corbin et al. (2013),

CAEP (2013), and Kirchner (2012). The purpose of the survey was to measure the

assessment coordinators' overall satisfaction with the ability of their electronic

assessment systems to meet NCATE Standard 2 and CAEP Standard 5.3. The survey

consisted of four separate sections to distinguish between type of electronic assessment

systems, level of support of utilizing electronic assessment systems at higher education

institutions, requirements to meet NCATE Standard 2, and requirements to meet CAEP

Standard 5.3. The 12 data categories for NCATE Standard 2 included the following

system capabilities:

- Systematically collects data

- Allows faculty access to information collected against goals and standards

- Aggregates data

- Disaggregates data

- Collects student admission data

- Collects information on student dispositions

- Addresses need to have multiple assessment points

- Collects information on professional, state, or national standards

- Collects information on clinical practice

- Collects teacher certification/licensure information on program completers

- Collects student exit information on program completers

- Collects information about students after graduation

The 8 data categories for "Performance Appraisal Against Goals and Relevant Standards" of CAEP Standard 5.3 included the following system capabilities:

- Allows faculty access to information collected against goals and standards

- Addresses need to have multiple assessment points

- Collects information on professional, state, or national standards

- Documents leadership commitment to sustain continuous improvement

- Tracks the hiring of completers in fields for which prepared

- Collects cost of attendance against the Professional ED Unit set goals

- Compares cost of attendance against similar providers

- Uses admission criteria as set by the Professional ED Unit

The 10 data categories for "Tracking Results over Time" of CAEP Standard 5.3 included the following system capabilities:

- Address need to systematically collect data

- Aggregates data

- Disaggregates data

- Collects information on student dispositions

- Collects information on clinical practice

- Collects student exit information on program completers

- Tracks beginning salary of completers compared with national data for similar positions and locations

- Collects admission data and correlates the data with measures of P-12 student learning and development

- Tracks developing non-academic factors in relation to subsequent teacher performance. Examples include: volunteerism, civic organizations, commitment to urban issues, cultural competency, etc…

- Disaggregates completers by racial, ethnic and other target groups identified in the Professional ED Unit recruitment plans

The 9 data categories for "Improving Program Elements and Processes" of CAEP Standard 5.3 included the following system capabilities:

- Collects student admission data

- Collects teacher certification/licensure information on program completers

- Collects information about students after graduation

- Tracks students' graduation rate to drive improvement

- Tracks pattern of placement locations of completers over time to drive improvement in certain program elements

- Studies the effectiveness of diverse field experiences on candidates' instructional practices

- Provides reliable or valid measures or innovative models of high quality practices, partnerships, clinical educators, or clinical experiences

- Shares data with both internal and external audiences and uses the data for program improvement

- Tests the validity and reliability of measures to test and improve processes

Section 1 of the survey (see Appendix A) asked general questions about the type of institution, overall size, type of assessment system currently used, how long the system has been in use, and was the system active during last NCATE visit. The purpose of these questions was to collect general information and historical data about the institution and the assessment system. This data was useful during the analysis phase of this study.

Section 2 of the survey (see Appendix A) used Likert-scale questions to allow assessment coordinators to indicate their perception of their system's ability to address a comprehensive list of NCATE Standard 2 data assessment needs. The responses to these questions helped answer research question 1, "To what extent do assessment coordinators perceive that their electronic assessment systems facilitated the compliance of their teacher preparation programs with the NCATE Standard 2 requirements?" Responses to each of the questions in this section provided a perceived level of satisfaction for specific data points. When combined, all of the questions in this section provided an overall indication of the respondents' perceptions of their system's ability to meet NCATE Standard 2 requirements. Since there were three distinct types of electronic assessment systems that can be chosen (commercial, in-house, or a hybrid), a one-way ANOVA with F-test of equality of variances was run to explore respondent's level of component satisfaction based on the type of system indicated in an earlier survey question.

Additional exploration using Bonferroni's Post hoc test was conducted on the statistically significant components to determine which means were significantly different from each other among the three assessment systems. The analysis of these data provided answers to whether the type of system selected facilitated the teacher preparation program's ability to meet NCATE Standard 2 as perceived by assessment coordinators.

Section 3 of the survey (see Appendix A) used Likert-scale questions to allow assessment coordinators to indicate their perception of their system's ability to address a comprehensive list of CAEP Standard 5.3 data assessment needs. The responses to these questions helped answer research question 2, "To what extent do assessment coordinators perceive that their electronic assessment systems will be able to facilitate the compliance of the teacher preparation programs with the CAEP Standard 5.3 requirements by addressing: performance appraisal, tracking results, and improving program elements and processes?" Responses to each of the questions in this section provided a perceived level of satisfaction for specific data points. When combined, all of the questions in this section provided an overall indication of the respondents' perceptions of their system's ability to meet CAEP Standard 5.3 requirements. Since there were three distinct types of electronic assessment systems that can be chosen (commercial, in-house, or a hybrid), a one-way ANOVA with F-test of equality of variances was run to explore respondent's level of component satisfaction based on the type of system indicated in an earlier survey question. Additional exploration using Bonferroni's post hoc test was conducted on the statistically significant components to determine which means were significantly different from each other among the three assessment systems. The analysis of these data provided answers to whether the type of system selected will be able to facilitate the

teacher preparation program's ability to meet CAEP Standard 5.3 as perceived by assessment coordinators.

Section 4 of the survey (see Appendix A) asked questions about how well the infrastructure and level of support of personnel and technology influenced the confidence level of assessment coordinators that such support had facilitated meeting accreditation requirements. This section of the survey was intended to show the level of commitment of leadership at colleges of education to provide the necessary support, resources, and training in order to comply with national accreditation standards. The responses to these questions helped answer research question 3, "To what extent does the level of support of using electronic assessment systems at higher education institutions influence the confidence level of assessment coordinators in meeting CAEP 5?"

A Likert scale was developed to answer the survey questions. The accuracy of Likert scales is a function of the scale level. When developing the survey in Appendix A, the researcher used a 6-point Likert scale for sections 2 and 3 (*Extremely Well, Well, Moderately Well, Moderately Poor, Poor, Extremely Poor*). The 6-point scale was used to produce a forced choice response and to eliminate neutrality at the midpoint of an odd level scale. This type of scale pushed assessment coordinators to give a positive or negative feedback about their own perceptions and removed any uncertainty in answering the survey questions. Researchers, such as Johns (2010) and Fink (2009), advocated the use of even point Likert scales as better indicators to measure satisfaction in areas of controversial research fields such as politics and social studies. For section 4 of the survey, a 4-point Likert scale was used (*High Need, Moderate Need, Low Need, No Need*). This section of the survey was intended to answer questions related to the level of

support that higher education institutions provided to assessment coordinators and to the system in use. For the purpose of this research, assessment coordinators are considered experts in their fields and hence section 4 of the survey was adopted from Corbin et al. (2013) study with the finer 4-point Likert scale. The scale still covered a wide spectrum of responses and provided adequate insight about coordinators' perceptions that captured the various levels of support.

The internal consistency of the instrument and the two Likert scales were tested using Cronbach's α reliability analysis. The reliability coefficients were determined for the entire instrument and for each scale and results were reported in Chapter 4 of this study. Reliability coefficients of .70 or greater are considered acceptable (Fraenkel & Wallen, 2006). However, some researchers (Rudner & Schafer, 2001) stated that coefficients of .50 are sufficient for research conducted in the field of social science.

Procedure

The survey in Appendix A was created using the online Qualtrics survey tool. A link to the survey was e-mailed to assessment coordinators at the accredited NCATE institutions. The e-mail included an explanation of the purpose of this study and confidentiality statement as stated in the Institutional Review Board (IRB) guidelines. Participants were given an initial period of six weeks to complete the survey. In order to achieve a high response rate, a reminder was sent every two weeks to participants who did not respond to the survey. At the end of the six weeks, the data were imported into Excel to validate for accuracy and formatting and then exported to SPSS software for analysis.

Data Analysis

The researcher conducted quantitative research using statistical analysis to investigate the perception of assessment coordinators at accredited NCATE institutions in relation to the ability of their assessment systems to meet accreditation standards. A confidence level of 95% (α = .05) was assumed for all statistical analysis throughout this study. The data for NCATE Standard 2 and CAEP Standard 5.3 were first examined for univariate and multivariate normality using SPSS version 22. Furthermore, missing values analysis was conducted to determine if values were missing completely at random (MCAR) using Little's MCAR (Little, 1988) test such that p >.05 indicated data MCAR. In addition, z-scores were examined to determine if univariate outliers ($z > |3.29|$) were present. Measures of skewness and kurtosis values $> |1.0|$ were also examined to determine if the distribution of the data were skewed and or peaked or flat. Histograms were used to provide further evidence to the shape of the distribution. Mahalanobis distance was examined to determine if multivariate outliers existed such that $\chi^2_{12} = 32.9$ and $\chi^2_{27} = 55.4$ were considered outliers for NCATE and CAEP data respectively. The data were also tested for homogeneity of variances using Levene's test. Finally, the data were tested for mutlicollinearity to examine if two or more variables were highly correlated. A Variance Inflation Factor (VIF) of 10 was used as a critical value to determine if variables were highly correlated.

Responses to survey questions pertaining to research question (1) were analyzed using descriptive and inferential statistics. Frequencies, percentages, means, and standard deviations were reported to determine the perceptions of assessment coordinators that their assessment systems facilitated the compliance to meet the requirements of NCATE

61

Standard 2. The mean of each individual question indicated the perception of how well the system performed in that particular category. The overall mean for the entire set of questions was used to measure the perception of assessment coordinators for the ability of their systems to assist in meeting NCATE Standard 2. The researcher used this overall mean as an indicator to drive conclusions and to make comparisons. A one-way ANOVA with F-test of equality of variances was used to investigate the variation in results based on the type of assessment system used (commercial, in-house, or hybrid).

Similar analysis was conducted to responses obtained for survey questions pertaining to research question (2). However, additional descriptive and inferential statistics were performed to study the perceived impact of the assessment system on meeting the requirements of three components of CAEP Standard 5.3: performance appraisal, tracking results, and improving program elements. A one-way ANOVA with F-test of equality of variances was utilized to study the compliance of the assessment systems with these three components.

Canonical Correlation analysis was conducted to examine the relationship between two sets of variables – NCATE Standard 2 (x-variate) and CAEP Standard 5.3 (y-variate). This analysis was conducted to answer research question (4), "What relationship, if any, is there between the perceived outcomes of assessment coordinators that their electronic assessment systems are capable of meeting NCATE Standard 2 and CAEP Standard 5.3?" The NCATE Standard 2 variate was measured by the following compliance variables: systematically collect data, faculty access, aggregate data, disaggregate data, admission data, student dispositions, multiple assessments, standards-based data, clinical practice, teacher certification, exit information, and data after

graduation. On the other hand, the CAEP Standard 5.3 variate was measured by the following compliance variables: goals and standards, multiple assessments, standards-based data, leadership commitment, hiring completers, cost of attendance against goals, cost of attendance against similar providers, admission criteria, systematically collect data, aggregate data, disaggregate data, student dispositions, clinical practice, exit information, completers salaries, admission data, non-academic factors, disaggregate by target groups, teacher certification, after graduation, locations of completers, field experiences, develop innovative models, share data, and test the validity and reliability of measures. To examine the relationship, several sources of evidence were considered: (1) the number of statistically significant canonical correlations ($\alpha = .05$), (2) the relationship between the canonical correlations, (3) the shared variance between the variates, (4) the variance extracted by each variate with respect to its own set of variables, (5) the structure coefficients of each variable with attention given to loadings $\geq |.30|$, and (6) the redundancy captured by each variate. To enhance the interpretation of the canonical correlation analysis, a post hoc test using multi-regression analysis was conducted to generate separate regression equations for each dependent variable (CAEP variables) from the covariates (NCATE variables), holding all other dependent variables constant.

Research Methods

Quantitative methods utilizing SPSS software were used to analyze the data collected from surveying assessment coordinators at NCATE accredited higher education institutions. The survey that was sent to assessment coordinators was exploratory in nature since it tried to identify key indicators that contributed to the measurement of

specific variables related to the use of electronic assessment systems at the surveyed institutions.

Descriptive analysis was conducted to accurately measure the perception of assessment coordinators at colleges of education about the ability of their electronic assessment systems to meet certain accreditation standards. The use of descriptive statistics is intended to summarize a data set quantitatively by measuring variability and central tendency without using a probabilistic formulation (Lomax & Hahs-Vaughn, 2012). Mean, median, mode, frequency plots, distribution plots, histogram plots, skewness of data, standard deviation, and variance are typical outputs for descriptive statistics.

Inferential analysis, such one-way ANOVAs and multi-regression, was used to analyze responses for research questions 1, 2, and 4. The use of inferential analysis in research is intended to makes inferences about a population with a specific level of confidence using sample data (Lomax & Hahs-Vaughn, 2012). Hypothesis testing such as null hypothesis, alternative hypothesis, p-value, ANOVA, and post-hoc tests is key part of inferential analysis. Canonical Correlation analysis was used to examine the relationship between assessment systems and compliance with NCATE Standard 2 and CAEP Standard 5.3.

Summary

The implementation and sustainability of comprehensive electronic assessment systems in teacher preparation programs are key components to complying with national accreditation standards (Eaton, 2011; Kirchner, 2012; Mitchell, 2006; Schulte et al., 2006). The researcher in this study looked to the voices of assessment coordinators who

pointed to the perceived benefits and shortfalls of their electronic systems from their own perspectives. The survey that was sent to the assessment coordinators constituted the foundation of the data collection method for this study. This opinion survey covered a range of requirements by NCATE Standard 2 and CAEP Standard 5.3 in order to identify key indicators that contributed to specific variables related to the use of electronic assessment systems at the surveyed institutions. A Likert scale was developed to answer the survey questions. The sampling frame consisted of assessment coordinators at colleges of education that were accredited by NCATE. A link to the survey was e-mailed to the assessment coordinators using the online Qualtrics survey tool. A quantitative research analysis was conducted using SPSS statistical software. SPSS runs ranging from descriptive statistics to Canonical Correlation were used to analyze the data collected from surveying assessment coordinators at NCATE accredited institutions. The reliability of the survey was tested by calculating the reliability coefficients for the entire instrument, and also for each scale, using Cronbach's α reliability analysis.

CHAPTER 4

REPORT OF DATA AND DATA ANALYSIS

Introduction

Systematic data collection has been strongly associated with accreditation standards and is a crucial requirement for the accountability of teacher preparation programs (CAEP, 2013; Crowe, 2010; NCATE, 2008). Electronic assessment systems have extended the ability of teacher education programs to meet accreditation standard by collecting and reporting data requirements to drive improvement (Larkin & Robertson, 2013). However, electronic assessment systems have not been fully utilized by all colleges of education at higher institutions despite the enormous educational benefits they can provide. Due to the recent transition from NCATE and TEAC standards to the new CAEP standards, it is imperative that colleges of education begin to consider potential difficulties in meeting the new CAEP standards. The researcher in this study examined the impact, as perceived by assessment coordinators, of using electronic assessment systems on the outcome of the accreditation process as it relates to NCATE Standard 2 and to the new CAEP Standard 5.3. Further attention was given to the compliance of such systems to the following three components of CAEP Standard 5.3: meeting performance appraisal, tracking results, and improving program elements and processes. Moreover, the commitment of leadership at higher education institutions to provide needed support, personnel and capital resources, to comply with education standards was also investigated.

The survey in Appendix A was sent out to assessment coordinators at NCATE accredited colleges nationwide to collect data to answer the following research questions:

1. To what extent do assessment coordinators perceive that their electronic assessment systems facilitated the compliance of their teacher preparation programs with the NCATE Standard 2 requirements?

2. To what extent do assessment coordinators perceive that their electronic assessment systems will be able to facilitate the compliance of the teacher preparation programs with the CAEP Standard 5.3 requirements by addressing: performance appraisal, tracking results, and improving program elements and processes?

3. To what extent does the level of support of using electronic assessment systems at higher education institutions influence the confidence level of assessment coordinators in meeting CAEP 5?

4. What relationship, if any, is there between the perceived outcomes of assessment coordinators that their electronic assessment systems are capable of meeting NCATE Standard 2 and CAEP Standard 5.3?

The survey consisted of four separate sections to distinguish between type of electronic assessment systems, level of support of utilizing electronic assessment systems at higher education institutions, requirements to meet NCATE Standard 2, and requirements to meet CAEP Standard 5.3. Section 1 of the survey asked general questions to collect information and historical data about the institution and the assessment system. This data was useful during the analysis phase of this study. Section 2 of the survey used a 6-point Likert scale (*Extremely Well, Well, Moderately Well, Moderately Poor, Poor, Extremely Poor*) to allow assessment coordinators to indicate their perceptions of their system's ability to address a comprehensive list of NCATE Standard 2 data assessment needs. Section 3 of the survey also used a 6-point Likert

scale (*Extremely Well, Well, Moderately Well, Moderately Poor, Poor, Extremely Poor*)
to investigate assessment coordinators' perceptions of their system's ability to address a
comprehensive list of CAEP Standard 5.3 data assessment needs. The analysis of these
data provided answers to whether the type of system selected facilitated the teacher
preparation program's ability to meet CAEP Standard 5.3. Section 4 of the survey asked
questions about how well the infrastructure and level of support of personnel and
technology influenced the confidence level of assessment coordinators that such support
had facilitated meeting accreditation requirements. A 4-point Likert scale was used
(*High Need, Moderate Need, Low Need, No Need*) for this purpose. This section of the
survey was intended to show the level of commitment of leadership at colleges of
education to provide the necessary support, resources, and training in order to comply
with national accreditation standards.

Organization of Data Analysis

This chapter provides the findings and presents a detailed description of the
quantitative data collected from surveying assessment coordinators at NCATE accredited
colleges of education across the nation. The first part of this chapter provides descriptive
statistics and analysis about the type of institution, overall size, type of assessment
system currently used, how long the system has been in use, and was the system active
during last NCATE visit. The researcher also investigated the sentiment and loyalty of
assessment coordinators by gauging their willingness to recommend their assessment
systems as tools to facilitate compliance with accreditation standards. The Net Promoter
Score (NPS) scale was used for this purpose. In the second part of this chapter, responses
to research question (1) were analyzed using descriptive and inferential statistics.

Frequencies, percentages, means, and standard deviations were reported to determine the perceptions of assessment coordinators that their assessment systems facilitated the compliance to meet the requirements of NCATE Standard 2. A one-way ANOVA was used to investigate the variation in results based on the type of assessment system used (commercial, in-house, or hybrid). Similar analysis was conducted to responses obtained for research question (2). However, additional inferential statistics were performed to study the perceived impact of the assessment system on meeting the requirements of three components of CAEP Standard 5.3: performance appraisal, tracking results, and improving program elements. A one-way ANOVA was utilized to study the compliance of the assessment systems with these three components. Additional exploration using Bonferroni's Post hoc test was conducted on the statistically significant components to determine which means were significantly different from each other among the three assessment systems. Canonical Correlation analysis was conducted to examine the relationship between two sets of variables – NCATE Standard 2 (x-variate) and CAEP Standard 5.3 (y-variate). To enhance the interpretation of the canonical correlation analysis, a post hoc test using multi-regression analysis was conducted to generate separate regression equations for each dependent variable (CAEP variables) from the covariates (NCATE variables), holding all other dependent variables constant.

Response Rate

A list of 654 NCATE accredited colleges of education nationwide was created utilizing the NCATE website. Higher education institutions' websites were used to find the contact information of assessment coordinators at colleges of education. The associate deans or deans were contacted directly only if the contact information for

69

assessment coordinators was not accessible. The survey in Appendix A was uploaded

into the online Qualtrics survey tool. A link to the survey was e-mailed to assessment

coordinators at the accredited NCATE institutions. The e-mail included an explanation

of the purpose of this study and confidentiality statement as stated in the Institutional

Review Board (IRB) guidelines (See Appendix B). Participants were given an initial

period of six weeks to complete the survey. In order to achieve a high response rate, an

e-mail reminder was sent every two weeks to participants who did not respond to the

survey (See Appendix C). Out of the 654 accredited colleges, there were 12 undelivered

messages, 3 participants indicated that they were not interested, and 4 replied that they

were not the right person to contact. Three hundred and eight participants started the

survey, 88 dropped or did not complete the survey on time, 220 completed the entire

survey. Hence, the response rate of the survey was 47% with a completion rate of 34%.

The sample size determination table proposed by Bartlett, Kotrlik, and Higgins (2001)

was used to determine the minimum sample size required for a statistically acceptable

analysis. The table included different calculations for continuous data than categorical

data. For continuous data, the assumptions were confidence level of 95% ($\alpha = .05$), a

confidence interval (margin of error) of +/- 3%, and estimated standard deviation of the

scale as 1.167. Using the guidelines given by Bartlett et al. (2001), the minimum

returned sample size for a population of 654 should be 102 participants. Therefore, this

study has the minimum required sample size that is statistically representative of the

population. Furthermore, the acceptable margin of error for continuous data in

educational and social research is 3% (Krejcie & Morgan, 1970). For a population of 654

institutions and a sample of 220, the margin of error for the data in this study was +/-

2.25%, which is less than the acceptable level of 3%. For the 6-point Likert scale, the margin of error indicated that the researcher had a statistical confidence that the true mean of six point scale is within +/- 0.135 (.225 times six points on the scale) of the mean calculated from the sample. For the 4-point Likert scale, the margin of error indicated that the researcher had a statistical confidence that the true mean of four point scale is within +/- 0.090 (.225 times four points on the scale) of the mean calculated from the sample.

Validity and Reliability of Instrument

As was verified earlier, this study had the minimum required sample size that was statistically representative of the population. Section 2 of the survey in Appendix A used Likert-scale questions to allow assessment coordinators to indicate their perception of their system's ability to address a comprehensive list of NCATE Standard 2 data assessment needs. The questions in this section of the survey were partially adapted from the survey that was used by Kirchner (2012). To test the validity of his survey, Kirchner (2012) formed a pre-survey evaluation group that included deans, associate deans, assessment coordinators, and survey experts. Several revisions were made to improve the content validity of the survey. Section 3 of the survey that was used by this study (see Appendix A) used Likert-scale questions to determine assessment coordinators' perception of their system's ability to address a comprehensive list of CAEP Standard 5.3 data assessment needs. The questions in this section of the survey were partially adapted from CAEP Accreditation Standards as approved by the CAEP Board of Directors for Accreditation of Educator Preparation. Furthermore, the researcher in this study consulted several faculty members and made several revisions to improve the validity of

the survey questions. Section 4 of the survey was partially adapted from the survey that was used by Corbin et al. (2013).

The internal consistency of the instrument and the two Likert scales were tested using Cronbach's α reliability analysis. The reliability coefficients were determined for the entire instrument and for each scale. Reliability coefficients of .70 or greater are considered acceptable (Fraenkel & Wallen, 2006). The Cronbach's α was above the threshold of 0.7 for each factor and for the entire instrument (Table 2).

Table 2

Measurement of Reliability for Instrument and Factors Using Cronbach's α

Variable	Cronbach's α
Research Question 1 (NCATE Variables)	
Systematically Collect Data	.879
Faculty Access	.856
Aggregate Data	.859
Disaggregate Data	.850
Admission Data	.849
Student Dispositions	.856
Multiple Assessments	.854
Standards Data	.851
Clinical Practice	.852
Teacher Certification/Licensure	.850
Exit Information	.858
After Graduation	.857

72

Total NCATE Instrument (All Variables)	.865

Research Question 2 (CAEP Variables)

Faculty Access	.943
Multiple Assessments	.943
Standards Data	.942
Leadership Commitment for Continuous Improvement	.941
Hiring of Completers	.941
Cost of Attendance Against ED Unit	.942
Cost of Attendance Against Similar Providers	.942
Admission Criteria	.941
Systematically Collect Data	.943
Aggregate Data	.942
Disaggregate Data	.942
Student Dispositions	.943
Clinical Practice	.942
Exit Information	.941
Salary of Completers	.942
Correlates Admission Data	.941
Non-Academic Factors	.942
Disaggregate Completers by Groups	.942
Admission Data	.942
Teacher Certification/Licensure	.941
Exit Information	.941

Students' Graduation Rate	.941
Locations of Completers Over Time	.941
Effectiveness of Diverse Field Experiences	.942
Innovative Models of High Quality Practices	.941
Use the Data for Program Improvement	.941
Test the Validity and Reliability of Measures	.942
Total CAEP Instrument (All Variables)	.944

Research Question 3 (Level of Support Variables)

More Support for System Administrators	.761
More Support for User	.749
More Personnel	.765
Better Software Functionality	.782
More Training / Consultation	.733
Better Hardware	.788
Total Level of Support Instrument (All Variables)	.795

Presentation of Descriptive Characteristics of Respondents and Assessment Systems

This section describes the general characteristics of the surveyed colleges as it relates to the type of institution, overall size, type of assessment system currently used, how long the system has been in use, and was the system active during last NCATE visit. For the type of institution, three levels of stratification were used: public, private for-profit, and private non-profit. Table 3 shows that 63% of the participants categorized their institutions as public, 33% as private no-profit, and 1.8% as private for-profit. Three participants did not indicate the type of their institutions.

Table 3

Institution Type

	n	*%*
Public	139	63.2
Private (non-profit)	74	33.6
Private (for-profit)	4	1.80
Missing	3	1.40

Table 4 shows student enrollment at the surveyed institutions. The data in Table 4 indicates that the largest number of responses came from institutions that have enrollment between 2,501 – 10,000 students (40.9%). The remainder of responses was relatively evenly split amongst other size institutions (around 10%) with the exception of institutions that have between 1,501 – 2,500 students where responses constituted 15% of the total.

Table 4

Institution Size

	n	*%*
0 – 1,500	23	10.5
1,501 – 2,500	33	15.0
2,501 – 10,000	90	40.9
10,001 – 15,000	24	10.9
15,001 – 25,000	21	9.50
> 25,001	24	10.9

75

Missing	5	2.30

Table 5 shows the distribution of responses for the type of assessment system used at the surveyed institutions. The respondents who indicated the use of commercial electronic assessment system constituted 45.5% of the total. This finding does not match the results from Kirchner's study (2012) where only 29.3% of the participants indicated the use of commercial electronic assessment system at their institutions (Kirchner, 2012). Figure 1 shows the comparison in participants' responses between this study and Kirchner's (2012) results regarding the type of electronic assessment system used at their institutions.

Table 5

Type of Assessment System

	n	*%*
Commercial	100	45.5
Developed in-house	45	20.5
Hybrid	75	34.0
Missing	0	0.00
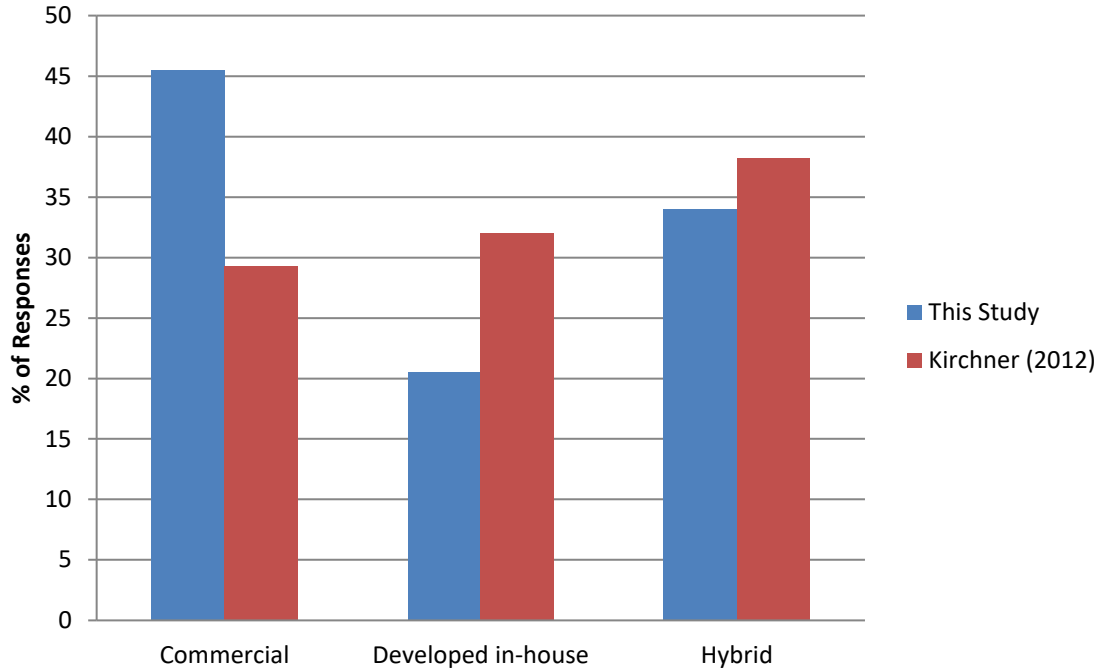
Figure 1: Comparison in Participants' Responses for the Type of Electronic Assessment System Used by NCATE Accredited Institutions

The participants in this study were also asked to provide the name of the primary assessment system or electronic tool used by their institutions to collect and manage students' data. The top four electronic assessment systems used by the surveyed institutions were LiveText® (21.4%), TaskStream® (18.6%), TK20® (17.3%), and Chalk&Wire® (7.7%). Respondents indicated much lower use of the remaining fifteen systems that were listed in the survey. Table 6 shows the list of systems that were used by the surveyed institutions as indicated by the assessment coordinators.

Table 6

Primary Assessment System Selected

	n	*%*
Blackboard	8	3.60

Chalk&Wire	17	7.70
Filemaker Pro	4	1.80
Folioteck	5	2.30
ILAT Pass-Port	2	0.90
In-house system or database	22	10.0
LiveText	47	21.4
Microsoft Access	5	2.30
Microsoft Excel	4	1.80
Rcampus	1	0.50
TaskStream	41	18.6
TK20	38	17.3
Digication	0	0.00
Epsilen	0	0.00
Mahara	0	0.00
Teachscape	0	0.00
TracDat- iwebfolio	0	0.00
Waypoint Outcomes	0	0.00
Other	22	10.0
Missing	4	1.80

Participants were also asked to indicate the number of years they have been using their primary assessment systems. Table 7 shows that around 90% of the participants

indicated that their primary assessment systems have been in use for at least two years. Moreover 72% of the respondents indicated that their current assessment system was in use during the last NCATE visit.

Table 7

Length of System Use

	n	*%*
1 year or less	22	10.0
2 - 3 years	36	16.4
4 - 5 years	58	26.4
6 or more years	101	45.9
Missing	3	1.40

In this study, the researcher intended to gauge the level of satisfaction of assessment coordinators with the capability of their current systems to support accreditation of their programs during next CAEP visit. Table 8 shows the confidence level of assessment coordinators for their systems to do that.

Table 8

Would Select System Again

	n	*%*
Definitely would not select	16	7.30
Probably would not select	21	9.50
Not sure I would select	42	19.1
Probably would select	81	36.8

79

Definitely would select	47	21.4
Missing	13	5.90

An important metric to measure the sentiment and loyalty of a user to a certain service or brand is the Net Promoter Score (NPS). This is a measurement of the willingness of a customer to recommend a company's product or service to others (Keiningham, Cooil, Andreassen, & Aksoy, 2007; Reichheld, 2003). The way to calculate NPS is to subtract the percentage of customers who are not satisfied with the product or service, "Detractors", from the percentage of satisfied customers, "Promoters". NPS ranges between (+100) to (-100) and the number can be negative if the percentage number of detractors is more than the percentage number of promoters. In this study, the researcher intended to measure the level of satisfaction of assessment coordinators with the capability of their current systems to support accreditation of their programs during next CAEP visit. Table 8 was used for this purpose. The NPS number calculated by using responses from all of the participants in this study was 41.4. Figures 2-6 show the loyalty of assessment coordinators to the electronic assessment systems that are currently used by the surveyed institutions and the corresponding NPS's sorted by system type.

Electronic Assessment Systems
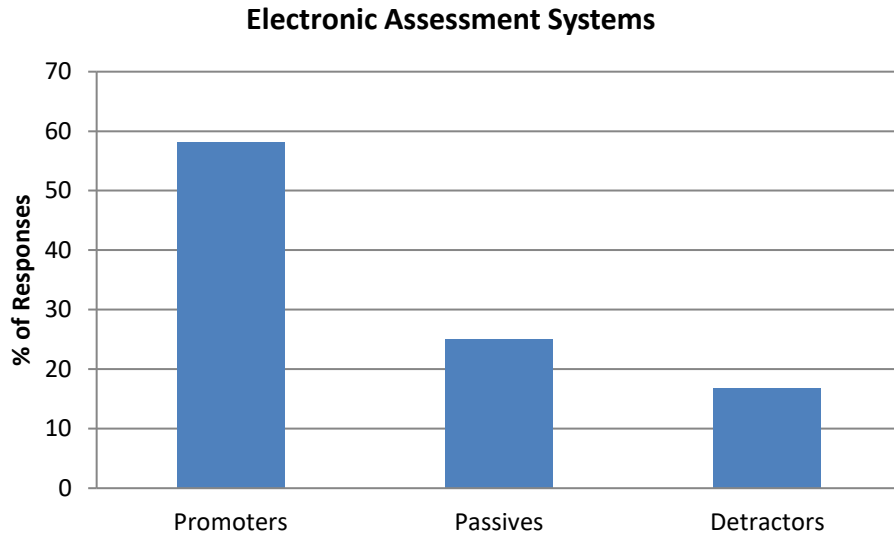
Figure 2: Level of Satisfaction for Electronic Assessment Systems
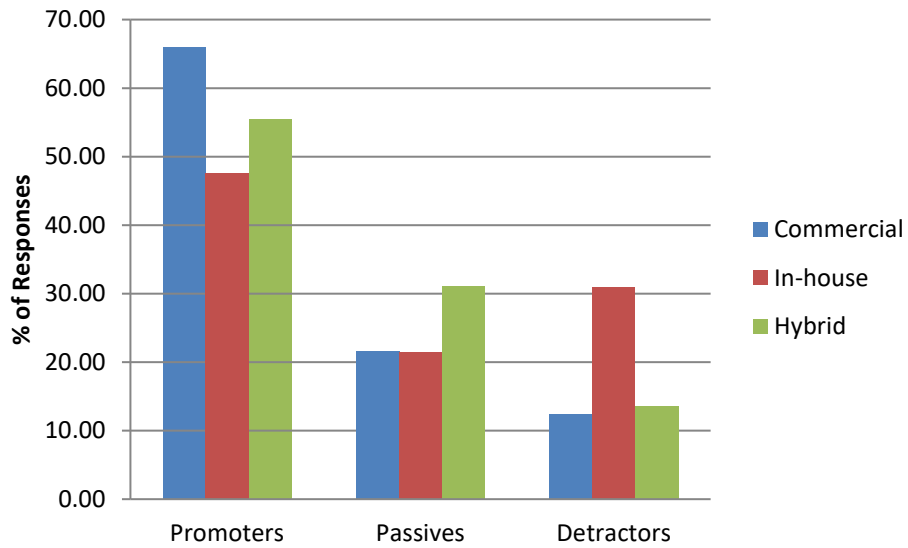
Figure 3: Level of Satisfaction for Electronic Assessment System Type
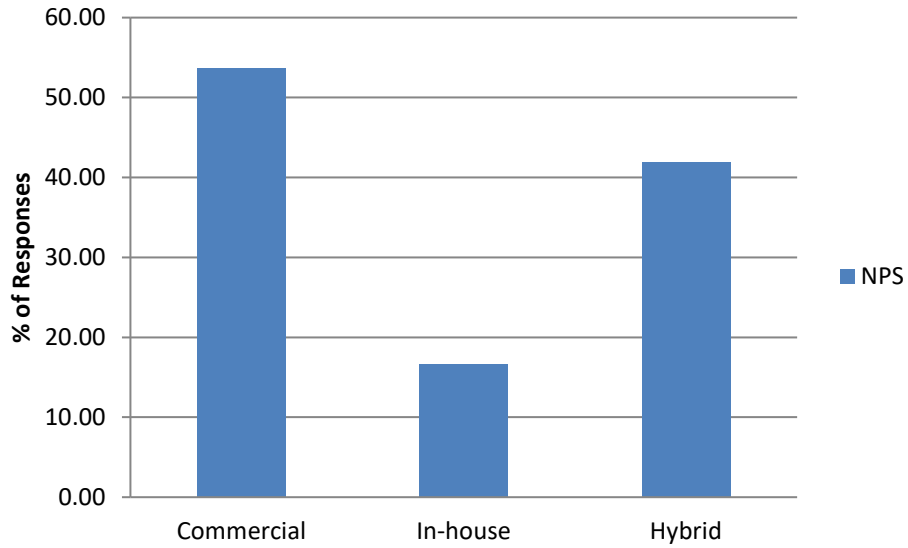
Figure 4: NPS for the Electronic Assessment Systems
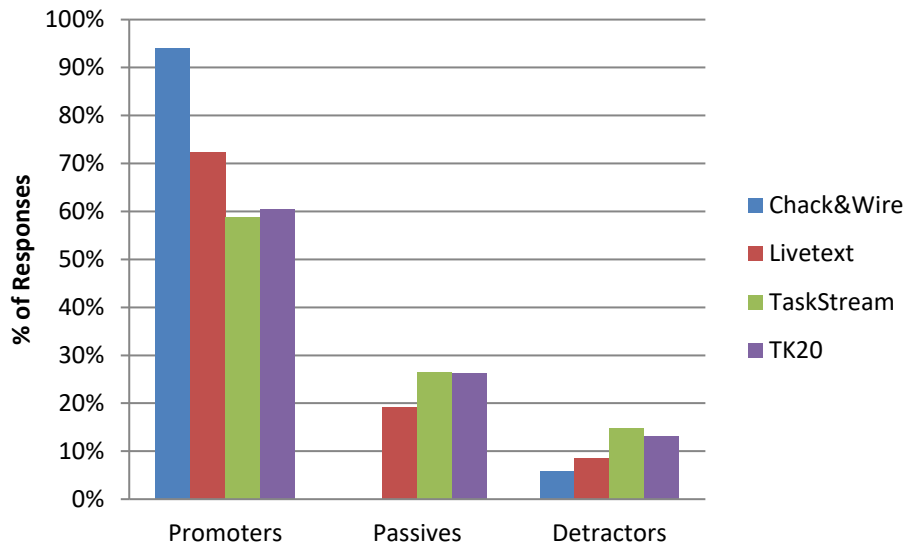
Figure 5: Level of Satisfaction for Commercial Electronic Assessment Systems
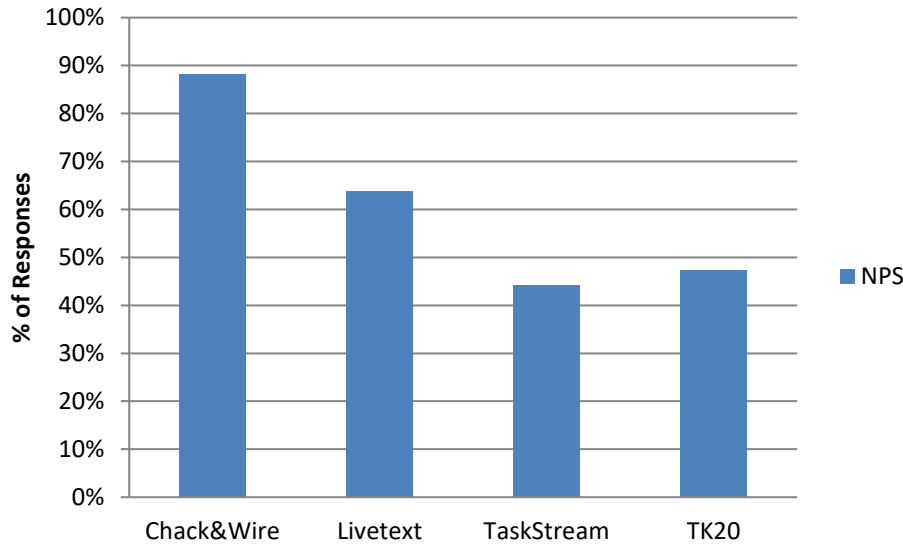
Figure 6: NPS for Commercial Electronic Assessment Systems

Description, Analysis, and Interpretation of Results

This section provides the findings and presents a detailed description of the quantitative data collected from surveying assessment coordinators at NCATE accredited colleges of education to answer the research questions in this study.

Research Question 1

"To what extent do assessment coordinators perceive that their electronic assessment systems facilitated the compliance of their teacher preparation programs with the NCATE Standard 2 requirements?"

Research question (1) explored the perception of assessment coordinators that their electronic assessment systems facilitated compliance of their teacher preparation programs with the NCATE Standard 2 requirements. The assessment coordinators' overall satisfaction with the capability of their electronic assessment systems to meet the following 12 data categories' requirements was investigated:

- Systematically collects data

- Allows faculty access to information collected against goals and standards

- Aggregates data

- Disaggregate data

- Collects student admission data

- Collects information on student dispositions

- Addresses need to have multiple assessment points

- Collects information on professional, state, or national standards

- Collects information on clinical practice

- Collects teacher certification/licensure information on program completers

- Collects student exit information on program completers

- Collects information about students after graduation

Likert-scale questions (from the survey in Appendix A) were used to measure the perception of assessment coordinators on how well their electronic assessment systems facilitated the compliance of their teacher preparation programs with the NCATE Standard 2 requirements. The 6-point Likert scale used the following ratings: Extremely Well = 6, Well = 5, Moderately Well = 4, Moderately Poor = 3, Poor = 2, Extremely Poor = 1. The survey included a comprehensive list of NCATE Standard 2 data assessment needs. The data collected from responses to survey questions pertaining to research question (1) were analyzed using descriptive and inferential statistics. The mean of each individual question indicated the perception of how well the system performed in that particular category. The overall mean for the entire set of questions was used to measure the perception of assessment coordinators for the ability of their systems to assist in meeting NCATE Standard 2. The results for NCATE Standard 2 ($n = 217$) indicated that

there were missing data for 11 out of the 12 variables. The variables were missing from .5% to 3.3% of their data. In addition, the data were found to be missing completely at random ($\chi^2_{92} = 104.81, p = .170$). Outlier analysis revealed that all of the z-scores were within acceptable limits (all z < $|3.29|$). The skewness and kurtosis values showed near-normal distributions. All 12 variables had acceptable skewness values $Sk < |1.0|$, except for "Student Dispositions" Sk = -1.226, "Multiple Assessment" Sk = -1.148, and "Standards Data" Sk = -1.299. The results showed very mild leptokurtic and platykurtic distributions for the 12 variables (-1.34 < K < 2.28). The histograms provided further evidence for the near-normal distribution. As such, the data was left unaltered.

The level of satisfaction of assessment coordinators that their system facilitated compliance with NCATE Standard 2 varied across the different requirements of the Standard (see Table 9). The highest reported satisfaction across all requirements was the ability of the system to "Systemically Collect Data" (M = 4.86) and the lowest was for collecting information about students "After Graduation" (M = 2.82). The average perception of assessment coordinators about the ability of their system to facilitate compliance with NCATE Standard 2 was M = 4.26. As was discussed earlier in the "Response Rate" section of the study, the calculated means of the NCATE variables were statistically significant and within +/- 0.135 margins of the true population means. The confidence interval of the 6-point Likert scale was +/- 2.25% with 95% confidence level.

Table 9

Perception of Respondents that their System Facilitated Compliance of NCATE Standard 2

Component	n	M	SD

Systematically Collect Data	217	4.86	0.78
Faculty Access	215	4.40	1.13
Aggregate Data	216	4.75	1.02
Disaggregate Data	216	4.74	1.04
Admission Data	210	3.89	1.63
Student Dispositions	213	4.47	1.36
Multiple Assessments	213	4.85	0.99
Standards Data	214	4.56	1.29
Clinical Practice	213	4.59	1.19
Teacher Certification/Licensure	213	3.33	1.76
Exit Information	212	3.87	1.63
After Graduation	211	2.82	1.72
Standard 2 Average	214	4.26	1.47

Note. Rating scale: Extremely Well = 6, Well = 5, Moderately Well = 4, Moderately Poor = 3, Poor = 2, Extremely Poor = 1

Since there were three distinct types of electronic assessment systems that can be chosen (commercial, in-house, or a hybrid), a one-way ANOVA was used to investigate the variation in results based on the type of assessment system used. The analysis of these data provided answers to whether the type of system selected facilitated the teacher preparation program's ability to meet NCATE Standard 2. Table 10 shows descriptive statistics across NCATE Standard 2 components, reported by system type. For most of the components, commercial systems had higher mean scores followed by hybrid systems and then in-house systems.

Table 10

Descriptive ANOVA - Research Question 1 by System Type

Component		*n*	*M*	*SD*
Systematically Collect Data	commercial	97	4.99	0.78
	in-house	43	4.68	0.89
	hybrid	77	4.79	0.69
	Total	217	4.86	0.78
Faculty Access	commercial	97	4.59	1.09
	in-house	42	3.98	1.44
	hybrid	76	4.41	0.90
	Total	215	4.40	1.13
Aggregate Data	commercial	96	4.83	0.99
	in-house	43	4.53	1.29
	hybrid	77	4.77	0.85
	Total	216	4.75	1.02
Disaggregate Data	commercial	97	4.70	1.05
	in-house	42	4.66	1.26
	hybrid	77	4.83	0.87
	Total	216	4.74	1.04
Correlate Admission Data	commercial	95	3.89	1.67
	in-house	41	4.10	1.53
	hybrid	74	3.75	1.61
	Total	210	3.89	1.63

87

Student Dispositions	commercial	96	4.65	1.24
	in-house	41	4.39	1.61
	hybrid	76	4.30	1.33
	Total	213	4.47	1.36
Multiple Assessments	commercial	97	4.97	0.92
	in-house	40	4.70	1.26
	hybrid	76	4.78	0.91
	Total	213	4.85	0.99
Standards Data	commercial	97	4.74	1.19
	in-house	41	4.14	1.57
	hybrid	76	4.53	1.19
	Total	214	4.56	1.29
Clinical Practice	commercial	96	4.66	1.15
	in-house	41	4.73	1.26
	hybrid	76	4.42	1.19
	Total	213	4.59	1.19
Teacher Certification/Licensure	commercial	97	3.11	1.80
	in-house	41	3.75	1.71
	hybrid	75	3.38	1.72
	Total	213	3.33	1.76
Exit Information	commercial	95	4.02	1.65
	in-house	41	3.34	1.76
	hybrid	76	3.96	1.50

	Total	212	3.87	1.63
After Graduation	commercial	96	2.76	1.72
	in-house	41	2.48	1.77
	hybrid	74	3.07	1.66
	Total	211	2.82	1.72
Standard 2 Average	commercial	97	4.33	0.86
	in-house	43	4.14	1.09
	hybrid	77	4.26	0.77
	Total	214	4.26	1.47

Note. Rating scale: Extremely Well = 6, Well = 5, Moderately Well = 4, Moderately Poor = 3, Poor = 2, Extremely Poor = 1

The omnibus F-test revealed that there were only two NCATE components that showed statistically significant perceptual differences that the system type had different impact on the compliance of the assessment system with NCATE Standard 2 ($p < .05$). These two components were "Faculty Access" ($p = .013$) and "Standards Data" ($p = .044$), as shown in Table 11.

Table 11

Inferential ANOVA - Research Question 1, System Type

Component	SS	df	MS	F	p-value
Systematically Collect Data	3.11	2	1.55	2.59	.077
Faculty Access	10.95	2	5.47	4.45*	.013
Aggregate Data	2.71	2	1.35	1.32	.269
Disaggregate Data	1.01	2	0.51	0.46	.627

Component					
Admission Data	3.52	2	1.76	0.66	.516
Student Dispositions	5.70	2	2.85	1.55	.214
Multiple Assessments	2.93	2	1.46	1.48	.229
Standards Data	10.26	2	5.13	3.16*	.044
Clinical Practice	3.41	2	1.70	1.20	.300
Teacher Certification/Licensure	12.23	2	6.11	1.98	.140
Exit Information	14.24	2	7.12	2.69	.07
After Graduation	9.39	2	4.69	1.60	.204
Standard 2 Average	1.04	2	0.52	0.66	.515

* $p < .05$ Note. Rating scale: Extremely Well = 6, Well = 5, Moderately Well = 4,

Moderately Poor = 3, Poor = 2, Extremely Poor = 1

Additional exploration using Bonferroni's post hoc test was conducted on the

statistically significant components, "Faculty Access" $F(2, 212) = 4.45$, $p = .013$ and

"Standards Data" $F(2, 211) = 3.16$, $p = .044$, to determine which means are significantly

different from each other among the three assessment systems (commercial, in-house,

hybrid). The post hoc test results showed a statistically significant difference in the

following NCATE Standard 2 components: "Faculty Access" between commercial ($M =$

4.59) and in-house ($M = 3.98$) and "Standards Data" between commercial ($M = 4.74$) and

in-house ($M = 4.14$). Table 12 shows results for the NCATE Standard 2 Bonferroni's

post hoc analysis.

Table 12

Inferential ANOVA - Post hoc Research Question 1, System Type

Component	System Type	Mean Diff.	*p*-value

Faculty Access	commercial	in-house	.611*	.010
		hybrid	.179	.874
	in-house	hybrid	-.431	.133
Standards Data	commercial	in-house	.595*	.038
		hybrid	.202	.900
	in-house	hybrid	-.393	.338

* p < .05, Mean Diff. = difference between the means of the two systems being compared

Research Question 2

"To what extent do assessment coordinators perceive that their electronic assessment systems will be able to facilitate the compliance of the teacher preparation programs with the CAEP Standard 5.3 requirements by addressing: performance appraisal, tracking results, and improving program elements and processes?"

Research question (2) explored the perception of assessment coordinators at colleges of education across the country in regard to the ability and readiness of their assessment systems to meet the newly established CAEP Standard 5.3. The assessment coordinators' overall satisfaction with the capability of their electronic assessment systems to meet the certain data categories requirements was investigated. The 8 data categories for "Performance Appraisal Against Goals and Relevant Standards" of CAEP Standard 5.3 included the following system capabilities:

- Allows faculty access to information collected against goals and standards

- Addresses need to have multiple assessment points

- Collects information on professional, state, or national standards

- Documents leadership commitment to sustain continuous improvement

91

- Tracks the hiring of completers in fields for which prepared

- Collects cost of attendance against the Professional ED Unit set goals

- Compares cost of attendance against similar providers

- Uses admission criteria as set by the Professional ED Unit

The 10 data categories for "Tracking Results over Time" of CAEP Standard 5.3 included the following system capabilities:

- Address need to systematically collect data

- Aggregates data

- Disaggregates data

- Collects information on student dispositions

- Collects information on clinical practice

- Collects student exit information on program completers

- Tracks beginning salary of completers compared with national data for similar positions and locations

- Collects admission data and correlates the data with measures of P-12 student learning and development

- Tracks developing non-academic factors in relation to subsequent teacher performance. Examples include: volunteerism, civic organizations, commitment to urban issues, cultural competency, etc…

- Disaggregates completers by racial, ethnic and other target groups identified in the Professional ED Unit recruitment plans

The 9 data categories for "Improving Program Elements and Processes" of CAEP Standard 5.3 included the following system capabilities:

- Collects student admission data

- Collects teacher certification/licensure information on program completers

- Collects information about students after graduation

- Tracks students' graduation rate to drive improvement

- Tracks pattern of placement locations of completers over time to drive improvement in certain program elements

- Studies the effectiveness of diverse field experiences on candidates' instructional practices

- Provides reliable or valid measures or innovative models of high quality practices, partnerships, clinical educators, or clinical experiences

- Shares data with both internal and external audiences and use the data for program improvement

- Tests the validity and reliability of measures to test and improve processes

The researcher used Likert-scale questions (survey, Appendix A) to determine assessment coordinators' perceptions of their system's ability to address a comprehensive list of CAEP Standard 5.3 data assessment needs. The 6-point Likert scale used the following ratings: Extremely Well = 6, Well = 5, Moderately Well = 4, Moderately Poor = 3, Poor = 2, Extremely Poor = 1. The responses to these questions provided answers to research question (2). Since there were three distinct types of electronic assessment systems that can be chosen (commercial, in-house, or a hybrid), a one-way ANOVA was run to explore respondents' levels of component satisfaction based on the type of system indicated in an earlier survey question. The analysis of these data provided answers to

whether the type of system selected facilitated the teacher preparation program's ability to meet CAEP Standard 5.3.

The results for CAEP Standard 5.3 ($n = 217$) revealed that there were missing data for all 27 variables. The variables were missing from 1.4% to 5.3% of their data. In addition, the data were found to be missing completely at random ($\chi^2_{520} = 489.26\, p = .829$). Outlier analysis revealed that all of the z-scores were within acceptable limits (all z < $|3.29|$). The skewness and kurtosis values showed near-normal distributions. All 27 variables had acceptable skewness values $Sk < |1.0|$, except for "Standards Data" $Sk = -1.231$, "Cost of Attendance Against Similar Providers" $Sk = 1.114$, "Salary of Completers" $Sk = 1.46$, and "Non-Academic Factors" $Sk = 1.136$. The results showed very mild leptokurtic and platykurtic distributions for the 27 variables ($-1.56 < K < 1.64$). The histograms provided further evidence for the near-normal distribution. As such, the data was left unaltered.

The data collected from responses to survey questions pertaining to research question (2) were analyzed using descriptive and inferential statistics. The mean of each individual question indicated the perception of how well the system performed in that particular category. The overall mean for the entire set of questions was used to measure the perception of assessment coordinators for the ability of their systems to assist in meeting CAEP Standard 5.3. The level of satisfaction of assessment coordinators that their system facilitated compliance with CAEP Standard 5.3 varied across the different requirements of the Standard. The highest reported satisfaction across all requirements for the "Performance Appraisal" component was "Multiple Assessments" ($M = 4.84$) and the lowest was "Cost of Attendance Against Similar Providers" ($M = 2.05$). The

"Performance Appraisal" mean score was M = 3.43 (see Table 13). The highest reported satisfaction across all requirements for the "Tracking Results" component was "Aggregate Data" (M = 4.80) and the lowest was "Salary of Completers" (M = 1.88). The performance appraisal mean score was M = 3.74 (Table 14). The highest reported satisfaction across all requirements for the "Improving Program Elements and Processes" component was "Multiple Assessments" (M = 4.84) and the lowest was "Cost of Attendance Against Similar Providers" (M = 2.05). The performance appraisal mean score was M = 3.43 (Table 15). The average perception of assessment coordinators about the ability of their systems to facilitate the compliance with the three components of CAEP Standard 5.3 was M = 3.42. As was shown in the "Response Rate" section in this chapter of the study, the calculated means of the CAEP variables were statistically significant and within +/- 0.135 margins of the true population means. The confidence interval of the 6-point Likert scale was +/- 2.25% with 95% confidence level.

Table 13

Perception of Respondents that their System will Facilitate Compliance of CAEP Standard 5.3 - Performance Appraisal

Component	n	M	SD
Faculty Access	214	4.40	1.25
Multiple Assessments	213	4.84	1.01
Standards Data	213	4.60	1.23
Leadership Commitment for Continuous Improvement	211	3.51	1.72
Hiring of Completers	210	2.35	1.59
Cost of Attendance Against ED Unit	209	2.13	1.52

Component	n	M	SD
Cost of Attendance Against Similar Providers	205	2.05	1.53
Admission Criteria	207	3.27	1.88
Performance Appraisal Average	212	3.43	1.06

Note. Rating scale: Extremely Well = 6, Well = 5, Moderately Well = 4, Moderately

Poor = 3, Poor = 2, Extremely Poor = 1

Table 14

Perception of Respondents that their System will Facilitate Compliance of CAEP

Standard 5.3 - Tracking Results

Component	n	M	SD
Systematically Collect Data	214	4.73	1.04
Aggregate Data	214	4.80	1.05
Disaggregate Data	212	4.72	1.08
Student Dispositions	211	4.50	1.30
Clinical Practice	211	4.57	1.21
Exit Information	212	3.82	1.68
Salary of Completers	207	1.88	1.41
Correlate Admission Data	206	2.30	1.64
Non-Academic Factors	207	2.12	1.57
Disaggregate Completers by Groups	209	3.64	1.78
Tracking Results Average	212	3.74	0.95

Note. Rating scale: Extremely Well = 6, Well = 5, Moderately Well = 4, Moderately

Poor = 3, Poor = 2, Extremely Poor = 1

Table 15

Perception of Respondents that their System will Facilitate Compliance of CAEP

Standard 5.3 - Improving Program Elements and Processes

Component	*n*	*M*	*SD*
Admission Data	211	3.81	1.75
Teacher Certification/Licensure	211	3.10	1.82
Exit Information	210	2.38	1.58
Students' Graduation Rate	208	2.68	1.78
Locations of Completers Over Time	210	2.51	1.74
Effectiveness of Diverse Field Experiences	211	3.26	1.76
Innovative Models of High Quality Practices	210	3.37	1.71
Use the Data for Program Improvement	209	3.55	1.60
Test the Validity and Reliability of Measures	206	3.24	1.68
Improving Program Elements and Processes Average	213	3.09	0.89

Note. Rating scale: Extremely Well = 6, Well = 5, Moderately Well = 4, Moderately

Poor = 3, Poor = 2, Extremely Poor = 1

A one-way ANOVA was used to investigate the variation in results based on the type of electronic assessment system used (commercial, in-house, or a hybrid). The analysis of these data provided answers in regard to the perception of assessment coordinators that the type of system they use will be able to facilitate their teacher preparation programs' ability to meet CAEP Standard 5.3. Table 16 shows descriptive statistics across CAEP Standard 5.3 components reported by system type. Similar to the

97

NCATE Standard 2 results, most of the components showed higher scores for commercial systems followed by hybrid and then in-house systems.

Table 16

Descriptive ANOVA - Research Question 2 by System Type

Component		*n*	*M*	*SD*
Faculty Access	commercial	97	4.61	1.14
	in-house	43	3.88	1.54
	hybrid	72	4.43	1.098
	Total	214	4.40	1.25
Multiple Assessments	commercial	97	4.98	0.91
	in-house	42	4.57	1.39
	hybrid	72	4.80	0.84
	Total	213	4.84	1.01
Standards Data	commercial	97	4.84	1.05
	in-house	42	4.07	1.65
	hybrid	72	4.59	1.05
	Total	213	4.60	1.23
Leadership Commitment for Continuous Improvement	commercial	95	3.63	1.71
	in-house	42	3.19	1.81
	hybrid	72	3.52	1.70
	Total	211	3.51	1.72
Hiring of Completers	commercial	96	2.26	1.64

98

	in-house	42	1.88	1.21
	hybrid	70	2.75	1.64
	Total	210	2.35	1.59
Cost of Attendance Against ED Unit	commercial	94	2.15	1.64
	in-house	42	1.73	1.12
	hybrid	71	2.35	1.54
	Total	209	2.13	1.52
Cost of Attendance Against Similar providers	commercial	92	2.19	1.69
	in-house	41	1.65	1.23
	hybrid	70	2.10	1.45
	Total	205	2.05	1.53
Admission Criteria	commercial	94	3.32	1.94
	in-house	42	3.50	1.83
	hybrid	69	3.08	1.81
	Total	207	3.27	1.88
Performance Appraisal Average	commercial	97	3.52	1.05
	in-house	43	3.10	1.07
	hybrid	72	3.49	1.02
	Total	212	3.43	1.06
Systematically Collect Data	commercial	97	4.98	0.95
	in-house	43	4.44	1.16
	hybrid	72	4.56	1.00

	Total	214	4.73	1.04
Aggregate Data	commercial	97	4.95	0.96
	in-house	43	4.55	1.24
	hybrid	72	4.72	1.01
	Total	214	4.80	1.05
Disaggregate Data	commercial	96	4.86	1.02
	in-house	42	4.47	1.27
	hybrid	72	4.65	1.00
	Total	212	4.72	1.08
Student Dispositions	commercial	95	4.68	1.25
	in-house	42	4.26	1.46
	hybrid	72	4.38	1.22
	Total	211	4.50	1.30
Clinical Practice	commercial	96	4.63	1.24
	in-house	42	4.54	1.25
	hybrid	71	4.52	1.18
	Total	211	4.57	1.21
Exit Information	commercial	96	3.89	1.70
	in-house	43	3.44	1.74
	hybrid	71	3.87	1.56
	Total	212	3.82	1.68
Salary of Completers	commercial	95	1.88	1.48
	in-house	42	1.69	1.17

	hybrid	68	2.01	1.44
	Total	207	1.88	1.41
Correlate Admission Data	commercial	93	2.41	1.73
	in-house	42	1.95	1.46
	hybrid	69	2.37	1.61
	Total	206	2.30	1.64
Non-Academic Factors	commercial	95	2.37	1.78
	in-house	42	1.59	1.01
	hybrid	68	2.10	1.45
	Total	207	2.12	1.57
Disaggregate Completers by Groups	commercial	95	4.01	1.74
	in-house	43	3.18	1.93
	hybrid	69	3.42	1.67
	Total	209	3.64	1.78
Tracking Results Average	commercial	97	3.90	0.96
	in-house	43	3.44	0.95
	hybrid	72	3.70	0.90
	Total	212	3.74	0.95
Admission Data	commercial	96	3.79	1.86
	in-house	42	4.07	1.58
	hybrid	71	3.70	1.67
	Total	211	3.81	1.75
Teacher Certification/Licensure	commercial	97	2.87	1.83

101

	in-house	42	3.42	1.75
	hybrid	70	3.20	1.81
	Total	211	3.10	1.82
Exit Information	commercial	96	2.36	1.64
	in-house	42	2.04	1.43
	hybrid	70	2.62	1.57
	Total	210	2.38	1.58
Students' Graduation Rate	commercial	95	2.51	1.77
	in-house	42	2.80	1.78
	hybrid	69	2.84	1.79
	Total	208	2.68	1.78
Locations of Completers Over Time	commercial	96	2.58	1.87
	in-house	42	2.09	1.46
	hybrid	70	2.71	1.67
	Total	210	2.51	1.74
Effectiveness of Diverse Field Experiences	commercial	96	3.38	1.78
	in-house	42	3.07	1.90
	hybrid	71	3.23	1.65
	Total	211	3.26	1.76
Innovative Models of High Quality Practices	commercial	95	3.51	1.76
	in-house	42	3.35	1.69
	hybrid	71	3.22	1.64
	Total	210	3.37	1.71

Use the Data for Program Improvement	commercial	95	3.45	1.72
	in-house	42	3.76	1.46
	hybrid	70	3.60	1.49
	Total	209	3.55	1.60
Test the Validity and Reliability of Measures	commercial	93	3.50	1.66
	in-house	41	2.95	1.71
	hybrid	70	3.10	1.66
	Total	206	3.24	1.68
Improving Program Elements and Processes Average	commercial	97	3.08	0.90
	in-house	43	3.10	0.84
	hybrid	73	3.10	0.92
	Total	213	3.09	0.89
CAEP Standard 5.3 Average	commercial	97	3.53	1.04
	in-house	43	3.23	0.98
	hybrid	73	3.44	1.01
	Total	213	3.42	1.02

Note. Rating scale: Extremely Well = 6, Well = 5, Moderately Well = 4, Moderately Poor = 3, Poor = 2, Extremely Poor = 1

The omnibus F-test revealed that there were a total of six CAEP components that showed statistically significant perceptual differences that the system type will have a different impact on the compliance of the assessment system with CAEP Standard 5.3 (p

< .05, see Table 17). These components were "Faculty Access" (p = .005), "Standards Data" (p = .003), "Hiring of Completers" (p = .014), "Systematically Collect Data" (p = .005), "Non-Academic Factors" (p = .025), and "Disaggregate Completers by Groups" (p = .018). Collectively for all components, the ANOVA analysis did not discriminate perceptual differences that the system type will have a different impact on the compliance with CAEP Standard 5.3. However, there was a statistically significant perceptual difference that the system type will have different impact on the "Tracking Results" component of CAEP Standard 5.3.

Table 17

Inferential ANOVA - Research Question 2, System Type

Component	SS	df	MS	F	p-value
Faculty Access	16.15	2	8.07	5.39*	.005
Multiple Assessments	5.28	2	2.64	2.61	.076
Standards Data	17.56	2	8.78	6.11*	.003
Leadership Commitment for Continuous Improvement	5.71	2	2.85	0.95	.386
Hiring of Completers	21.61	2	10.80	4.38*	.014
Cost of Attendance Against ED Unit	10.01	2	5.00	2.16	.117
Cost of Attendance Against Similar Providers	8.40	2	4.20	1.79	.169
Admission Criteria	4.83	2	2.41	.68	.506
Performance Appraisal Average	5.72	2	2.86	2.60	.077
Systematically Collect Data	11.45	2	5.72	5.53*	.005

Aggregate Data	5.39	2	2.69	2.48	.086
Disaggregate Data	4.82	2	2.41	2.09	.125
Student Dispositions	6.49	2	3.24	1.94	.146
Clinical Practice	0.58	2	.292	.195	.823
Exit Information	9.04	2	4.52	1.62	.199
Salary of Completers	2.73	2	1.36	0.68	.506
Correlate Admission Data	6.79	2	3.39	1.25	.287
Non-Academic Factors	17.94	2	8.97	3.73*	.025
Disaggregate Completers by Groups	25.23	2	12.61	4.07*	.018
Tracking Results Average	6.36	2	3.18	3.56*	.030
Admission Data	3.68	2	1.84	0.60	.548
Teacher Certification/Licensure	10.08	2	5.04	1.53	.219
Exit Information	8.97	2	4.48	1.80	.168
Students' Graduation Rate	5.04	2	2.52	0.79	.454
Locations of Completers Over Time	10.58	2	5.29	1.75	.175
Effectiveness of Diverse Field Experiences	3.00	2	1.50	0.48	.619
Innovative Models of High Quality Practices	3.46	2	1.73	0.59	.554
Use the Data for Program Improvement	2.91	2	1.45	0.56	.567
Test the Validity and Reliability of Measures	11.29	2	5.64	2.01	.136
Improving Program Elements and Processes Average	0.01	2	0.01	0.01	.991
CAEP Standard 5.3 Average	2.64	2	1.32	1.26	.286

p < .05 Note. Rating scale: Extremely Well = 6, Well = 5, Moderately Well = 4, Moderately Poor = 3, Poor = 2, Extremely Poor = 1

Additional exploration using Bonferroni's post hoc test was conducted on the statistically significant components, "Faculty Access" $F(2,209) = 5.39$, $p = .005$, "Standards Data" $F(2, 208) = 6.11$, $p = .003$, "Hiring of Completers" $F(2, 205) = 4.38$, $p = .014$, "Systematically Collect Data" $F(2, 209) = 5.53$, $p = .005$, "Non-Academic Factors" $F(2, 202) = 3.73$, $p = .025$, and "Disaggregate Completers by Groups" $F(2, 204) = 4.07$, $p = .018$, to determine which means are significantly different from each other among the three assessment systems (commercial, in-house, hybrid). The post hoc test results showed a statistically significant difference in the following CAEP Standard 5.3 components: "Faculty Access" between commercial ($M = 4.61$) and in-house ($M = 3.88$), "Standards Data" between commercial ($M = 4.84$) and in-house ($M = 4.07$), "Hiring of Completers" between in-house ($M = 1.88$) and hybrid ($M = 2.75$), "Systematically Collect Data" between commercial ($M = 4.98$) and in-house ($M = 4.44$) and also between commercial ($M = 4.98$) and hybrid ($M = 4.56$), "Non-Academic Factors" between commercial ($M = 2.37$) and in-house ($M = 1.59$), and finally "Disaggregate Completers by Groups" between commercial ($M = 4.01$) and in-house ($M = 3.18$). Table 18 shows results for the CAEP Standard 5.3 Bonferroni's post hoc analysis.

Table 18

Inferential ANOVA - Post hoc Research Question 2, System Type

Component	System Type		Mean Diff.	*p-* value
Faculty Access	Commercial	in-house	.734*	.004

			Mean Diff.	Sig.
		hybrid	.188	.973
	in-house	hybrid	-.546	.064
Standards Data	Commercial	in-house	.773*	.002
		hybrid	.248	.554
	in-house	hybrid	-.525	.075
Hiring of Completers	Commercial	in-house	.379	.579
		hybrid	-.496	.137
	in-house	hybrid	-.876*	.014
Systematically Collect Data	Commercial	in-house	.537*	.013
		hybrid	.409*	.031
	in-house	hybrid	-.127	0.99
Non-Academic Factors	Commercial	in-house	.783*	.021
		hybrid	.276	.790
	in-house	hybrid	-.507	.289
Disaggregate Completers by Groups	Commercial	in-house	.824*	.035
		hybrid	.590	.106
	in-house	hybrid	-.234	.99

* $p < .05$, Mean Diff. = difference between the means of the two systems being compared

Finally, a comparison of NCATE Standard 2 and CAEP Standard 5.3 results is shown in Figure 7. One can notice a slightly bigger gap between NCATE Standard 2 and CAEP Standard 5.3 results for in-house systems.
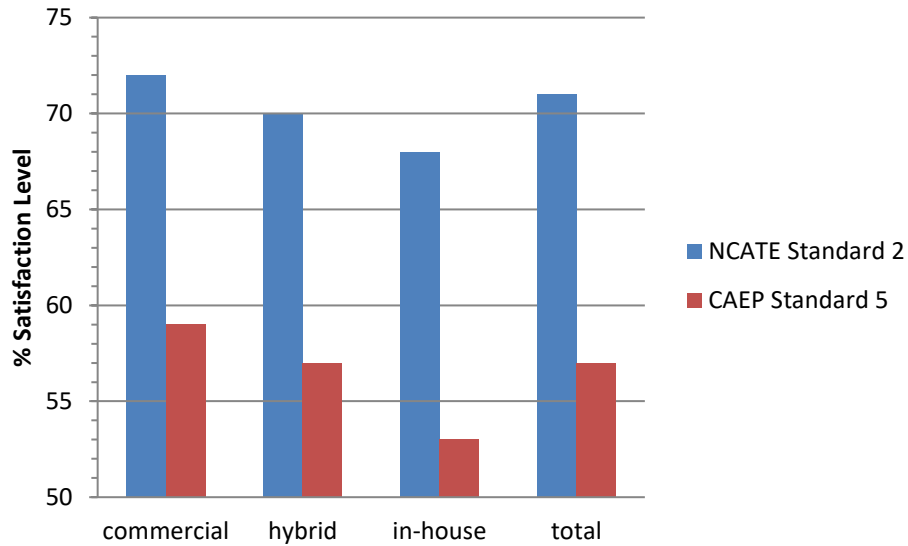
Figure 7: Perception of Assessment Coordinators of System Compliance of NCATE Standard 2 and CAEP Standard 5.3

Research Question 3

"To what extent does the level of support of using electronic assessment systems at higher education institutions influence the confidence level of assessment coordinators in meeting CAEP 5?"

The NCATE website was used to create a list of accredited colleges of education at higher education institutions to participate in this study. The contact information of assessment coordinators was found using the higher education institutions' websites. Assessment coordinators are most likely the most knowledgeable personnel at these institutions to be able to respond to the survey questions accurately. Additional help in responding to the survey questions was solicited from other personnel at the surveyed institutions, such as deans, on as needed basis. The first question in section 4 of the survey in Appendix A was intended to find the location of the teacher education program at the surveyed institutions. As shown in Table 19, respondents overwhelmingly (85 %)

indicated that the teacher education program is located at the schools or colleges of education.

Table 19

Location of Teacher Ed Program

	n	*%*
School or College of Education	182	85
Department within Arts and Sciences	12	6.0
Department located elsewhere	6	3.0
Program within a department	4	2.0
Other	10	5.0

The role of the respondents in their respective colleges is shown in Table 20 with 45% indicating that they were Assessment Coordinators/Directors, 23% indicating they were Department Chair/Teacher Education Director/Dean/Assistant Dean/Associate Dean, and 18% indicating they were Faculty Members.

Table 20

Roles or Positions of Respondents

	n	*%*
Faculty member	39	18
Technology coordinator/director	5	2.0
Assessment coordinator/director	97	45
Department chair/teacher education director/dean/assistant dean/associate dean	49	23

Administrative assistant	4	2.0
Other	20	9.0

Table 21 shows the percentage of time respondents approximately devote to data collection, management, analysis, and reporting related to program approval and accreditation efforts. The results show that 18% of the respondents spend less than 25% of their time, 35% of the respondents spend between 25 to 50% of their time, 24% of the respondents spend 50 to 75% of their time, and only 23% of the respondents spend more 75% of their time.

Table 21

Time Devoted by Respondents to Manage their Assessment Systems

	n	*%*
Less than 25%	38	18
25 to 50%	74	35
50 to 75%	51	24
More than 75%	48	23

The approximate percentage of time respondents devoted to data collection, management, analysis, and reporting related to program approval and accreditation efforts was compared to the results from Corbin et al. (2013). Figure 8 shows significant differences in the percentage of time devoted to data management between respondents in this study and Corbin's et al. (2013) study. The results from this study showed an 8% increase in devoted time for the "more than 75%" selection, 12% increase in devoted

110

time for the "50 to 75%" selection, and a 20% decrease in devoted time for the "less than 25%" selection.
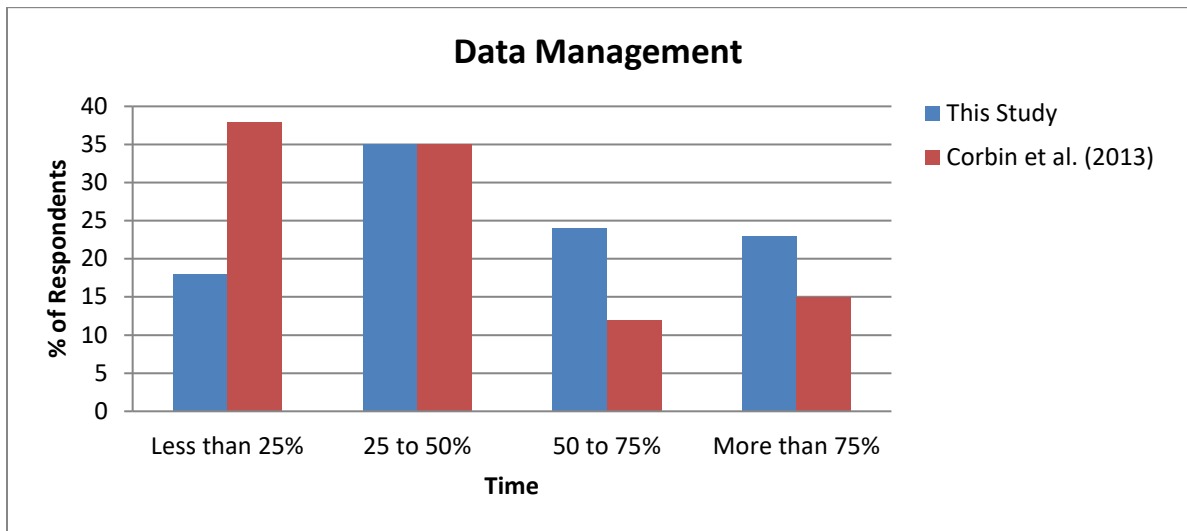
Figure 8: Time Devoted for Data Management

Section 4 of the survey in Appendix A asked questions about how well the infrastructure and level of support of personnel and technology influenced the confidence level of assessment coordinators that such support had facilitated meeting accreditation requirements. The 4-point Likert scale used the following ratings: High Need = 1, Moderate Need = 2, Low Need = 3, No Need = 4. A higher score would indicate a higher level of commitment by the leadership at the higher education institutions to provide support to assessment coordinators and to the system in use.

The data collected from responses to survey questions pertaining to research question (3) were analyzed using descriptive statistics. The mean of each individual question indicated the perception by assessment coordinators about the level of support provided by their leaders. The overall mean for the entire set of questions was used to measure the extent of support of using electronic assessment systems at higher education institutions influence the confidence level of assessment coordinators in meeting CAEP

111

5. The level of satisfaction of assessment coordinators that they are receiving appropriate support was relatively in the middle of the scale for all questions (see Table 22). The highest reported satisfaction was the existing hardware ($M = 2.62$) and the lowest score was the need for better software functionality ($M = 1.86$). Assessment coordinators felt there was a moderate need for teacher education units to increase resources to meet CAEP Standard 5.3 ($M = 2.07$). As was shown in the "Response Rate" section in this chapter of the study, the calculated means of the Level of Support variables were statistically significant and within +/- 0.090 margins of the true population means. The confidence interval of the 4-point Likert scale was +/- 2.25% with 95% confidence level.

Table 22

Perception of Respondents that the Teacher Education Unit Needs to Increase Resources to Meet CAEP Standard 5.3 Requirements

Component	*n*	*M*	*SD*
More support for system administrators	211	1.97	0.92
More support for user	212	2.03	0.88
More personnel	210	1.96	0.89
Better Software functionality	209	1.86	0.91
More training / consultation	211	2.00	0.88
Better hardware	208	2.62	0.99
Other	33	2.52	1.60
Average (less "Other")	210	2.07	0.94

Note. Rating scale: High Need = 1, Moderate Need = 2, Low Need = 3, No Need = 4

Participants in this study were asked to indicate if their institutions provide adequate personnel support to manage their assessment systems. Only 5% responded with an excellent and 23% with an adequate personnel support to the management system while the majority (72%) reported minimal or inadequate support. Figure 9 compares the results from this study with data from Corbin et al. (2013) in regard to the perception of assessment coordinators about the adequacy of personnel support in managing data at their institutions. The results from both studies were relatively comparable.
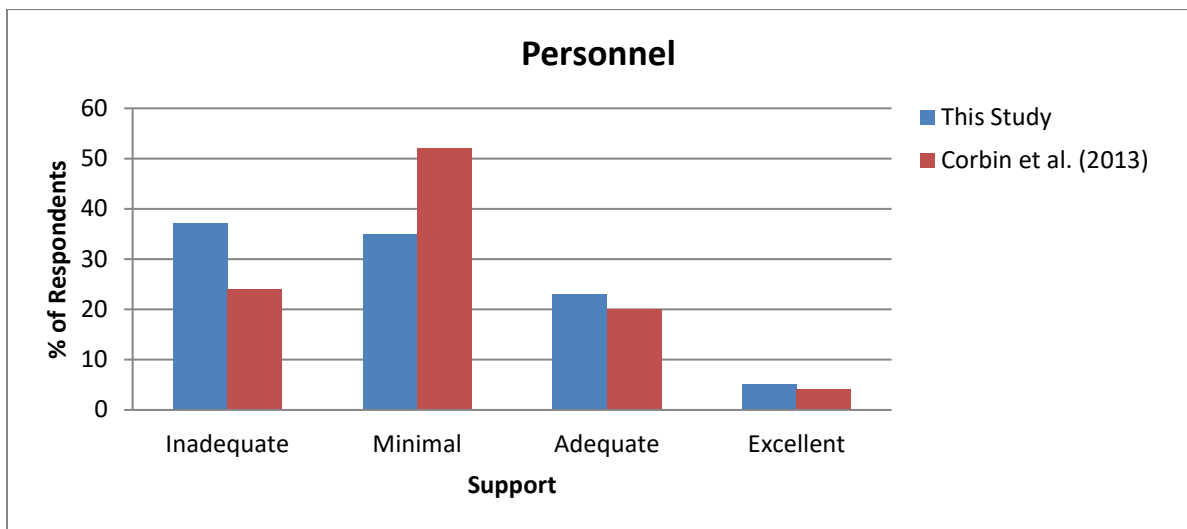
Figure 9: Personnel Support in Managing Data

Participants in this study were also asked to indicate the adequacy of the software that is used as their primary data management system. Only 32% of the respondents agreed that their systems are adequate or excellent while 68% indicated that their systems are inadequate or minimally adequate. This is a deviation from the results by Corbin et al. (2013), as can be seen in Figure 10, where 62% of the respondents rated their systems as excellent or adequate. Collectively for all questions in section 4 of the survey in Appendix A, similar deviation was found between the results in this study and in the results by Corbin et al. (2013). Figure 11 shows the collective level of satisfaction of

www.manaraa.com

assessment coordinators with the infrastructure of their assessment systems and the

support in personnel and technology they receive.
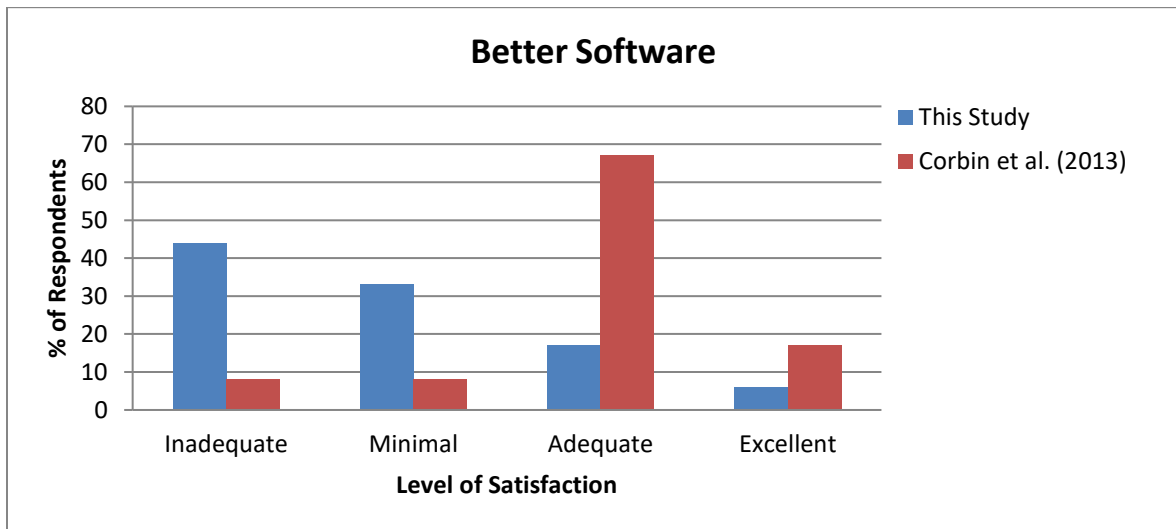
Figure 10: Adequacy of Software
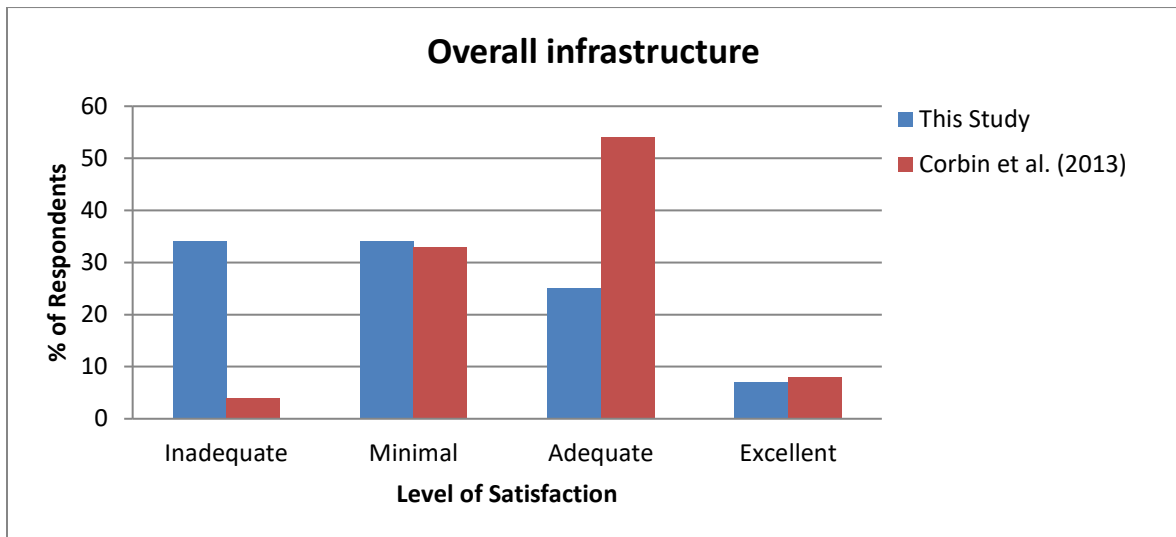
Figure 11: Collective Level of Satisfaction of Assessment Coordinators with Support

Research Question 4

"What relationship, if any, is there between the perceived outcomes of assessment coordinators that their electronic assessment systems are capable of meeting NCATE Standard 2 and CAEP Standard 5.3?"

Canonical Correlation analysis was conducted to examine the relationship between two sets of variables – NCATE Standard 2 (x-variate) and CAEP Standard 5.3 (y-variate). The NCATE Standard 2 variate was measured by the following compliance variables: systematically collect data, faculty access, aggregate data, disaggregate data, admission data, student dispositions, multiple assessments, standards based data, clinical practice, teacher certification, exit information, and data after graduation. On the other hand, the CAEP Standard 5.3 variate was measured by the following compliance variables: goals and standards, multiple assessments, standards based data, leadership commitment, hiring completers, cost of attendance against goals, cost of attendance against similar providers, admission criteria, systematically collect data, aggregate data, disaggregate data, student dispositions, clinical practice, exit information, completers salaries, admission data, non-academic factors, disaggregate by target groups, teacher certification, after graduation, locations of completers, field experiences, develop innovative models, share data, and test the validity and reliability of measures.

Multivariate outlier analysis was performed using Mahalanobis distance for the NCATE Standard 2 and CAEP Standard 5.3 data. For the NCATE Standard 2 data ($n = 217$), three multivariate outliers ($\chi_{12}^2 = 32.9$, $p < .001$) existed in the data set. The multivariate outliers were sequentially deleted resulting in a reduced sample ($n = 214$). The data were then tested for mutlicollinearity using Variance Inflation Factor (VIF).

115

VIF values for all variables ranged between 1.94 and 7.80, which is below the critical value of 10. For the CAEP Standard 5.3 data ($n = 217$), four multivariate outliers ($\chi^2_{27} = 55.4$, $p < .001$) existed in the data set. The multivariate outliers were sequentially deleted resulting in a reduced sample ($n = 213$). The data were then tested for mutlicollinearity using Variance Inflation Factor (VIF). VIF values for all variables ranged between 1.82 and 9.63, which is below the critical value of 10.

To examine the relationship, several sources of evidence were considered: (1) the number of statistically significant canonical correlations ($\alpha = .05$), (2) the relationship between the canonical correlations, (3) the shared variance between the variates, (4) the variance extracted by each variate with respect to its own set of variables, (5) the structure coefficients of each variable with attention given to loadings $\geq |.30|$, and (6) the redundancy captured by each variate. The analysis yielded 12 functions, matching the least number of variables in the two variates, with squared canonical correlations (R^2_c) ranging between .431 and .033 for all functions. Using the Wilk's λ criterion, the full model collectively across all functions was statistically significant with Wilk's $\lambda = .061$, $F(324, 1488.56) = 1.327$, $p < .001$. Since the variance that is not explained by the model is represented in terms of Wilk's λ, then the value of $(1 - \lambda)$ represents the effect size for the full model in terms of r^2 metric (Sherry and Henson, 2005). Hence, for the set of the 12 canonical functions, the effect size was $(1 - .061) = 0.939$. This result indicates that a substantial portion (93.9%) of the variance shared between the variable sets can be explained by the full model.

The results indicated two statistically significant canonical correlations. The first canonical correlation $F(324, 1488.56) = 1.327$, $p < .001$, revealed a relatively strong

116

relationship between the two variates (r = .656). Moreover, 43.10% of the variance was shared between the two variates. The second statistically significant canonical correlation $F(286, 1382.35) = 1.184$, p = .029, also revealed a relatively strong relationship between the two variates (r = .585). Moreover, 34.30% of the variance was shared between the two variates for this second canonical function. To interpret the standardized weights and structure coefficients for the statistically significant canonical functions, the table structure for canonical correlation analysis proposed by Sherry and Henson (2005) was used. Table 23 summarizes the weights (coef), structure coefficients (r_s), squared structure coefficients (r_s^2), communality coefficients, and canonical correlation coefficients (R_c) for the criterion (y-variate or "Dependent", CAEP Standard 5.3) and the predictor (x-variate or "Covariate", NCATE Standard 2) variables for the two statistically significant canonical functions.

Table 23

Canonical Solution for NCATE Standard 2 Predicting CAEP Standard 5.3 for Functions 1 and 2

Variable	Function 1			Function 2			
	Coef	r_s	r_s^2	Coef	r_s	r_s^2	h^2
NCATE Variable			(%)			(%)	(%)
Systematically Collect Data	-.588	-.415	17.22	-.320	-.196	3.84	21.06
Faculty Access	-.238	-.224	5.02	-.438	-.345	11.90	16.92

Aggregate Data	.608	-.100	1.00	.594	-.115	1.32	2.32
Disaggregate Data	-.256	-.167	2.79	-.593	-.325	10.56	13.35
Admission Data	-.067	-.169	2.86	-.560	-.510	26.01	28.87
Student Dispositions	-.341	-.373	13.91	-.119	-.242	5.86	19.77
Multiple Assessments	-.069	-.258	6.66	.085	.0338	0.11	6.77
Standards Data	.490	.037	0.14	.232	-.061	0.37	0.51
Clinical Practice	-.591	-.536	28.73	.332	-.026	0.07	28.80
Teacher Certification/Licensure	-.308	-.077	0.59	.118	-.141	1.99	2.58
Exit Information	.199	.013	0.02	.674	.058	0.34	0.35
After Graduation	.715	.331	10.96	-.660	-.519	26.94	37.89
R_c^2			43.10			34.30	
CAEP Variable							
Faculty Access	-.367	-.124	1.54	-.285	-.199	3.96	5.50

Multiple Assessments	.004	-.111	1.23	.851	.143	2.04	3.28
Standards Data	.207	.040	0.16	-.370	-.198	3.92	4.08
Leadership Commitment for Continuous Improvement	.257	.077	0.59	-.529	-.455	20.70	21.30
Hiring of Completers	.307	.167	2.79	-.054	-.313	9.80	12.59
Cost of Attendance Against ED Unit	.111	.196	3.84	.368	-.129	1.66	5.51
Cost of Attendance Against Similar Providers	.079	.169	2.86	.292	-.084	0.71	3.56
Admission Criteria	.418	.027	0.07	-.284	-.275	7.56	7.64
Systematically Collect Data	-.246	-.135	1.82	.297	.069	0.48	2.30
Aggregate Data	.798	-.071	0.50	-.224	-.016	0.03	0.53
Disaggregate Data	-.206	-.129	1.66	-.157	-.088	0.77	2.44
Student Dispositions	-.361	-.305	7.78	.058	-.023	0.05	7.84

Clinical Practice	-.406	-.341	11.63	-.252	-.211	4.45	16.08
Exit Information	.546	.081	0.66	.496	.058	0.34	0.99
Salary of Completers	-.358	.122	1.49	-.408	-.383	14.67	16.16
Correlates Admission Data	.297	.150	2.25	.234	-.245	6.00	8.25
Non-Academic Factors	.306	.172	2.96	-.189	-.395	15.60	18.56
Disaggregate Completers by Groups	-.298	-.070	0.49	.062	-.185	3.42	3.91
Admission Data	-.696	-.310	8.53	-.021	-.102	1.04	9.57
Teacher Certification/Licensure	.050	-.103	1.06	.009	-.138	1.90	2.97
Exit Information	-.014	.140	1.96	-.439	-.472	22.28	24.24
Students' Graduation Rate	.145	.021	0.04	.004	-.249	6.20	6.24
Locations of Completers Over Time	-.391	-.083	0.69	.179	-.149	2.22	2.91
Effectiveness of Diverse Field Experiences	-.305	-.246	6.05	.068	-.163	2.66	8.71
Innovative Models of High Quality Practices	-.433	-.178	3.17	-.074	-.174	3.03	6.20

Use the Data for Program Improvement	-.250	-.073	0.53	-.151	<u>-.336</u>	11.29	11.82
Test the Validity and Reliability of Measures	.584	.106	1.12	.184	-.168	2.82	3.95

Note. Structure coefficients (r_s) greater than $|.30|$ are underlined. Coef = standardized canonical function coefficient; r_s = structure coefficient; r_s^2 = squared structure coefficient; h_2 = communality coefficient.

By reviewing the first canonical correlation (Function 1) coefficients, one sees that the relevant predictor (NCATE Standard 2) variables (loadings > $|.30|$) were "Systematically Collect Data", "Student Dispositions", "Clinical Practice", and "After Graduation". This conclusion was supported by the squared structure coefficients. Furthermore, these predictor variables had larger canonical function coefficients and all of them had negative signs (directly proportional) except for "After Graduation", which means that "After Graduation" is inversely related to the other three relevant predictor variables. In other words, assessment coordinators unfavorable perception of the capability of their systems to meet "Systematically Collect Data", "Student Dispositions", and "Clinical Practice" components of NCATE Standard 2 is associated with favorable perception of the capability of their systems to meet "After Graduation" component of the Standard. Moreover, the first canonical correlation (Function 1) yielded only three relevant criterion (CAEP Standard 5.3) variables (loadings > $|.30|$): "Student Dispositions", "Clinical Practice", and "Admission Data". All these variables had negative signs, which indicated that they were directly proportional to the negative sign NCATE variables and inversely proportional to the positive sign NCATE variables.

Therefore, for the first canonical correlation (Function 1), an unfavorable perception by assessment coordinators of the capability of their electronic assessment systems to meet "Systematically Collect Data", "Student Dispositions", and "Clinical Practice" components of NCATE Standard 2 is associated with: 1) a favorable perception of the capability of their systems to meet "After Graduation" component of the Standard and 2) unfavorable perception of the capability of their systems to meet "Student Dispositions", "Clinical Practice", and "Admission Data" components of CAEP Standard 5.3.

By reviewing the second canonical correlation (Function 2) coefficients, one sees that the relevant predictor (NCATE Standard 2) variables (loadings > |.30|) were "Faculty Access", "Disaggregate Data", "Admission Data", and "After Graduation". These predictor variables had larger canonical function coefficients and all of them had negative signs (directly proportional). Furthermore, the second canonical correlation (Function 2) yielded six relevant criterion (CAEP Standard 5.3) variables (loadings > |.30|): "Leadership Commitment for Continuous Improvement", "Hiring of Completers", "Salary of Completers", "Non-Academic Factors", "Exit Information", and "Use the Data for Program Improvement". All these variables had negative signs, which indicated that they were directly proportional to the negative sign NCATE variables. Therefore, for the second canonical correlation (Function 2), an unfavorable perception by assessment coordinators of the capability of their electronic assessment systems to meet "Faculty Access", "Disaggregate Data", "Admission Data", and "After Graduation" components of NCATE Standard 2 is associated with unfavorable perception of the capability of their systems to meet "Leadership Commitment for Continuous Improvement", "Hiring of

Completers", "Salary of Completers", "Non-Academic Factors", "Exit Information", and "Use the Data for Program Improvement" components of CAEP Standard 5.3.

A post hoc test using multi-regression analysis yielded separate regression equations for each dependent variable (CAEP variables) from the covariates (NCATE variables), holding all other dependent variables constant. Table 24 shows only statistically significant coefficients for the regression equations generated from predicting CAEP variables using NCATE variables.

Table 24

Post hoc Multi-Regression Analysis for NCATE and CAEP Variables

	Un-std. Coef.		Std. Coef.		
Mode	b	SE	β	t	p
Faculty access – Faculty Access	.253	.114	.222	2.22	.028
Standards Data – Standards Data	.228	.108	.222	2.10	.013
Leader Commitment – After Graduation	.215	.105	.214	2.03	.043
Hiring Completers – After Graduation	.208	.095	.228	2.17	.031
Aggregate Data – Aggregate Data	.326	.145	.308	2.00	.047
Disaggregate Data – Disaggregate Data	.298	.149	.276	1.99	.048
Clinical Practice – Clinical Practice	.232	.109	.217	2.11	.036
Exit Info – Exit Info	.297	.112	.285	2.65	.009
Non-academic Factors – faculty Access	.400	.138	.281	2.88	.005

	b	SE	β	t	p
Non-academic Factors – Clinical Practice	-.315	.143	-.228	-2.19	.030
Target Groups – Faculty Access	.349	.151	.218	2.30	.023
Target Groups – Multi Assessment	-.582	.218	-.318	-2.66	.008
Target Groups – Exit Info	.301	.116	.267	2.58	.011
After Graduation – Faculty Access	.315	.135	.224	2.32	.021
Placement Location of Completers – Multi Assessment	-.467	.225	-.261	-2.07	.039

b = values for the regression equation for predicting the dependent variable from the independent variable, SE = Standard Error, β = standardized coefficients

Table 25 summarizes the regression relationship between the common components of the NCATE Standard 2 and CAEP Standard 5.3 variables. For example, for every unit increase in the assessment coordinators' perceptions that their electronic assessment systems are capable of meeting "Faculty Access" component of the NCATE Standard 2 there is .253 unit increase in their perceived outcomes that the systems are capable of meeting "Faculty Access" component of the CAEP Standard 5.3, holding all other dependent variables constant. Similar interpretations can be made for the other five common components between the two Standards.

Table 25

Regression Relationship between the Common Components of the NCATE Standard 2 and CAEP Standard 5.3

NCATE (Predictor) Variable	CAEP (Criterion) Variable	Regression Coef. (b)
Faculty Access	Faculty Access	.253

Standards Data	Standards Data	.228
Aggregate Data	Aggregate Data	.326
Disaggregate Data	Disaggregate Data	.298
Clinical Practice	Clinical Practice	.232
Exit Info	Exit Info	.297

Summary

The first finding of this research was that colleges of education are now utilizing more commercial electronic assessment systems to address their data collection and accreditation needs. Participants in this study were more likely to recommend commercial electronic assessment systems over hybrid and in-house systems. This was evident by the higher Net Promoter Score (NPS) obtained by the commercial systems. Out of the four most used commercial electronic assessment systems, Chalk&Wire® had the highest NPS rating (88%) followed by LiveText® (64%), TK20® (47%), and finally TaskStream® (44%).

The level of satisfaction of assessment coordinators that their system facilitated compliance with NCATE Standard 2 varied across the different requirements of the Standard. The average perception of assessment coordinators about the ability of their system to facilitate compliance with NCATE Standard 2 was $M = 4.26$ (71% satisfaction level). This score falls between "Well" and "Moderately Well" ratings using the 6-point Likert scale from the survey in Appendix A of this study.

The level of satisfaction of assessment coordinators that their system will be able to facilitate compliance with CAEP Standard 5.3 varied across the different requirements of the Standard. Collectively for all three components of the Standard, the average perception of assessment coordinators about the ability of their systems to facilitate the compliance with CAEP Standard 5.3 was $M = 3.42$ (57% satisfaction level). This score falls between "Moderately Poor" and "Moderately Well" ratings using the 6-point Likert scale from the survey in Appendix A of this study. Compared to NCATE Standard 2 results from research question (1), there is a significant drop (14%) in the perception of assessment coordinators that their system will be able to facilitate compliance with CAEP Standard 5.3.

About 53% of participants in this study indicated that they spent less than 50% of their time to data collection, management, analysis, and reporting related to program approval and accreditation efforts. The majority of participants (72%) reported minimal or inadequate personnel support by their institutions to manage their assessment systems. Furthermore, only 32% of the respondents agreed that their primary data management systems are adequate or excellent while 68% indicated that their systems are inadequate or with minimal adequacy.

The results indicated two statistically significant canonical correlations between NCATE and CAEP variables. The first canonical correlation revealed a relatively strong relationship between the two variates ($r = .656$) with 43.10% of the variance was shared between the two them. The second statistically significant canonical correlation also revealed a relatively strong relationship between the two variates ($r = .585$) with 34.30% of the variance was shared between them.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Colleges of education at higher education institutions have relied on homegrown in-house electronic systems, proprietary commercial electronic systems, or hybrid electronic systems for data collection and accreditation needs. Many factors such as cost, integration with other existing systems, data management, interactivity with inside and outside resources, repository capacity, and assessment ability must be considered in evaluating the best electronic assessment system for a particular institution (Strudler & Wetzel, 2011). By using electronic assessment systems, colleges of education in the higher educational institutions started to revamp their programs to focus on the use of technology, promote changes by disbanding outdated practices that yield mediocrity, improve relationships between P-12 schools and higher education, and invest financial and human resources to meet accreditation requirements (Owsiak, 2008; Sivakumaran et al., 2010; Wineburg, 2006). This chapter of the study summarizes the purpose of this research, conclusions derived from main findings, limitations of the study, recommendations for future research, and implications for practice for colleges of education.

Summary of the Study

In this study, the researcher investigated the impact of using electronic assessment systems on meeting the data collection requirements of NCATE Standard 2 and CAEP Standard 5.3 as perceived by the assessment coordinator or the person most familiar with the system at the surveyed higher education institutions. The researcher explored if the electronic systems used by the surveyed institutions are capable of: (1) collecting useful data to the institution, (2) providing valid and reliable information to drive future

127

improvement, (3) enhancing teaching and student learning outcomes, and (4) assisting institutions to comply with accreditation standards. The researcher also addressed any variation in the outcomes due to system type, commercial, in-house, or hybrid. Furthermore, the commitment of leadership at higher education institutions to provide needed support, human and financial resources, to comply with the national standards for data requirements in education was also investigated.

Since there has not been any research conducted yet to study the impact of using electronic assessment systems to meet the newly established CAEP Standards, the researcher reviewed prior research related to the struggle of meeting accreditation requirements in higher education institutions, the impact of electronic assessment systems on collaboration among stakeholders, the impact of using electronic assessment systems on meeting NCATE Standard 2, and the perception of stakeholders on using electronic assessment systems. This review of literature constituted a building block to support the main purpose of this study; investigating the impact of using electronic assessment systems on meeting performance appraisal, tracking results, and improving program elements and processes to comply with CAEP Standard 5.3.

The survey in Appendix A was sent out to assessment coordinators at NCATE accredited colleges nationwide to collect data to answer the following research questions:

1. To what extent do assessment coordinators perceive that their electronic assessment systems facilitated the compliance of their teacher preparation programs with the NCATE Standard 2 requirements?

2. To what extent do assessment coordinators perceive that their electronic assessment systems will be able to facilitate the compliance of the teacher preparation

programs with the CAEP Standard 5.3 requirements by addressing: performance

appraisal, tracking results, and improving program elements and processes?

3. To what extent does the level of support of using electronic assessment systems at

higher education institutions influence the confidence level of assessment

coordinators in meeting CAEP 5?

4. What relationship, if any, is there between the perceived outcomes of assessment

coordinators that their electronic assessment systems are capable of meeting NCATE

Standard 2 and CAEP Standard 5.3?

The survey consisted of four separate sections to distinguish between type of

electronic assessment systems, level of support of utilizing electronic assessment systems

at higher education institutions, requirements to meet NCATE Standard 2, and

requirements to meet CAEP Standard 5.3. A list of 654 NCATE accredited colleges of

education nationwide was created utilizing the NCATE website. A link to the survey was

e-mailed to assessment coordinators at the accredited NCATE institutions. Out of the

654 accredited colleges, 220 participants completed the entire survey with a completion

rate of 34%. By achieving this response rate, this study had the minimum required

sample size that is statistically representative of the population.

One of the initial findings of this research was that colleges of education are now

utilizing more commercial electronic assessment systems to address their data collection

and accreditation needs. Participants in this study were more likely to recommend

commercial electronic assessment systems over hybrid and in-house systems. This was

evident by the higher Net Promoter Score (NPS) obtained by the commercial systems.

Out of the four most used commercial electronic assessment systems, Chalk&Wire® had

the highest NPS rating (88%) followed by LiveText® (64%), TK20® (47%), and finally TaskStream® (44%).

Related to research question (1), results showed that the level of satisfaction of assessment coordinators that their system facilitated compliance with NCATE Standard 2 varied across the different requirements of the Standard. The average perception of assessment coordinators about the ability of their system to facilitate compliance with NCATE Standard 2 was $M = 4.26$ (71% satisfaction level). This score falls between "Well" and "Moderately Well" ratings using the 6-point Likert scale from the survey in Appendix A of this study.

Related to research question (2), results showed that the level of satisfaction of assessment coordinators that their system will be able to facilitate compliance with CAEP Standard 5.3 also varied across the different requirements of the Standard. Collectively for all three components of the Standard, the average perception of assessment coordinators about the ability of their systems to facilitate the compliance with CAEP Standard 5.3 was $M = 3.42$ (57% satisfaction level). This score falls between "Moderately Poor" and "Moderately Well" ratings using the 6-point Likert scale from the survey in Appendix A of this study. Compared to NCATE Standard 2 results from research question (1), there is a significant drop (14%) in the perception of assessment coordinators that their system will be able to facilitate compliance with CAEP Standard 5.3.

Related to research question (3), about 53% of participants in this study indicated that they spent less than 50% of their time to data collection, management, analysis, and reporting related to program approval and accreditation efforts. The majority of

participants (72%) reported minimal or inadequate personnel support by their institutions to manage their assessment systems. Furthermore, only 32% of the respondents agreed that their primary data management systems are adequate or excellent while 68% indicated that their systems are inadequate or with minimal adequacy.

Related to research question (4), the analysis yielded two functions with statistically significant canonical correlations. The first canonical correlation showed that an unfavorable perception by assessment coordinators of the capability of their electronic assessment systems to meet "Systematically Collect Data", "Student Dispositions", and "Clinical Practice" components of NCATE Standard 2 is associated with: 1) a favorable perception of the capability of their systems to meet "After Graduation" component of the Standard and 2) an unfavorable perception of the capability of their systems to meet "Student Dispositions", "Clinical Practice", and "Admission Data" components of CAEP Standard 5.3. The second canonical correlation showed that an unfavorable perception by assessment coordinators of the capability of their electronic assessment systems to meet "Faculty Access", "Disaggregate Data", "Admission Data", and "After Graduation" components of NCATE Standard 2 is associated with an unfavorable perception of the capability of their systems to meet "Leadership Commitment for Continuous Improvement", "Hiring of Completers", "Salary of Completers", "Non-Academic Factors", "Exit Information", and "Use the Data for Program Improvement" components of CAEP Standard 5.3.

Conclusions

This section summarizes the findings from the results of this study and compares them with the results of other researchers from Chapter 2 of this study.

General Findings Related to Assessment Systems

The distribution of responses for the type of assessment system used at the surveyed institutions is shown in Table 5 of Chapter 4 (p. 73). The respondents who indicated the use of commercial electronic assessment systems constituted 45.5% of the total. This is an interesting finding since in Kirchner's (2012) study only 29.3% of the participants indicated the use of commercial electronic assessment system at their institutions (Kirchner, 2012). This discrepancy in results could be an indication that since 2012 more institutions are relying on, or trusting, commercial electronic assessment systems for data collection and accreditation needs. Weztel et al. (2009) noticed a migration from off-the-shelf programs such as Microsoft Word and Excel to the use of large-scale systems such as LiveText® and TaskStream®. Furthermore, Swade et al. (2009) indicated that replacing a paper-based assessment system with an electronic system helped the teacher preparation program to track student progress, enhance learning, and produce favorable results to meet the certification and accreditation needs of the program. As was shown in Table 6 of Chapter 4 (p. 74), the results from this study were in agreement with the findings from Weztel et al. (2009) and Swade et al. (2009).

The participants in this study were asked to provide the name of the primary assessment system or electronic tool used by their institutions to collect and manage students' data. It is worth noting here that this study showed a 6.4% drop in the use of in-house developed systems from what was shown in Kirchner's (2012) study. Moreover 72% of the respondents indicated that their current assessment system was in use during the last NCATE visit. This is a 10% increase over what was reported by Kirchner (2012). From this result, one can presume that colleges of educations are now more aware of the

132

need to use comprehensive electronic assessment systems to withstand the scrutiny of accreditation organizations in regard to the quality of the data management system used by institutions of higher education. The NPS number for the top four electronic assessment systems used by the surveyed institutions were Chalk&Wire® (88%), LiveText® (64%), TK20® (47%), and TaskStream® (44%).

Research Question 1

"To what extent do assessment coordinators perceive that their electronic assessment systems facilitated the compliance of their teacher preparation programs with the NCATE Standard 2 requirements?"

The level of satisfaction of assessment coordinators that their system facilitated compliance with NCATE Standard 2 varied across the different requirements of the Standard. The average perception of assessment coordinators about the ability of their system to facilitate compliance with NCATE Standard 2 was $M = 4.26$ (71% satisfaction level, where 100% is used as the threshold for satisfaction level). This score falls between "Well" and "Moderately Well" ratings using the 6-point Likert scale from the survey in Appendix A of this study. Kirchner (2012) reported in his study a slightly higher satisfaction level by the respondents ($M = 4.48$, 74% satisfaction level). This slight discrepancy is within the variability assumptions in the data collected by the two studies. However, it could also be attributed to increased concerns by respondents that accrediting bodies are raising the bar when it comes to data assessment systems and certification of the teacher preparation programs. Systematic data collection is a fundamental requirement for the accountability of teacher preparation programs and it has been strongly associated with accreditation standards (CAEP, 2013; Crowe, 2010;

133

Sivakumaran et al., 2010; NCATE, 2008). The biggest four areas that respondents felt their systems are performing poorly were "After Graduation" (47% satisfaction level), "Teacher Certification/Licensure" (55% satisfaction level), "Exit Information" (64% satisfaction level), and "Admission Data" (65% satisfaction level). It is understandable why the responses of assessment coordinators are not favorable to the ability of their systems in collecting students' data after graduation. Once students graduate and relocate to their new jobs, it is hard to track them and collect useful data that can be used to drive program improvements. Some states started to help out in this area by providing teachers' data, which is collected by systems at the state level, back to teacher preparation programs (Weineburg, 2006). The low score in "Teacher Certification/Licensure" component can be explained by the fact that each state has its own requirements to issue certifications to its teachers. These specific requirements might not be easy to track in a consistent basis by electronic assessment systems that are designed for a more general data collection purposes (Kirchner, 2012). For "Admission Data" and "Exit Information", these data might be managed collectively for all students attending different colleges at higher education institutions. Assessment coordinators might have felt that their own assessment systems did not necessarily manage the data for these two components of the NCATE Standard 2.

Since there were three distinct types of electronic assessment systems that can be chosen (commercial, in-house, or a hybrid), the variation in results based on the type of assessment system was investigated. The analysis of these data provided answers to whether the type of system selected facilitated the teacher preparation program's ability to meet NCATE Standard 2. For most of the NCATE Standard 2 components,

134

commercial systems had higher mean scores followed by hybrid systems and then in-house systems. Collectively, the overall satisfaction level with facilitating compliance with NCATE 2 Standard was $M = 4.33$ (72% satisfaction level) for commercial system, $M = 4.26$ (70% satisfaction level) for hybrid, and $M = 4.14$ (68% satisfaction level) for in-house. This result is in line with prior research findings about the advantages of commercial electronic systems over in-house and hybrid systems in managing data for accreditation purposes (Kirchner 2012; Wetzel et al. 2009). The ANOVA analysis revealed that there were only two NCATE components that showed statistically significant perceptual differences that the system type had different impact on the compliance of the assessment system with NCATE Standard 2. These two components were "Faculty Access" and "Standards Data". For "Faculty Access", the satisfaction level with facilitating compliance with NCATE 2 Standard was $M = 4.59$ (77% satisfaction level) for commercial system, $M = 4.41$ (74% satisfaction level) for hybrid, and $M = 3.98$ (66% satisfaction level) for in-house. Additionally, a post hoc test was conducted to determine which means are significantly different from each other among the three assessment systems (commercial, in-house, hybrid). The post hoc test results showed a statistically significant difference in "Faculty Access" between commercial ($M = 4.59$) and in-house ($M = 3.98$). Commercial electronic assessment systems are normally web based systems that give more flexibility access to faculty and students using any computer or electronic device as long as there is a connection to the internet. In-house systems can be restricted in accessibility to certain computer machines and only while in campus. For "Standards Data", the satisfaction level with facilitating compliance with NCATE 2 Standard was $M = 4.74$ (79% satisfaction level) for

commercial system, $M = 4.53$ (76% satisfaction level) for hybrid, and $M = 4.14$ (69% satisfaction level) for in-house. The post hoc test results showed a statistically significant difference in "Standards Data" between commercial ($M = 4.74$) and in-house ($M = 4.14$). "The Standards Data" component embraces the ability of the system to collect performance measures on students as it relates to state and national standards and required by NCATE Standard 2. In-house systems are typically simplistic in nature and intended to address specific set of basic needs for users (Kirchner, 2012). On the other hand, commercial systems normally include comprehensive assessment tools with built-in modules to address multiple standards. Software companies that market commercial systems do frequent updates to their systems in order to stay abreast of changes in the standards and to enhance the users' experiences. Finally, collectively for all components, the ANOVA analysis did not discriminate perceptual differences that the system type had different impact on the compliance with NCATE Standard 2. This result contradicts the findings by Kirchner (2012) where statistically significant differences were reported between commercial and hybrid systems. One can conjuncture that this discrepancy in the results can indicate that assessment coordinators who were surveyed in this study had better understanding about the capabilities of each system type than those surveyed in Kirchner's (2012) study.

Research Question 2

"To what extent do assessment coordinators perceive that their electronic assessment systems will be able to facilitate the compliance of the teacher preparation programs with the CAEP Standard 5.3 requirements by addressing: performance appraisal, tracking results, and improving program elements and processes?"

The level of satisfaction of assessment coordinators that their system will be able to facilitate compliance with CAEP Standard 5.3 varied across the different requirements of the Standard. The average perception of assessment coordinators about the ability of their system to facilitate compliance with the CAEP Standard 5.3 components were M = 3.43 (57% satisfaction level) for "Performance Appraisal", M = 3.74 (62% satisfaction level) for "Tracking Results", and M = 3.09 (51% satisfaction level) for "Improving Program Elements and Processes". It is not a surprise that "Improving Program Elements and Processes" had the lowest satisfaction level. This part of the Standard includes components that are either vague, such as "Innovative Models of High Quality Practices" and "Use the Data for Program Improvement", or data that are hard to collect or track, such as "Locations of Completers Over Time", "Exit Information", and "Admission Data". Collectively for all three components, the average perception of assessment coordinators about the ability of their systems to facilitate the compliance with CAEP Standard 5.3 was M = 3.42 (57% satisfaction level). This score falls between "Moderately Poor" and "Moderately Well" ratings using the 6-point Likert scale from the survey in Appendix A of this study. Compared to NCATE Standard 2 results from research question (1), there is a significant drop (14%) in the perception of assessment coordinators that their system will be able to facilitate compliance with CAEP Standard 5.3. This highlights the level of concern that assessment coordinators might have related to the transition from NCATE and TEAC standards to the new CAEP standards. The results show that assessment coordinators are not comfortable yet that their existing assessment systems have the framework and infrastructure to support such changes. Based on this result, there could be significant implications for colleges of education

nationwide as they go through the CAEP accreditation process. If these colleges do not act to remedy deficiencies in their assessment systems, as perceived by assessment coordinators, they might find themselves unable to meet accreditation requirements as set by the standards during their next CAEP visit. Respondents felt that their systems need significant improvements (Poor to Moderately Poor rating) in the following areas of the Standard: "Salary of Completers" ($M = 1.88$, 31% satisfaction level), "Cost of Attendance Against Similar Providers" ($M = 2.05$, 34% satisfaction level), "Non-Academic Factors" ($M = 2.12$, 35% satisfaction level), "Cost of Attendance Against ED Unit" ($M = 2.13$, 36% satisfaction level), "Admission Data" ($M = 2.30$, 38% satisfaction level), "Hiring of Completers" ($M = 2.35$, 39% satisfaction level), "Exit Information" ($M = 2.38$, 40% satisfaction level), "Locations of Completers Over Time" ($M = 2.51$, 42% satisfaction level), "Students' Graduation Rate" ($M = 2.68$, 45% satisfaction level). This is aligned with the results from research question (1) for NCATE Standard 2 where respondents felt their systems are performing poor in the following areas of the Standard: "After Graduation" (47% satisfaction level), "Teacher Certification/Licensure" (55% satisfaction level), "Exit Information" (64% satisfaction level), and "Admission Data" (65% satisfaction level). These findings support the concern that was raised by some educators and researchers about the transition and the new requirements of CAEP Standards. As mentioned in Chapter 2 of this study, a letter that was sent to the President of CAEP, Dr. Cibulka, by Harvey Rude, President of Higher Education Consortium for Special Education and Vivian Correa, President of Teacher Education Division Council for Exceptional Children (personal communication, March 29, 2013) raised the following issues regarding the CAEP Standards:

138

1. The Standards assume accountability against teacher preparation programs on issues that they might not have control of.

2. The Standards appear to include variables that might not be associated with program improvement or effectiveness.

3. Teacher preparation programs might be asked to provide information that they do not have or are unable to collect.

4. Without detailed articulation of what is acceptable as evidence to meet different standards, it could be problematic for teacher preparation programs to provide useful feedback.

From Research question (2) results, it seems that assessment coordinators are in agreement with these concerns. Results showed that that assessment coordinators felt that their systems need significant improvements in areas that they might not have control of or data that they are not able to collect, such as "Salary of Completers", "Exit Information", "Non-Academic Factors", "Hiring of Completers" "Locations of Completers Over Time" and "After Graduation". This was also supported by the comments received by participants in this study, such as "In this state the computer system at the DOE does not speak to the computer system at the licensure commission which means we must rely on self report of completers", "The issues I have marked 'not able' are not the software's problem but issues within our state where we are not allowed to access information about our graduates jobs and salaries", and "I don't believe the response is indicative of a failure in the system, as much as the question hasn't been raised, or the information is process (sic) through our Public Education Department, and it has not been shared with us."

139

Since there were three distinct types of electronic assessment systems that can be chosen (commercial, in-house, or a hybrid), the variation in results based on the type of assessment system was investigated. The analysis of these data provided answers to whether the type of system selected will help to facilitate the teacher preparation program's ability to meet CAEP Standard 5.3. For most of the CAEP Standard 5.3 components, commercial systems had higher mean scores followed by hybrid systems and then in-house systems. This matches the results for NCATE Standard 2. Collectively, the overall satisfaction level with facilitating compliance with CAEP 5 Standard was $M = 3.53$ (59% satisfaction level) for commercial system, $M = 3.44$ (57% satisfaction level) for hybrid, and $M = 3.23$ (53% satisfaction level) for in-house. Comparison of NCATE Standard 2 and CAEP Standard 5.3 results is shown in Figure 7 of Chapter 4. One can notice a slightly bigger gap between NCATE Standard 2 and CAEP Standard 5.3 results for in-house systems. This indicates that colleges of education that use in-house assessment systems might face more difficulties during the transition from NCATE Standard 2 to CAEP Standard 5.3. Again this can be explained by the fact that in-house systems are typically simplistic in nature and intended to address specific set of basic needs for users (Kirchner, 2012). Respondents felt that their in-house systems might not be good enough for a successful transition to the new CAEP standards.

The ANOVA analysis revealed that there were six CAEP components that showed statistically significant perceptual differences that the system type had different impact on the compliance of the assessment system with CAEP Standard 5.3. These components

140

were "Faculty Access", "Standards Data", "Hiring of Completers", "Systematically Collect Data", "Non-Academic Factors", and "Disaggregate Completers by Groups".

Additionally, a post hoc test was conducted to determine which means are significantly different from each other among the three assessment systems (commercial, in-house, hybrid). The post hoc test results showed a statistically significant difference in the following CAEP Standard 5.3 components: "Faculty Access" between commercial ($M = 4.61$) and in-house ($M = 3.88$), "Standards Data" between commercial ($M = 4.84$) and in-house ($M = 4.07$), "Hiring of Completers" between in-house ($M = 1.88$) and hybrid ($M = 2.75$), "Systematically Collect Data" between commercial ($M = 4.98$) and in-house ($M = 4.44$) and also between commercial ($M = 4.98$) and hybrid ($M = 4.56$), "Non-Academic Factors" between commercial ($M = 2.37$) and in-house ($M = 1.59$), and finally "Disaggregate Completers by Groups" between commercial ($M = 4.01$) and in-house ($M = 3.18$).

Research Question 3

"To what extent does the level of support of using electronic assessment systems at higher education institutions influence the confidence level of assessment coordinators in meeting CAEP 5?"

The data collected from section 4 of the survey in Appendix A was used to answer questions about how well the infrastructure and level of support of personnel and technology influenced the confidence level of assessment coordinators that such support had facilitated meeting accreditation requirements. This section of the survey was intended to show the level of commitment of leadership at colleges of education to provide the necessary support, resources, and training in order to comply with national

141

accreditation standards. Respondents overwhelmingly (85%) indicated that the teacher education program is located at the schools or colleges of education.

The approximate percentage of time respondents devoted to data collection, management, analysis, and reporting related to program approval and accreditation efforts was compared to the results from Corbin et al. (2013). Figure 8 in Chapter 4 shows significant differences in the percentage of time devoted to data management between respondents in this study and Corbin's et al. (2013) study. The results from this study showed 8% increase in devoted time for the "more than 75%" selection, 12% increase in devoted time for the "50 to 75%" selection, and a 20% decrease in devoted time for the "less than 25%" selection. The participants in Corbin et al. (2013) study were mostly technology managers responsible for the electronic assessment systems at the surveyed IHEs (Institutes of Higher Education) in the state of North Carolina. However, the majority of these participants indicated that they had other primary roles and data management was only one function within their responsibilities in their positions at the IHEs (Corbin et al., 2013). This could explain why 73% of these participants indicated that they spend less than 50% of their time managing the data. On the other hand, participants in this study were mainly assessment coordinators or education directors whose primary roles were to manage the data where they spent appropriate time to do so.

Participants in this study were asked to indicate if their institutions provide adequate personnel support to manage their assessment systems. Only 5% responded with an excellent and 23% with an adequate personnel support to the management system while the majority (72%) reported minimal or inadequate support. The transition from

142

NCATE standards to CAEP will only increase the demand on data management (Kirchner, 2012; Corbin et al., 2013) and hence this will add another level of strain on assessment coordinators and the need for additional personnel support. Figure 9 in Chapter 4 compares the results from this study with data from Corbin et al. (2013) in regard to the perception of assessment coordinators about the adequacy of personnel support in managing data at their institutions. The results from both studies were relatively comparable.

Participants in this study were also asked to indicate the adequacy of the software that is used as their primary data management system. Only 32% of the respondents agreed that their systems are adequate or excellent while 68% indicated that their systems are inadequate or with minimal adequacy. This is a deviation from the results by Corbin et al. (2013), as can be seen in Figure 10 of Chapter 4, where 62% of the respondents rated their systems as excellent or adequate. Again, most of the participants in Corbin et al. (2013) study were technology managers who might have better knowledge and understanding of the capabilities of the software use than the assessment coordinators surveyed in this study. Collectively for all questions in section 4 of the survey in Appendix A, similar deviation was found between this study and the results by Corbin et al. (2013) as can be seen in Figure 11 of Chapter 4 (p. 110). Strudler and Wetzel (2011) indicated that providing adequate resources by stakeholders is crucial to the success of implementing electronic assessment systems programs. McPherson (2010) concluded that leadership support was vital to the adoption and success of implementing TaskStream® and to ensure that faculty and candidates have what they need for implementation. Sivakumaran et al. (2010) signified the importance of financial,

personnel, and moral support by leadership to the success of implementing commercial assessment systems that comply with accreditation requirements for data management. The results from this study agreed with prior research (Strudler & Wetzel, 2011; McPherson, 2010; Sivakumaran et al., 2010) that leadership at higher education institutions must allocate resources to implement electronic assessment systems and adequate resources are crucial to success.

Research Question 4

"What relationship, if any, is there between the perceived outcomes of assessment coordinators that their electronic assessment systems are capable of meeting NCATE Standard 2 and CAEP Standard 5.3?"

A canonical correlation analysis was conducted using the 12 NCATE Standard 2 variables as predictors of the 27 CAEP Standard 5.3 variables to evaluate the multivariate shared relationship between the two variable sets. In other words, the researcher was interested in learning if the perceived outcomes of assessment coordinators that their electronic assessment systems are capable of meeting NCATE Standard 2 can predict their perceived outcomes that the systems are capable of meeting CAEP Standard 5.3. The analysis yielded 12 functions but only two of these functions produced statistically significant canonical correlations. Collectively, the full model across all functions was statistically significant using the Wilks's $\lambda = .061$ which indicated that the full model explained a substantial portion, about 94%, of the variance shared between the variable sets.

For the first canonical correlation (Function 1), an unfavorable perception by assessment coordinators of the capability of their electronic assessment systems to meet

Systematically "Collect Data", "Student Dispositions", and "Clinical Practice" components of NCATE Standard 2 is associated with: 1) a favorable perception of the capability of their systems to meet "After Graduation" component of the Standard and 2) an unfavorable perception of the capability of their systems to meet "Student Dispositions", "Clinical Practice", and "Admission Data" components of CAEP Standard 5.3. For the second canonical correlation (Function 2), an unfavorable perception by assessment coordinators of the capability of their electronic assessment systems to meet "Faculty Access", "Disaggregate Data", "Admission Data", and "After Graduation" components of NCATE Standard 2 is associated with an unfavorable perception of the capability of their systems to meet "Leadership Commitment for Continuous Improvement", "Hiring of Completers", "Salary of Completers", "Non-Academic Factors", "Exit Information", and "Use the Data for Program Improvement" components of CAEP Standard 5.3.

To enhance the interpretation of the canonical correlation analysis, a post hoc test using multi-regression analysis was conducted. The test yielded separate regression equations for each dependent variable (CAEP variables) from the covariates (NCATE variables), holding all other dependent variables constant. There were 15 statistically significant coefficients (see Table 24 in Chapter 4) for the regression equations generated from predicting CAEP variables using NCATE variables. This post hoc test yielded interesting results since the statistically significant regression equations were able to identify a direct association amongst common components of the NCATE Standard 2 and CAEP Standard 5.3 ("Faculty Access", "Standards Data", "Aggregate Data", "Disaggregate Data", "Clinical Practice", and "Exit Information"). Table 25 in Chapter 4

(p. 119) summarizes the regression relationship between the common components of the NCATE Standard 2 and CAEP Standard 5.3 variables. For example, for every unit increase in the assessment coordinators' perceptions that their electronic assessment systems are capable of meeting "Faculty Access" component of the NCATE Standard 2 there is .253 unit increase in their perceived outcomes that the systems are capable of meeting "Faculty Access" component of the CAEP Standard 5.3, holding all other dependent variables constant.

Implications

The preparation of quality teachers should be the paramount goal to teacher preparation programs at all institutions of higher education. Producing quality teachers will in turn yield better experiences and outcomes for students in Pre-K to twelfth grade. Implementing comprehensive electronic assessment systems at higher education institutions to drive continuous improvement and meet accreditation standards is in sync of achieving such goal (Larkin & Robertson, 2013). For electronic assessment systems to become more valuable in driving program improvement, stronger relation is needed between national standards and the ability of teacher preparation programs to collect and analyze useful data (Keil & Haughton, 2009). While several researchers (Kirchner, 2012; Schnackenberg et al., 2007; Mitchell, 2006) studied the relation between the use of electronic assessment systems and compliance with NCATE Standard 2, the recent transition from NCATE and TEAC standards to the CAEP standards will have an effect on teacher preparation programs and the electronic assessment systems used by these programs. The results of this analysis are intended to be used by teacher preparation

programs as a guideline to make educated decisions on implementing improvement to their assessment systems in order to comply with the CAEP standards.

The first finding of this research was that colleges of education are now utilizing more commercial electronic assessment systems to address their data collection and accreditation needs. Participants in this study were more likely to recommend commercial electronic assessment systems over hybrid and in-house systems. This was evident by the higher Net Promoter Score (NPS) obtained by the commercial systems. Out of the four most used commercial electronic assessment systems, Chalk&Wire[®] had the highest NPS rating (88%) followed by LiveText[®] (64%), TK20[®] (47%), and TaskStream[®] (44%). Colleges of education may use this finding to streamline the evaluation process of their data management systems prior to the next CAEP visit.

The level of satisfaction of assessment coordinators that their system facilitated compliance with NCATE Standard 2 varied across the different requirements of the Standard. The biggest four areas that respondents felt their systems are performing poorly were "After Graduation" , "Teacher Certification/Licensure", "Exit Information", and "Admission Data". For most of the NCATE Standard 2 components, commercial systems had higher mean scores followed by hybrid systems and then in-house systems. These findings can be used by colleges of education to improve their data management systems in areas where assessment coordinators felt their systems were inadequate in meeting accreditation standards.

The level of satisfaction of assessment coordinators that their system will be able to facilitate compliance with CAEP Standard 5.3 varied across the different requirements of the Standard. Compared to NCATE Standard 2 results from research question (1), there

is a significant drop (14%) in the perception of assessment coordinators that their system will be able to facilitate compliance with CAEP Standard 5.3. This highlights the level of concern that assessment coordinators might have related to the transition from NCATE and TEAC standards to the new CAEP standards. The results show that assessment coordinators are not comfortable yet that their existing assessment systems have the framework and infrastructure to support such changes. Based on this result, there could be significant implications for colleges of education nationwide as they go through the CAEP accreditation process. If these colleges do not act to remedy deficiencies in their assessment systems, as perceived by assessment coordinators, they might find themselves unable to meet accreditation requirements as set by the standards during their next CAEP visit. Respondents felt that their systems need significant improvements (Poor to Moderately Poor rating) in areas that they might not have control of or data that they are not able to collect, such as "Salary of Completers", "Exit Information", "Non-Academic Factors", "Hiring of Completers" "Locations of Completers Over Time" and "After Graduation". For most of the CAEP Standard 5.3 components, commercial systems had higher mean scores followed by hybrid systems and then in-house systems. The mean perception scores between NCATE Standard 2 and CAEP Standard 5.3 results showed a slightly bigger gap for in-house systems. This indicates that colleges of education that use in-house assessment systems might face more difficulties during the transition from NCATE Standard 2 to CAEP Standard 5.3. It is not a surprise that "improving Program Elements and Processes" had the lowest satisfaction level. This part of the Standard includes components that are either vague, such as "Innovative Models of High Quality Practices" and "Use the Data for Program Improvement", or data that are hard to collect

or track, such as "Locations of Completers Over Time", "Exit Information", and "Admission Data". This implies that for colleges of education to have successful experiences during their next CAEP visits, they must improve in areas where assessment coordinators perceptions of their systems' capabilities were unfavorable. Colleges of education must also communicate with CAEP and obtain clarifications in areas where the Standard requirements might be vague, such as "Innovative Models of High Quality Practices" and "Use the Data for Program Improvement". One participant from this survey stated the following in the comment section: "CAEP needs to provide instructions with tested instruments and models so that institutions are not reinventing the wheel."

Researcher of this study investigated the level of commitment of leadership at colleges of education to provide the necessary support, resources, and training in order to comply with national accreditation standards. About 53% of participants in this study indicated that they spent less than 50% of their time to data collection, management, analysis, and reporting related to program approval and accreditation efforts. The majority of participants (72%) reported minimal or inadequate personnel support by their institutions to manage their assessment systems. Furthermore, only 32% of the respondents agreed that their primary data management systems are adequate or excellent while 68% indicated that their systems are inadequate or with minimal adequacy. The transition from NCATE standards to CAEP will only increase the demand on data management and hence add another level of strain on assessment coordinators for the need of additional personnel and software support. The comments received from participants in this section of the survey showed a level of frustration by assessment coordinators regarding the support they were receiving to manage their data. Comments

such as "need more money", "more resources are needed for development, training, data entry time, reporting, …", "more integrated systems; not piece meal", "more time; less additional responsibilities", and "computers that work" highlights some of the challenges that colleges of education are faced with in order to build systems' infrastructures that are capable of meeting accreditation standards and driving continuous improvement to their programs.

The researcher was interested in learning if the perceived outcomes of assessment coordinators that their electronic assessment systems are capable of meeting NCATE Standard 2 can predict their perceived outcomes that the systems are capable of meeting CAEP Standard 5.3. The data yielded two functions with statistically significant canonical correlations. A post hoc test using multi-regression analysis yielded interesting results since the statistically significant regression equations were able to identify a direct association amongst common components of the NCATE Standard 2 and CAEP Standard 5.3 ("Faculty Access", "Standards Data", "Aggregate Data", "Disaggregate Data", "Clinical Practice", and "Exit Information"). Colleges of education can use these results to extrapolate the strengths and weaknesses of their assessment systems in meeting NCATE Standard 2 to accomplish a successful transition in system requirements as required by the newly established CAEP Standard 5.3.

Comparison to Prior Research

Comparing the results of this study with the findings from Corbin et al. (2013) study, there were significant differences in the percentage of time devoted to data management between the participants of the two studies. Only 32% of respondents in this study agreed that their systems are adequate or excellent against 62% of the

150

respondents in Corbin's et al. study. However, both studies returned comparable results in adequacy of personnel support to manage data.

Larkin & Robertson (2013) concluded that the use of commercial assessment systems provide efficiencies in data management and can save time and effort. The researcher of this study also concluded that participants were more likely to recommend commercial electronic assessment systems over hybrid and in-house systems.

Compared to Kirchner (2012) study, 46% of the respondents in this study indicated the use of commercial electronic assessment systems against 29% by Kirchner's. Respondents in both studies agreed about the advantages of commercial electronic systems over in-house and hybrid systems in managing data for accreditation purposes. The overall satisfaction level of respondents that their systems are capable of meeting NCATE Standard 2 was comparable (71% overall satisfaction level in this study versus 74% in Kirchner's). Furthermore, this study showed a 6.4% drop in the use of in-house developed systems from what was shown in Kirchner's study. Collectively for all components, the ANOVA analysis did not discriminate perceptual differences that the system type had different impact on the compliance with NCATE Standard 2. This result contradicts the findings by Kirchner (2012) where statistically significant differences were reported between commercial and hybrid systems.

The findings from this study were in agreement with the findings from Strudler & Wetzel (2011) study. Both studies reported a greater use of electronic assessment systems as a data source to address NCATE standards and far greater use of commercially available electronic assessment systems. Furthermore, both studies

151

concluded that stakeholders must allocate resources to implement electronic assessment systems programs and adequate resources are crucial to success.

McPherson (2010) concluded that leadership support was vital to the adoption and success of implementing TaskStream® as the electronic assessment system at the New York Institute of Technology (NYIT) to ensure that faculty and candidates have what they need during implementation. Using TaskStream® as the assessment system for five years through two NCATE cycles has demonstrated the value for program evaluation and helped to provide evidence of having adequate data management system during the accreditation process. The participants in this study indicated that leadership must allocate resources to implement electronic assessment systems programs. Adequate resources are crucial to success. Participants in this study were also more likely to recommend the use of commercial electronic assessment systems to comply with NCATE Standard 2.

Sivakumaran et al. (2010) concluded that financial, personnel, and moral support by leadership is critical to the success of implementing commercial assessment systems that comply with accreditation requirements for data management. The surveyed assessment coordinators in this study agreed that leadership must allocate resources to implement electronic assessment systems programs. Adequate resources are crucial to success.

Swade et al. (2009) determined that replacing a paper-based assessment system with an electronic system helped the teacher preparation program at Saint Leo University to track student progress, enhance learning, and produce favorable results to meet the certification and accreditation needs of the program. This is in agreement with the

findings from this study that the use of electronic assessment systems for data management facilitated compliance with NCATE Standard 2.

Wetzel et al. (2009) found a migration by colleges of education from using off-the-shelf programs such as Microsoft Word and Excel to the use of large-scale systems such as LiveText® and TaskStream®. Also, 71% of the surveyed NCATE institutions reported the use of electronic assessment systems. This agrees with the findings from this study where participants were more likely to recommend the use of commercial electronic assessment systems to comply with NCATE Standard 2. Furthermore, participants in this study indicated that the use of electronic assessment systems for data management facilitated compliance with NCATE Standard 2.

Schulte et al. (2006) concluded that the use of an assessment system at the University of Nebraska at Omaha that is comprehensive and integrated created alignment between assessments and standards. It also aligned the requirements between data collection and analysis. By doing so, University of Nebraska at Omaha has avoided the pitfalls of meeting NCATE Standard 2. These findings aligned well with the results from this study where participants indicated that the use of electronic assessment systems for data management facilitated compliance with NCATE Standard 2.

Love & Cooper (2004) found that online assessment systems can offer significant benefits by creating and distributing value to a wide range of stakeholders in ways that are superior to other solutions, including paper-based portfolios. Participants in this study agreed with Love & Cooper (2004) finding where they indicated that the use of electronic assessment systems for data management can facilitate compliance with accreditation standards, and this is especially true for commercial systems.

153

Research Limitations

One of the limitations of this study was that the population consisted of assessment coordinators at NCATE accredited colleges of education. A listing of accredited higher education institutions posted on the NCATE website was used to identify colleges of education to participate in this study. The study did not consider higher education institutions that are not currently members of NCATE or are in the process of getting accredited.

Another limitation of this study is that 23% of the respondents were department chairs, teacher education directors, deans, assistant deans, or associate deans. These positions are considered to have leadership roles at their perspective colleges. Hence, this might have resulted in some bias when these participants provided their own perceptions to answer the research questions that were included in the survey of this study. The impact of this bias would definitely be more pronounced when providing answers to research question 3 where the level of commitment of leadership at colleges of education to provide the necessary support, resources, and training in order to comply with national accreditation standards is investigated.

One more limitation is making generalizations of the results based on predetermined methodology of an opinion survey. Participation in this study was voluntarily and opinions or professional judgments might results in perceptions with self-selection bias. Participants in this study were assumed to be the most knowledgeable personnel to answer questions related to the capabilities of their electronic assessment systems to meet national standards. However, this might not be entirely true since some

154

institutions, as reported by Corbin et al. (2013), might use technology managers rather than assessment coordinators to manage their data systems.

It is the researcher's opinion that the above limitations do not pose a significant risk for the validity of this study since the survey questions were adapted from prior research that was tested for validity. Furthermore, the survey returned a large sample size which should improve the precision, statistical power, and validity of the study (Weithunat, Kaelin, Vuillaume, & Kallischnigg, 2010). However, the impact of the above limitations on the outcome needs to be considered by the reader.

Recommendations for Further Research

Higher education is made up of a complex system that encompasses multi-dimensions that include teaching, research, communication among stakeholders, national policies, accreditation, and accountability. Data management systems play a vital role in all the components that define what higher education is. Although this research examined the perceived impact of using different types of electronic assessment systems on meeting NCATE Standard 2 and CAEP Standard 5.3 as observed by assessment program coordinators, more can be done in the future in order to provide critical pieces in the data collection puzzle and to comply with national standards. Future researchers might wish to compare states' requirements for data management systems to that of CAEP Standard 5.3. Participants in this study indicated unfavorable perception about the capability of their systems to meet the following components of CAEP 5 Standard: "Salary of Completers", "Exit Information", "Hiring of Completers", "Locations of Completers Over Time", and "After Graduation". These data are most probably residing in states' electronic systems that are not accessible to higher education institutions. This

155

assumption is supported by several statements from participants, as one of them noted: "The issues I have marked 'not able' are not the software's problem but issues within our state where we are not allowed to access information about our graduates jobs and salaries." The future research can examine alignment of states' and national standards as it relates to assessment system requirements and future collaboration between the two to drive quality education and continuous improvement at colleges of education nationwide.

A second research topic related to electronic assessment systems in higher education would be to conduct a longitudinal study to examine whether or not assessment coordinators perceptions change after their institutions go through the first CAEP visit. Such a study can focus upon addressing more specific factors that are used by CAEP to measure the performance of assessment systems during their accreditation process. This proposed study could also investigate other antecedents that can affect assessment coordinators' perception about the ability of their systems to meet certain accreditation standards.

As this study used quantitative data and analysis, more in depth qualitative research can be conducted as a compliment for this study. This proposed future qualitative research could extract more information related to the capabilities and shortcomings of electronic assessment systems as perceived by assessment coordinators. A qualitative descriptive methodology can be used to explore the experiences of assessment coordinators with the ability of their data management systems to comply with CAEP Standard 5.3. In-depth qualitative phone interviews can be used as the primary data collection tool. Face-to-face interviews can also be conducted on an as needed basis. The study can utilize a typological scheme for data analysis. Raw data

clusters can be identified and combined to form emerging themes for discussion. Follow-up phone interviews can provide confidence to the validity of the collected data. The outcome of this qualitative research can provide further insight to the selection process and level of satisfaction for the electronic assessment systems used at higher education institutions.

Dissemination

Sixty-seven percent of the participants indicated their interest in receiving a summary of the results via e-mail. After the completion of this study, those participants will be provided a web-link to have access to the final version of this study. Furthermore, the researcher believes that the findings from this study can be published in highly reputable scholarly journals in the field of assessment, accountability, technology, and accreditation in higher education. Finally, the researcher has been attending the annual LiveText® Assessment and Collaboration Conference for the last few years and plans to present the results from this study that are associated with commercial electronic assessment systems at this conference.

References

Barrett, H. (2004). Differentiating electronic portfolios and online assessment management systems. In C. Crawford, N. Davis, J. Price, & D. Willis. (Eds.). *Technology and teacher education annual* (pp. 210-213) Norfolk, VA: Association for the Advancement of Computing in Education.

Barrett, H. (2007). Researching electronic portfolios and learner engagement: The REFLECT initiative. *Journal of Adolescent & Adult Literacy, 50*(6), 436-449.

Bartlett, J. E., Kotrlik, J. W., & Higgins, C. C. (2001). Organizational research: Determining appropriate sample size in survey research. *Journal of Information Technolgy, Learning, and Performance, 19*(1), 43-50.

Boody, R., & Kitajima, T. (2012). Teacher education accountability systems: What an examination of institutional reports shows about current practice. *Journal of Assessment and Accountability in Educator Preparation, 2*(1), 48–57.

Buckridge, M. (2008). Teaching portfolios: Their role in teaching and learning policy. *International Journal for Academic Development, 13*(2), 117–127.

Cavanaugh, T., Cavanaugh, C., & Daniels, L. (2005). A journey of design: developing a technology based unit assessment system: Designing and implementing a teacher education unit assessment system. In C. Crawford, N. Davis, J. Price, & D. Willis. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2005* (pp. 40-46). Chesapeake, VA: AACE.

Commission on the Future of Higher Education (2006). *A test of leadership: Charting the future of U.S. higher education*. A Report of the Commission Appointed by Secretary of Education Margaret Spellings. Washington, DC: U.S. Department of

Education. Retrieved from

https://www2.ed.gov/about/bdscomm/list/hiedfuture/reports/final-report.pdf

Corbin, R., Carpenter, C. D., & Nickles, L. (2013). The capacity of teacher education

institutions in North Carolina to meet program approval and accreditation

demands for data. *International Journal of ePortfolio, 3*(1), 47-61.

Council for the Accreditation of Educator Preparation (2010, October 25). *NCATE and

TEAC form new accrediting body* [press release]. Retrieved from

http://caepnet.org/news/press-releases/ncate-and-teac-form-new-accrediting-body/

Council for the Accreditation of Educator Preparation (2013). *CAEP Accreditation

standards as approved by the CAEP Board of Directors for accreditation of

educator preparation on August 29, 2013*. Retrieved from

http://caepnet.org/accreditation/standards/

Crowe, E. (2010). *Measuring what matters: A stronger accountability model for teacher

education.* Washington, DC: Center for American Progress. Retrieved from

http://www.americanprogres.org/issues/2010/07/pdf/teacher_accountability.pdf

Darling-Hammond, L. (2012). *Creating a comprehensive system for evaluating and

supporting effective teaching*. Stanford, CA: Stanford Center for Opportunity

Policy in Education. Retrieved from

https://edpolicy.stanford.edu/sites/default/files/publications/creating-

comprehensive-system-evaluating-and-supporting-effective-teaching.pdf

Eaton, J. S. (2011). U.S. accreditation: Meeting the challenges of accountability and

student achievement. *Evaluation in Higher Education, 5*(1), 1-20.

Evans, S., Daniel, T., Mikovch, A., Metze, L., & Norman, A. (2006). The use of
    technology in portfolio assessment of teacher education candidates. *Journal of*
    Technology and Teacher Education, 14(1), 5-27.

Eifler, K., Potthoff, D., & Dinsmore, J. (2004). A bucket of eels: A tripartite approach to
    renewing a teacher education program, *Journal of Teacher Education*, *55*(1), 91-
    101.

Fink, A. (2009). *How to conduct surveys: A step-by-step guide* (4th ed.). Los Angeles:
    SAGE.

Fraenkel, J. R. & Wallen, N. E. (2006). *How to design and evaluate research in*
    education (6th ed.). Boston: McGraw-Hill.

Hall, L. D., Fisher, C., Musanti, S., & Halquist, D. (2006). Professional development in
    teacher education: What can we learn from PT3? *TechTrends*, *50*(3), 25-31.

He, W., & Hartley, K. (2010). A supporting framework of online technology resources
    for lesson planning, *Journal of Educational Multimedia and Hypermedia*, *19*(1),
    23-37.

Herring, M., & Wilson, B. (2010). Enhancing student learning through evidence, self-
    assessment, and accountability: Closing the loop. *Journal of Assessment and*
    Accountability in Educator Preparation, 1(1), 46-52.

Jackson, J. (2006). *Increasing accountability for teacher preparation programs*. Atlanta,
    GA: Southern Regional Accreditation Board. Retrieved from
    http://publications.sreb.org/2006/06E18_Increasing_Accountability.pdf

Johns, R. (2010). *Likert Items and Scales* [SURVEY QUESTION BANK: Methods Fact Sheet 1]. Retrieved from

http://www.surveynet.ac.uk/sqb/datacollection/likertfactsheet.pdf

Keil, V. L., & Haughton, N. A. (2009). Technology supported systems in SCDE: Myth versus reality. *Journal of Educational Computing Research, 41*(3), 369-390.

Keiningham, T. L., Cooil, B., Andreassen, T. W., & Aksoy, L. (2007). A longitudinal examination of net promoter and firm revenue growth. *Journal of Marketing, 71*(3), 39-51.

Kirchner, A. (2012). *Evaluation of electronic assessment systems and their ability to meet NCATE Standard 2*. Ed.D. dissertation, Western Kentucky University. Retrieved from http://digitalcommons.wku.edu/diss/20

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*, 607-610.

Larkin, M. J., & Robertson, R. L. (2013). Complex moving parts: Assessment systems and electronic portfolios. *International Journal of ePortfolio, 3*(1), 21-37.

Little, R.J.A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*, 1198-1202.

Lomax, R. G. & Hahs-Vaughn, D. L. (2012). *An introduction to statistical concepts* (3rd ed.). New York: Routledge.

Love, T., & Cooper, T. (2004). Designing online information systems for portfolio-based assessment: Design criteria and heuristics. *Journal of Information Technology Education*, *3*(1), 65-81.

McNabb, M., & Vandersall, K. (2002). America's PT3 initiative: Addressing the 21st
century teacher quality challenge. *TechKnowLogia, 4*(4), 17-22.

McPherson, S. (2010, October 11). *E-portfolio systems for performance assessment and
program evaluation*. Retrieved from
http://education.jhu.edu/PD/newhorizons/Journals/Fall2010/McPherson

Means, B. (2010). Technology and education: Focus on student learning, *Journal of
Research on Technology in Education, 42*(3), 285-307.

Miller, R., & Morgaine, W. (2009). The benefits of e-portfolios for students and faculty
in their own words. *Peer Review, 11*(1), 8-12.

Mitchell, A. (2006, October). *NCATE unit standards 1 and 2*. Paper presented at
NCATE's Accreditation, Accountability, and Quality: An Institutional
Orientation and Professional Development Conference, Arlington, VA.

Mitchell, A., & Yamagishi, Y. (2005). *The results are in: What deans and NCATE
coordinators think about the NCATE unit standards*. Retrieved from
http://www.ncate.org/dotnetnuke/LinkClick.aspx?fileticket=%2BwVOfBHxvHA
%3D&tabid=357

Mitchell, A., Allen, S., & Ehrenburg, P. (2006). *Spotlight on schools of education:
Institutional responses to NCATE standards 1 and 2*. Washington, DC: NCATE.

Moore, R. (2003). Reexamining the field experiences of preservice teachers. *Journal of
Teacher Education, 54*(1), 31-42.

National Council for Accreditation of Teacher Education. (2008). *Professional standards
for accreditation of teacher preparation institutions*. Retrieved from
http://www.ncate.org/documents/standards/NCATE%20Standards%202008.pdf

NCATE (n.d.). *Quick facts about NCATE*. Retrieved from

http://www.ncate.org/Public/AboutNCATE/QuickFacts/tabid/343/Default.aspx

Noell, G. H., & Burns, J. L. (2006). Value-added assessment of teacher preparation.

Journal of Teacher Education, 57(1), 37-50.

Nowinski, M. B. (2005). NCATE endorses benchmarking of teacher licensure tests: Fall

meetings also focus on assessment, online programs. *AACTE Briefs, 26*(16), 1-8.

Ntuli, E., Keengwe, J., & Kyei-Blankson, L. (2009). Electronic portfolios in teacher

education: A case study of early childhood teacher candidates. *Early Childhood

Education Journal, 37*(2), 121-126.

Oner, D., & Adadan, E. (2011). Use of web-based portfolios as tools for reflection in

preservice teacher education. *Journal of Teacher Education*, *62*(5), 477-492. DOI:

10.1177/0022487111416123.

Owsiak, N. (2008). *Teacher quality accountability measures: Perceptions of degree and

direction of influence on university-based teacher education programs*. Ed.D.

dissertation, The George Washington University. Retrieved from

http://media.proquest.com/media/pq/classic/doc/1472138751/fmt/ai/rep/NPDF?_s

=ESptBfD%2BXkPUhs8mIJWA0Nzymr0%3D

Peck, C.A., Gallucci, C., & Sloan, T. (2010). Negotiating implementation of high-stakes

performance assessment policies in teacher education: From compliance to

inquiry. *Journal of Teacher Education, 61*(5), 451-463.

Reichheld, F. (2003). The one number you need to grow. *Harvard Business Review,

81*(12), 46-54.

Reusser, J., Butler, L., Symonds, M., Vetter, R., & Wall, T. J. (2007). An assessment system for teacher education program quality improvement. *International Journal of Educational Management, 21*(2), 105-113.

Rudner, L. M. & Schafer, W. D. (2001). Reliability. *ERIC Digest. ERIC Clearinghouse on Assessment and Evaluation*, Washington, D.C. Retrieved from http://www.ericfacility.net/databases/ERIC_Digests/ed458213.html

Sandoval, P., & Wigle, S. (2006). Building a unit assessment system: creating quality evaluation of candidate performance. *Education*, *126*(4), 640-652.

Schnackenberg, H. L., Zadoo, E., & Aubrey, D. (2007). 25 guidelines for NCATE unit assessment. *Journal of Education and Human Development*, *1*(1), 87-99.

Schulte, L. E., Danielson, L. M., Conway, D. F., & Clark, P. A. (2006, March). *Avoiding the pitfalls: A comprehensive approach to meeting NCATE's standard 2*. Paper presented at the annual meeting of the American Association of Colleges for Teacher Education, Hilton New York, New York, NY. Retrieved from http://citation.allacademic.com/meta/p142055_index.html

Sherry, A., & Henson, R. K. (2005). Conducting and interpreting canonical correlation analysis in personality: A user-friendly primer, *Journal of personality assessment, 84*(1), 37-48.

Shoffner, M. (2009). Personal attitudes and technology: Implications for preservice teacher reflective practice, *Teacher Education Quarterly, 36*(2), 143-162.

Sivakumaran, T., Holland, G., Wishart, W., Heynig, K., & Flowers-Gibson, B. (2010). Electronic assessment systems: Implementation, maintenance and support. *Focus on Colleges, Universities, and Schools, 4*(1), 1-9.

Slavin, R. E. (2007). *Educational research in an age of accountability*. Boston, MA: Pearson.

Strudler, N., & Wetzel, K. (2011). Electronic portfolios in teacher education: Forging a middle ground. *Journal of Research on Technology in Education, 44*(2), 161–173.

Swade, V., Parrish, T., & Walker, C. (2009). *Electronic assessment: Impact on teaching and learning.* Paper presented at the SoTL Commons Conference at Georgia Southern University, GA. Retrieved from http://digitalcommons.georgiasouthern.edu/cgi/viewcontent.cgi?article=1236&context=sotlcommons

Tabachnick, B. G. & Fidell, L. S. (2012). *Using multivariate statistics* (6th ed.). Boston: Pearson.

Teacher Education Accreditation Council. (2009). *TEAC principles and standards for teacher education programs*. Retrieved from http://www.teac.org/wp-content/uploads/2009/03/quality-principles-for-teacher-education-programs.pdf

TEAC (n.d.). *About TEAC*. Retrieved from http://www.teac.org/about/about-us/

Weitkunat, R., Kaelin, E., Vuillaume, G., & Kallischnigg, G. (2010). Effectiveness of strategies to increase the validity of findings from association studies: size vs. replication. *BMC Medical Research Methodology, 10*(47), 1-6.

Wetzel, K., & Strudler, N. (2005). The diffusion of electronic portfolios in teacher education: Next steps and recommendations from accomplished users. *Journal of Research on Technology in Education, 38*(2), 231-243.

Wetzel, K., Strudler, N., Addis, A. & Luz, T. (2009, March). *Trends in the use of electronic portfolios for accreditation purposes.* Paper presented at the annual

meeting of the Society for Technology and Teacher Education, Charleston, SC. Retrieved from http://coe.nevada.edu/nstrudler/SITE_09_Wetzel-Strudler.pdf

Whipp, J. L. (2003). Scaffolding critical reflection in online discussions helping prospective teachers think deeply about field experiences in urban schools. *Journal of Teacher Education, 54*(1), 321-333.

Wilkins, E. A., Young, A., & Sterner, S. (2009). An examination of institutional reports: Use of data for program improvement. *Action in Teacher Education, 31*(1), 14-23.

Wineburg, M. S. (2006). Evidence in teacher preparation: Establishing a framework for accountability. *Journal of Teacher Education, 57*(1), 51-64. doi:10.1177/0022487105284475

Yancey, K. B. (2009). Electronic portfolios a decade into the twenty-first century: What we know, what we need to know. *Peer Review, 11*(1), 28-32.

Yao, Y., Aldrich, J., Foster, K., & Pecina, U. (2009). Preservice teachers' perceptions of an electronic portfolio as a tool for reflection and teacher certification. *Journal of Educational Research & Policy Studies, 9*(1), 25-43.

APPENDICES

**Assessment Coordinators Perceptions of the Impact of Electronic Assessment
Systems on Meeting NCATE and CAEP Standards Survey**

The survey will take approximately 15 minutes to complete. Thank you for your willingness to participate in this research study.

SECTION 1

Please answer the following questions about your institution and your position.

Type of Institution?
- ○ Public
- ○ Private (nonprofit)
- ○ Private (for profit)

Overall Size of Entire Institution (FTE)?

- ○ 0-1500
- ○ 1501-2500
- ○ 2501-10000
- ○ 10001-15000
- ○ 15001-25000
- ○ >25001

Please answer the following questions regarding the electronic data system(s) you have in place to track your assessment information and for accreditation.

Please indicate the type of system(s) currently used to provide assessment data on your students.

- ○ Commercial
- ○ Developed in-house
- ○ Hybrid (combination of commercial and in-house)

Please select the primary assessment system(s) or electronic tool you are using to address the collection needs in your initial preparation programs (select only one).

- ○ Blackboard
- ○ Chalk&Wire
- ○ Digication

○ Epsilen

○ Filemaker Pro

○ Foliotek

○ ILAT Pass-Port

○ In-House System(s) or Database

○ Livetext

○ Mahara

○ Microsoft Access

○ Microsoft Excel

○ RCampus

○ TaskStream

○ TK20

○ TracDat- iwebfolio

○ Waypoint Outcomes

○ Teachscape

○ Other_____

In terms of the system(s) selected above, please answer the following questions.

How long have you been using the system(s) to collect data for NCATE/CAEP accreditation?

○ 1year or less

○ 2-3 years

○ 4-5 years

○ 6 or more years

Was the system(s) in use during your last NCATE/CAEP visit?

○ Yes

○ No

If you were just now considering purchasing/selecting your primary assessment system(s), knowing what you know today about your system(s), how likely would you be to select the same system(s) for your next CAEP visit?

- ○ Definitely Would Select
- ○ Probably Would Select
- ○ Not Sure I Would Select
- ○ Probably Would Not select
- ○ Definitely Would Not Select

SECTION 2

In terms of NCATE Standard 2, please answer the following questions about your <u>primary</u> assessment system(s).

How well did your system(s) address your need to systematically collect data?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow faculty access to information collected against goals and standards?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow you to aggregate data?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow you to disaggregate your data by program?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow you to collect student admission data?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) collect information on student dispositions?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow you to address your need to have multiple assessment points?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

171

How well did your system(s) allow you to collect information on professional, state, or national standards?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow you to collect information on clinical practice?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow you to collect teacher certification/licensure information on your program completers?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow you to collect student exit information on your program completers?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow you to collect information about your students after graduation?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

SECTION 3

In terms of CAEP Standard 5.3, please answer the following questions about your <u>primary</u> assessment system(s).

A) Performance Appraisal Against Goals and Relevant Standards

How well does your system(s) allow faculty access to information collected against goals and standards?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to address your need to have multiple assessment points?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to collect information on professional, state, or national standards?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) document leadership commitment to sustain continuous improvement?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) track the hiring of completers in fields for which prepared?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to collect cost of attendance against the Professional ED Unit set goals?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) compare cost of attendance against similar providers?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) use admission criteria as set by the Professional ED Unit?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

B) Tracking Results over Time

How well does your system(s) address your need to systematically collect data?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to aggregate data?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to disaggregate your data by program?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) collect information on student dispositions?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well did your system(s) allow you to collect information on clinical practice?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to collect student exit information on your program completers?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) track beginning salary of completers compared with national data for similar positions and locations?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) collect admission data and correlate the data with measures of P-12 student learning and development?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) track developing non-academic factors in relation to subsequent teacher performance? Examples include: volunteerism, civic organizations, commitment to urban issues, cultural competency, etc…

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to disaggregate completers by racial, ethnic and other target groups identified in the Professional ED Unit recruitment plans?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

C) Improving Program Elements and Processes

How well did your system(s) allow you to collect student admission data?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to collect teacher certification/licensure information on your program completers?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to collect information about your students after graduation?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) track students' graduation rate to drive improvement?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) track pattern of placement locations of completers over time to drive improvement in certain program elements?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to study the effectiveness of diverse field experiences on candidates' instructional practices?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to provide reliable or valid measures or innovative models of high quality practices, partnerships, clinical educators, or clinical experiences?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) share data with both internal and external audiences and use the data for program improvement?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

How well does your system(s) allow you to test the validity and reliability of measures to test and improve processes?

Extremely Well   Well   Moderately well   Moderately Poor   Poor   Extremely Poor

SECTION 4

Which best describes where teacher education is located in your institution?

- ○ School or College of Education
- ○ Department within Arts and Sciences
- ○ Department located elsewhere
- ○ Program within a department
- ○ Other, Please list below _____

How would you best describe your primary role?

- ○ Faculty member
- ○ Technology coordinator/director
- ○ Assessment coordinator/director
- ○ Department chair/teacher education director/dean/assistant dean/associate dean
- ○ Administrative assistant
- ○ Other, Please list below _____

175

Approximately what percentage of YOUR time is devoted to data collection, management, analysis, and reporting related to program approval and accreditation efforts?

○ Less than 25%

○ 25 to 50%

○ 50 to 75%

○ More than 75%

Given your current system, indicate the areas where your teacher education unit needs to increase resources to meet (or exceed) your requirements:

	High Need	Moderate Need	Low Need	No Need
More support for system administrators	○	○	○	○
More support for user	○	○	○	○
More personnel	○	○	○	○
Better Software functionality	○	○	○	○
More training / consultation	○	○	○	○
Better hardware	○	○	○	○
Other	○	○	○	○

Please provide any additional comments regarding your assessment system(s) which might help us better understand your answers to this research project.

Would you like to receive a summary of the results sent to you by email after completion of the study?

○ Yes, I would

○ No, I would not

If yes, please provide your email address (this information will not be shared and only be used in conjunction with this research project).

Optional- Name of Institution

*This survey is partially adapted from:

Council for the Accreditation of Educator Preparation (2013). CAEP Accreditation

Standards as approved by the CAEP Board of Directors for Accreditation of

Educator Preparation on August 29, 2013. Retrieved from

http://caepnet.org/accreditation/standards/

Kirchner, A. (2012). *Evaluation of Electronic Assessment System(s)s and Their Ability to*

Meet NCATE Standard 2 (Doctoral dissertation). Retrieved form:

http://digitalcommons.wku.edu/diss/20/

Corbin, R., Carpenter, C. D., Nickles, L. (2013) The capacity of teacher education

institutions in North Carolina to meet program approval and accreditation

demands for data. *International Journal of ePortfolio, 3*(1), 47-61.

Appendix B:

Institutional Review Board (IRB) Approval Letter

COLUMBUS STATE
UNIVERSITY

Institutional Review Board
4225 University Avenue • Columbus, Georgia 31907-5645

Date: 3/6/15
Protocol Number: 15-069
Protocol Title: Assessment Coordinators' Perceptions of the Impact of Using Electronic
Assessment Systems in the Transition from NCATE Standard 2 to CAEP Standard 5.
Principal Investigator: Saoussan Maarouf
Co-Principal Investigator: Deirdre Greer

Dear Saoussan Maarouf,

Representatives of the Columbus State University Institutional Review Board have reviewed
your research proposal identified above. It has been determined that the research project poses
minimal risk to subjects and qualifies for expedited review under 45 CFR 46.110.

Approval is granted for one (1) year from the date of this letter for approximately 250 subjects.
Please note any changes to the protocol must be submitted in writing to the IRB before
implementing the change(s). Any adverse events, unexpected problems, and/or incidents that
involve risks to participants and/or others must be reported to the Institutional Review Board at
irb@columbusstate.edu or (706) 507-8634.

You must submit a Final Report Form to the IRB once the project is completed or within 12
months from the date of this letter. If the study extends beyond 1 year, you must submit a Project
Continuation Form to the IRB. Both forms are located on the CSU IRB website
(http://research.columbusstate.edu/irb/). The completed form should be submitted to
irb@columbusstate.edu. Please note that either the Principal Investigator or Co-Principal
Investigator can complete and submit this form to the IRB. Failure to submit this required form
could delay the approval process for future IRB applications.

If you have further questions, please feel free to contact the IRB.

Sincerely,

Jennifer L. Brown, Ph.D.
Chair, Institutional Review Board

Appendix C:

E-mail Message Sent to Accredited NCATE Institutions

Dear Program Assessment Coordinator,

My name is Saoussan Maarouf. I am conducting a research for my doctoral dissertation at Columbus State University titled "Assessment Coordinators' Perceptions of the Impact of Using Electronic Assessment Systems in the Transition from NCATE Standard 2 to CAEP Standard 5" (please see the attached IRB letter). You were selected to be contacted about this research opportunity because you are currently working as a program assessment coordinator.

Due to the recent transition from NCATE and TEAC to CAEP, my study will analyze the impact of the major shift in accreditation requirements as it relates to the use of electronic assessment systems and compare the ability of such systems to meet NCATE Standard 2 and CAEP Standard 5. The research will more specifically study the perception of assessment coordinators in regard to the ability and readiness of colleges of education across the country to meet the newly established CAEP Standard 5.3.

I would appreciate your participation in this study because the results of this research will provide a solid basis for institutions of higher education to make an educated decision on implementing an electronic assessment system that provides critical pieces in the data collection puzzle to comply with the CAEP standards.

If you are interested in participating in this study, please follow this link:
http://columbusstate.qualtrics.com/SE/?SID=SV_0BS6MCwXCoOKAFn.

If you are interested in participating, I kindly ask you to complete the survey by April 30, 2015. Participants who complete the survey by the due date will be entered in a drawing for a chance to win a Charbroil grill delivered free of charge to the winner: http://www.charbroil.com/gas-grill-value-series-463622514.html

If you are not a program assessment coordinator in your institution, I would very much appreciate if you would forward this email to the proper recipient(s). I would welcome the opportunity to discuss this with you by phone if that would be helpful. In addition, I would be happy to provide any further information you may require in order to make a decision.

Thank you for your time.

Sincerely,

Saoussan

COLUMBUS STATE
UNIVERSITY

Ms. Saoussan Maarouf
LiveText Coordinator

College of Education and Health Professions
Jordan Hall, Room 351

181