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A Study of the Response to Accountability and Standardized Testing in a State University System: Predictive Models, Gatekeeping Strategies, and Intervention in Teacher Education

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A STUDY OF THE RESPONSE TO ACCOUNTABILITY AND STANDARDIZED
TESTING IN A STATE UNIVERSITY SYSTEM: PREDICTIVE MODELS,
GATEKEEPING STRATEGIES, AND INTERVENTION IN TEACHER EDUCATION

A Dissertation

Submitted to the School of Graduate Studies and Research

In Partial Fulfillment of the

Requirements for the Degree

Doctor of Education

Mary Lynn Barton

Indiana University of Pennsylvania

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Indiana University of Pennsylvania
The School of Graduate Studies and Research
Department of Professional Studies

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Title: A Study of the Response to Accountability and Standardized Testing in a State University System: Predictive Models, Gatekeeping Strategies, and Intervention in Teacher Education

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This study was an investigation of the perceptions of university certification officers in teacher education in a state university system regarding university responses to accountability, standardized testing, predictive models, gatekeeping, and intervention strategies, and incorporates the issues of social justice and ethics. This study also includes the development of a predictive model to predict results on the Praxis II Elementary Education: Curriculum Instruction and Assessment (ELED:CIA) test in one sample university.

Results of the quantitative study indicated that there are significant relationships between SAT tests scores, Praxis I test scores, first year college GPA and high school percentile. A regression analysis was conducted which concluded that all of the variables (SAT scores, high school percentile, Praxis I scores, and first year college GPA), when used together, can predict test scores on the Praxis II ELED:CIA test. A stepwise regression revealed that the removal of the SAT Math as a predictor variable would not adversely affect the variance accounted for (the different between 41.2% and 40.7%).

The qualitative component of the study revealed that the majority of the certification officers did not believe that using any one means of evaluation for teacher

education students as a gatekeeping device was a fair or just means of assessment and eliminated certain populations. In addition, it was perceived that standardized tests cannot measure talent, quality of teaching, skill, motivation to teach, disposition, or classroom management skills. Standardized high-stakes testing used as a gatekeeper was perceived as unethical; however, the use of standardized tests in combination with other assessment tools, some of which should be subjective, was perceived as ethical and just when used as a gatekeeper.

The predictive model developed could be used to provide interventions to assist teacher candidates in passing the Elementary ELED:CIA test. It could also be used earlier in students' programs to assist with the passing of Praxis I tests. Assessment of intervention strategies used would be beneficial, as well as the sharing of best practices for the purpose of assisting teacher education students in being successful.

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- *This dissertation is dedicated to my husband, Lloyd, who lived through the wild rantings and ravings of a maniac and yet stood by me and loved me anyway (and remained married to me!); my children, Kim and Brooke, who are still shaking their heads in disbelief; and my parents, Myrle and Isabelle, who are proud of what one of their children has accomplished.*

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CHAPTER 1

THE RESEARCH PROBLEM

Introduction/Purpose

The purpose of this study was to examine the response of selected university teacher education programs to increasing demands for high standards and passing scores on standardized tests. This examination included the development of a predictive model that could possibly be used in admissions, development of intervention strategies, and development of program modifications. This model could be used as a gatekeeper or an intervention tool at different levels throughout an education program (admission to the university, teacher candidacy, student teaching, or graduation and certification). Issues of social justice and ethics inherent in responding to higher standards while seeking to retain equal access for a diverse pool of future teachers were also examined. To accomplish this critical analysis, the study was composed of two methods of research, a two-phase data collection process as identified by Creswell (2002), one quantitative and the other qualitative. A large university state system was studied, and a predictive model was developed and analyzed in one sample university within the large state system.

The quantitative method was a statistical analysis of existing data at one sample university in a large university state system. This particular university was chosen for study because, for the last six years, the Praxis II Elementary Education: Curriculum Instruction and Assessment (ELED:CIA) pass rates have been below the state pass rates (Title II Higher Education Act [Title II], 2006). The results of this analysis could potentially provide gatekeeping information to address possible changes in admission criteria, development of intervention strategies that may be made available at different

stages of a student's program, and/or modification of program curriculum in the teacher education program to assist the students in becoming successful.

Gatekeeping is a screening mechanism used at different points in the educational process to prevent entrance or to halt progress in a program for students who are not equipped with the requisite knowledge, skills, and values needed for successful completion of an education program (Koerin & Miller, 1995). It is a means of controlling access, and is commonly used by university admissions offices to determine entry into universities. Usually several variables are assessed for admission to universities (i.e., SAT scores, high school rank, high school grade point average) to predict the probable success of students and to admit or deny admittance to the university. Gatekeeping is also used by universities at program levels by requiring students to meet certain criteria in order to enter, progress, and exit their programs (i.e., grade point average, grades in specific coursework). Teacher education programs have had to adapt to new standards and gatekeeping procedures implemented by both national and state educational agencies as the call for more highly qualified teachers remains at the forefront of political educational agendas.

The model developed in this study was based on the statistical analysis of factors (SAT scores, high school percentile, Praxis I scores, and first year college grade point average) that contribute to the ability of students to pass Praxis II tests, in particular, the Elementary Education: Curriculum Instruction and Assessment test, in the process of gaining state certification. The development of this predictive model is intended to assist in creating interventions to aid a talented, qualified, and diverse population of potential teachers in being successful.

If such a model was to be used solely as a gatekeeping function for admission to a teacher education program by predicting passage of future tests, it could possibly eliminate the opportunity for other students who demonstrate quality and talent and may affect the diversity of the future pool of teachers. However, the information obtained or the model developed could also be used to develop intervention strategies or modify program curriculum to increase the probability of successful passing of standardized tests once students have been accepted into teacher education programs. Although the predictive model can be used at various levels of the teacher education process (admission to the university, teacher candidacy, student teaching, and graduation and certification), its use in predicting the probability of success on Praxis II tests, which are based primarily on college course content, might address the possible need for modification of program curriculum. Since standardized tests continue to be required in the nation and in the state under study for teacher education students, this information could also promote the recruitment and retention of a larger pool of talented, qualified, and diverse students by identifying the use of intervention strategies or program modifications to assist in successful completion of Praxis standardized testing.

The qualitative method of research was composed of interviews of teacher certification officers in the same large university state system in which the quantitative study was conducted. The interviews focused on the perception of issues that exist with the use of predictive models and standardized testing as gatekeeping tools, and the ethics and justice of using them as gatekeeping methods to admission to and progression in teacher education programs. Also included in the interviews were questions regarding how the predictive model might assist with admission policies, intervention strategies and

program curriculum, what predictive models are currently being used by any of the state schools and at what point in the program they might be used, and other strategies that the schools in the large university state system are using or are anticipating implementing to meet the high standards of state and federal policy with the requirement of standardized testing and a highly qualified teacher in every classroom.

With national, state and local leaders in agreement that there should be a qualified teacher in every classroom (EPLC Reports and Publications [EPLC], 2003), and with teacher quality considered to be the best solution to student achievement (National Commission on Teaching and America's Future [NCTAF], 1996), the need for universities to effectively admit and teach prospective future teachers while providing the tools necessary to educate and certify a talented, qualified, and diverse pool of teacher candidates is critical. Standardized testing is currently utilized to assess teacher quality in many states, and past studies indicate that standardized tests are an obstacle for minority and low-income populations, eliminate talented and qualified students, and are biased (College Board, 2006; Haney, Madaus, & Kreitzer, 1987). The U.S. Census Bureau is predicting a large increase in the minority population within the next 40 years, and it is estimated that 40% of public schools have no minority teachers at all (U.S. Department of Education National Center for Education Statistics [USDOE National Center for Education Statistics], 1999). With the expected rise in minority populations, the issue of bias in standardized tests, and the elimination of talented and qualified potential teachers due to the inability to test well (Darling-Hammond, 1998; Kuncel, Hezlett & Ones, 2004), the justness and fairness in the evaluation of potential future teachers needed to be investigated.

Statement of the Problem

Higher education has experienced increased calls for accountability from constituents, with teacher quality in the forefront of current discussions (Spellings, 2006). Many new policies have been implemented to meet the call for accountability, from the national No Child Left Behind (NCLB) Act (U.S. Department of Education [USDOE], 2006) to policies implemented by individual states. Universities are being held accountable and need to effectively admit and teach prospective future teachers while providing the tools necessary to educate and certify a talented, highly qualified and diverse pool of teacher candidates. Admission criteria, intervention strategies and program modification should be addressed in order to ensure that universities are actively assisting potential teachers in making them successful.

The justness and fairness of the use of standardized tests as a teacher education program requirement also needs to be examined since some potentially qualified, talented, and diverse potential teachers may be eliminated from the teaching pool due to standardized testing requirements alone. Currently, the minority population is not well represented in the teaching force (Gillis, 1990-91) and the public school demographics continue to change, with a steadily increasing minority population (USDOE National Center for Education Statistics, 2007). One barrier for minority populations has been identified as the passing of standardized tests, which some critics believe are biased and eliminate minority populations (College Board, 2006; Haney, Madaus, & Kreitzer, 1987). Minority populations may well have been educated in low income areas where schools have less than adequate resources and expectations. Some minority students might have more potential than opportunity due to these limited resources and expectations.

Specifically preparing this minority population for standardized tests in the context of a strong education may be particularly helpful to these students. At the present time, 34 states require passing of Praxis tests for teacher certification, and a number of other states require the passing of various other standardized tests (Educational Testing Service [ETS], 2006). Test anxiety has also been determined to be an obstacle for some students (Darling-Hammond, 1998; Kuncel, Hezlett & Ones, 2004).

Currently nearly 4 out of every 10 students in the United States belong to a minority group, and it is predicted that by 2035, Whites may be the minority in the United States. At this time, the teaching profession is overwhelmingly White and female (National Education Association, 2007). Additionally, the U.S. Census Bureau projects that by the year 2050, about half of the U.S. population will be minorities and will be equally reflected in our nation's public schools (USDOE National Center for Education Statistics, 2007). Matching the diversity of teachers to the diversity of students has been identified by some as an important component of providing quality and equality to all students (Dilworth, 1990; Dorman, 1990; Franklin, 1987; Gillis, 1990-91; King, 1993a). Also, it is appropriate to provide access to all professions for diverse individuals who seek to enter them and have the potential to do so.

Significance of the Study

The intended outcome of this research is to assist the national effort in supplying a more qualified, talented, and diverse pool of teachers for the future by adding data regarding teacher education reform in the context of the shifting demographics. The results of the research might lead to improved policies related to recruitment and retention of a talented, qualified, and diverse pool of students in teacher education to

include equal access to teacher education opportunities, and the continued improvement of teacher education programs to meet the rigorous demands of the state department of education and the NCLB standards. Additionally, making data-driven decisions regarding admission of students to teacher education programs, provision of intervention strategies, and development of program modifications could increase the pool of talented, highly qualified and diverse teachers. Furthermore, the justness and fairness of the use of standardized testing for assessing the quality of potential future teachers is also of significance since it has been shown to affect the talent and diversity of the teaching pool (Gillis, 1990-91; King, 1993b).

Only one large university state system is being examined regarding current and anticipated policies, procedures and programs being used or developed to assist in adjusting admission criteria, creating intervention strategies, and modifying programs. However, the information gleaned from this study may be used by other universities to modify their teacher education requirements as well. The universities in the state system were examined to determine if there is a pattern or theme that might be of assistance to other universities in providing aid to students in meeting the requirements for teacher certification successfully. Mandatory passing of standardized tests is currently required for evaluation of potential future teachers and additional studies should be conducted. These studies should continue the examination of bias in standardized testing and the use of high-stakes tests for teacher education candidates and the effect it has on teacher quality, talent and diversity of the teacher education pool.

Because the placement of highly qualified teachers in every classroom in the nation is a priority for both educators and policymakers (USDOE, 2006), research that

provides good insights into teacher education can have a positive effect on K-12 education. The continuous improvement of teacher preparation interventions and programs to address the critical need to have a qualified teacher in every classroom is crucial to the success of K-12 learners. There should be accountability to stakeholders, including K-12 students, parents of K-12 students, and university students and their parents, resulting in more satisfaction of stakeholders and improved learning of K-12 students.

Background of the Study

Student achievement has become a prominent national concern and after almost twenty years of standards-based education reform, it appears that teacher quality is the strongest factor in student achievement (NCTAF, 1996). The public agrees that teacher quality is of great importance as indicated by a national poll conducted by Recruiting New Teachers, Inc. in 1998 (Haselkorn & Harris, 1998).

When U.S Secretary of Education, Margaret Spellings, established the Commission on the Future of Higher Education on September 19, 2005 (USDOE, 2006) and announced her plans to improve the U.S. higher education system based on the Commission's recommendations, states across the nation took note. Spellings observed that urgent improvement is needed. One of her recommendations was to improve the quality of higher education. Margaret Spellings also addressed the need for accountability in her September 2006 recommendations and noted the need to report publicly in order to provide consumers and policymakers a way to measure the effectiveness of colleges and universities (USDOE, 2006), which also encourages universities to improve the quality of their teacher education candidates.

Beginning in 1998, federal policy took on a more proactive role than in the past regarding the preparation and certification of teachers. Title II of the federal Higher Education Act (2006) was amended to require states and higher education institutions to report annually on the status of teacher preparation. In another federal effort, even though all states were already concerned about student learning, in January of 2002, President George W. Bush signed a national education policy, the No Child Left Behind (NCLB) Act, which sets national policy for all children, all teachers, and all schools and requires states to implement national policy in order to qualify for federal funding. It includes the need for all teachers to be highly qualified (USDOE, 2006).

The state in which the university system in this study operates was already committed to a strong, standards-based system and had adopted Chapter X (a pseudonym is being used for anonymity and is referenced as State Department of Education, State Code [SDOE, State Code], 2006). Chapter X requires the preparing institution to have in place a required document for applications for admission to initial and advanced preparation programs which culminate in a bachelor's degree or higher to be admitted to a professional education program. With the NCLB Act stipulating that a highly qualified teacher be in every classroom, the state under study noted the importance of teacher education programs at the university level. The need for traditional university-based teacher education programs has not been debated in literature, but the need to improve teacher education programs has been addressed (Darling-Hammond, 1998). Universities need to demonstrate their ability to graduate students who are considered highly qualified in the public school system. In order to meet this demand, universities must be proactive

in developing and adjusting admission criteria, intervention strategies, and program curriculum that produce a talented, highly qualified, and diverse pool of teachers.

In addition to Title II, NCLB and Chapter X, the issue of standardized testing remains in the forefront of discussions and debates, with the effect of standardized testing on the talent, quality, and diversity of the teaching pool being major issues (King, 1993a; Darling-Hammond, 2000b). SAT and Praxis tests consistently and for decades have reported lower scores for minorities and low-income students and despite attacks by Nairn, Nader and staff (1980) regarding the “reign of ETS,” reformers pressed on with demands for accountability through increased testing (Popham, 2000). Testing bias has also been examined and, although it is difficult to determine what testing bias is, Scheuneman and Slaughter (1991) listed five biases that make test results suspect: historical, cultural, biological, educational, and psychometric (confusion about the test). In addition to testing bias, life bias may also be suspect. Life bias may include such things as economic conditions, racial inequality, insufficient funding for schools, gender, lack of family support, or poor testing conditions (Wakefield, 2003). To add to the concern of the use of standardized tests as mandatory requirements for entrance and exit from teacher certification programs is the issue of eliminating talented students on the sole basis of their ability to pass standardized tests (Darling-Hammond, 2000b).

There is a history of standardized testing suggesting that they may be significant barriers to many students from minority and low-income populations (King, 1993a; Graham, 1997). The removal of barriers for these populations will allow a more representative teacher pool and will provide a just and fair system of evaluation to all populations. The U.S. Census Bureau forecasts that about one-half of the U.S. population

will be African-American, Hispanic, or Asian by the year 2050 (USDOE National Center for Education Statistics, 2007). Currently, nearly 4 out of every 10 students in the United States is a member of a cultural or racial minority; yet the teaching profession is overwhelmingly White and approximately 40% of all public schools have no minority teachers at all on their staff (National Education Association, 2007). Additionally, the importance of having diversity of teachers along with the diversity of students has been addressed and is considered to be a significant issue (Dilworth, 1990; Dorman, 1990; King, 1993a).

With NCLB requirements demanding a quality teacher in every classroom, and with states attempting to educate those prospective teachers while creating a qualified, talented and diverse pool of future teachers, universities must enable students to meet the standards by adjusting admission criteria, providing intervention strategies, and modifying programs to best equip students to be successful. Federal and state governments, along with universities, must also take into consideration the justice of eliminating certain populations by using gatekeeping methods such as standardized tests as mandatory criteria for determining the quality and certification of prospective teachers.

Need for the Study

Studies such as this are needed to provide insight into the fact that universities must respond to higher standards even as they seek to admit a diverse pool of potential teachers. To meet the demand of a highly qualified teacher in every classroom, universities must be held accountable and adjust, modify and fine-tune their admittance procedures, intervention strategies, and teacher preparation programs to better develop a talented, qualified, and diverse pool of potential future teachers.

In addition, examination and assessment of the use of gatekeeping models for teacher education students (at admission to a university, at teacher candidacy level, at admission to student teaching, and at graduation and certification) as criteria for the success of teacher education candidates can assist in fairness and justness for all individuals. Examination and assessment of the current use of standardized testing is also essential since it can limit the talent and diversity of potential teachers. Testing bias has been documented in regard to SAT tests, and the content of the SAT test has changed numerous times, usually due to criticism of prejudice and the need to align with current curriculum and institutional practices in high school and college. Critics claim that the SAT test is biased toward the White male, and it has been documented that SAT scores vary according to race, income, and parental educational background (College Board, 2006). Furthermore, educational background can be an issue, and those from low income areas that have less than adequate resources and limited expectations in K-12 schools may have more difficulty in passing standardized testing. Many times there is more potential than opportunity for minority populations. Because of less educational opportunity, past performance on standardized testing, and bias in testing (College Board, 2006; Haney, Madaus, & Krreitzer, 1987; Darling-Hammond, 1998; Kuncel, Hezlett & Ones, 2004), the fairness of standardized testing needed to be examined.

Furthermore, since standardized testing currently continues to escalate in importance in assessing the quality of teacher candidates, assistance at different academic levels should be developed to ensure a just and ethical method of developing potential teachers. Improved policies related to recruitment and retention of a talented and diverse pool of students in teacher education programs, equal access to teacher education

opportunities, successful completion of education programs, and increasing the number of qualified teachers is the intended outcome of this study.

Definition of Terms

For the purpose of this study, the following definitions will appear in the study:

Chapter X – A pseudonym is being used for anonymity. Chapter X is the standards for the preparation of professional educators in the state under study which was approved by the State Board (SDOE, State Code, 2006). This code requires the preparing institution to have a required document for applications for admission to initial and advanced preparation programs which culminate in a bachelor's degree or higher to be admitted to a professional education program. Academic preparation includes specific course requirements and the maintaining of a certain level of academic performance in each academic discipline that the candidates plan to teach. Curriculum standards must also be met, including application of knowledge and demonstration of assessment abilities, as well as knowledge of educational technology. Field experiences and student teaching are also required.

Gatekeeping – A screening mechanism used at different points in the educational process to prevent entrance or exit from a program of students who are not equipped with the requisite knowledge, skills, and values needed for successful completion of an education program (Koerin & Miller, 1995).

Highly qualified teacher – A highly qualified teacher as defined by NCLB must have a bachelor's degree, full state certification and licensure as defined by the state, and demonstrated competency, as defined by the state, in each core academic subject he or she teaches (USDOE, 2006). Quality teachers have a grasp of the subject matter they

teach (NCTAF, 1996); knowledge and skills in conveying that content through a variety of strategies so that diverse students can learn it (Darling-Hammond, 2000a); good verbal skills for conveying content and otherwise communicating with students) and successful experience (Murnane, 1985).

K-12 – In schools in the United States, K-12 is reflective of kindergarten, elementary school, middle school and high school.

No Child Left Behind (NCLB) Act - A national K-12 education law, signed in January 2002 by President Bush that is very broad, setting national policy for all children, all teachers, and all schools and requiring states to implement national policy in order to qualify for federal funding. Key provisions are: states must establish academic standards, test all children in grades 3-8 annually, and ensure that all children achieve proficiency on state standards within 12 years; all teachers must be "highly qualified;" and no certification requirements can be waived on an emergency basis (USDOE, 2006).

Praxis standardized testing – Praxis tests are standardized state certification exams administered by ETS and required in many states for teacher education students in order to be certified to teach in that state. These exams test a student's mathematics, reading, writing, and subject-area knowledge. States develop their own pass rates, and students must attain those passing scores to be recommended to the state department of education for teacher certification. Praxis I tests include Reading, Writing and Mathematics. Praxis II tests are specific to the subject area. The Elementary Education: Curriculum Instruction and Assessment test is a Praxis II test designed to assess methodology knowledge of teacher candidates (ETS, 2006).

Predictive model – Predictive models or equations are developed from prediction studies that are conducted to test variables believed to be good predictors of a criteria. Prediction studies are used to predict an individual's likely level of success in a specific course or program (Gay & Airasian, 2003).

SAT test – Standardized test required by many universities and colleges as admittance criteria. It measures critical reading, mathematical reasoning, and writing skills that students have developed over time and that they need to be successful in college (College Board, 2007).

Teacher Preparation Programs – Educational programs developed by universities to prepare future teachers and provide state certification. Programs usually include general education coursework, methodology courses, and subject matter content knowledge. Requirements of program content and standardized testing are determined by the state and various accrediting bodies (College Board, 1996).

Title II – Title II of the Federal Higher Education Act was amended in 1998 regarding the preparation and certification of teachers, and requires states and higher education institutions receiving federal funding to report annually on the status of teacher preparation. Title II reporting includes standards for teachers and their alignment with standards for students; requirements for an initial teaching certificate or license through either an alternate or regular route; pass rates on each assessment used by states in certifying or licensing teachers; state standards for evaluating the performance of teacher preparation programs; and teachers in the classroom on waivers, that is, teaching without an initial regular certificate or license from any state. The law also requires institutions to include the information in their reports in publications such as college catalogs and

promotional materials sent to potential applicants, secondary school counselors, and prospective employees of an institution's graduates (Title II, 2006).

Research Questions

This study was designed to explore issues in the response of universities to new standards and includes a quantitative analysis that could lead to a predictive model. Furthermore, this study includes a qualitative component that identifies concerns related to the justness and fairness of using standardized testing and gatekeeping methods as requirements for entrance and exit to teacher education programs.

This dissertation uses both qualitative and quantitative research methods to address the following questions:

1. To what extent are SAT scores (verbal and mathematics), Praxis I scores (Reading, Writing and Mathematics), first year college grade point average (GPA), and high school percentile correlated at one sample university within a large university state system? To what extent are these variables predictors of the Praxis II ELED:CIA test at the sample university?
2. What university adjustments to teacher education programs at various levels have been implemented or plan to be implemented at universities in the system under study to address the changes in state and federal law, and to meet the requirements of standardized testing?
3. What is the perception of university certification officers regarding gatekeeping and its impact on admissions, intervention strategies, and curriculum revision and assistance leading to students' success?

4. What is the perception of university certification officers at the same large university state system regarding ethical and social justice issues relating to gatekeeping methods for admission to teacher education programs and successful continuance in teacher education programs, and the effect this might have on the diversity of the potential pool of teacher candidates?

Summary

Providing insight into the fact that universities must respond to higher standards even as they seek to admit a diverse pool of potential teachers and at the same time meet the demand of a highly qualified teacher in every classroom, is in the best interest of all students. Universities must adjust, modify and fine-tune their admittance procedures, intervention strategies, and teacher preparation programs to better develop a talented, qualified, and diverse pool of potential future teachers.

In addition, examination and assessment of the use of predictive models and gatekeeping to determine admittance or continuance in teacher education programs can assist in fairness and justness for all individuals. Furthermore, examination and assessment of the current use of standardized testing is critical since it can limit the talent and diversity of the pool of potential teachers. However, since standardized testing currently continues to be highly regarded in many states across the nation as an assessment tool for teacher candidates, academic assistance should be developed to ensure a just and ethical method of developing potential teachers. This allows for equal access to teacher education opportunities, successful completion of education programs, and increasing the number of qualified teachers.

Since university teacher education programs have historically been the accepted method of educating potential future teachers for the eventual attainment of state certification (National Education Association, 2003), educators must reexamine the current standards used for admission and retention in teacher education programs to effectively admit and teach prospective future teachers while providing the tools necessary to educate and certify a talented, qualified, and diverse pool of teachers. Making data-driven decisions regarding admission, interventions, and program content ensures potential teachers being highly qualified.

Additionally, the requirement of high-stakes standardized testing for teacher candidates is an issue of ethics and justice, particularly since it limits talent, quality, and diversity of the teaching pool. Critics claim that testing bias and life bias in standardized testing eliminates minorities and low-income students (Scheuneman & Slaughter, 1991; King, 1993a; Graham, 1997). However, reformers continue to persist with demands for accountability through increased testing (Popham, 2000). With nearly 4 out of every 10 students in the United States currently being a member of a cultural or racial minority and the anticipation of half of the U.S. population being African-American, Hispanic, or Asian by 2050 (USDOE National Center for Education Statistics, 2007), there is a need for the teaching pool to be representative of the student population in order to provide role models and multiple perspectives. Currently, the teaching profession is overwhelmingly White and approximately 40% of all public schools have no minority teachers on staff (National Education Association, 2007). Additionally, elimination of talented students from the teaching profession because of their inability to pass

standardized tests needs to be examined in order to provide a just and fair system for all populations (Kuncel, Hezlett & Ones, 2004).

Continuous improvement of the educational system to increase the talent, quality and diversity of the teaching pool should be a priority for all educators. Evaluation and assessment of the tools used to determine the quality of potential teachers should be considered a priority.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

The purpose of this study was to examine the response of selected university teacher education programs to increasing demands for high standards and passing scores on standardized tests. This examination included the development of a predictive model that could possibly be used in admissions, development of intervention strategies, and development of program modifications. This model could be used as a gatekeeper or an intervention tool at different levels throughout an education program (admission to the university, teacher candidacy, student teaching, or graduation and certification). Issues of social justice and ethics inherent in responding to higher standards while seeking to retain equal access for a diverse pool of future teachers were also examined. To accomplish this critical analysis, the study was composed of two methods of research, a two-phase data collection process as identified by Creswell (2002), one quantitative and the other qualitative. A large university state system was studied, and a predictive model was developed and analyzed in one sample university within the large state system.

While the quantitative method developed a predictive model that might be used to adjust admission criteria, determine intervention strategies, or modify program curriculum to assist students in being successful, the qualitative component examined what interventions colleges and universities have developed or modified or anticipated developing or modifying to address admission and retention and recruitment of a qualified, talented, and diverse pool of potential future teachers. The qualitative component also included examination of the perception of university certification officers

regarding the justice of using standardized testing and predictive models to evaluate teacher quality, and how that affects the talent, quality and diversity of the teaching pool. This review of literature is organized around the following: teacher quality; teacher academic ability; standardized testing and its effect on the talent of potential teachers and minority recruitment and retention; ethical and social justice issues related to standardized testing; correlation and prediction; and adaptations made by universities to address current state and federal requirements.

Student achievement has become a significant concern of the nation and teacher quality is a key factor in student achievement (National Commission on Teaching and America's Future [NCTAF], 1996). A national poll conducted by Recruiting New Teachers, Inc. in 1998 (Haselkorn & Harris, 1998) indicates that the public also believes that teacher quality should be a priority. With the quality of teachers being in the forefront of educational issues and the need for colleges and universities to meet that challenge, this study was developed to address the role of colleges and universities in providing effective education and tools to ensure the quality of future teachers and to address the justness and fairness of using standardized testing as a determining method of evaluating future teachers.

Research has been conducted on the use of standardized testing and its effect on minority and low-income populations, as well as its effect on the talent and quality of the potential teaching pool. This review of existing research examines recent and historical information and perceptions related to the use of standardized tests as gatekeeping systems, and the fairness and justice of using standardized tests as a mandatory means of

assessing the quality and certification of future teachers, and its effect on the talent and diversity of the potential teaching pool.

Additionally, the correlation of variables and the development and use of predictive models was examined in order to provide a sound research base for the development of a predictive model and the correlation of several variables. Manipulation of variables to determine better predictive models was also addressed.

The final review of literature includes adaptations made by several universities in an attempt to increase the success of their potential teachers. Some universities have adjusted program curriculum and developed strategies to assist students in passing standardized testing, in particular, Praxis II tests.

Teacher Quality

Teacher quality has for many years been a focus of ongoing research and debate on the part of national policymakers as well as those who work in teacher preparation programs. Federal and state legislation has addressed the need for teacher quality with the establishment of No Child Left Behind (NCLB), Title II, standardized testing, and the Praxis Series. Also in the dialogue with educators and policymakers is the continued development of teacher preparation programs and the need for better recruitment and retention of teachers.

The definition of a highly qualified teacher as defined by NCLB is a person that has a bachelor's degree, full state certification and licensure as defined by the state, and demonstrated competency, as defined by the state, in each core academic subject he or she teaches (USDOE, 2006). The state in this study adds to the federal definition by including completion of pedagogical course work in education and student teaching

(Highly Qualified Teachers in STATE, 2003). Darling-Hammond (2000a) defines a quality teacher as one who understands the subject matter that he/she teaches, can convey that knowledge to a diverse student population, and has good verbal ability and successful experience.

“Quality teaching” matters in improving student academic achievement (EPLC, 2003). Studies done in Texas and Tennessee indicate that the effect of teacher quality on student performance is more important than other school variables and can prevail over family background characteristics as well (Ferguson, 1998; Sanders and Rivers, 1996). Having high quality teachers (especially consecutive high quality teachers) can even close the achievement gap between disadvantaged and non-disadvantaged students. (Haycock, 1998).

Although there are differing opinions on how to produce and assess highly qualified teachers, there is a consensus that the ultimate goal is to provide a qualified teacher in every classroom in the nation (USDOE, 2006). Most concur that there is a need to hire approximately two million teachers by 2010 (Darling-Hammond, 2000b). Additionally, it is estimated that 30% of new teachers do not teach more than two years (Odell & Ferraro, 1992; Peterson, Williams, Dick & Dunham, 1998). Furthermore, the high drop-out rate among new teachers continues (Scherer, 1990). Therefore the education and quality of potential teachers becomes an even higher priority.

The concern of educators and policymakers alike is improvement in student achievement and after almost twenty years of standards-based education reform, national and state policymakers, along with educators, all want quality teachers in the classroom

to ensure optimal learning of K-12 students (USDOE, 2006). In pursuit of this goal, many policies and laws have been formed both at the national and local levels.

No Child Left Behind

The federal No Child Left Behind Act (NCLB) is the comprehensive reauthorization of the Elementary and Secondary Education Act of 1965, and commits the entire nation to a goal of universally high academic standards. One component of the NCLB Act stipulates that states define what it takes to be a qualified teacher. The NCLB directives for a highly qualified teacher have ignited new efforts to attract teachers into the profession and support them after they enter; however there remain many shortcomings with NCLB (Berry & Darling-Hammond, 2006; SDOE, 2006). Berry and Darling-Hammond (2006) identify some of the shortcomings as inflexibility for multiple-subject teachers, insufficient resources for recruitment and preparation, disregard for teacher working conditions, and too little technical knowledge available to school districts. The NCLB Act was due for renewal in January 2007, and in April 2008, U.S. Secretary of Education, Margaret Spellings, proposed new regulations to strengthen and clarify NCLB.

Title II

Also on the federal level, Title II of the federal Higher Education Act was amended in 1998 regarding the preparation and certification of teachers, and requires states and higher education institutions to report yearly on the status of teacher preparation (USDOE, 2006). The Title II reporting requires annual report cards that include an explanation of certification assessments and standards that must be met for initial certification (including pass rates of Praxis testing), how certification requirements

are aligned with state academic standards, the percentage of teaching candidates who passed each certification assessment and the passing score required by the state, the number of teachers granted emergency teaching credentials and the prevalence of these credentials in high and low-poverty school districts and among subject areas, an explanation of the state's alternative certification programs and the percentage of teachers certified through these programs who pass state certification assessments, state criteria for assessing teacher preparation programs, and information about how prospective teachers are assessed for subject matter knowledge. Higher education institutions must also report on the number of students enrolled in teacher preparation, the average number of hours of supervised student teaching, and the faculty-student ratio in student teaching, as well as whether the program is accredited or designated as low-performing by the state (USDOE, 2006).

Chapter X

At the state and local levels, many policies and procedures have been developed or improved to assist in meeting NCLB standards and ensuring quality teachers in every classroom. The state under study developed Chapter X to address the need for a highly qualified teacher in every classroom. Chapter X requires a public school teacher to obtain a state teaching certificate appropriate for the grade level and subject matter that the applicant was teaching. Both the State Board of Education regulations and the State Department of Education standards regulate teacher preparation and certification. In order to become certified to teach in the public school system in this state, one must complete a minimum of a bachelor's degree in an approved teacher education program, pass appropriate Praxis tests, and be recommended to the State Department of Education

by the certification officer at the university in which he/she received his/her degree (SDOE, 2006).

Accreditation

In an effort to ensure potential teachers are highly qualified, many institutions seek external professional accreditation. Some of the universities in the state system under study are accredited by the National Council for the Accreditation of Teacher Education (NCATE), considered by many to be a standard of excellence in teacher preparation. NCATE defines accreditation as “a process for assessing and enhancing academic and education quality through voluntary peer review” (National Council for Accreditation of Teacher Education [NCATE], 2006). Seven hundred out of 1200 teacher preparation institutions are NCATE accredited or candidates for NCATE accreditation and many of the states without NCATE accreditation have adapted NCATE standards as their state standards. The primary purpose of NCATE, and its mission, is:

to ensure high quality teacher and other educator preparation programs through professional accreditation of education units in U.S. colleges and universities.

NCATE’s performance-based system of professional accreditation fosters competent performance of classroom teachers and other educators to improve the education of all P-12 students. It is a primary mechanism to advance professionalism in teaching (NCATE, 2006).

NCATE has four goals: 1) to operate an efficient and effective accreditation system, 2) to strengthen the quality of preparation programs for professional school personnel, 3) to enhance the role of accreditation in a comprehensive quality assurance system for the education profession and 4) to improve the quality of educator preparation

programs by encouraging more institutions to participate in the accreditation process (NCATE, 2006).

NCATE was founded in 1954 by 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). All of these organizations are key stakeholders in producing teacher quality and are concerned about the ability of our higher education institutions to produce high quality teachers. In an effort to supply high quality teachers to our nation, these organizations recognized the need for an independent means of evaluating teacher quality (NCATE, 2006). NCATE is not the only accrediting body in the nation, but is considered to be one of the most prominent.

A study that was done in 1999 related to the effectiveness of NCATE accredited schools versus non-NCATE accredited schools. ETS examined 160,000 candidates seeking a teaching license between 1995 and 1997 who took Praxis II tests in the content area and who also had taken the SAT, and compared the candidates by attendance at NCATE accredited schools. Their findings indicated that 91% of those from NCATE accredited institutions passed the Praxis II tests, while only 83% of those graduating from unaccredited institutions passed the Praxis II tests, which is statistically significant (Wise, 1999).

Teacher Academic Ability

Teacher academic ability has been a concern since at least the 1920s (Haney, Madaus & Kreitzer, 1987) and still remains a concern. Although SAT scores provide an

analysis of academic ability at the end of high school, and although many qualities that are unrelated to academic ability go into making an accomplished teacher, “it would be absurd to argue that academic ability is not or should not be at least one measure of teacher quality” (Weaver, 1983, p. 1). Gitomer and Latham (2000) agree that academic ability is one component of academic aptitude.

Higher education needs to focus on teacher academic ability, and address both the product and the process. Vanazza and Winter suggest that many processes must be involved in higher education.

Modifications to the systems in higher education are needed with respect to both instruction and administration, with attention to all the processes of the institution. With its focus on quality, involvement, and continuous improvement of both the product (student achievement) and the process (teaching and learning), the principles of total quality management contribute to the improvement of higher education. (Vazzana and Winter, 1997, p. 2)

Traditional approaches to teacher education are university-based certification programs, and these programs continue to change to address the necessity of developing in potential teachers the need for multicultural competence and awareness of diversity issues (Haberman & Post, 1998). Academic programs also need to be modified to address successful completion of Praxis testing since the passing of Praxis testing is required for certification in 34 states, including the state under study. Other states also require some form of standardized testing (USDOE, 2006).

Many people believe that anyone can teach, or at the very least, that knowing the subject area is enough to enable a person to teach the subject well (Darling-Hammond,

2000a). Others believe that teaching can be learned by trial and error on the job (Darling-Hammond, 2000a). Evidence however, shows that, even with alleged shortcomings of current teacher education programs, certified teachers are generally better rated and more successful with students than teachers without this preparation (Ashton & Crocker, 1986; Evertson, Hawley, & Zlotnick, 1985). Additionally, these authors and others (Darling-Hammond, 2000a, 2000b; Gitomer, Latham, & Ziomek, 1999; Haycock, 1998; Haselkorn & Harris, 1998; Murnane, 1985), have found that pedagogical knowledge (including knowledge of learning, teaching methods, and curriculum) is more frequently found to influence teaching performance and often exert even stronger effects than subject-matter knowledge.

It is important to note that a significant majority of teachers admit to feeling underprepared to teach the material before them, and discover that they lack the basic knowledge and skills needed for successful teaching in even the earliest grades (Core Knowledge Foundation, 2002). Many have admitted their teacher training was inadequate at best. Teachers are becoming more concerned with each stage of teacher education, from core knowledge curriculum to national standards. The National Center for Educational Statistics found that only 36% of new teachers feel “very well prepared” to teach to the challenging new academic standards being introduced (Darling-Hammond, 2000b).

Liston, Whitcomb and Borko (2006) note that teacher education programs must do a better job of preparing prospective teachers to teach. Narratives from first year teachers indicate that there is a struggle to design curriculum, learn who their students are, develop routines, build knowledge of fair standards, balance career demands with

other activities, learn school bureaucracies, increase student learning, and learn to interact with their colleagues and parents.

Arthur Levine addressed academic quality in a report published in September 2006 “Educating School Teachers,” a part of the Education Schools Project. He is a former president of Columbia’s Teacher’s College and the current president of the Woodrow Wilson National Fellowship Foundation and Director of the Education Schools Project begun in 2001. Levine has yet another view of teacher education programs and their quality. Levine had a derogatory view toward education institutions with teacher education programs. He noted in his report that three-quarters of the country’s 1,206 university-level schools of education do not have the capacity to produce excellent teachers because they have lowered admission standards and have less accomplished professors, as noted by employing adjunct faculty with no meaningful expertise in the academic content they are to teach, or employing full-time professors who have no recent experience in teaching.

Levine also indicates these schools of education have watered down coursework, all of which result in faster and less demanding degrees. His report is significant for two reasons: 1) the research is based on four years of broad and methodical research, including surveys of school principals and deans, faculty members and graduates of education school, and 2) programs and practices were studied at 28 institutions. Levine believes that no one really knows what makes a good teacher today and that there is an unmanageable mix of approaches because there is no consensus on how long teachers should study or whether they should concentrate on teaching theory or mastering subject matter (Levine, 2006).

Levine also maintains that the teacher education curriculum is in disarray, leaning too heavily toward theory and not enough toward clinical experience, and says that teacher education, as a field, lacks a widely shared, concrete vision of effective practice. He states that:

There is a schism over the how's and when's of teacher education between those who believe teaching is a profession like law or medicine, requiring a substantial amount of education before an individual can become a practitioner, and those who think teaching is a craft like journalism, which is learned principally on the job. (Levine, 2006, p. 13)

Levine also observes:

On one hand, reflecting the position that teaching is a profession, states have created a more regulated and regimented environment that strive to improve teacher quality, demands higher standards of the people entering the teaching professions, and seeks greater accountability from teachers and the institutions that prepare them... On the other hand, the belief that teaching is a craft, compounded by pressure to find enough teachers to fill empty classrooms, has resulted in many states' deregulating entry requirements for teachers, creating a more open marketplace for teacher education. (p. 14).

Additionally, Levine notes in his report that many universities encourage their education departments to admit and graduate almost anybody in order to get tuition dollars. He suggests closing some schools and directing students toward more rigorous academic institutions or professional schools. According to Levine our future teachers need to learn how "to educate all of their students to achieve the highest learning

outcomes in history” (Levine, 2006, p. 11). He indicates that “the task before us is to redesign teacher education for a new era – to produce a great number of high-quality teachers with the skills and knowledge necessary to raise student achievement to the highest levels in history” (Levine, 2006, p. 12). Levine’s report is only one report, however, and no matter how well researched, is biased to some degree.

History of Standardized Testing

Standardized testing (SAT tests) emerged from intelligence testing, and yet there is still controversy in the linking of intelligence quotient (IQ) and the current SAT tests. SAT tests are typically used for entrance into college programs. Even though the first Scholastic Achievement Test was developed from an army IQ test, which was spearheaded by Carl C. Brigham, considered to be the father of the SAT test, the controversy remains. In collaboration with James Bryant Conant, president of Harvard College in 1933, the SAT was first used as a measuring tool to award scholarships at Harvard (Frontline, 2007). It later was used as an admittance tool to universities. In 1942, because of the war, all the pre-existing College Board admissions tests were abolished, so the SAT became the test for all applicants. In 1944, under contract to the Army and the Navy, Henry Chauncey administered the SAT to more than 300,000 people all over the country on a single day. In 1948 the Educational Testing Service was chartered and the SAT was on its way to becoming the basic college admissions device for millions.

Standardized testing became increasingly utilized for college placement and universities tended to use these standardized tests to compare prospective students. Since there are substantial differences in teaching methods and curriculum among U.S. secondary schools, both in regard to high schools in separate states and between high

schools in the same state, standardized tests provide a means to compare prospective students in an effort to identify and admit the most worthy and promising candidates (College Board, 2006). Additionally, graduate screening was accomplished with such tests as the Graduate Record Exam and the Multiple Subjects Assessment for Teachers (Burton & Wang, 2005).

The SAT Reasoning test (2007) is currently a type of standardized test frequently used by colleges and universities in the United States to assist in the selection of incoming students, and is considered to be a component of assuring a quality teacher in every classroom. It measures critical reading, mathematical reasoning, and writing skills that students have developed over time and that they will need to do well in college (College Board, 2006). The content of the test has changed numerous times, usually due to criticism of prejudice and the need to align with current curriculum and institutional practices in high school and college. There is criticism of the unfairness of questions regarding evolution, environmentalism, multiculturalism, observant Jews, and Seventh Day Adventists, to name a few. Critics claim that the test is biased toward the White male, and it has been documented that SAT scores vary according to race, income, and parental educational background (College Board, 2006). Fair Test, The National Center for Fair and Open Testing (2007), also identifies bias in the SAT and states that the SAT consistently under-predicts the performance of females in college and over-predicts the performance of males. Fair Test also addresses the concern for bilingual students whose first language is not English and notes that research suggests that the SAT does not predict Hispanic students' first-year college grades as well as it does White students' grades. Furthermore, Fair Test asserts that African American, Latino, new Asian

immigrants and many other minority test-takers score significantly lower than White students on the SAT, which effectively eliminates academically promising minority (and low-income) students who apply with strong academic records but relatively low SAT scores.

The newest SAT test, with an additional writing component, was first administered in March 2005. Because of the newness of the test, most colleges and universities plan to study the results of these tests for several years before setting expectations and requirements (College Board, 2006). The SAT is administered by ETS, and is developed, published, and scored by the College Board. ETS has strengthened their fairness review process and now examines each question for potential biases. In an effort to be fairer, analogy questions have been entirely eliminated. However, some see this as a watering-down of the test and have pointed out that the SAT is now so 'fair' that it is not representative of real-world reasoning circumstances and language. Regardless of attempts to make the test fair to all populations, there continues to be controversy regarding the validity of the SAT test and its assessment of academic performance (College Board, 2006).

Another criticism of standardized testing is error in scoring which has been documented in both SAT scoring and Praxis scoring. In early March 2006, it was found that 4,600 SAT tests were scored incorrectly. An additional 1,600 tests were found to need rechecking just one week later. The tests in question were offered in October 2005 and it appeared that the weather was damp on the day the tests were offered and the answer sheets expanded and then were misaligned with the scoring scanners. Although the 4,600 tests affected were only 0.8% of the total of 495,000 tests taken on that day, it

was important to those students who had miscalculated tests (Neuman, 2006; Marklein, 2006). It also affected admission decisions at many universities (1,168 colleges were affected) which caused havoc for students as well as their parents. However, whenever humans and machines are involved, errors will occur (Marklein, 2006).

However controversial the SAT test is, the number of people who took the SAT in 1998-99 was 2.2 million, of which 1.2 million were high school seniors. The percentage of four-year colleges that required SAT tests in 1998-99 was 83%. Because of the continued use of the SAT by university admissions personnel, it endures as a tool to determine academic ability (College Board, 2006).

The issue of the testing of teacher candidates was brought forward by the National Commission on Excellence in Education (1983) when they used test scores to suggest that the United States was losing its global leadership position, which brought educational reform to the forefront in U.S. politics (Popham, 2000). As teacher quality became more of an issue, and as the nation strived to produce quality teachers, standardized testing became an even more important component of the assessment process, and began to be used for teacher education students in the early 1980s. Many states instituted standardized tests to ensure that all teacher candidates possess basic skills. Additionally, with Title II of the Higher Education Act requiring that teacher preparation institutions publicly report pass rates of their graduates on testing, the issue of passing rates for teacher education standardized testing became even greater.

Even as standardized testing became a requirement for potential teachers, well-recognized and respected individuals in education such as John Hope Franklin (1987), and well known educational publications such as *Phi Delta Kappan* (Graham, 1987),

published articles noting a decline in the number of students entering teaching as a career, in particular, African American students. Additionally, several teacher educators conducted studies that suggested one reason for this decline was the introduction of test requirements for admission to teacher education (Garcia, 1986; Gillis, 1990-91). There were others with concerns relating to the decline in choosing teaching as a career, especially regarding the minority populations. The American Association of Colleges for Teacher Education (Dilworth, 1990) and the North Central Regional Educational Laboratory (Dorman, 1990), along with other well-known educational organizations and agencies, published reports that agreed with the notion that standardized test requirements were either preventing many people of color from becoming teachers because of the specific testing requirements, or were discouraging people of color from selecting teaching as a career, and included convincing reasons to reverse this trend. An article was published in the well-regarded *Review of Educational Research* (King, 1993a) which summarized research evidence of the importance of having African American teachers in the nations' schools.

However, litigation against teacher tests had occurred in the 1980s, and while some experts wanted to continue to challenge the tests in court (Ware, 1989), others turned their efforts to ways to design admission and standardized tests so that their use would continue to be upheld in the courts (Cohen, 1989; D'Costa, 1993). During this time, standardized tests moved from the testing of professional knowledge to the testing of basic skills (Haney et al, 1987). Additionally, most discussions revolving around the law and standardized testing had become rare in educational journals by the end of the 1990s (Kelemen & Koski, 1998), and publications that did appear focused on ways to

make licensure tests legal and defensible (Klein, 1998; Sireci & Green, 2000). For African Americans in particular, other research that was done during the 1990s indicated that low teacher salaries, low prestige, and an unappealing work environment (Gordon, 1994; King, 1993b; Mack, Smith & Jackson, 1996) were reasons for the lack of African American teachers. ETS was quick to note that teacher testing should not be blamed for the low percentage of African Americans in teaching (Latham, Gitomer & Ziomek, 1999). Also in the 1990s, NCATE standards changed to reflect greater emphasis on multicultural education (Gidonese, 1992) and in 2000, NCATE created a separate standard of diversity (Wise & Leibbrand, 2000), one of only six standards.

The end of the 1990s, however, brought a renewed effort to bring greater diversity to the teaching force (Futrell, 1999; Urban Teacher Collaborative, 2000), especially since data indicate that most pre-service teachers trained in traditional university-based programs are young, White, middle-class females (American Association of Colleges for Teacher Education, 1987; Sleeter, 1993). Additionally, the U.S. Census Bureau projects that by the year 2050, about half of the U.S. population will be African-American, Hispanic, or Asian (USDOE National Center for Education Statistics, 2007). This demographic growth and diversification is reflected in our nation's public schools, and teachers are currently not represented in this diversity. The National Education Association report (2007) "Status of the American Public School Teacher" indicates that nearly 4 out of every 10 students in the United States is a member of a cultural or racial minority, yet the teaching profession is overwhelmingly White. Approximately 40% of all public schools have no minority teachers at all on staff. Currently, the percentage of African-American teachers is the lowest since 1971, and only 5% of the nation's teachers

are Hispanics, Asians, or from other non-Caucasian ethnic groups. With today's teachers being primarily White, female, married, religious, and on average, 43 years old (National Education Association, 2007), there is cause for concern.

The use of standardized testing as a required means of evaluating the quality of potential teachers has also been discussed and studied and, although the effect of standardized testing has continually been an issue, it has not been the only concern of the use of standardized testing for potential teachers. The EPLC's survey of school district superintendents in 2001 (EPLC Reports and Publications, 2003) identified characteristics that district superintendents looked for when hiring what they felt were qualified teachers, which included creativity, problem-solving, verbal skills, flexibility, mental agility, teamwork, compassion, and love of children. One superintendent defined it as "kid magnets." These types of characteristics that are considered to be important when hiring teachers are not evaluated with standardized testing, and indeed are not evaluated by any means when universities graduate and recommend students for state certification.

To add to the concern that standardized tests have a one-dimensional focus, some have noted that the use of standardized tests to assess the quality of potential teachers does not allow for the need to develop other portable skills such as critical thinking, making connections between ideas, and knowing how to keep on learning (Berry and Darling-Hammond, 2006). Critics believe that the use of standardized testing allows potential teachers that are good standardized test takers, but have no other teaching skills, to become teachers and teach in meticulous and uninspired ways (Darling-Hammond, 2000b). Although basic skills assessed by standardized testing are important (they are considered the building blocks), basic skills alone are not enough (Darling-Hammond,

2000b). Regardless of the concerns related to standardized testing, it continues to be a requirement across the nation for potential teachers.

Praxis testing (state standardized certification exams) is a form of standardized testing currently used in 34 states as a licensing requirement for prospective teachers, as well as in the state under study. Praxis tests were previously known as National Teaching Exams (NTEs) and are administered by the ETS, a private, not-for-profit organization. ETS has had great financial gain in the last few years, however, and in 2003, increased revenues to \$600 million (Wakefield, 2003). As teacher quality and accountability became priorities for school reform efforts, ETS was able to provide a means for a quantitative tracking system.

The Praxis tests assess a student's ability in reading, writing, mathematics, and subject-area content knowledge (ETS, 2006). Each individual state determines acceptable passing scores. In some cases, students who graduate and cannot pass Praxis testing in the state under study move to other states and seek certification since Praxis score requirements are lower. It is interesting to note that studies of teachers' scores on the subject content knowledge tests have found no consistent relationship between the measure of subject matter knowledge and teacher performance as measured by student outcomes or supervisory ratings. Most studies show small, statistically insignificant relationships, both positive and negative (Andrews, Blackmon & Mackey, 1980; Haney et al, 1987). Therefore, although standardized testing is required in many states for certification, it does not mean that high scores necessarily imply good teachers.

For teacher candidates, successful completion of Praxis I tests (general knowledge) are required in the state under study for admission into a teacher candidacy

program. Passing Praxis II scores (subject area tests) are also required for certification in the state (SDOE, State Code, 2001).

Many educators of teachers, although they want to comply with federal and state law regarding teacher education programs, do not believe high-stakes testing is an efficient means of determining quality teachers. As Luna, Solsken, and Kutz (2000) write, “Teacher educators face a dilemma: How do we prepare pre-service teachers to pass new high-stakes certification tests when these tests are often based on philosophical perspectives that run counter to our own beliefs about literacy, learning, and teaching?” (p. 276). Alfie Kohn, an opponent of high-stakes testing, says that “Multiple choice tests and contrived open response items are not meaningful ways of assessing how much students understand, and neither are they particularly effective in telling us how well educators can educate” (Kohn, 2000). Results of a study done by Joshua Angrist and Jonathan Guryan in 2005, using the Schools and Staffing Survey to estimate the effect of state teacher testing requirements on teacher wages and teacher quality as measured by educational background, suggest that state-mandated teacher testing increases teacher wages with no corresponding increase in quality.

However, to meet current state and federal standards, standardized testing is a condition that must be endured. The effect of standardized testing on various talented, qualified and diverse populations should encourage continued studies on the need for standardized testing, its validity, and its use as a required high-stakes means of evaluating potential future teachers.

Ethics and Social Justice

“Justice is the guide that regulates how people live their lives as members of a given community” (Rebore, 2001, p.227). Rebore also says that “justice implies that an individual or a group of people can be treated justly or unjustly, with justice or injustice, fairly or unfairly” (p. 228). Justice is an entitlement, says Rebore, and individuals and groups have claims that are due them. Rebore also believes that it is the responsibility and obligation of a society to include the right of education to all of its members.

With the use of standardized testing and the validity of the tests themselves, as well as their use as an assessment tool for potential future teachers, justice of the use of the tests requires more examination. John Rawl’s theory of justice as fairness (Rebore, 2001) includes two principles that he believes people would choose as a means of applying the notion of fairness; the first acknowledges that all persons should have an equal right to basic rights and liberty. Although everyone does not have the basic right to be a teacher, anyone who wants to be a teacher should have fair access to the opportunity, including those who might enter college without all the skills fully in place. The second holds that inequalities can exist only if they produce balanced benefits for everyone, and particularly for the least-advantaged people in society. Equal opportunity to secure positions must be open to all populations (Rawls, 1999), including teaching positions. Current literature suggests that this is not the case.

Many conflicts arise about what is fair and just in society and Jürgen Habermas (1995) considers that ethics is the pursuit of how conflicting interests can result in moral judgments. Habermas has developed a procedure for moral augmentation: reasoned agreement by those who are affected by the norm. This principle of what is identified as

discourse ethics is that the validity of the norm rests on the acceptability of the consequences of the norm by all participants in the discourse. This method of discourse involves the community in dialogue who look at the perspective of the moral agents, thus creating a sense of empathy. In the case of the use of standardized testing, the tests would be evaluated by minorities and low-income populations along with the norm in order to assess the fairness and justness of the tests.

The importance of having African American teachers in the nations' schools has been addressed in various publications, including articles published by King (1993a) and Boyer and Baptise, Jr. (1996). Additionally, Latino, new Asian immigrants and many other minority test-takers score significantly lower than White students on SAT standardized tests (Fair Test, 2007). Furthermore, research suggests that the SAT standardized test, when administered to Hispanic students, does not reflect students' first-year college grades as accurately as it does White student' grades (Fair Test, 2007). With the U.S. Census Bureau projecting that about half of the U.S. population will soon be African-American, Hispanic, or Asian (USDOE National Center for Education Statistics, 2007), and standardized test requirements preventing many people of color and other minorities from becoming teachers because of the specific testing requirements or discouraging people of color or other minorities from selecting teaching as a career (Garcia, 1986; Dilworth, 1990; Dorman, 1990; Gordon, 1994; Futrell, 1999; Fair Test, 2007), a reconsideration of standardized test requirements for teacher education becomes an issue of justice and fairness.

Additionally, teacher educators are concerned that standardized tests are based on philosophical perspectives regarding literacy, learning and teaching that are opposite of

teachers' beliefs (Luna, Solsken, & Kutz, 2000). Others believe that multiple choice tests and manufactured open response items do not assess students' understanding or whether they are good educators (Kohn, 2000). Some students can do well on standardized tests but may prove not to have a rapport with students in the classroom, and may not be able to teach well.

Some believe that although academic ability is a desirable trait in teachers, evaluation of academic ability alone is incomplete since many qualities that are unrelated to academic ability go into making an accomplished teacher (Gitomer & Latham, 2000; Weaver, 1983). Gitomer and Latham (2000) argue that it is preferable to seek a teaching force with reasonable academic skills and to help prospective and current teachers develop into excellent teachers who can prepare students for more in-depth pursuits in particular disciplines. Additionally, Gitomer, Latham and Ziomek (1999) say that the goal should be to commit sufficient resources to ensure that all individuals have equal opportunity to enter the teaching profession.

In Maine, the issue of preventing a well-qualified but culturally and linguistically diverse population from becoming teachers by standardized testing was viewed as an equity issue. Although well-intentioned policy goals may seek to achieve a greater good, they may at the same time have unintended consequences (Ross, 2005), and in this case, the Praxis I tests were preventing equity from occurring in Portland, Maine.

Reevaluation and reform have shown in the past to be an effective means of providing justice (Rebore, 2001) as demonstrated in four major laws passed by Congress to secure justice: The Civil Rights Act of 1964 as Amended (provides that people cannot be denied a job or unfairly treated during employment because of race, color, religion,

sex or national origin), the Age Discrimination in Employment Act of 1967 (promotes the employment of older workers based on ability rather than age by prohibiting arbitrary discrimination), Title V of the Rehabilitation Act of 1973 (prohibits recipients of federal financial assistance from discriminating against people with disabilities in relation to recruitment, selection, compensation, job assignment/classification, and provide reasonable accommodations), and The Americans with Disabilities Act of 1990 (protects the rights of people with disabilities including regulating employment practices) (Rebore, 2001). Additionally, citizens in the United States have certain rights as embodied in documents on which the United States was founded. The Bill of Rights, the Declaration of Independence, and the Constitution of the United States all contain principles concerning justice (Rebore, 2001).

Because of the success of past legislation, educational opportunities need to be reevaluated and reformed to meet the needs of all populations, including minority and low-income populations. The reassessment of standardized testing for potential future teachers must occur in order to have a just and fair system for all populations in the evaluation of future teachers.

Correlation and Prediction

Recent literature indicates that some standardized tests have a relationship. Pool, Dittrich, Longwell, Pool and Hausfather (2004) investigated the correlation between SAT and Praxis I scores required for teacher certification which showed moderately strong, positive correlations between the SAT Verbal and the Praxis I Reading, and the SAT Math and Praxis I Math scores. Their study was done at three types of institutions of

higher learning: a highly selective school, a selective school, and a regional state university.

Additionally, Hezlett, Kuncel, Vey, Ahart, Ones, Campbell, & Camara (2001) provide a synopsis of an analysis involving the predictive qualities of the SAT with regard to college performance. Their findings show that SAT scores validly predict first year GPA and academic performance later in college. They also cite strong evidence for the predictive relationship between the SAT and the Praxis I Series that was studied by the Teaching and Learning Division of the Praxis Series in 1999.

There have been misgivings and warnings regarding high-stakes testing, (Kohn, 2000) but NCLB overlooked those concerns and made testing of teacher candidates a part of state compliance plans, creating situations where quantitative test data is used to determine a qualitative aptitude for teaching (Wakefield, 2003). Blue and O'Grady (2002) cite Mitchell, Robinson, Plake and Knowles for the National Academy of Sciences as they caution against the use of a single evaluative measure for determining candidate confidence.

Blue and O'Grady (2002) also studied 328 program completers from eight graduating classes between 1994 and 2001 at Elizabethtown College in Pennsylvania regarding SAT and Praxis I tests. They reported a correlation of .69 between total SAT scores and the General Knowledge test of the Praxis Series (General Knowledge was later replaced by PPST: Reading, PPST: Writing, and PPST: Math Praxis I tests). They suggested that SAT scores alone would isolate certain teacher types, saving money and time for prospective teachers.

In addition, Cohn, Cohn, Balch and Bradley Jr (2004) conducted a study to assess the degree to which SAT scores, high-school GPA and class rank predicted success in college. Although their population was limited to those students enrolled in several sections of Principles of Economics at the University of South Carolina (in 2000 and 2001), their research indicated that high school percentile rank, high-school GPA, and SAT were all statistically significant in predicting success in college, as long as SAT scores were included in the equation. When SAT scores were dropped from the equation, it had a substantial effect on the predictive power of the model.

Furthermore, Lenning (1975) conducted a study that showed that ACT and SAT scores provided good predictive validity of freshman GPA, and Noble (1991) demonstrated with his study that models that use either ACT or high-school grades alone do not predict as well as models that include both.

Moreover, other studies have been conducted regarding the correlation between SAT scores and Praxis I scores. In 2003, Longwell conducted a study in a college in Maryland correlating performance of 93 program completers of the SAT Math Praxis and found that only 2 candidates with SAT scores above 500 did not meet state cut scores on Praxis I. Additionally, Wakefield (2003) carried out a study in Georgia with fewer candidates and found that the average SAT score for those candidates passing Praxis I was 951.

In Virginia, SAT scores can substitute for Praxis I tests dependent upon the SAT scores (Jacobson, 2004). If teacher candidates had at least 530 on each of the math and verbal sections (after April 1995), and a combined score of at least 1100, they could bypass the Praxis I tests. An ETS administrator indicated that if they met these SAT

minimums, they would likely pass the Praxis I tests (ETS also produces and administers the SAT). Connecticut, Delaware and Georgia also use college-entrance-exam scores in place of Praxis I. Virginia has the highest Praxis I cutoff scores in the nation (178 in Math and Reading, and 176 in Writing). This shows recognition by the state board that there are multiple ways to accomplish the goal of having highly qualified people in the classroom and can also be used as a recruiting tool. Students in high school would then know in advance that they had already met one standard. Because people outside the education field are far more familiar with the SAT than the Praxis, Virginia's decision may also make this process more understandable and convey the expectations for teachers more clearly to the public.

Others have studied the predictive indicators for various types of standardized tests including Kuncel, Hezlett, and Ones (2004) and Burton and Wang (2005). They examined the relationship of the Graduate Record Examinations (GREs) at the graduate level to other measures of cognitive, academic and work-related abilities and found a statistical significance that the GREs could predict outcomes of academic success. Although this predictive model does not relate directly to SAT scores, it is yet another indicator that standardized tests can predict an academic outcome.

Completion of a teacher certification program represents a significant time and financial commitment on the part of teacher candidates and the schools providing the training. The traditional timeframe for completing a teacher education program is approximately four years, including the student teaching experience. With this level of commitment by teacher candidates and programs, it is of vital importance that the opportunity for success is augmented by examining what we know of teacher candidate

characteristics at the time of admission and the relationship of those characteristics to attaining important program goals (teacher candidacy and passing of standardized testing) so these teacher candidates are successful in entering the field of teaching. Examining these characteristics allows a university to carefully select those teacher candidates who are predicted to do well in the field of teacher education. Because considerable resources are spent on Praxis preparation and analyses, it seems that educators must intensify their efforts to examine the general assumptions of a testing regiment that relies on Praxis or similar instruments for program admission and exit decisions (Gage & Berliner, 1998; Kohn, 2000).

Although other studies have measured the relationship of SAT scores on Praxis I test scores, there is no available data regarding the predictive validity of standardized testing (SATs and/or Praxis I testing) and first year college GPA to Praxis II tests in general and to the Praxis II ELED:CIA test in particular. Studies that have been conducted are much broader and have mostly looked at SAT scores, high school rank, high school GPA, and their relationship to Praxis I results.

Adaptations by Universities

Some colleges and universities have made adaptations to their teacher education programs in one way or another to assist in the passing of Praxis tests for all populations. The University of North Carolina in March 1998 made specific efforts to improve Praxis II: Principles of Learning and Teaching (PLT) performance and developed four strategies and activities that would have a positive impact on students' performance by: 1) improving curriculum alignment and changing the kinds of tests in courses, 2) engaging in conversations with faculty in Arts and Sciences who teach most of the content courses,

3) placing more controls on when students take the tests, and 4) initiating a whole variety of activities to help students prepare for the tests (Strategies of UNC Colleges/Schools/Departments of Education [Strategies of UNC], 1998). The format of the tests were reviewed, and individual faculty worked with students, conversed with their colleagues, and conducted intensive counseling and student analysis to determine student needs. Additionally, a formal course was offered to prepare students for Praxis II tests, faculty members were encouraged to take the tests and share insights, and specialty area coordinators analyzed course content to ensure alignment of the test competencies and courses [Strategies of UNC, 1998].

At Cleveland State University, Professor Rosemary Sutton (2004) adjusted curriculum to address the Praxis II: Principles of Learning and Teaching (PLT) tests which were mandated in 2004. By taking the test, she determined much of the content of the PLT tests was related to educational psychology, so all undergraduate teacher education students had to take an additional educational psychology course, along with the prerequisites of Child or Adolescent Psychology and one introductory education course. Professor Sutton also added case studies and reduced writing assignments to more closely match the content and format of the Praxis test. Additionally, other faculty were encouraged to take the tests and then discussed the data and possible modification of their courses to align their curricula. Students were informed of university resources (including an on-campus ETS workshop) to help them prepare for the test, and students who had already taken the test were encouraged to share their experiences. Professor Sutton altered the assessments content and teaching methods in her course.

Others have made adaptations to their admission criteria. Iowa State University addresses scholarship, interest in teaching, character, interpersonal skills, and physical and mental health in review of students seeking admission to the teacher education program (Iowa State University Teacher Education Program, 2007). The state under study changed grade point average requirements to a minimum 3.0 from the 2.5 requirement that had previously been in place (SDOE, 2006).

As can be seen, some universities have adapted their programs and curriculum to address specific demonstrated needs of their students. This study attempts to identify needed changes in the state under study for teacher education programs, and to share collected information to improve the quality of teacher education programs and to increase the talent and diversity of potential teacher education students.

Summary

Because of the increasing demands for high standards and the use of standardized tests for teacher education, universities have been and must continue to adjust and modify their teacher education programs to meet these standards. It is of equal importance to examine and evaluate the use of standardized testing as a mandatory means of assessing potential teacher candidates. Although changes to educational programs have been made in the past in an effort to meet national and state standards, adjustments must continue to be made at various levels. Creating a fair and just system for all individuals should be the goal of all educators and educational institutions.

CHAPTER 3

RESEARCH AND DESIGN METHODOLOGY

Introduction

The purpose of this study was to examine the response of selected university teacher education programs to increasing demands for high standards and passing scores on standardized tests. This examination included the development of a predictive model that could possibly be used in admissions, development of intervention strategies, and development of program modifications. This model could be used as a gatekeeper or an intervention tool at different levels throughout an education program (admission to the university, teacher candidacy, student teaching, or graduation and certification). Issues of social justice and ethics inherent in responding to higher standards while seeking to retain equal access for a diverse pool of future teachers were also examined. To accomplish this critical analysis, the study was composed of two methods of research, a two-phase data collection process as identified by Creswell (2002), one quantitative and the other qualitative. A large university state system was studied, and a predictive model was developed and analyzed in one sample university within the large state system.

The quantitative method was a statistical analysis of the correlation of specific variables (SAT Scores, high school rank, Praxis I scores, and first year college GPA) and the effect those variables had on an outcome variable (Praxis II ELED:CIA test scores) at one sample university in a large university state system. The development of a predictive model could potentially provide gatekeeping information or be a gatekeeping model to address possible changes in admission policies, development of intervention strategies that may be made available at different stages of a student's program, and modification of

program curriculum in teacher education programs to assist students in becoming successful. This information or model was based on a statistical analysis of factors that contribute to the ability of students to pass Praxis II tests in the process of gaining state certification.

If such a model was to be used solely as a gatekeeping function for admission to a teacher education program, it could potentially be discriminatory and eliminate talent, quality, and diversity of students from teacher education programs. However, the information obtained or the model developed could also be used to develop intervention strategies or modify program curriculum to increase the likelihood of the passing of standardized tests once students have been accepted into teacher education programs. Since standardized tests for teacher education candidates continue to be required in many states and specifically in the state under study, this information could lead to recruitment and retention of a larger pool of talented, qualified, and diverse students by identifying the use of intervention strategies or program modifications to assist in successful completion of Praxis testing.

The qualitative component examines universities in the large university state system that includes the sample university. The qualitative method of research was composed of interviews of the teacher certification officers in the universities in the large university state system. The certification officers had knowledge of current policies, procedures, and programs used in their universities in relationship to teacher education programs. The interviews focused on the perception of issues that exist with the use of predictive models and standardized testing as gatekeeping tools, and the ethics and justice of using them as a gatekeeping method to admission and progression in teacher education

programs. Also included in the interviews were questions regarding how a predictive model might assist with admission adjustments, intervention strategies, and program modifications. Additionally, other questions in the interviews addressed what predictive models are currently being used by any of the state system schools and at what point in the program they might be used, and other strategies that the schools in the state system are using to meet the high standards of state and federal policy with the requirement of standardized testing and a highly qualified teacher in every classroom.

The use of standardized testing and predictive models as gatekeeping methods in teacher education must be addressed in order to adhere to a just and fair system for all teacher candidates to enable a talented, qualified, and diverse future teaching pool. K-12 student populations continue to become more diverse (USDOE National Center for Education Statistics, 2007), and the teaching pool currently does not match the change in the student demographics (Darling-Hammond, 2000).

It is anticipated that the information obtained from the statistical analysis and the predictive model will be used to assist in the success of students by adjusting admission criteria, developing intervention strategies, or modifying program curriculum to promote the retention of a talented, qualified, and diverse pool of future teachers. Additionally, this study was needed to ensure equal educational opportunities for all populations, and that a fair and just system is in place to evaluate the talent, quality, and diversity of future teachers. Furthermore, knowledge of admission criteria, effective intervention strategies, and successful program changes used by various universities can assist other colleges and universities in implementing strategies that will aid in the successful retention and recruitment of future teachers.

Research Design

This study utilized both quantitative and qualitative methodology. This is identified by Creswell (2002) as a two-phase data collection process.

Quantitative Methodology

Quantitative research is defined by Krathwohl (1993, p.740) as “research that describes phenomena in numbers and measures instead of words.” Quantitative research is associated with the belief that reality exists and that it is the researcher’s task to define and describe that reality and is deductive and theory-driven. This study will utilize the following types of quantitative measures; Pearson r product moment correlation coefficient, multiple correlation (or multiple regression), and stepwise regression.

A correlation is a statistic that is calculated from two sets of data or variables and describes an existing condition (Holcomb, 2002; Gay & Airasian, 2003). The correlation statistic suggests the strength and direction of a relationship and is expressed as numbers that range from -1.00 to +1.00 (Gay & Airasian, 2003). A correlation coefficient of +1.00 would be a positive correlation, meaning that scores on one variable (i.e, SAT verbal) would be directly related to scores on another variable (i.e., Praxis I Reading). This would be considered a high correlation. A correlation coefficient of -1.00 is a negative correlation, which would demonstrate an inverse relationship (where as the score on one variable goes higher, the scores on another variable would go lower). This would also signify a high correlation. The closer the coefficient is to 0, the weaker the relationship. Whether a correlation is positive or negative is not relevant to the degree of correlation and there would be no difference in the predictive power of the correlation. Both high positive and high negative relationships are equally useful for making predictions. Perfect

correlations are mostly nonexistent and would indicate a perfect relationship between two variables. Gay and Airasian (2003) also note that variables to be correlated should be selected on the basis of some rationale that is logical and based on experience or suggested by theory. Additionally, they note that correlational research is conducted in order to make predictions.

In this study, the Pearson r product moment correlation coefficient was utilized to determine if there was a relationship between variables (SAT scores- verbal and mathematical, high school percentile, Praxis I scores - Reading, Writing and Mathematics, and first year college GPA) and the outcome variable, the Praxis II ELED:CIA test. The Pearson r is used when both variables to be correlated are continuous data such as ratio or interval data and is most often used in education because the variables to be correlated are treated as interval data (Gay & Airasian, 2003). Additionally, Pearson r results in the most accurate estimate of correlation and is therefore the preferred method of establishing a correlation. For this particular study, when SAT and Praxis I scores are extracted, if multiple scores of either were available for a given student, the highest score was used.

Prediction studies are conducted to assist in making decisions regarding individuals or to assist in various types of selection. They are also used to test variables that are thought to be good predictors of a criterion, and then to determine the predictive validity of measuring instruments. Additionally, they are used to predict the likeliness of success in a certain area of study (Gay & Airasian, 2003), in this particular study, the ELED:CIA test. Therefore prediction studies are many times used by admissions directors and perspective employers. A prediction based on one variable is less accurate

than a prediction based on a combination of variables and is the rationale for considering various variables.

A multiple regression (or multiple correlation) indicates the extent to which a combination of variables predicts an outcome variable (Baldwin & Basse, 2001; Holcolmb, p.66) and was also used in this study. A multiple regression determined that a predictive model could be developed to predict the success of teacher candidates in passing the Praxis II ELED:CIA test at this specific university. The variables from the Pearson *r* correlation analysis were used in the multiple regression analysis, which generated an equation that determined that certain variables can predict the Praxis II ELED:CIA score. Currently, there is more research needed regarding the prediction of Praxis II scores. Many studies have shown a correlation between some variables (SAT scores, high school rank, and ACT scores) and college success (Cohn et al, 2004; Lenning, 1975; Blue & O'Grady, 2002; Kuncel et al, 2001, 2004; Pool et al, 2004). However, literature regarding predictors of Praxis II tests is not readily available. Although there are other Praxis II tests that lead to teacher certification, the ELED:CIA test was selected to study at this university due to the pass rates that are consistently below the state pass rates as determined by data submitted for Title II.

A simple, or one-way, analysis of variance (ANOVA) is used to determine if there is a significant difference between two or more means at a selected probability level (Gay & Airasian, 2003). An ANOVA was conducted in this study to determine whether the differences among the means represented true, significant differences or chance differences due to sampling error.

A stepwise regression was performed which allows removal or addition of variables to the regression model to identify a useful subset of the predictors. In this particular study, a backward elimination regression analysis allowed the researcher to remove variables to determine if the predictor model was affected and if a simpler predictive model could be developed.

Site Selection

The sample university selected to examine for the quantitative statistical analysis was selected because it is a part of a large university state system, and the Praxis test being studied (Praxis II ELED:CIA) has had pass rates below the state average for the past six years, as reported in Title II (2006). Furthermore, all existing data used in this quantitative study from this sample university will remain anonymous even to the principal investigator since no identifying information was viewed or recorded. Review of existing data poses no conflict of interest to students when records are included in the data set. Such data review is standard practice under the purview of the principal investigator and the capacity as researcher for this study using only existing data sets is of no bearing for any student. Only aggregate data results were reviewed. Student information was not disaggregated by individual. It is important to note that the students' first time performance on the ELED:CIA test was not reflected in the overall pass rate; the overall pass rate consisted of students who may have attempted the test several times before passing.

Participants

For the quantitative component of this study, existing data from the sample university in a large university state system were examined. Existing data were used

based on the following: 1) completion of program coursework at the selected university, 2) completion of an Elementary Education major or a dual major with one component of Elementary Education, 3) recorded scores for the Elementary Education: Curriculum Instruction and Assessment Praxis II test, 4) recorded scores for SAT tests, and 5) recorded scores for Praxis I tests. Because recorded data of all the components were not available prior to 2003, all data used was from 2003 to the present. All existing data used in this study from this sample university will remain anonymous even to the principal investigator since no identifying information was viewed or recorded. Review of existing data poses no conflict of interest to students when records are included in the data set. Such data review is standard practice under the purview of the researcher and the capacity as researcher for this study using only existing data sets is of no bearing for any student. Only aggregate data results were reviewed. Student information was not disaggregated by individual.

Instrumentation

This study utilized data from existing instruments (SATs, Praxis scores, high school percentile, and first year college GPA) in order to conduct correlational and predictive studies. First, a correlation study was performed to determine if there was any relationship between SAT Math and Verbal scores, Praxis I (Reading, Writing and Mathematics) scores, high school percentile and first year college GPA.

A commonly accepted sample size for a correlational study is 30 records as long as the variables correlated have high reliabilities and validities and the records or participants will not be subdivided (Gay & Airasian, 2003). This study used 288 data records. Descriptive statistics were then run on all the variables to include the number of

participants, mean, median, standard deviation, standard error of the mean, minimum and maximum scores and quartile distributions.

All input variables were extracted from institutional records. The data were compressed into a Microsoft Excel spreadsheet and then exported into Minitab statistical software (Minitab User's Guide 2, 2000). All statistical analysis was conducted using Minitab.

Because SAT scores are consistently used as admission criteria for universities and are formally reported, and because previous literature has determined a correlation between SAT and success in college (Barron & Norman, 1992; Blue & O'Grady, 2002; Cohn et al, 2004; Hezlett et al, 2001; and Lenning, 1975), it was determined that SAT scores would be included as a variable in this study. Additionally, the SAT Verbal and Mathematics sections were separate scores since they are reported separately to institutions of higher learning and literature has shown correlations between the SAT Verbal and the Praxis I Reading and Writing (Pool et al, 2004).

High school percentile, along with SAT scores (both verbal and mathematics), is also a determinant of admission into universities and was therefore included as a variable. Various studies have shown a correlation between high school rank, high school grades, and college performance (Barron & Norman, 1992; Blue & O'Grady, 2002; Cohn et al, 2004).

Passing Praxis I test scores are essential for formal admittance into the teacher education program in the state under study. The Praxis I tests consist of three levels of professional assessments for the beginning teacher and are designed to be a demanding and meticulously validated assessment that provides accurate, reliable information used

by state education agencies in making licensure decisions (ETS, 2004). The state under study requires the passing of Praxis I tests to be formally admitted into an education program (SDOE:State Code, 2000) and was therefore selected as a variable and possible predictor of the ELED:CIA test. The Praxis I tests include Reading, Writing and Mathematics.

Although any students, either new freshman or transfer students with less than approximately thirty credits, can declare a major in teacher education at this university, formal admittance to an education program is required by the state after one to two years of full-time college coursework. Students must meet certain standards to be formally accepted at this juncture. Since some studies have shown that there is a correlation between college students' grade point averages and test scores (Pettijohn II, 1995), the first year college GPA was also included as a variable. Most first year college courses are general education courses and therefore are various subjects with various professors which allow for a broader GPA which is not dependent upon methodology professors or repeat professors and eliminates the possibility of a personality conflict with repeat professors.

A multiple regression analysis was employed to examine the contribution of the predictor variables (SAT scores, high school percentile, Praxis I scores, and first semester college GPA) to the criterion variable, the Praxis II ELED:CIA (first reported score). The multiple regression analysis shows how much the regression equation accounts for the variance in the scores of the Praxis II ELED:CIA test.

An analysis of variance (ANOVA) was performed to determine if the differences among the means were true, significant differences or chance differences due to sampling

error. This determined if there were significant contributions of predictor variables (SAT scores, high school percentile, Praxis I scores, and first semester college GPA) to the criterion variable performance (Praxis II ELED:CIA, first reported score).

Furthermore, a stepwise regression was performed to identify a useful subset of the predictors. A backward elimination procedure was conducted (the stepwise regression presented the variables in order of power) by removing variables to determine if the predictor model could establish a simpler predictive model that will serve as well as a complicated procedure.

Limitations of Quantitative Research

Because this data is from one sample university, the conclusions were limited. However, since this is an initial study on predictors of the Praxis II ELED:CIA test, it is anticipated that other researchers will conduct studies to attempt to replicate the conclusions drawn in this study in order to reinforce these results. Additionally, the study is limited because data records must have recorded SAT scores, high school percentile, Praxis I test scores, first year GPA, and Praxis II ELED:CIA test scores. If any one of these variables was not documented, then the data record was not included in the study.

Furthermore, Praxis I scores are normally reported by ETS to universities when requested by a student. Past practice at this university was not to manually input scores if they were not automatically reported. However, beginning in 2003, test scores have been manually adjusted in the student database when not reported electronically by ETS. This allowed for a much larger population after 2002. The fact that the total years are restricted may limit this study.

Reviewer error may also be a limitation and lead to bias. Dunkin (1996) identifies several areas in which errors may occur by the reviewer. Excluding research that is pertinent to the topic under review, without explanation, can lead to erroneous conclusions by the researcher. Also, much of the literature available may not be of equal quality (conference papers versus publications in scholarly journals), but is treated by the researcher as conclusive. Additionally, inaccurate statements regarding sampling, methods, designs, procedures, and contexts of the studies can lead to flawed conclusions. Furthermore, errors in double counting may also occur, especially with new researchers (counting results of previous studies that may have been published in different formats). Moreover, using flawed conclusions of a previous author may cause yet more faulty conclusions. Yet one more possible limitation is suppression of contrary findings, where the researcher reports only that literature which supports the conclusions of the current study.

Besides the issues noted by Dunkin (1996), another issue is that of information input. Errors in the inputting of information into the statistical software may cause faulty conclusions. Minitab, the software used in this study, identifies unusual observations and outliers which may have a significant influence upon regression results. These should be reviewed to determine their impact.

In the stepwise regression, consideration must be given to the possibility that the process can look at many variables and select ones which by sheer chance happen to fit well. Also, many times the analysis of variables is reliable; however the interpretation is not accurate. Furthermore, automatic procedures such as quantitative analysis cannot take into account any special knowledge that the researcher may have about the data.

Qualitative Methodology

There is a lack of agreed-upon approaches for analyzing and narrating qualitative data, however there are guidelines. In the qualitative component of this study, data was gathered and analyzed using five steps: the breaking down of data, becoming familiar with the data and identifying potential themes, examining the data in depth, classifying (categorizing, coding and grouping into themes), and interpreting (Gay & Airasian, 2003). Data gathered were compared, categorized, and themes and patterns were developed. This comparative case study methodology allowed for a within-case analysis which allows for the provision of a detailed description of the procedure of each university and themes within those procedures. Yin (2003) states that a case study analysis “allows investigators to retain the holistic and meaningful characteristics of real-life events – such as individual life cycles, organizational and managerial processes, etc.” and many times “contributes to our knowledge of individual, group, organizational, social, political and related phenomena” (p. 1-2).

Grady (1998) defines qualitative research by its “primary data collection strategies” and lists three possible strategies for data collection: interviews, observations, and document analysis. Interviews were used for this study as a major strength of interviewing, according to Grady (1998), is that it affords two-way communication and the interviewer can use the spontaneity of face-to-face communication to expand on questions, ask follow-up questions, seek clarification, or change the direction of the interview.

This study was conducted to provide insight into the fact that universities must respond to higher standards even as they seek to admit a diverse pool of potential

teachers. Examination and assessment of the use of gatekeeping models as criteria for the success of teacher education candidates can assist in fairness and justness for all individuals. Additionally, examination and assessment of the current use of standardized testing is essential since it can limit the talent and diversity of potential teachers. Furthermore, since standardized testing currently continues to escalate in importance in assessing the quality of teacher candidates, assistance at different academic levels should be developed to ensure a just and ethical method of developing potential teachers. Improved policies related to recruitment and retention of a talented and diverse pool of students in teacher education programs, equal access to teacher education opportunities, successful completion of education programs, and increasing the number of qualified teachers were the intended outcomes of this study. This was accomplished by the qualitative interviews of various certification officers.

Site Selection

For the qualitative component of this study, it was determined that a large university state system has many variables worth examining in producing high quality teachers. Therefore, examining this state system would be appropriate to determine current strategies being used and anticipated strategies to be implemented. Additionally, concerns related to the ethics and justice of using standardized testing and predictive models as gatekeeping methods for admission to and progression in teacher education programs were investigated. In this particular large university state system, there are various pass rates on the Praxis tests, which could indicate that a variety of admission criteria, intervention strategies, and program curriculum are currently being used.

Furthermore, the schools in this particular large university state system have a variety of demographics which allows for a broader generalization of the research results.

Participants

For the qualitative component, teacher certification officers with knowledge of current policies, procedures, and programs used in their university relating to the teacher education programs, and who agreed to participate, were interviewed. Presidents of each university were notified by letter of the intent of the principal investigator, and gave their permission by signature to conduct the study at their university and to contact the certification officers (Appendix A). Then the university certification officers were contacted by telephone and informed of the intent of the study. The eight certification officers who agreed to take part in the qualitative component of this study and had knowledge of the policies, procedures, and programs at their university, were faxed a consent form for signature (Appendix B) and then responded to a series of telephone interview questions (Appendix C). Participation was voluntary, and any certification officer who declined to participate and appointed no other representative from his/her university, were excluded from the study.

The interviews were recorded and a verbatim record of each interview was completed and shared with the interviewees to verify and promote accuracy. These drafts were then summarized and compared. This technique was employed in accordance with case study methodology whereby research participants “help to triangulate the researcher’s observations and interpretations” by examining drafts of writing for “accuracy and palatability” (Stake, 1995, p. 112). One sample summary is included in the dissertation.

Participation was voluntary and signed consent forms will be kept on file for each participant. To protect privacy and identities, the large university state system, each individual university, and the respective teacher certification officers who were interviewed have all received pseudonyms. There are no risks since all information will remain anonymous. The only individuals who know the identity of the large university state system are the principal investigator, her faculty sponsor, and her committee members. The only individual who knows the identity of the certification officers and could match responses to names was the principal investigator. This information will be kept confidential.

Instrumentation

Because case studies and qualitative program evaluations can go into greater detail in a number of areas, interviews are excellent methods for answering the “how” and “why” questions (Grady, 1998). Case studies, along with measurable outcomes, could give greater detail regarding implementation within each university. “What did the more successful institutions do?” (Benson, 2000, p. 122).

Reviewing and comparing the differences in admission criteria, intervention strategies, and program modifications to meet the current requirements for highly qualified teachers and the need to pass standardized tests for teacher certification can be advantageous to many universities. Using this within-case analysis to develop categories, themes, and patterns may also improve the quality and diversity of potential teachers, and at the same time, improve K-12 student academic achievement.

Interviews were conducted at each participating state system university to each of the certification officers or his/her representative who agreed to participate. Qualitative

interviews provide rich data in terms of employee perceptions (Grady, 1998). The interview tapes were personally transcribed by the researcher, summarized, and shared with each participant to ensure accuracy. Additionally, merging themes were identified that relate to the research questions.

Validity and Reliability for Qualitative Research

“It is true that we deal with many complex phenomena and issues for which no consensus can be found as to what really exists – yet we have ethical obligations to minimize misrepresentation and misunderstanding. We need certain protocols, efforts that go beyond simple repetition of data gathering to deliberative effort to find the validity of data observed” (Stake, 1995, P. 115-116).

In qualitative research, validation is “the process through which we make claims for trustworthiness of our interpretations” (Reissman, 1994, p. 65). It is, however, not possible in narrative studies for validation to be a set of formal rules or standard technical procedures (Reismann, 1994). A pilot study was conducted at five universities in the state but not in the state system to determine the validity of the interview questions. The researcher increased the validity of this study by eliciting the same basic information from each interviewee.

Reliability addresses the ability to replicate the findings since research findings are considered more valid if repeated observations produce similar results (Merriam, 1998). Merriam suggests several techniques to increase a study’s reliability such as multiple methods of data collection and analysis. In this study, data collection was described by the researcher, along with themes and a predictive model.

Limitations

Qualitative research studies “strive to identify the often-illusive answers to ‘big questions’” and that “qualitative researchers examine words, phrases, and statements to determine themes that respond to research questions” (Grady, 1998, p. 19). Grady (1998, p. 20) also states that “consistency is somewhat problematic because the researcher brings more of his or her personal history, experience and perspectives to the analysis.” However, Grady further states that “although qualitative studies certainly are not problem-free, they can contribute greatly to answering many questions” (Grady, 1998, p. 20).

Additionally, sample size can limit the results of a qualitative study. This particular study examined one state system and limits both the number of participants and geographical location.

Summary

The purpose of this study was to examine the response of selected university teacher education programs to increasing demands for high standards and passing scores on standardized tests. This examination included the development of a predictive model that could possibly be used in admissions, development of intervention strategies, and development of program modifications. This model could be used as a gatekeeper or an intervention tool at different levels throughout an education program (admission to the university, teacher candidacy, student teaching, or graduation and certification). Issues of social justice and ethics inherent in responding to higher standards while seeking to retain equal access for a diverse pool of future teachers were also examined. The combination of research methodologies, both quantitative and qualitative, will contribute to the

success of a more talented, qualified, and diverse pool of future teachers. This model could then be replicated by other universities in other states to improve their programs.

The qualitative information gleaned from the interviews can have positive consequences to other universities, as well as the universities in the state system under study. The sharing of best practices used in the various state system universities to ensure the success of their teacher education students, including the adjustment of admission criteria, development of intervention strategies, and modification of programs, can assist universities in the entire nation in producing a talented, qualified, and diverse pool of teachers for the future. Additionally, the perception of a large number of individuals highly invested in the training and education of our future teachers regarding the ethics and justice of using standardized testing and predictive models as gatekeeping methods for teacher education candidates might encourage state and federal policy-makers to review the use of standardized testing for mandatory evaluation of future teachers.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

Introduction

This chapter presents the results of this research study as well as development of themes for analysis of data. The purpose of this study was to examine the response of selected university teacher education programs to increasing demands for high standards and passing scores on standardized tests. This examination included the development of a predictive model that could possibly be used in admissions, development of intervention strategies, and development of program modifications. This model could be used as a gatekeeper or an intervention tool at different levels throughout an education program (admission to the university, teacher candidacy, student teaching, or graduation and certification). Issues of social justice and ethics inherent in responding to higher standards while seeking to retain equal access for a diverse pool of future teachers were also examined. To accomplish this critical analysis, the study was composed of two methods of research, a two-phase data collection process as identified by Creswell (2002), one quantitative and the other qualitative. A large university state system was studied, and a predictive model was developed and analyzed in one sample university within the large state system. Data were collected to answer the following research questions:

1. To what extent are SAT scores (verbal and mathematics), Praxis I scores (Reading, Writing and Mathematics), first year college GPA, and high school rank percentile correlated at the sample university? To what extent are these variables predictors of the Praxis II ELED:CIA test at the sample university?

2. What university adjustments to teacher education programs at various levels have been implemented or plan to be implemented to address the changes in state and federal law, and to meet the requirements of standardized testing?
3. What is the perception of university certification officers regarding gatekeeping and its impact on admissions, intervention strategies, and curriculum revision and assistance leading to students' success?
4. What is the perception of university certification officers at the same large university state system regarding ethical and social justice issues relating to gatekeeping methods for admission to teacher education programs and successful continuance in teacher education programs, and the effect this might have on the diversity of the potential pool of teacher candidates?

This two-phase collection process is described by Creswell (2002) as an explanatory mixed method design that begins with quantitative data collection and then qualitative data collection to expand on the quantitative results. The quantitative and qualitative studies were conducted, analyzed and presented individually, and the results of both studies are reported using the explanatory mixed method design.

The Setting

The large university state system under study was located in a state in the United States, and represents a large population of university students. A university state system has many variables worth examining in producing high quality teachers and therefore was appropriate for investigating current strategies being used and anticipated strategies to be implemented, as well as concerns related to the ethics and justice of using standardized testing and predictive models as gatekeeping methods for admission to and progression in

teacher education programs. In this particular large university state system, there are various pass rates on the Praxis tests, which could indicate that a variety of admission criteria, intervention strategies, and program curriculum are currently being used. Furthermore, the schools in this particular large university state system have a variety of demographics which allows for a broader generalization of the research results.

The Pilot

In February 2008, a pilot study of five universities not affiliated with the state system was conducted prior to the administration of the interview questions to the participants in the study. The intent of the informal pilot study was to determine the following items: (a) clarity of directions, (b) clarity of questions, (c) mechanics, and (d) approximate time needed for the telephone interviews. The pilot study included five certification officers in five different schools within the state under study (but not a part of the state system) who had knowledge of current policies, procedures and programs in their teacher education programs in their universities. Feedback gained from the pilot study was used to revise the interview questions. The interview questions were not well aligned with the research questions and information obtained with the original questions, although informative, was not specifically answering the research questions. The interview questions were modified and reorganized to be consistent with the research questions. Following the modification of interview questions, it was determined that participants would need approximately 30 minutes to complete the interview questions.

Quantitative Analysis

Subjects

The quantitative method was a statistical analysis of existing data at one sample university in a large university state system. This particular university was chosen for study because for the last six years, the Praxis II Elementary Education: Curriculum Instruction and Assessment (ELED:CIA) pass rates have been below the state pass rates (Title II Higher Education Act [Title II], 2006). The results of this analysis could potentially provide gatekeeping information to address possible changes in admission criteria, development of intervention strategies that may be made available at different stages of a student's program, and/or modification of program curriculum in the teacher education program to assist the students in becoming successful. The quantitative data incorporated a statistical analysis of correlational data, a regression analysis and a stepwise regression at the sample university.

Data retrieval for the quantitative portion of this study was conducted in January, 2008 at the sample university under study and data were identified by the testing date of the Praxis II ELED:CIA test scores (first attempt). The data include only the records of existing data where the Praxis II ELED:CIA test (first recorded attempt) occurred between January 1, 2004 and January 7, 2007. Each data record used also had to have recorded scores for SAT tests (highest recorded scores for verbal and mathematics), Praxis I tests (highest recorded scores for Reading, Writing, and Mathematics), high school percentile, and 30 credits completed at the sample university for use as first year GPA. If any one of those variables was not recorded, the data was not included. The sample consisted of 288 student data records. All data was entered into a Microsoft

Excel spreadsheet and then exported into Minitab statistical software, where the statistical analysis was conducted.

Descriptive Statistics

Table 1 depicts measures of central tendency and variability for all variables used in the correlational study and regression analysis. SAT Math and Verbal represent the highest score recorded, as does Praxis I Reading, Writing and Math scores. Praxis II ELED:CIA represents the first attempt recorded, and GPA represents the first year college GPA as determined at 30 earned hours. It is important to note that the ELED:CIA scores are the first attempt recorded compared to Praxis I and SAT scores, which were the highest scores recorded.

SAT and High School Percentile

The SAT Math, SAT Verbal and high school percentile (H.S. Per.) are predictor variables that are determined prior to university entrance. For this sample, SAT Math and SAT Verbal performance appear to have a somewhat normal distribution. The means and medians are similar, standard deviations are similar, and the inter-quartile is similar. There is, however, a wide range (approximately 400 points) between minimum and maximum scores on each test. The minimum and quartile range reflect a significant number of students who may be characterized as low performers on the SAT. On measures of variability and central tendency, SAT Math and SAT Verbal performance for this sample are very similar.

The high school percentile is also a predictor variable that is determined before entry into a university. This sample represents a wide range of reported performance based on high school percentile rank. Percentile rank indicates “the percentage of scores

that fall at or below a given score” (Gay & Airasian, 2003, p. 422) and in this study is calculated by combining all incoming students’ high school rank and determining where they are in relationship to other incoming students. As per Gay and Airasian (2003), the median of a set of scores corresponds to the 50th percentile, which means that it is the point below which 50% of the scores fall. Percentile ranks are frequently used in the public schools to report test results of students in an understandable form. With a median of 71, 25% of the sample is below 53 and 25% of the sample is between 82 and 100.

Praxis I Testing and First Year College GPA

Praxis I testing and the first year college GPA are variables that are determined after entrance into the university. First year college GPA was calculated at the completion of 30 credits (typically a first year student completes 15 credits per semester and two semesters constitutes the end of the freshman year) completed at the institution under study. For all 288 subjects, the first year GPA falls between 2.11 and 4.00. One-half of the subjects fall between 2.88 and 3.6, and the mean and median are nearly identical (mean = 3.22 and median = 3.20).

In this sample, Praxis I Reading, Writing and Math performance also appears to have a somewhat normal distribution. The means, medians, standard deviations and the inter-quartile are similar. The scores for the Praxis I represent the highest score reported and not the first attempt of the subject. Fifty percent of the sample scored between 175 and 181 on Reading, between 174 and 178 on Writing, and between 175 and 183 on Math. The central tendency in measures of variability are very similar for all Praxis I data.

Criterion Variable

The ELED:CIA Praxis II is the criterion variable and is the first reported attempt. Comparison of the mean and median (175.06 and 177), standard deviation (12.87), and inter-quartile range (Q1 = 167, Q3 = 185) suggest a normal distribution.

Table 1

Central Tendency and Variability of Predictor and Criterion Variables
N = 288

<u>Variable</u>	<u>M</u>	<u>Mdn</u>	<u>TR</u> <u>Mean</u>	<u>SD</u>	<u>SEM</u>	<u>Min.</u>	<u>Max.</u>	<u>Q1</u>	<u>Q3</u>
SAT Math	480.99	480.00	480.60	66.75	3.93	270.00	660.00	430.00	520.00
SAT Verbal	487.12	490.00	487.04	70.78	4.17	260.00	680.00	440.00	540.00
Praxis Reading	178.09	178.00	178.05	3.80	0.22	170.00	187.00	175.00	181.00
Praxis Writing	176.11	176.00	175.95	2.75	0.16	169.00	186.00	174.00	178.00
Praxis Math	179.45	179.00	179.37	4.44	0.26	171.00	190.00	175.00	183.00
ELED: CIA	175.06	177.00	175.55	12.87	0.76	139.00	198.00	167.00	185.00
H.S. Per.	66.14	71.00	67.26	21.09	1.24	1.00	100.00	53.00	82.00
1 st Yr GPA	3.2241	3.2000	3.2319	0.4774	0.0281	2.1100	4.0000	2.8800	3.6000

Note. SEM (Standard Error of the Mean), Q1 (25% of population is at or below Quartile 1), Q3 (25% of the population is at or above Quartile 3), TR Mean (Trimmed Mean takes the bottom and top 5% scores out of the calculation for finding the TR Mean in an effort to limit their effect on the findings).

Pearson r Product Moment Correlation

The Pearson r product moment correlation coefficient examines the relationship between quantitative variables in the descriptive study. Gay and Airasian (2003) indicate that the correlation statistic suggests the strength and direction of a relationship and is expressed as numbers that range from -1.00 to +1.00. This correlational analysis was conducted to determine if there is a relationship between the predictor variables (SAT Math, SAT Verbal, Praxis I tests, high school rank percentile and first year college GPA) and the outcome variable (ELED:CIA Praxis II test). The Pearson r product moment correlation coefficient is the most preferred method of establishing a correlation because it results in the most accurate estimate of correlation (Gay & Airasian, 2003).

Relationships between all the predictor variables and the relationship between the predictor variables and criterion variable are presented in Table 2. Results show that the criterion is directly related to all predictor variables at $p = .001$ while the correlation coefficients range from 0.349 to 0.580. Correlational analysis suggests that regression analysis to develop a predictive equation is reasonable.

Table 2

Pearson r Product Moment Correlations

	<u>SAT Math</u>	<u>SAT Verbal</u>	<u>Praxis Reading</u>	<u>Praxis Writing</u>	<u>Praxis Math</u>	<u>H.S. Dec</u>	<u>ELED:CIA</u>
<u>SAT Verbal</u>	0.634 0.001						
<u>Praxis Reading</u>	0.504 0.001	0.617 0.001					
<u>Praxis Writing</u>	0.398 0.001	0.475 0.001	0.438 0.001				
<u>Praxis Math</u>	0.695 0.001	0.456 0.001	0.524 0.001	0.338 0.001			
<u>H.S. Per</u>	0.475 0.001	0.5397 0.001	0.318 0.001	0.330 0.001	0.385 0.001		
<u>ELED:CIA</u>	0.462 0.001	0.580 0.001	0.3541 0.001	0.432 0.001	0.419 0.001	0.349 0.001	
<u>1st Yr GPA</u>	0.452 0.001	0.364 0.001	0.438 0.001	0.290 0.001	0.395 0.001	0.382 0.001	0.439 0.001

Cell Contents: Pearson *r* correlation
P-Value

Multiple Regression Analysis

Regression analysis and regression equation constitute the predictive equation.

The multiple regression equation is: ELED: CIA = - 129 - 0.0016 SAT Math + 0.0566 SAT Verbal + 0.672 Praxis Reading + 0.606 Praxis Writing + 0.227 Praxis Math + 0.0316 H.S. Dec. + 2.56 GPA. This equation accounts for over 40% of the variance in

ELED:CIA scores (R-Sq Adjusted = 41.2%). Refer to Table 3 for the regression analysis and Appendix D for Unusual Observations and Residual Effects.

Table 3

Regression Analysis

<u>Predictor</u>	<u>Coef.</u>	<u>SE Coef.</u>	<u>T</u>	<u>p</u>
Constant	-129.17	52.18	-2.48	0.014
SAT Math	-0.00164	0.01445	-0.11	0.910
SAT Verbal	0.05656	0.01229	4.60	0.001
Praxis Reading	0.6723	0.2163	3.11	0.002
Praxis Writing	0.6058	0.2497	2.43	0.016
Praxis Math	0.2269	0.1920	1.18	0.238
H.S. Per.	0.03159	0.03326	0.95	0.343
1 st Yr. GPA	2.556	1.478	1.73	0.085
S = 9.867		R-Sq = 42.7%		R-Sq (adj) = 41.2%

Note. Coef.=Coefficient ; SE Coef. = Standard Error Coefficient.

ANOVA Analysis

The analysis of variance (ANOVA) was performed and in Table 4 at $p = 0.001$, $F = 29.78$, $df = 7$, confirms significant contributions of predictor variables to ELED:CIA performance.

Table 4

Analysis of Variance

<u>Source</u>	<u>df</u>	<u>SS</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Regression	7	20294.0	2899.1	29.78	0.001
Residual Error	280	27258.0	97.4		
Total	287	47552.0			

<u>Source</u>	<u>df</u>	<u>Seq SS</u>
SAT Math	1	10137.7
SAT Verbal	1	6569.0
Praxis Reading	1	2185.7
Praxis Writing	1	727.1
Praxis Math	1	176.6
H.S. Per.	1	206.8
1 st Yr. GPA	1	291.1

Note. df= Degrees of Freedom provides an estimate of the number of values for the amount of statistics that may vary from the norm in final calculations.

Stepwise Regression

The purpose of a stepwise regression is to allow removal or addition of variables to the regression model to identify a useful subset of the predictors (the stepwise regression would present the variables in order of power). In this particular study, through backward elimination regression analysis, the researcher identified a useful

subset of predictors by removing variables to determine if the predictor model was affected and if a simpler predictive model could be developed.

Table 5 shows that the SAT Math may be eliminated from the equation. The percent of variance for SAT Verbal accounts for 31.39 %. If SAT Verbal is added to Praxis I Reading the percent of variance is 39.33.

Table 5

Stepwise Regression

Step	1	2	3	4
Constant	127.14	-62.67	-155.28	-173.87
S01	0.0995	0.0645	0.0558	0.0528
T-Value	11.89	6.71	5.59	5.22
p-Value	0.000	0.000	0.000	0.000
P710		1.16	1.04	0.92
T-Value		6.35	5.58	4.65
p-Value		0.000	0.000	0.000
P720			0.67	0.63
T-Value			2.85	2.68
p-Value			0.005	0.008
P730				0.27
T-Value				1.73
p-Value				0.085
S	10.7	10.1	9.97	9.94
R-Sq	31.39	39.33	40.90	41.47
R-Sq (adj)	31.17	38.94	40.32	40.70

Standardized tests tend to predict standardized tests. Many studies have shown a correlation between SAT scores, high school rank, and ACT scores and college success (Cohn et al, 2004; Lenning, 1975; Blue & O'Grady, 2002; Kuncel et al, 2001, 2004).

Other studies have indicated a correlation between SAT standardized tests and Praxis I

tests (Pettijohn II, 1995) and grade point averages and standardized test scores (Pettijohn II, 1995). In this particular state, the ELED:CIA test is of great importance since it is a high-stakes test, the passing of which is required for certification. The study of this sample shows that the regression equation accounts for 40% of the variance. This equation appears to provide a reasonable predictive model that universities may consider for this certification exam. Using the regression equation with the stepwise regression, a freshman entering a teacher education program with an SAT Math score of 400, an SAT Verbal score of 400, and Praxis I scores in Reading of 168, Writing of 169 and Math of 169, would earn a predicted ELED:CIA test score of 148, well below the required 168 minimum required by the state. Using slightly higher scores, if a freshman student entered with an SAT Math score of 450, an SAT Verbal score of 450, Reading Praxis of 170, Writing Praxis of 170, and Math Praxis of 170, the student would earn a predicted ELED:CIA test score of 152, again still well below the passing score of 168. This finding suggests that this small set of predictor variables may be considered by teacher education programs in developing or adjusting admission criteria, intervention strategies and program modifications to assist students. Furthermore, the regression analysis indicates that the Math SAT score can be dropped from the equation and the model will still be predictive

Qualitative Analysis

The qualitative study was conducted at the same large university state system in March and April, 2008, and included nine certification officers from various universities within the state system. Two categories of data were examined. The first included information collected from interview sessions with certification officers in the

participating universities. The second category of data collected and analyzed were the university websites. These two categories provided the framework for the data analysis in this qualitative component. The combination of these data aligned with the research questions helped to produce three emergent themes. This section details the information gathered from the interviews and the websites. The emergent themes are discussed for each research question.

Data Sources

Although there is a lack of agreed-upon approaches for analyzing and narrating qualitative data, there are some guidelines. The data gathered in this particular study were analyzed using five steps: data managing (breaking down of data), reading/memoing (becoming familiar with the data and identifying potential themes), describing the context and participants (examining the data in depth), classifying (categorizing, coding and grouping into themes, and interpreting (interpreting and synthesizing the organized data into general written conclusions, is reflective and explanatory) (Gay & Airasian, 2003).

The data was gathered, read, re-read, sorted, analyzed and interpreted using the researcher's experience and critical eye. Wolcott (2001) states that "the real work of qualitative research lies in mindwork, not fieldwork" (p. 96), and this researcher agrees. Wolcott says that "analysis falls more on the scientific side of things" and "interpretation on the humanistic side" (p. 36). Wolcott also states that "analysis follows standard procedures for observing, measuring and communicating with others about the nature of what is 'there'" while interpretation "is derived from our efforts at sensemaking, a human activity that includes intuition, past experience, emotion..." (p. 36). "Interpretation

invites the examination, the ‘pondering’ of data in terms of what people make of it” (p. 125) asserts Wolcott.

Wolcott also states that “good qualitative research ought to confound issues, revealing them in their complexity rather than reducing them to simple explanation” (p. 125). This researcher acknowledges that the issue of using standardized testing and predictive models is a very complex matter and studying their uses can be difficult and confusing.

“In qualitative analysis, several simultaneous activities engage the attention of the researcher: collecting information from the field, sorting information into categories, formatting the information into a story or a picture, and actually writing the qualitative text” (Creswell, 1994, p. 153). This researcher attempted to organize information into certain patterns or themes and then analyze it.

The themes that emerged from this study were informative and provided a solid framework for exploring how various universities might implement different strategies on their campuses. This analysis approach is advocated by Gay and Airasian (2003) as well as Merriam (1988) who state that data collection and analysis must be simultaneous processes in a qualitative study.

A secondary data collection technique used was document analysis since documents can be valuable in understanding a situation and setting a context and for increased accuracy since interviews can be colored by the desires of the subjects to portray themselves in particular ways (Grady, 1998). Documents are less likely to be manipulated, states Grady. The data analyzed for this secondary method were retrieved

from each university website to confirm the information obtained from the interviews. This was only used as a supportive method of corroborating interview responses.

Interviews

This element of the qualitative component of this study was composed of interviews of teacher certification officers (those who had knowledge of current policies, procedures, and programs used in their universities in relationship to teacher education programs) in nine universities in the large university state system. Permission was granted via a signed statement from nine university presidents to study their university and interview teacher certification officers. Consent was then obtained from the nine university certification officers to record a telephone interview, approximately one-half hour in length. Interview questions (Appendix C) were then disseminated to the participants via email and a date and time were determined for the telephone interviews. The interviews were conducted during a four week period in March and April 2008. The interview questions were divided into two domains: (a) those questions related to admission criteria, intervention strategies, and program modifications and (b) those questions related to the justice and ethics of using standardized tests and gatekeeping models. The interviews were tape-recorded and raw data were supplied to the certification officers after the interviews for verification.

The university certification officers who were interviewed will remain anonymous to everyone except the researcher. The researcher will keep the names of individuals and universities confidential. Transcripts are on file and will remain anonymous. Participation was voluntary and signed consent forms are on file for each university president and university certification officer or their representative. The

results of the interviews, along with the information gleaned from the websites, were coded and analyzed and are presented below.

Adjustments to Teacher Education Programs

Admission to the university. The admission criteria used by the universities for teacher education students was the same as the admission criteria used for other incoming students in six of the nine universities; there were no special conditions considered for teacher education students. Any changes to university admission criteria for these six universities that have occurred since the new laws have taken effect were unrelated to the new law. Two universities, however, had raised their requirements for teacher education students, and requirements were now higher than for the general population of students admitted to the university (higher high school GPA, higher SAT, and higher high school rank). One university made these changes because of new state law; one did not. The remaining university, raised standards for incoming education majors, although those majors housed outside of the education department (i.e., secondary education majors which were housed in content area departments) did not have standards raised. Those standards that were raised for education majors included SAT scores and high school GPA.

Five of the university certification officers noted that there was concern by upper administration regarding enrollment numbers of the university. The concern noted was that if students were denied admittance to the education program at the time of admittance to the university, those students might choose to go elsewhere, thus lowering enrollment numbers. Lower enrollment resulted in less revenue for the university. Additionally, these same five certification officers noted concern for their faculty if

enrollment decreased in education programs; they would not be able to justify the continued employment of their faculty if enrollment numbers in education programs decreased.

A major theme for admission to the universities was that there was little change made to admission criteria due to the new state law, and most universities had the same admission criteria for education students that they had for all other incoming university students. “We don’t do anything different at admission to the university than the normal things the admissions office looks at,” and “admission to the university is no different for the education program than it is for the university” were common responses made by the certification officers. In many cases, this decision to retain the same criteria for admission as before the new state law resulted from upper administration’s concern regarding enrollment and revenue and concern for continued employment of education faculty.

Admission to teacher candidacy. The teacher candidacy gate was a new requirement of the state law, and it was dictated by state law that this gatekeeper must be at 48 credits, with a 2.8 GPA with the passing of Praxis I tests. It included a 10% rule that allowed 10% of the applicants to be admitted without meeting all conditions of candidacy. It also included a dispositions clause that was to be signed by their advisor of their character. However, each university had implemented the law slightly differently. All the universities abided by state law but had developed nuances of their own. All nine universities had some type of candidacy level; seven of which required applications for candidacy; one university had developed an interview process; and one university required an electronic portfolio (all other information required was tracked on-line). All

the universities met at least the state minimum criteria of the passing of Praxis I tests; four universities required the minimum 2.8 GPA while the other five universities required a higher GPA of 3.0. All the universities required three credits of English composition, three credits of literature, and six credits of college level math courses as mandated by state law; three indicated they required additional courses as well. None of the universities identified the use of SAT or ACT scores in place of Praxis I tests, although allowed by state law.

Five of the universities required candidacy at 48 credits (dependent upon program), three required it at 45 credits, and one university identified candidacy at 60 credits. One university officer noted that they “go strictly by the state requirement of 3.0 GPA”; however, state law allows that, if Praxis I tests are passed, the GPA can be a minimum of 2.8. Clearances for child abuse, criminal record and Federal Bureau of Investigation fingerprinting were required, along with TB tests, and five of the universities required all of these for teacher candidacy admittance, although not required by state law. Two universities used the 10% rule provided by the state that allows 10% of the applicant pool to be admitted to candidacy with less than the full requirements; however, two other universities allowed exceptions, but did not specifically use the 10% rule. Five universities addressed dispositions in some format; two identified diversity as being required; and two noted an early field experience was required (Table 6). State law does not mandate any conditions regarding dispositions, diversity, or field experience for teacher candidacy.

Table 6

Admission to Teacher Candidacy

<u>University</u>	<u>Application</u>	<u>Interview</u>	<u>Praxis I</u>	<u>2.8 GPA</u>	<u>3.0 GPA</u>	<u>Math/Eng</u>	<u>Other Courses</u>
1	x		x	x		x	x
2	x		x		x	x	
3	x		x	x		x	
4		x	x		x	x	
5	x		x		x	x	x
6	x		x	x		x	x
7	x		x	x		x	x
8	eportfolio		x		x	x	
9	x		x		x	x	x

Four universities called for a myriad of other requirements, including a school-based observation packet, approval by the department, a career development workshop, a faculty interview, approval by the Teacher Education Council, approval by the Dean, and a technology self-test (Table 7). It should be noted that one university demanded more of a variety of conditions be met for candidacy than any of the other universities.

Table 7

Further Teacher Candidacy Requirements

<u>University</u>	<u>45 cr</u>	<u>48 cr</u>	<u>Clearances</u>	<u>10% Rule</u>	<u>Exceptions</u>	<u>Dispositions</u>	<u>Diversity</u>	<u>Early Field</u>
1		x	x		x	x		x
2	x					x	x	
3		x	x					x
4		60	x	x	x			
5		x	x		x			
6		x				x	x	
7	x			x	x	x		
8		x	x			x		
9		x						

A common theme relating to admission to teacher candidacy was the development of a teacher candidacy gate that stipulated certain requirements as indicated by state law (the passing of Praxis I tests, the successful completion of two mathematics courses that were not considered remedial and three credits of English composition and three credits of English literature). Although there were a variety of other requirements dependent upon university, and certain conditions were to be met at slightly different times in the students' programs, the key concept was the development of a gate for teacher candidacy. One certification officer summed it up by saying, "We have different transition points..... and we track our education students from the time they take Praxis tests until they graduate, and teacher candidacy enables us to begin the tracking model."

A second major theme was that certification officers believed that identifying students in need earlier in their program eliminates the issue of students graduating and not being able to get certified to teach in the state because they do not meet the standards. Comments included: “I used to feel in the old days that we were doing a tremendous disservice to students that they would get all the way through student teaching and couldn’t pass the Praxis and couldn’t get certified. It just didn’t seem that was the right thing, to let them go that far.”

Admission to student teaching. For admission to student teaching, requirements had changed with the state requirement of a higher GPA. Entrance to student teaching was used as a gatekeeper by some of the universities, however, each university used gatekeeping slightly differently. A minimum GPA of 2.8 was used as a gatekeeper by all the universities, although five of the universities used the higher 3.0 GPA requirement. Of the four universities that indicated a 2.8 GPA was required, they also had in place an advisement tool that advised students of their status regarding graduation and certification and the required 3.0 GPA for certification. “It is unethical to allow students to have a 2.8 at admission to student teaching and not give them the ramifications of less than a 3.0 GPA at graduation” was one comment that encompassed the attitude of all of the universities that had a 2.8 GPA requirement at the entrance to student teaching. One certification officer stressed that state law “does not require a 3.0 GPA at graduation, but rather for certification” and was concerned that some of the state universities were not allowing students to graduate with less than a 3.0 GPA. All the universities required continued clearances and current TB tests. Only one university did not require any type of Praxis II testing before student teaching, and the certification officer indicated “it was

under discussion.” Three universities required the passing of Praxis II tests before student teaching, one of which indicated they could use the 10% rule allowed by the state for exceptions. One certification officer indicated that his university would “never, ever, ever again” allow an exception of any kind because it “becomes a nightmare.” The third university officer indicated that they are “setting their students up for failure if they allow exceptions.” Three universities required the taking of Praxis II tests before student teaching, but not the passing of the tests. One university required the passing of Fundamental Subjects: Content Knowledge required for K-6 and K-12 and the taking of the specialty area; the last university required only the taking of Fundamental Subjects: Content Knowledge.

The use of another gatekeeper at the student teaching level was one central theme of entrance into student teaching. With the need to meet higher standards for certification, universities had developed a unified front in instituting a second “gate” with specific requirements to enter student teaching (the first gate was at teacher candidacy). Certification officers made such comments as “We need to get them ready to graduate and be certified successfully.”

A second theme was the implementation of an advising system at entrance into student teaching for any students who had less than a 3.0 GPA or who had not passed Praxis II testing. Comments included “Advisement throughout the process is good and they don’t waste their money,” “We want students to be aware of how this might affect their careers,” and “We advise them mathematically we don’t think they are going to make a 3.0 GPA and that is a requirement for graduation out of education and certification.”

Graduation and certification requirements. For graduation and certification, the universities had changed their requirements to varying degrees since state law had been enacted. For graduation, four of the nine universities indicated they allow students to graduate with less than a 3.0 GPA. Of those four, two universities noted that it would be unusual and would require individual evaluation. Another university officer indicated that they do not make exceptions; however, “we did make one exception for an individual that was an international student, but there were extenuating circumstances.” All the universities required a 3.0 GPA for recommendation for certification; however, two universities indicated they could apply the 10% rule allowed by the state if the student was below the mandated 3.0 GPA.

The passing of Praxis II tests was required for graduation by four universities; however one of those used the 10% rule for graduation and certification. All of the universities required the passing of Praxis II tests to be certified (as was dictated by the state) and no university made exception to state law regarding the Praxis testing.

Of the four universities that required the 2.8 for entry into student teaching, all four had some kind of advisement tool in place to inform students of their standing for graduation and certification. “If it was mathematically impossible for students to reach the 3.0 to graduate and be certified, we tell them up front” was one comment made. This could be either because the GPA was too low or student teaching was offered as Pass/Fail and was not counted in the GPA. Two schools indicated they would advise them not to graduate and take more courses until they could reach the 3.0 so they would be eligible for graduation and recommendation for certification.

Although state law does not specify that students cannot graduate with less than a 3.0 GPA, since five universities require a 3.0 GPA at entrance to student teaching, four of those five universities indicated they would not graduate or make a recommendation for certification without students having met the 3.0 GPA and the passing of Praxis II tests. Four universities indicated that without the 3.0 GPA, they would not graduate students with an education degree, but would graduate them in an alternate degree program with possible additional courses. Three universities indicated they would allow students to graduate with an education degree with less than a 3.0 GPA but would not recommend students for certification who did not meet all requirements. Two of those three universities indicated they would use the 10% rule for GPA issues, but not for Praxis test requirements. One university developed an intervention course if a student was having difficulty in student teaching, would drop the student from student teaching and enroll them in the intervention course, and give targeted assistance to the student in order to bring their skills to the required level. Students could then repeat student teaching the following semester or opt to graduate with a degree other than education. All of the universities advised students to either withdraw from student teaching or look at other options if their GPAs or Praxis testing were an issue. Three universities required signed acknowledgements before student teaching if graduation or certification were in jeopardy. Two schools used the 10% rule at the point of graduation and certification.

One common theme was the taking or passing of Praxis II before graduation which was considered to more likely result in the successful certification of potential teachers. The certification officers were in agreement that the requiring of Praxis testing

earlier in students' programs resulted in more students being eligible for certification at the time of graduation.

A second major theme was that advisement "during" student teaching was essential since GPA and Praxis testing could be an issue when it came to graduation and certification. One certification officer indicated advisement was done and students had to "sign a contract" indicating they were aware that "if they have not passed Praxis we will allow them to go out and student teach with the understanding that they must take that the next time Praxis comes up, and they must take it again, and they cannot be certified unless they passed all of them. ... We will graduate them in a degree in education without certification. But they must have signed a contract." Another certification officer indicated that "We review them on a case by case basis to determine whether or not a student must take additional coursework to get the GPA up," or "retake any courses they are eligible to retake."

Intervention strategies for Praxis I testing. There were many kinds of intervention strategies that had been developed for Praxis I testing and the universities used multiple strategies. The strategies used included the offering of workshops, tutoring (both one-on-one and group), PLATO (a purchased online product), attendance at a community college Praxis course, the use of test preparation books and practice testing, offering mathematics and composition courses early in the freshman year, creation of math courses, use of websites, creation of a credited in-house Praxis course, development of an individualized plan for students, and the use of a screening test at orientation that determined the need for intervention (see Table 6).

Two universities had developed specific mathematics courses for elementary education majors that met state requirements and also gave a foundation for the Praxis I Math test. All the universities either had developed intervention strategies in-house or recommended their students to take a community college course to assist in passing the Praxis I tests. One university had developed a “screening tool” that was a combination of ten questions each related to Praxis I math, reading, and writing. This screening tool is administered at orientation and dependent upon the test results, recommendations were made for assistance (i.e., PLATO, take an intervention course relating to standardized testing, take remedial math or English courses). One university is in the process of developing a gatekeeper course with a Praxis I component to assist students in being prepared for the Praxis I tests.

A common theme regarding intervention strategies for Praxis I tests was that some kind of intervention had been developed or encouraged by all the universities. “A number of students take advantage of our tutoring in our tutoring center” was the comment of one certification officer. Other comments included: “we have an online tutorial that we encourage students to use, and we also encourage students to take a course on the Praxis prep;” “we try to get their math course in as soon as possible to help them be successful on their Praxis;” “we developed a Praxis screening test that we administer at orientation;” “we recommend that they take a course that we developed;” and “we recommend a community college course that was developed for Praxis I testing.” “We developed a math course to help pass Math Praxis” was mentioned by two certification officers (see Table 8)

Table 8

Intervention Strategies for Praxis I Tests

<u>Univ</u>	<u>TW</u> <u>LRC</u>	<u>PLATO</u>	<u>CC</u> <u>Prep</u> <u>Crse</u>	<u>Test</u> <u>Prep</u> <u>Bks</u>	<u>Early</u> <u>Math/</u> <u>Eng</u> <u>Crse</u>	<u>Cr</u> <u>math</u> <u>crse</u>	<u>Web-</u> <u>sites</u>	<u>Cr</u> <u>Pr</u> <u>crse</u>	<u>IP</u>	<u>PST</u>
1	x	x	x	x	x	x				
2			x							
3	x									
4	x			x						
5	x				x				x	
6			x							
7	x			x	x	x	x			
8		x						x		x
9	x	x	x							

Notes: TW-LRC, (Tutoring, Workshops, Learning Resource Center), CC Prep Crse (Community College Prep Course), Cr math crse (Created math course), Cr Pr crse (Created Praxis course), IP (Individualized Plan), PST (Praxis Screening Test at Orientation)

Intervention strategies for Praxis II testing. Intervention strategies for Praxis II tests had not been developed to the extent that intervention strategies for Praxis I testing had been developed. Although two universities took advantage of community college courses and three universities paid to have faculty take the tests to assess the content of the tests, tutoring and workshops were available at only four universities. One university identified individual departments as having developed intervention workshops as

opposed to a central tutoring agency. One university identified the development of a Praxis II one credit course that was developed in-house for elementary education majors.

A major theme regarding interventions for Praxis II testing was that there were not very many interventions that had been developed at this level and the universities that had developed interventions for Praxis II had very few options. “We haven’t created anything;” “we haven’t had as much difficulty with students passing Praxis II; “we have an agreement with a community college to provide their Praxis II workshops on this campus;” and “we don’t have any workshops” were all comments made by the certification officers.

Curriculum changes. Although four of the universities identified no curriculum changes at all, the remaining universities had designed some changes in their curriculum to address both Praxis I and Praxis II tests. Two universities designed new mathematics courses to address Praxis I Math testing, although those were the only curriculum changes mentioned for Praxis I tests (there is an overlap between intervention strategies developed for Praxis I and curriculum changes regarding the math courses for Praxis I tests). In addressing Praxis II tests, three universities absorbed the cost for faculty members to take the Praxis II tests and then used this information to adjust the content of their curriculum while maintaining the standards for accreditation, or to create informational workshops or one-on-one assistance to address what were perceived to be weaknesses in their students’ testing. One university carefully studied ETS test results of students and determined that assessment and evaluation were issues. The assessment course was then redeveloped to address those issues. One university noted that some of their faculty had begun to include Praxis-like questions in their teaching; showing the

students how what they were learning might be addressed in Praxis testing. Yet another university indicated that the curriculum was changed as needed to be aligned with state requirements but no additional changes had been made.

Although some universities made curriculum changes to better align with Praxis testing, a common theme was that few changes had been made in curriculum to address the content of Praxis testing.

Perceptions of Predictive Models as Gatekeepers and Intervention Tools

Although all nine certification officers were familiar with the terms “gatekeeping” and “predictive models,” their interpretations varied slightly; therefore the definitions used for this study were provided. Gatekeeping is defined as a screening mechanism used at different points in the educational process to prevent entrance or exit from a program of students who are not equipped with the requisite knowledge, skills, and values needed for successful completion of an education program (Koerin & Miller, 1995). Predictive models or equations are developed from prediction studies that are conducted to test variables believed to be good predictors of a criteria. Prediction studies are used to predict an individual’s likely level of success in a specific course or program (Gay & Airasian, 2003). Seven of the universities indicated that they did not use a predictive model at any level. However, of those seven, four identified using specific criteria before making decisions, and one indicated the use of a probability table. The probability table was developed by the individual university and showed a correlation between the SAT and the passing of the Praxis tests. One university noted the utilization of a predictive model at the point of entrance into the university, using SAT and high school GPA to determine the likelihood of passing Praxis I tests. The other university currently using a

predictive model indicated that, although a predictive equation was not used at admission on any level, one has been used to predict performance on Praxis II tests in hopes to identify students in need sooner, and therefore be able to assist students earlier in their programs. This predictive model uses first year GPA, SAT scores, and Praxis I scores.

Perceptions regarding the use of predictive models as a gatekeeper were similar. Only one university used a predictive model at the time of admission, and that university certification officer believed the use of a predictive model was “good for everyone,” and noted that “predictive models are good gatekeepers; we keep refining it, and we actually had SAT requirements set a little higher but there were people in the middle group who would have a solid chance of passing, so we adjusted it.” Seven of the eight other university officers did not like the use of predictive models as a sole gatekeeping method. One comment made was, “I am very uncomfortable using a predictive model as a gatekeeper, especially since some students mature at a later time; who are we to say they will never mature?” Others pointed out, “There is always someone who does not fit the mold,” “Give everyone a chance,” and “It would unjustifiably eliminate people who could probably do it.”

However, all of the certification officers noted that with current state requirements, criteria were evaluated at the point of entrance to teacher candidacy, which could be construed as using a predictive model as a gatekeeper. One certification officer indicated, “although a ‘predictive equation’ might not be used, because state law requires specific requirements, specific ‘criteria’ is being used and in reality, is very similar to a predictive model.” This same university officer indicated that GPA and Praxis scores are used as a screen or gatekeeper to meet state requirements, and believed that “perhaps a

predictive equation might help in advising students to pursue alternative career pathways earlier in their careers which would eliminate students from continuing to pursue education when their GPAs and Praxis scores do not meet the minimum standards.”

Although only two of the universities used a predictive model in any way, seven of the nine certification officers believed that the use of a predictive model would be useful as a gatekeeping method as long as it was in combination with multiple other assessments. It was the opinion of all nine certification officers that any one kind of assessment to determine entrance into a teacher education program was not sufficient regardless of the method, and the use of multiple assessments would be more effective and beneficial. One of the two certification officers who would not use a predictive model in any way commented, “I do not believe that a predictive model should be used in any way or at any point in time for teacher education candidates,” citing that “only situational evaluation and observations can determine a person’s acceptability or potential as a teacher.” The other certification officer who would not use a predictive model noted, “I do not believe in quantifiable measures.”

However, seven of the university certification officers agreed that the use of a predictive model to develop intervention strategies to assist students at an earlier point in their teaching career was a definite advantage. A common theme regarding predictive models was that although a predictive model was not being used by the majority of the universities, the use of a predictive model would be very helpful as an assessment tool to provide interventions to students at an earlier point, allowing for a more successful outcome for students. However, the use of a predictive model would need to be used in combination with other methods of assessment and not as a singular assessment tool.

Comments included “The earlier you get to the students, the better it is for the program, the faculty and the students.” “We can then work on areas of improvement at an earlier time” was an observation made by another certification officer. One certification officer believed that “a predictive model would be very successful as an intervention tool, but universities would have to put resources behind building those intervention strategies.”

A probability table, which is very similar to a predictive model, was used by one university, developed in-house over a period of years by keeping data records. The probability table is based primarily on the fact that there is a correlation between the SAT score and passing the Praxis test at the certification officer’s own university. After having collected and reviewed the data, the probability table indicated that SAT scores needed to be above 1060 at this particular university for students to have a decidedly better chance to succeed (the correlation was .73). Using a lower SAT score of 1000, the correlation dropped to .57 at this particular university. An SAT score below 950 showed a .27 or .28 correlation at this particular university.

Perceptions of Standardized Tests as Gatekeepers

Much of the concern related to gatekeeping was centered on the use of standardized testing as high-stakes testing. Standardized testing was a concern whether it was included as part of the predictive model or if it was a stand-alone requirement. One certification officer indicated “We know some people by their very nature are not good test takers; however they may be very effective teachers.” Another shared, “Standardized tests should be one of multiple factors.” Another certification officer pointed out that “It might eliminate certain populations and talent.”

“Quantifiable tests that determine a persons’ acceptability or potential as a teacher,” as noted by one certification officer, “lack the use of situational evaluations or observations.” He indicated that “you cannot do a multiple choice test to find out if the candidate knows his or her skills. Teaching is not a multiple choice occupation. Teaching is a judgment.” A major theme regarding standardized testing was the belief that assessment of potential teachers cannot be accomplished with a single assessment of a high-stakes test.

Perceptions Regarding Social Justice and Ethics

Predictive models. The use of predictive models was consistently cited as ethical and to the benefit of students if used with other measures and as an intervention tool, not as a gatekeeper. The predictive model itself was considered ethical and all but two certification officers indicated they would use a predictive model if it was reliable. One certification officer noted, “It is difficult to say if a predictive model should be used as a gatekeeper, although in some cases it is more ethical to stop students from moving forward in an attempt to meet standards that are most likely unattainable.”

The two certification officers that would not use a predictive model in any way were both of the mindset that only subjective assessment is useful in evaluating if a student will be “highly qualified” as a teacher. However, they both conceded that with state and federal law demanding more accountability and mandating the use of standardized tests to assess candidates’ abilities, they would continue to meet the demands of the state. One certification officer indicated “I have resigned myself to Chapter X.”

The two certification officers who believed only subjective evaluation was appropriate were both former school psychologists. One of the two believed that predictive models should not be used in any format, since there are too many “exceptions to the rule.” The other participant noted that using a predictive model can be very effective in most instances, as long as other alternatives were provided to those who did not meet the standard but were still interested in teaching (i.e., personal interviews, proof of ability after a year of college courses).

Standardized tests. Perceptions of the ethics and justice of using standardized testing focused on two different components: program versus student. Comments regarding whether it was ethical to use standardized testing to evaluate programs indicated that it is ethical and just to use standardized testing for program evaluation; “it holds institutions accountable to the same standard and compares programs collectively.” Of the five universities that noted the difference between program and student, all believed that it was ethical to use standardized testing to evaluate programs.

However, when the use of standardized tests was associated with the evaluation of students, the perceptions of ethics and social justice were not the same as for programs. Although it was agreed by the majority of certification officers that standardized testing measures the base knowledge of a candidate and it is a necessary part of accountability, all the certification officers noted that there are other factors that must be evaluated, and ethical and social justice issues were a large part of the discussions.

There were concerns regarding the fairness of standardized testing for all populations. Responses included concern with the content of the tests since it was perceived that there appears to be an ethnic and racial bias in the test questions. Of the

certification officers that mentioned bias in the test questions, none of them believed that ETS, despite its efforts, had managed to eliminate the prejudice of questions. It was noted that the test questions must be “sensitive to the needs and background of the test takers,” and it was perceived that was not the case. One participant mentioned that ETS is also “too strict on the idea of the time limit of taking standardized tests; a certain level of reading ability is necessary and it is certainly not fair to ELL populations.” Another certification officer, however, believed that “if everybody is equal, then everybody is equal, and I think we have to work with the students that come in from minorities and help them to succeed.”

One participant observed that “for students who don’t have a history of performing well on standardized tests or come out of a school system that didn’t offer a really good opportunity to challenge them, they may come in under-prepared and have not done well on standardized tests and they say they are just not good test takers. Whether they are under-represented populations or kids that live in poverty, I think real strict requirements on standardized tests probably limit opportunities to achieve or go into a profession. Mainly it is a mindset that they have that they are afraid of standardized testing or they came out of a school system that their experience with standardized tests is that they are average or they have never shown their potential based on these standardized tests; SATS or PSSAs.”

Other opinions voiced included observations that standardized tests do not have the ability to measure talent, unless as one certification officer noted, “you count being good at taking tests a talent.” Others noted that standardized tests cannot measure if someone will make a good teacher; they can only measure content knowledge. One

participant observed that standardized testing “has absolutely nothing to do with whether or not someone will make a good teacher, but is at least a little more aligned with what people ‘do’ as teachers as opposed to being strictly content.” Yet another indicated that “it doesn’t measure skill or motivation or the ability to establish classroom climate.”

One certification officer observed that “teachers can be trained,” and commented that some countries have ‘teacher training programs’ as opposed to ‘teacher education programs.’ He noted that “the preconceived notion of only good test takers being good teachers is illogical.” It was also noted that the use of standardized testing as a sole measure of a candidate’s ability to teach “does not allow for the human capacity to be embraced.”

Eight of the university certification officers perceived one-time, high-stakes assessment as a poor way to determine if someone will make a good teacher; and all believed that multiple assessments are needed to determine if someone will make a good teacher, including evaluating how the students perform in an actual classroom and the use of authentic assessments with portfolios, using learning style, and articulating and demonstrating knowledge. It was also noted that “having four to five years of college and an entire future dependent upon one high-stakes test is not ethical or just for anyone.”

Many of the certification officers indicated that no one is certain what standardized tests even measure, including ETS. One participant noted that standardized tests “are reliable because the more people you give it to, the more reliable it is.” He also believed that, in reality, “no test is really fair.” Another comment made was “I think we believe in the credibility of tests a lot more than we probably should believe in them. It is part of the political piece of education more than anything else.” One

certification officer noted “I am adamantly opposed to Praxis testing. It is a multiple choice test and teaching is not a multiple choice occupation. Teaching is a judgment, using your head, thinking outside the box. It’s doing all the things you have to do when you work with people. You need classroom management skills and the right dispositions. Praxis is what today’s environment believes is needed, but it has no connectivity to success in the classroom.”

One certification officer felt that there was no point in discussing issues that could not be changed since “state law is state law; it is required and we can’t make a difference.” However, the other eight certification officers wanted to voice their concern regarding standardized tests.

Theme Formation for Research Questions

A two-phase data collection process (Creswell, 2002) was used to examine the response of university teacher education programs to increasing demands for high standards and passing scores on standardized tests. The quantitative portion of this study was conducted at a sample university within a state system, and a predictive model was developed that predicted the likelihood of success of elementary education teachers in the passing of Praxis II tests required for their major. Then certification officers from the same state system where the predictive model was developed were interviewed to determine what university education programs had incorporated into their programs to meet the high standards and the required passing of standardized testing. Also included in the interview questions was the perception of the certification officers, if a predictive model could be developed, of using that predictive model in their teacher education programs and how or if it could be incorporated into their programs. The predictive

model is incorporated into the discussion and analysis of the research questions, particularly in research question number four relating to the perceptions regarding the use of predictive models in education programs.

The challenges in analyzing qualitative data is recognized by Yin (2003) when he explains, “Much depends on an investigator’s own style of rigorous thinking, along with the sufficient presentation of evidence and careful consideration of alternative interpretations” (p. 110). Yin also acknowledges that verbatim records (such as the interview transcripts from this study) are “likely only part of a case study, aimed at surfacing salient concepts or themes” (p. 110). Such is the case with this research project; the verbatim interview records revealed many themes and concepts which are expanded upon later in this text. The interviews clearly and consistently indicated an understanding of the current issues, but a lack of agreement on how to resolve issues of the use of standardized testing as high-stakes testing and the use of predictive models.

In this particular study, the process was initiated by transcribing the interview tape recordings verbatim. The research questions were then reflected upon by the researcher regarding changes made to existing programs to adhere to Chapter X and the perceptions and attitudes of certification officers with the use of standardized testing and predictive models. The transcribed information was carefully compared and analyzed.

Many commonalities occurred among the interviewees and in the information collected from the university websites. Each interview transcript and supporting websites lend interesting insight, observations and perspectives to the research project. The emergent themes are presented for the qualitative component of the study, and research question number one, which is quantitative, will be discussed within the emergent themes

for the qualitative component. Therefore emergent themes will begin with research question two.

Emergent Theme for Research Question Two

What university adjustments to teacher education programs at various levels have been implemented or plan to be implemented to address the changes in state and federal law, and to meet the requirements of standardized testing?

Each university had made some changes to adapt to Chapter X at admission to each of the levels of education with the exception of the admission to the university. Most of the universities continued the same requirements that had been mandatory before the introduction of Chapter X for admission to the university.

The changes came at the first gate which is identified as candidacy. All of the universities required some kind of candidacy form or interview process as mandated by the new state law, where none had existed before. This was a major change due to the new law and required the involvement of students, faculty, and administration and a commitment from all the involved population to meet the requirement. Although some interpreted the law slightly differently (the need for a 2.8 versus a 3.0 GPA), the universities were consistent in their requirement of the passing of Praxis I tests and the need to pass two mathematics courses that were not considered remedial, an English composition course, and an English literature course. Requirements of 45 or 48 credits were met by all universities, with one university choosing to require candidacy at a more advanced credit hour earning of 60 credits. Of the universities who participated, 77% of them chose not to use the 10% rule allowed by the state law.

At the point of admission to student teaching, regardless of GPA requirement, most of the universities required some type of advisement to their students who were borderline. All of the universities required either a 2.8 or 3.0 GPA as mandated by state law. All the universities required clearances, although those were also required before the introduction of Chapter X. Only one university did not require some type of Praxis II testing before student teaching, whether the taking of the tests or the passing of the test, which was an enormous change from before the introduction of Chapter X. Three universities actually require the passing of Praxis II testing before student teaching.

For graduation and certification, the large majority of the universities would graduate students with less than a 3.0 GPA; however, they differed in how they would determine what was best for the student (i.e., alternate degree, education degree with no certification, education degree with certification). The state law dictates a 3.0 GPA is required for certification with a 10% rule allowing exceptions. All the universities did not deter from the state law requirement of the passing of Praxis II testing for certification.

Intervention strategies had been developed at all the universities to assist students in meeting new requirements. However, most of those interventions had been put in place to assist in Praxis I testing. Although methods differed in how to intervene for the Praxis I testing, there were multiple intervention strategies being used at each university. Interventions for Praxis II testing were minimal. Curriculum changes were also minimal.

Emergent Theme for Research Question Three

What is the perception of university certification officers regarding gatekeeping and its impact on admissions, intervention strategies, and curriculum revision and assistance leading to students' success?

With the exception of one university officer, the perception of the university officers regarding the use of predictive models used alone as a gatekeeper were negative. However, eight of the nine university certification officers believed that the use of a predictive model along with various other assessment tools could provide a gatekeeping model that would be effective.

All nine certification officers agreed that the use of a predictive model or equation to develop intervention strategies or to modify program curriculum would be beneficial. They also believed that a predictive model, if proved reliable, could assist in adjusting admission criteria if not used alone.

Emergent Theme for Research Question Four

What is the perception of university certification officers at the same large university state system regarding ethical and social justice issues relating to gatekeeping methods for admission to teacher education programs and successful continuance in teacher education programs, and the effect this might have on the diversity of the potential pool of teacher candidates?

The nine certification officers were in agreement that the use of standardized testing as a high-stakes test that is used as a gatekeeper is not ethical, although all nine agreed that use of standardized tests was ethical as long as they were used with multiple other assessment tools (i.e., assessment of field and student teaching experience).

Additionally, eight of the nine certification officers believed that the use of predictive models as a sole determinant for entrance into a program was not ethical, but would be useful as one means of assessing prospective teachers.

Most of the certification officers believed that the use of standardized tests is unfair to many populations (i.e., minorities, poor standardized test takers, those who were raised in low income areas, English as second language learners). The certification officers indicated that minorities historically have not scored as well on standardized tests as White students, and their own programs have significantly low numbers of minority teacher candidates. However, they also agreed that low scoring of minority populations was an issue with all standardized tests, including the SAT tests. Most of the certification officers indicated they were not certain what standardized tests measure, and agreed that the companies that offer the tests nor the politicians that make the law know what the tests measure either. Moreover, the certification officers agreed that standardized testing measures base knowledge of a candidate but not the potential quality of future teachers, although it is a necessary part of accountability. However, most believed that other factors should be evaluated.

Summary

The contents of the study were guided by responses gathered from interviews and websites in an attempt to answer the research questions that directed the qualitative component. Information was described and analyzed through individual interviews. The research questions helped to produce three emergent themes for researching the processes used by nine universities in meeting the new requirements of Chapter X, state law.

Based on the findings at each university, the researcher developed the following three themes/issues regarding the implementation of Chapter X:

Adjustments to Teacher Education Programs

Perceptions of Using Predictive Models

Ethical and Social Justice

Many adjustments have been made to university admission requirements at all levels since the introduction of Chapter X to assist in the success of prospective teachers. Various intervention strategies, once students have begun their program in education, have been developed (i.e., development of specific courses related to standardized testing, development of workshops and tutoring programs) to create a more successful learning environment for prospective teachers. The curriculum for education majors has been addressed and faculty have taken Praxis tests to determine the adjustments needed in the curriculum to assist their education majors.

Additionally, although the certification officers understand the need for accountability, there is great concern regarding the ethical and social justice of using predictive models and standardized testing for prospective teacher candidates. The certification officers agree that the use of multiple assessments is necessary in order to be fair and just to all populations.

The final chapter will provide a discussion and analysis of the findings, recommendations and conclusions from this study. This information will be offered as a guide for further research in the use of predictive models and standardized testing for education majors.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents a discussion and analysis of the findings of this study and includes conclusions and recommendations. This purpose of this study was to examine the response of selected university teacher education programs to increasing demands for high standards and passing scores on standardized tests. A descriptive account was given in Chapter Four of the emergent themes as determined by the commonality of the responses in the interview sessions. Chapter Five is an analysis and interpretation of these emergent themes and shows the relationship of the individual parts identified in Chapter Four.

This research study produced data that was reported thematically in Chapter Four relating to the research questions regarding the use of standardized testing and predictive models. The emergent themes, organized by research question, were based on the commonality of responses shared throughout the interview sessions, the data collected from websites, and the development of a predictive model.

Discussion and Analysis of Findings

The study findings related to the broader research question of the use of standardized testing and predictive models for prospective future teachers are examined through each of the following research questions and emergent themes. The data interpretation is based on the associations, common characteristics, and linkages among the data, especially the identified categories and patterns (Gay & Airasian, 2003). This study began with a large set of issues and data which was narrowed into small and

important groups of key data, or categories. Schatzman and Struass (1973) believe that categories should be emphasized in qualitative research:

Probably the most fundamental operation in the analysis of qualitative data is that of discovering significant classes of things, persons, and events and the properties which characterize them. In this process, which continues throughout the research, the analyst gradually comes to reveal his own “is’s” and “because’s”: he names classes and links one with another, at first with “simple” statements (propositions) that express the linkages, and continues this process until his propositions fall into sets, in an ever-increasing density of linkages (p. 110).

Once categories were developed, the categories were reflected on to develop patterns. Patterns are links between two or more categories that further classify the data and that usually become the principal foundation for organizing and reporting the outcomes of the study (Gay & Airasian, 2003).

The intent of this comparative method used to develop categories, themes and patterns, is to understand and explain qualitative data. The information gleaned from these categories and patterns provide the basis of the recommendations and conclusions for this research study. Since research question one was quantitative, it will be discussed and analyzed independently of the themes. However, it will also be discussed in relationship to the other research questions within the theme analysis. The use of websites to confirm information gleaned from the interviews was another method used in the qualitative component.

Research Question One

To what extent are SAT scores (verbal and mathematics), Praxis I scores (Reading, Writing and Mathematics), first year college grade point average (GPA), and high school percentile correlated at one sample university within a large university state system? To what extent are these variables predictors of the Praxis II ELED:CIA test at the sample university?

Results of the quantitative study indicated that there are significant relationships between SAT test scores, Praxis I test scores, first year college GPA and high school percentile. Earlier research also indicated relationships between these variables, but none of those studies included all of these variables (Cohn et al, 2004; Lenning, 1975; Blue & O'Grady, 2002; Kuncel et al, 2001, 2004; Pool et al, 2004; Pettijohn II, 1995).

Gay and Airasian (2003) indicate that correlational research is conducted so that predictions can be made, and prediction studies are performed to assist in making decisions regarding individuals or to assist in various types of selection. They are also used to test variables that are thought to be good predictors of a criterion, and then to determine the predictive validity of measuring instruments, as well as to predict the likeliness of success in a certain area of study.

Since significant correlations were established between variables, the subsequent charge was to develop a predictive model that could predict the probability of success on the Praxis II ELED:CIA test. A regression analysis was conducted which concluded that all of the variables (SAT scores, high school percentile, Praxis I scores, and first year college GPA), when used together, can predict test scores on the ELED:CIA test. A stepwise regression was then conducted to determine if any variables could be eliminated

from the equation and still validly predict ELED:CIA scores. This stepwise regression revealed that the removal of the SAT Math as a predictor variable would not adversely affect the variance accounted for (the difference between 41.2% and 40.7%) and therefore would provide a simpler predictive equation.

There are various approaches to the use of predictive models in teacher education programs, both as gatekeepers (denying admittance) and as methods of identifying students who could benefit from interventions. The following discussion and analysis is separated by two levels of teacher education gates (points in programs where students are evaluated) where predictive models might be of value; admission to the university and admission to teacher candidacy.

Admission to the University

The predictive model developed could be utilized as a gatekeeper at admission to the university to deny students entrance to a teacher education major if it is predicted that they will not be successful in Praxis II testing. Similar models have been developed by admissions offices to bar entrance to the university. This particular model could be utilized as a gatekeeper at the admissions level to deny students entrance to the education major even if they met conditions for entry to the university. Although the model developed in this study employed variables that would not be determined until at least one collegiate academic year had been completed (i.e., use of first year college GPA), the use of SAT scores and high school rank to determine eligibility could be considered and utilized to be more selective at the time of admission to assure success in the education program. Only one certification officer noted the use of a predictive model as a gatekeeper at the time of admission to the university. Furthermore, the other eight

university certification officers were not in favor of use of a predictive model as a gatekeeper for admission to the major when entering the university.

This model might also be used to identify students who are predicted to have difficulty in passing Praxis I (basic skills in reading, writing and mathematics) and Praxis II tests (content area information) in the future, and rather than bar entrance to the program, universities might recognize their own role in the provision of intervention strategies for students who are predicted to do poorly on Praxis testing. The one certification officer that indicated the current use of a predictive model for teacher education majors at the time of admission to the university noted that the students were not eliminated from the program “forever,” but rather were provided alternate paths for entrance. A specific alternate path identified by this certification officer was a minimum 3.0 GPA after one year of collegiate academic study and the passing of Praxis I tests. Additionally, for these students that might be denied admission to the teacher education major, intervention strategies may be provided at this level by the universities. These could include providing assistance with Praxis I preparation along with additional assistance with English composition and mathematics.

The data showed that the use of a predictive model as a gatekeeper for entrance into an education major at admission to the university was not well received by the certification officers. Although one university was actively using a predictive model for this purpose, the general opinion of the certification officers was that they were much more comfortable in using the predictive model at time of admission to the university as a means of identifying students who might have difficulty in passing standardized tests.

This would allow early intervention by the universities to address the needs of these students for the passing of standardized testing.

Conclusions drawn from these data by the researcher take into account the opinions and concerns of the certification officers. Since 89% of the certification officers did not believe the use of a predictive model as a gatekeeper at the time of admissions was advantageous to students, the university, or the education programs, there is validity in that assessment. Use of the predictive model, however, to identify students who might have difficulty in passing Praxis I or II tests seems to be a legitimate use of the model. This would allow earlier identification of students who might have difficulty with standardized testing, and would at the same time provide an opportunity for universities to provide assistance to the students who are interested in teaching as a profession in passing standardized tests.

Admission to Teacher Candidacy

A predictive model could also be used at the teacher candidacy level for different purposes, and the predictive model developed included variables that would be viable at this gate. Because state law requires specific conditions be met at 45-48 credits, a gate had been identified by all universities for use in identifying students who had or had not met certain standards. The predictive model could then be considered for use either as a gatekeeper (denying entrance into teacher candidacy) if students were predicted to be unsuccessful in passing Praxis II tests, or for use to identify students who might need additional assistance in passing Praxis II tests. Although specific standards were required by the state at this point, because universities were permitted to allow 10% of their students who did not meet all standards to be accepted into teacher candidacy and

continue to move forward in the program, the use of the predictive model to develop intervention strategies appears to be a beneficial use of the predictive equation.

Although gatekeeping is used at the teacher candidacy level, the standards that are required may still be lower than the minimum requirements that the predictive model demonstrates must be attained in order to pass Praxis II tests. The standards for each university at this level varied, with GPA requirements ranging from 2.8 to 3.0. Additionally, although all the universities required the passing of Praxis I tests, since two universities employed the use of the 10% state rule which allows 10% of the applicants to be approved for candidacy even if they don't meet the standards, some students received candidacy even without meeting the minimum standard. Therefore students might not pass all the Praxis tests or might have a GPA lower than 2.8. In addition, students even meeting the minimum standards at this point in their program might still be predicted to do poorly on Praxis II testing.

This particular predictive equation demonstrates, for example, that a teacher candidate who enters a university with a minimum SAT Verbal score of 475, is in the top fourth of his/her graduating class, earns a first year college GPA of 3.0 or higher, and passes Praxis I tests with a minimum score of 175 on each test (or a combined total of 525), is predicted to pass the ELED:CIA test. Conversely, if a student earns an SAT Verbal score of 450, is in the top fourth of his/her graduating class, earns a first year college GPA of 3.0, and passes Praxis I tests with scores of 173, this student is predicted to not pass the ELED:CIA test. This particular example shows that a student might meet all the requirements for teacher candidacy (perhaps a 2.8 GPA and passing Praxis scores of 173 on each test) and be granted candidacy, but would still be predicted to not

successfully complete Praxis II tests. These students many times are not noticed until repeated attempts of Praxis II tests are unsuccessful. With the use of a predictive model at entrance to teacher candidacy, these students could be identified and offered additional assistance.

The researcher has gained invaluable insight regarding the use of a predictive model as a gatekeeper at admission to teacher candidacy, and concludes that the use of a predictive equation as a gatekeeper at the point of admission to teacher candidacy is not realistic. Due to the multiple assortment of variables required at each university, the allowance of exceptions to the rules, and the fact that the predictive model developed requires higher standards than the teacher candidacy gate requirements at most of the universities, it would be impractical to utilize this predictive model as a gatekeeper at the teacher candidacy level.

However, the use of this predictive model would be a significant asset if used as an intervention tool to determine if students would need additional assistance for Praxis II tests. If the model predicted poor performance on the Praxis II tests, supplementary support could be provided either inside or outside the classroom that could assist the students in achieving their goals of becoming a teacher by passing the standardized Praxis tests.

Research Question Two

What university adjustments to teacher education programs at various levels have been implemented or plan to be implemented at universities in the system under study to address the changes in state and federal law, and to meet the requirements of standardized testing?

This study revealed that although many adjustments had been made at various levels for teacher education programs (from admission to the university to graduation and certification), and some were consistent throughout the schools. The following is a discussion and analysis of the adjustments made to teacher education programs, linking data to form categories (Schatzman & Strauss, 1973).

Admission to the University

At the level of admission to the university, most of the universities did not change their requirements to address the need to meet the higher standards of state and federal law, nor did the majority of universities change anything to meet the requirements of standardized testing at the point of admission to the university. It appeared that the universities believed that if they raised their standards, they would lower the number of students in their programs, which was problematic for at least two reasons: employment of faculty and revenue for the university. Although two certification officers cited an increase in standards for teacher education majors (higher high school GPA, higher high school rank, and/or higher SAT scores), the other certification officers seemed to hope that their students would be successful once they arrived at the first gate of teacher candidacy. At this point, if students did not meet the standards of teacher candidacy and were denied candidacy, it was believed it was more likely they would choose to change majors or utilize assistive measures than to drop out of the university entirely. Again, this would preserve the number of students at the universities, even if the number of students in teacher education programs declined. An analysis of these data clearly shows that revenue and security of employment were factors in determining admission standards for teacher education majors.

It was also noteworthy that the two universities that raised their standards also made exceptions on an individual basis if students did not meet all the standards. One university indicated the development and use of a predictive model at admission to the university for education majors, and if students did not meet the standards, would admit students into the university in other majors with the understanding that if they met minimum standards after their first year of study, they could then enter the teacher education program. Since some students do not meet all the standards but want to be teachers, it is reasonable to offer alternative solutions that might still result in successful completion of a teacher education program. Although this is a significant means of assisting students, this was not, however, a methodology employed by the other eight universities.

That same university also required specific testing to determine if Praxis assistance was needed, and if it was determined by test scores that additional support was required, information was provided to students regarding the specific type of assistance that was available to them. That was the only university that addressed Praxis testing by offering any assistance at the time of admittance to the university.

The researcher found that admission to the university was a economic issue as well as an academic issue. With funding of the universities by the state system dependent on enrollment numbers, it was critical that the universities kept their enrollment at a consistent level. In the process of keeping enrollment constant so state allocations would be made available, concessions were made at the time of admission to accept students who might not be successful in teacher education programs with the anticipation that once admitted, students could change their majors and remain at the university, resulting

in the retention of the students at the university. This would make available a dependable source of income to the university with the preservation of enrollment numbers, with the understanding that students who could be accepted as education majors might not actually be successful in the education program.

Admission to Teacher Candidacy

Teacher candidacy was a new requirement of state law that required compliance with higher standards than had previously been required and necessitated the review and assessment of students as they entered teacher education programs. At the point of teacher candidacy, a gatekeeping strategy was utilized to meet the standards for state law at all the universities. Although a gatekeeper was used, the requirements were not consistent (only the passing of Praxis I tests and composition, literature and two math courses were consistent), and no predictive model was used at this point of entry. However, it was also noted that although a gatekeeper was in place, exceptions were made by some of the universities to allow students to move forward in their programs with the understanding that they must successfully complete the missing component. It was the consensus of the certification officers that a gatekeeper was necessary and helpful in ensuring the success of prospective teachers in teacher education programs.

The certification officers unanimously agreed that the use of only one method of assessment used as a gatekeeper was not in the best interest of students; however, the use of a gatekeeper with multiple assessments was an excellent method of ensuring success for their students. Although it was agreed that multiple assessments were viewed as the preferred method of gatekeeping at the teacher candidacy level, the theme that continued to surface was for the need to reevaluate the use of any one criteria as being a high-stakes

criteria. For instance, if multiple assessments were used as a gatekeeper (i.e., evaluation of performance in a field experience, the passing of standardized tests, and the development of a portfolio), then all of the assessments should be combined to allow an accurate assessment of the student's potential to teach. Therefore a lower assessment on the portfolio development and higher assessments in field experience and standardized testing would permit entrance into the program. In contrast, a lower assessment on standardized testing and higher assessments on field experience and portfolio development would also lead to candidacy. However, currently, standardized testing is a high-stakes test and regardless of other evaluations, the passing of standardized tests is required.

Also noteworthy was the optimistic attitude of the certification officers regarding the use of a predictive model at the level of teacher candidacy to enable the earlier identification of students who might need additional assistance with Praxis II testing. At the point of teacher candidacy, Praxis I tests and first year GPA, along with SAT scores and high school percentile, would all be complete and allow the use of the predictive model to identify students who were predicted to do poorly on Praxis II tests. Although the students would just be beginning their upper level education courses, including methodology and assessment courses that constitute the content of the Praxis II tests, it would already be determined that certain students would need additional support outside the courses offered. Before the new state law, once a student graduated and could not pass Praxis testing, there were no interventions the universities could provide. "It was too late to help" noted one certification officer. The use of a predictive model at the level of teacher candidacy was perceived as a tremendous asset to both the student and the

program by identifying students who needed additional support, and creating an opportunity for universities to develop interventions outside the classroom that could contribute to the success of those students in passing the required Praxis tests.

The researcher concluded that admission to teacher candidacy was driven by the conditions of the state system, not the state. However, the end result was decidedly positive, creating a system whereby students could not progress to the student teaching level only to find that they could not student teach because they did not meet the minimum requirements of the state (the passing of Praxis I tests). The state system and the state varied significantly in their requirements for students, with the state system having decidedly higher standards. These higher standards appeared to encourage students to complete conditions required for the state system (passing of Praxis I and II tests by graduation) much sooner in their programs, thereby meeting state standards for certification. This is considered by the researcher to be a positive outcome of the teacher candidacy gate.

Admission to Student Teaching

A second gatekeeper was developed for entrance into student teaching and was utilized by all nine universities. Although requirements differed by university (passing of Praxis II tests, taking of Praxis II tests, no requirement of taking or passing Praxis II tests, completion of portfolios, meeting disposition requirements, etc.), the certification officers agreed that the use of a gatekeeper at the student teaching level was beneficial in meeting state system requirements. Only one university did not require at least the taking of Praxis II tests before student teaching, and the issue was under discussion at that particular university. Because the state system required a 100% passing rate for Praxis II

tests at the time of graduation, this gatekeeper appeared to be beneficial. However, there was much controversy regarding the need to have a 100% passing rate. Although the state system condition appeared to promote the success of students in passing Praxis II tests in advance of their graduation, it did not allow alternatives to students who might still be experiencing difficulty in passing the required tests, and some of the university officers were not in agreement with this standard.

The use of a gatekeeper at student teaching also resulted in a much more sophisticated form of student advisement, which was viewed by the certification officers as a positive outcome of the state system standards. Although students were previously provided advisement from the point of admission to teacher education majors by their academic advisors (although value of academic advising is determined by the quality of each individual academic advisor), some students were completing the program without understanding the ramifications of not passing Praxis tests. The use of the gatekeeper encouraged additional intervention regarding the ramifications of not passing Praxis II testing. This intervention was typically provided by the academic advisor, the university student teaching supervisor, or the Dean of the School of Education. For example, if the passing of Praxis II tests was required but the student had attempted the tests on multiple occasions without success, one university required the student to meet with the Dean of Education to discuss their circumstances, and were then required to sign a waiver indicating the comprehension of the ramifications if Praxis II tests could not be passed before graduation.

The data analysis shows a distinct need for a gatekeeper at the time of entrance into student teaching since the state system requirements included 100% pass rates on

Praxis II testing. However, the state system requirement did not allow alternative solutions for students. Individual universities, it seemed, determined that state system initiatives were not “set in stone” and could be manipulated as needed. The 100% pass rates resulted in more funding for individual universities by the state system, but some universities were willing to give up that additional revenue and concentrate on other areas of funding in order to give their students more opportunities. One of the possibilities included graduation without certification, and students had an opportunity to continue to sit for the Praxis tests, or could move to other states with lower Praxis requirements for which the students’ scores might be high enough for them to obtain certification in that state.

Additionally, it is the concern of this researcher that the requirement of the state system of having 100% pass rates attached to funding is unfavorable to certain universities within the state system (i.e., because of geographical location or enrollment disparity). Although the end result of this requirement may be earlier certification for some students, it may result in no certification for other students.

Graduation and Certification Requirements

Advisement continued to be provided throughout the student teaching experience which was believed to keep students focused on what they needed to accomplish to graduate and become certified. If students were experiencing difficulty in their student teaching placements, student teaching supervisors were working with them on a one-on-one basis to determine the best course of action. Additionally, when deemed necessary, academic advisors, department chairpersons, disposition committees, and/or the Dean’s offices were included in discussions and provided guidance and recommendations. This

was considered an effective means of reviewing and assisting students and giving them viable alternatives to make them successful *before* their difficulties became insurmountable. When problems could not be resolved, alternatives were provided which included a change of student teaching site, a change of cooperating teacher, a withdrawal from student teaching, provision of additional field experiences, provision of one-on-one assistance with a current withdrawal from student teaching, or some combination of interventions. Although the certification officers did not quote statistics, they all believed since the new state law had gone into effect, their graduation rates and certification rates were much higher.

A second common theme that revealed the concern of universities regarding the success of their students was demonstrated by the earlier requirement of taking or passing the Praxis II tests, which was a state system initiative. Since Praxis pass rates must be reported for Title II for students immediately after their graduation, if more students have passed Praxis II tests before graduation, there is a higher pass rate for Title II reporting (pass rates are determined by how many students completed student teaching in a given year, and how many of those students passed all required Praxis tests). This requirement of a higher pass rate by the state system reflects their need to show publicly the success of teacher education programs within the state system. It was also perceived that since more students were qualified to be certified immediately after graduation, more students actually applied for and were recommended for certification in the state. It was perceived that previously, students who could either not pass the required Praxis II tests before graduation, or intended to teach in another state and didn't take Praxis tests, affected the pass rates for Title II.

An analysis of these data shows that teacher education programs were providing multiple means of assistance to student teachers for them to be successful. Interventions were provided as soon as problems arose, and although all issues could not be resolved to the extent that the student teaching placement might be continued, viable alternatives were provided to promote eventual successful completion of student teaching. However, there is concern by the researcher, as discussed earlier, that the need for 100% pass rates as mandated by the state system may not be in the best interest of the students.

Intervention Strategies

Intervention strategies have been combined for this discussion and analysis to include Praxis I and curriculum changes and Praxis II and curriculum changes. In previous chapters, these strategies have been independent of each other. Due to common themes, this discussion and analysis will merge these intervention strategies.

Praxis I intervention strategies. Intervention strategies were used by all the universities and began at one university at admission to the university by testing education students to determine if they needed assistance with Praxis I testing and offering them support before they even attended the university. Other universities, although some kind of testing may have been conducted before admission to the university, did not use that testing to address the needs of teacher education students or Praxis testing in particular. Other multiple intervention strategies were used for Praxis I testing including the use of tutors, utilization of website practice sites and other online products including PLATO, the offering of Praxis preparation courses either in-house or at local community colleges, the development of mathematics course(s) (particularly for elementary education majors), the recommendation and/or provision of test preparation

books, the offering of earlier and/or remedial mathematics and composition courses, the offering of workshops, recommendation to use existing learning centers or support centers, the development of math courses particularly for elementary education potential educators, and the development of courses specifically to address the passing of Praxis I tests.

The data indicated that multiple intervention strategies were used at the Praxis I level; there was, however, a noticeable lack of assessment on the success of these interventions. Certification officers indicated they did not evaluate the effectiveness of the intervention strategies, and were uncertain which of the interventions might be more successful in assisting their students. This was of notable concern to the researcher as it appeared that universities were implementing programs or methods of assistance that may not be effective, yet could be using what meager revenue was available in ways in which were not assisting their students. Evaluation of current interventions appears to be needed at all the universities, resulting in the best use of financial resources to promote success for education students.

Praxis II intervention strategies. There seemed to be a minimum of interventions to assist in the passing of Praxis II tests, as noted by the use of very few interventions at any one university. Six universities used two or fewer methods of intervention at the Praxis II level, with one of those using no interventions at all. One university used three methods of intervention. The other two universities used multiple methods of intervention at the Praxis II level.

Interventions at the Praxis II level included tutoring or the offering of workshops, the recommendation to attend a community college Praxis II preparation course, the

development of a Praxis preparation course, the development of a curriculum and assessment package to be used by individual students, and the taking of Praxis II tests by faculty members to determine intervention adjustments that might best fit the need of their teacher education students. In three universities, the costs of faculty taking Praxis tests were absorbed by the schools of education. Faculty members used this information to adjust the content of their curriculum while maintaining the standards for accreditation, or to create informational workshops or one-on-one assistance to address what were perceived to be weaknesses in their students' testing.

There appears to be a lack of communication between universities and the sharing of best practices does not seem to occur. This is supported by the minimal interventions that were reported by most of the universities. Although the universities are all part of a state system, information does not appear to move through the state system, but rather appears to be stagnant in each individual university. There is a great disadvantage in not sharing best practices, as noted by Hubbard (1993). Hubbard indicates that many recent case studies on continuous quality improvement in education are based on achievements at individual schools, and many present general principles. Some studies, Hubbard notes, are actually limited to "how we do it good here."

Additionally, comments of concern to the researcher made by some certification officers included their perception that assistance was not needed at the Praxis II level. Four of the certification officers believed that if students were successful with Praxis I tests, they did not require intervention at the Praxis II level. If a student did struggle to pass Praxis II and appeared to require additional support, although perceived by the participants as negligible, individual assistance or workshops were sometimes provided.

One university evaluated on an individual basis each student having difficulty by reviewing their test results and supplying assistance in the area of most need as noted by test scores.

Research Question Three

What is the perception of university certification officers regarding gatekeeping and its impact on admissions, intervention strategies, and curriculum revision and assistance leading to students' success?

Predictive Models as Gatekeepers

Eight of the nine certification officers indicated they did not like using predictive models for education students as gatekeepers at the point of admission to the university (only one university was currently using a predictive model as a gatekeeper at admission to the university and it was perceived by that university officer as being beneficial). All of the certification officers noted that although the use of a gatekeeper is very beneficial at admittance to teacher candidacy, the utilization of a predictive model as a gatekeeper was not perceived as advantageous.

With the data that was obtained from this study, it was very clear to this researcher that the use of a predictive model as a gatekeeper was not considered to be ethical for education students. Although gatekeeping was considered to be a valid means of determining whether students could progress in an education program, the use of a predictive model, either at time of admission to the university or at the time of admission to teacher candidacy, was not in the best interest of students. Although one university indicated use of a predictive model at the time of admission to the university, that university also indicated that they offered an alternative path to students if they were

barred from the education major due to the predictive equation. It appears that the use of a predictive model as a gatekeeper as early as admission to the university seems unethical, and the use of a predictive model as a gatekeeper at entry to teacher candidacy is not an efficient use of the predictive model.

Predictive Models to Adjust Admission Criteria

There was some concern of the drawbacks that might be associated with using a predictive model to adjust admission criteria which might raise the criteria for education students if that predictive model indicated students would not be successful in passing standardized tests. Because each university has enrollment goals each year, it was believed by most of the certification officers that if a predictive model was used, the end result might be lower enrollment in the program which would be considered a negative outcome by upper administration since they are required to meet specific enrollment numbers each year. However, it was noted by one certification officer that, although their university had the same concern, they did raise their admission standards, and instead of enrollment dropping as anticipated, the quality of the students increased and enrollment numbers were maintained.

Being a part of a state system requires the meeting of not only state standards but state system standards as well. Funding continues to be an issue in this state system. Because funding is distributed by the state system office and is dependent upon the meeting of various requirements, the need to meet state system standards cannot be overstressed. The concern of the certification officers for keeping enrollment level is valid due to the distribution of funding dependent upon enrollment numbers at each university.

The use of a predictive model to adjust admission criteria could greatly change the enrollment numbers of some of the state system schools.

Predictive Models to Develop Intervention Strategies or Modify Program Curriculum

Although eight of the nine certification officers did not like the use of a predictive equation as a gatekeeper at any level, all nine certification officers agreed that the use of a predictive equation either at admission to the university or admission to teacher candidacy would identify students who needed assistance much earlier in their program of study, and would enable universities to provide critical interventions prior to the taking of Praxis I and II tests and prior to the student teaching experience. This was seen as a great advantage and could contribute to the successful certification of many more teacher education students, or at the very least, would encourage students who were still not successful after intervention to consider alternate career paths. Modification of program curriculum was perceived as an intervention strategy and was considered to be an appropriate intervention if curriculum warranted changes. It was noted, however, that program curriculum had to be aligned with state guidelines as well as accreditation requirements, and was therefore very prescriptive.

The certification officers all agreed that if a predictive model could be developed and proved to be reliable, the use of the predictive model to develop intervention strategies, including curriculum changes, would be an asset to their teacher education programs. “Proactive versus reactive” was the consensus of the certification officers, and they anticipated the use of a predictive model could only improve their programs if used to provide interventions to education students predicted to be “at risk.”

The data supports the use of a predictive model to be utilized to create intervention strategies or curriculum changes at both admission to the university and admission to teacher candidacy. Interventions could include the development of courses to be used by students as early as their first semester at the university (particularly mathematics or composition courses). Remedial courses could also be recommended or required at this early stage as well.

What is noticeably absent at each university is the assessment of their intervention strategies currently being used. Although the sharing of best practices would be beneficial to all the universities, it would be difficult to determine what the best practices were if no assessment of the effectiveness of the interventions had ever been completed. This negates the value of the sharing of strategies, since best practices cannot be identified.

Research Question Four

What is the perception of university certification officers at the same large university state system regarding ethical and social justice issues relating to gatekeeping methods for admission to teacher education programs and successful continuance in teacher education programs, and the effect this might have on the diversity of the potential pool of teacher candidates?

Ethical and social justice issues regarding predictive models and high-stakes standardized testing fueled a stimulating discourse. Although some of the responses for the two topics were similar, the discussion and analysis are divided into two categories: 1) perceptions regarding predictive models as gatekeepers and 2) perceptions regarding standardized testing as gatekeepers.

Perceptions Regarding Predictive Models as Gatekeepers

Eight of the nine certification officers believed that there were issues of concern regarding the ethics and justice of using a predictive model as a gatekeeper if used as the sole assessment for entry into the education major at the time of admission to the university. The one certification officer that did not believe there were any issues regarding the use of a predictive model as a sole determinant of gatekeeping at the time of admission to the university was currently using one as a gatekeeper. That certification officer believed that using a predictive model as a gatekeeper at this early stage (denying entry into the major at time of admission to the university) was more just and ethical than allowing students who were predicted to do poorly on standardized tests to begin a teacher education major. This certification officer believed that this was an early means of necessitating review by students of other avenues of study, or at the very least, ensured a commitment of the student to demonstrate their ability by offering an alternative means of entering the major (earning a minimum GPA of 3.0 in the first academic year and passing Praxis I tests). The other eight certification officers noted a variety of concerns regarding the ethical use of predictive models at the time of admission to the university and quantified their opinions by adding stipulations. Because these stipulations were considered to be issues at the time of admission to teacher candidacy as well, they will be discussed collectively.

The most notable stipulation was that it was more just and ethical to use a predictive model as a gatekeeper if it was combined with other multiple assessments regardless at what level it was used (admission to the university or admission to teacher candidacy), and that some of the assessments should be subjective. For admission to the

university, other assessments included personal interviews and recommendations from high school teachers or guidance counselors. At the level of admission to teacher candidacy, evaluation of how students perform in an actual classroom appeared to be essential to all the certification officers. Additionally, at the teacher candidacy level, the certification officers suggested the use of authentic assessments with portfolios, using learning style, and demonstrating knowledge as valid assessment measures when used with predictive models. The concern that was consistently reflected was that the use of a predictive model as a *sole* means of gatekeeping for teacher education students at either admission to the university or admission to teacher candidacy would be unfair to students. Furthermore, they indicated that the use of SAT standardized tests to predict Praxis test scores is probably valid, but standardized testing may not be equitable. This will be further discussed in the next section on standardized testing.

There was a consensus that some students just do not “fit the mold,” and the use of a predictive model as a sole means of assessment would eliminate those individuals. One concern cited was that some students do not “fit the mold” because of the content of the predictive model. For instance, if the predictive model used only standardized tests as variables, then it would not be fair or just to certain populations (i.e., those with high anxiety for taking standardized tests, those who might have come from economically disadvantaged school districts, those whose first language was not English). If the predictive model contained other variables in addition to standardized test scores (i.e., high school grade point average, high school percentile, first year college GPA), then it was perceived that use of a predictive model, either at the point of admission to the

university or at the point of admission to teacher candidacy, was ethical as long as it was used in combination with other multiple assessments.

Although the majority of the certification officers believed that the use of a predictive model as a sole means of gatekeeping (denying students entry to education majors at the time of admission to the university or denying entry into teacher candidacy) was not ethical or just, it was also their consensus that the use of a predictive model to create intervention strategies would be highly beneficial to teacher education students and teacher education programs alike. They believed that it was more ethical to provide interventions to assist students than to deny students' access to education majors or teacher candidacy because of a prediction.

The data collected indicate concern regarding the use of predictive models as gatekeepers, particularly when used as a sole assessment of a teacher candidate. Although prediction studies are used to predict the likelihood of success in a certain area of study (Gay & Airasian, 2003), and although admissions directors typically use predictive models to determine entry into a university, there was apprehension from the certification officers in utilizing a sole assessment of a predictive model as a gatekeeper (denying entry) for teacher education students either at entrance to the university or at entrance to teacher candidacy. The use of predictive models for teacher education students appeared to be considered by the certification officers as an unconstructive and unnecessary method of determining the ability of potential teacher educators. It seemed to be their belief that becoming a good teacher might not be well reflected if every student fit into a certain "mold" as determined by a predictive model. Teaching was more than a prediction, and the certification officers believed that there should be multiple ways to

achieve teacher certification, while allowing students to be autonomous individuals. Additionally, the certification officers indicated their dislike of having to meet standards at admission to the university without giving individuals the opportunity to grow and learn. One certification officer stated it concisely: “Who says when students mature?” The certification officers appeared to agree with the notion of John Rawls (1999) that anyone who wants to be a teacher should have fair access to the opportunity, including those who might enter college without all the skills fully in place.

Perceptions Regarding Standardized Tests as Gatekeepers

The use of standardized tests to assess the knowledge and quality of potential teachers is a national phenomenon. Although the certification officers understood the need for standardized testing and the ability of standardized testing to assess basic skills as supported by literature (Darling-Hammond, 2000b), they passionately voiced their opposition to standardized tests as high-stakes tests used as gatekeepers and indicated that basic skills were not enough. They appreciated the need for standardized tests to assess basic skills, to hold institutions accountable, and to offer equivalent programs for students; however, they believed that the use of standardized tests as high-stakes tests was unethical and unjust for multiple reasons.

As supported by literature regarding standardized testing (Haney, Madaus & Kreitzer, 1987; Darling-Hammond, 1998; Kuncel, Hezlett & Ones, 2004; Scheuneman & Slaughter, 1991), there was concern expressed by the certification officers regarding ethnic and racial bias in the test questions, with most of the certification officers noting that it is impossible to eliminate bias from the questions. The certification officers that mentioned ethnic and racial bias in test questions did not believe that ETS had managed

to eliminate the prejudice of questions, regardless of their efforts. It was also perceived that some populations have a disadvantage in all standardized tests, not specifically Praxis tests. If that is the case, their concern was that students who took SAT tests were disadvantaged by ethnic and racial bias in the questions, and then took Praxis I tests that might be ethnically and racially biased, there was no opportunity for them to demonstrate their knowledge and ability since standardized testing is considered high-stakes testing (you must pass the tests to be certified to teach) and is used as a gatekeeper. The need to be sensitive to the needs and background of the test takers was considered to be an obligation if a fair opportunity to teach was to be provided to all populations.

It was of particular interest to observe that the certification officers noted that if students came from certain backgrounds, they would have been negatively affected well before the college level by standardized testing. Low-income environments where education was not well supported because of poorly funded schools, minorities, and English as second language learners were all perceived to experience disadvantages in standardized testing. In effect, it was believed that they would have scored poorly on K-12 standardized tests and SAT tests. This would in turn affect their ability to do well on Praxis tests. Since standardized tests tend to predict standardized tests (Cohn et al, 2004; Lenning, 1975, Blue & O'Grady, 2002; Kuncel et al, 2001, 2004), the certification officers also noted that the use of a predictive model for teacher education students at entry to the university or entry into teacher candidacy using standardized test scores would just exacerbate the problem. Therefore they believed that due to the different backgrounds of students, using standardized tests as gatekeepers was not just to all populations.

Concern was also voiced that minorities and ESL students might not even attempt teacher education due to the requirement of high-stakes standardized testing, which could effectively eliminate the diversity of the teaching pool. Data indicate that most pre-service teachers trained in traditional university-based programs are White (American Association of Colleges for Teacher Education, 1987; Sleeter, 1993), and the U.S. Census Bureau projects that by the year 2050, about half of the U.S. population will be African-American, Hispanic, or Asian (USDOE National Center for Education Statistics, 2007). This demographic growth and diversification is also reflected in our nation's public schools, with nearly 4 out of every 10 students in the United States being a cultural or racial minority (National Education Association Report, 2007). Currently, approximately 40% of all public schools have no minority teachers at all on staff (National Education Association, 2007). This creates cause for concern that our teaching force does not reflect the demographics of our public schools. This was an additional reason noted as a detriment to using standardized tests as gatekeepers.

Of further concern related to the ethical use of standardized tests was that standardized tests cannot possibly measure talent, quality of teaching, skill, motivation to teach, disposition, or classroom management skills. Although the certification officers believed that standardized tests can ascertain whether a student has content knowledge, they cannot measure much of anything else. This is supported by the earlier numerous opinions of the certification officers to require multiple assessments, some of which should be subjective. It is also supported by previous literature that identifies characteristics that district superintendents looked for when hiring what they felt were qualified teachers, which included creativity, problem-solving, verbal skills, flexibility,

mental agility, teamwork, compassion, and love of children (EPLC Reports and Publications, 2003). Berry and Darling-Hammond (2006) also note that standardized tests do not assess the quality of such things as critical thinking and making connections between ideas. For example, a student may know the methodology for teaching reading, but unless he/she can keep students sitting and actively listening, there would be no learning.

The certification officers also commented that some students are just not good at taking standardized tests. Literature suggests that test anxiety may be reason for low test scores on standardized tests (Darling-Hammond, 1998; Kuncel, Hezlett & Ones, 2004). Students may have a GPA of well over 3.0 but score miserably on standardized tests. Although it is difficult to determine if there is lack of rigor in coursework, grade inflation, lack of experience by professors, or a multitude of other possibilities, it is still noted that GPAs do not necessarily reflect success on standardized tests. The same is true when discussing professors' opinions of student ability. The certification officers noted that on many occasions, if professors are asked if their students understand the content of the course and how to apply the methodology, the answer is a resounding yes. However, some of these same students do not perform well on standardized tests. In fact, some of them do not perform well on any type of test, but can demonstrate their ability and knowledge in the classroom. Although this again can be affected by the professor, rigor of the coursework, grade inflation or a variety of other factors, it is perceived by the majority of the certification officers that eliminating these types of students because of standardized testing is unethical and unjust. Additionally, the preconceived notion of only

good test takers being good teachers is illogical as noted by one certification officer and also supported in literature.

The data collected regarding using standardized tests as high-stakes tests and gatekeepers was definitive: it is not fair or just to use standardized tests as high-stakes tests and gatekeepers. All nine certification officers believed that a one-time, high-stakes assessment is a poor way to determine if someone will make a good teacher. The use of multiple assessments combined with standardized testing appeared to be a valid alternative. The current use of standardized testing for teacher education students in this state requires passing scores on Praxis tests. It was the consensus of the certification officers that the use of standardized testing is valid, just and fair, but only when combined with other assessments, and standardized testing should not be high-stakes (you must pass the test). When used with other assessments, the inclusion of standardized test scores in the assessment process would mean that if other assessments were high, then scores on standardized tests would not have to meet the passing score, thus eliminating the high-stakes component of assessment. This again is supported by literature which shows that multiple assessments are the preferred means of evaluation and high-stakes testing is not effective in determining the quality of a teacher (Berry-Hammond, 2000a; Berry & Darling-Hammond, 2006).

Recommendations/Conclusions

This study explored and studied the response of university teacher education programs to increasing demands for high standards and passing scores on standardized tests. The federal government, the state, the state system, and teacher education programs desire quality teachers in the classroom. Quality teachers, as defined by NCLB,

have a bachelor's degree, full state certification and licensure, and demonstrated competency in academic subject (USDOE, 2006). Quality teachers also have a grasp of the subject matter they teach (NCTAF, 1996), knowledge and skills in conveying that content through a variety of strategies so that diverse students can learn it (Darling-Hammond, 2000a), good verbal skills for conveying content and otherwise communicating with students, and successful experience (Murnane, 1985). The following conclusions and recommendations, based on the analysis of the information gathered, are presented.

Predictive Models

With the significant commitment by students of time and money expended to complete a teacher education program, and with the additional commitment of universities to provide quality programs, it is critical to scrutinize everything we know of the characteristics of teacher candidates at the time of admission to the university to determine how those characteristics might affect their performance and success (Gage & Berliner, 1998; Kohn, 2000). If it can be determined that the likelihood of success is minimal, it is essential that universities intervene as early as possible to identify those students who might be predicted to do poorly on standardized tests in order to provide early assistive interventions that may promote success

It is not my recommendation to use a predictive model for teacher education candidates as a gatekeeping device (denying students entrance), either at the time of admission to the university or at the time of admission to teacher candidacy, but rather to use it as an intervention tool. Since a predictive model was developed in this study that confirms significant contribution of the predictor variables (SAT scores, high school

percentile, Praxis I scores, and first year college GPA) of over 40% to Praxis II ELED:CIA test performance at the university under study, it is the recommendation of this researcher to utilize this predictive model to provide teacher candidates with intervention strategies that may assist them in passing the ELED:CIA test. With the use of this predictive model at the end of the first year college experience, intervention strategies could begin much sooner than previous practice had dictated. This would prepare students (who might be considered in jeopardy of completing a teacher education program successfully) for the rigors of passing high-stakes standardized testing.

This model could also be used as early as admission to the university for teacher candidates as an intervention tool (not as a gatekeeper). Incorporating SAT scores and high school percentile, this model could be used to identify students predicted to do poorly on Praxis I tests. Provision of interventions that may increase their likelihood of success on standardized tests could then be made available well before the Praxis I tests are required (at the point of entrance to teacher candidacy, approximately three semesters). This enables interventions to be provided to increase the likelihood of success on Praxis I tests in an adequate timeframe in order to meet the conditions of teacher candidacy. Provision of interventions to improve Praxis scores in this timely manner would be both ethical and just to all student populations. This earlier intervention could also improve the pool of potential teachers to include a more diverse, talented and qualified pool that might otherwise “get lost in the shuffle.”

Additionally, it is recommended that other universities test this predictive equation to determine if it is valid at their institutions. If validity is confirmed, it is recommended that this predictive equation be used at other universities as an intervention

tool (not as a gatekeeper) to identify students earlier in their academic career who might be at risk of not passing the Praxis II ELED:CIA test and provide intervention strategies that may be of assistance in the passing of the Praxis II test . Furthermore, this model could be used at other universities, incorporating the SAT scores and high school percentile, to identify students at risk of passing Praxis tests well before they are required to take the tests. If the predictive model is used in this manner, interventions could be provided before the Praxis I tests are required, and may assist in the successful passing of those tests. This could assist students by preparing them to pass the Praxis II ELED:CIA tests.

Expansion of this predictive model is also recommended. This predictive model was developed solely to predict success on the Praxis II ELED:CIA test. The testing of this model with all Praxis II tests rather than with one specific Praxis II test (ELED:CIA) would provide a much broader base for use in providing intervention strategies for students considered at risk.

It is important to prepare for greater diversity in the teaching force to match the diversity of students (Dilworth, 1990; Dorman, 1990; King, 1993a). To assist in accomplishing this task, the use of a predictive model to identify students who may be vulnerable at an earlier point in their academic career, and provide interventions to contribute to their success rather than eliminate them by using a gatekeeper, may produce a larger pool of certified minority teachers. Furthermore, because standardized testing has historically eliminated not only minorities but other talented and qualified potential teachers as well, it is essential that universities identify students who might require

additional support at a time when the assistance will result in an improved opportunity for students to be successful in their chosen careers.

Interventions

Based on the data gathered for this study, it appeared that although each university used some kind of intervention strategies, the sharing of best practices was non-existent. Although each university was a part of a state system, communication between universities did not occur. The lack of sharing of best practices resulted in some universities being unaware of successful strategies being used. Because in this state system the universities are competing for many of the same student population and revenue sources, the sharing of information is complicated. However it is suggested that the state system universities share the strengths of their programs, resulting in better educational opportunities for all students.

One major concern of the researcher was the noticeable lack of assessment of the use of intervention strategies. Although all the universities provided assistance at various levels of their programs, most did not assess the effect their interventions produced. Only one university certification officer indicated the use of an assessment tool to determine if their interventions resulted in an increase in success for their education students, either by increasing pass rates of Praxis tests, increasing graduation rates, increasing the number of students leaving the education program earlier, or increasing certification rates. It is recommended that universities assess their intervention strategies to determine if they have been successful in increasing the percentage of education graduates, percentage of certifications recommended, or percentage of minority potential teachers.

Limitations of this Research

Because the quantitative segment of this research was conducted at one sample university, the electronic data records had to include all the variables, and the data records used consisted of only elementary education majors to study one criterion variable (ELED:CIA test), the results of this study were limited to the ELED:CIA test at one university. Since this was, however, an initial study on predictors of the Praxis II ELED:CIA test, it is anticipated that other researchers will conduct similar studies to attempt to replicate the conclusions drawn in this study.

Qualitative researchers make every effort to examine words, phrases, and statements to determine themes related to each research question (Grady, 1998). However, consistency “is somewhat problematic because the researcher brings more of his or her personal history, experience and perspectives to the analysis” (Grady, 1998, p. 20). This study included the personal history of this researcher, and although the analysis was intended to be objective, personal opinions may have contributed to conclusions drawn.

Limitations to the qualitative component also included issues related to the quality of coursework. The coursework at the universities was not examined so it was difficult to determine if curriculum changes were needed or if other interventions were better suited. Also, variance in the expertise of the professor teaching a course, commitment to excellence on the part of the professor, quality of the course and instructions, and commitment of various education departments were not examined, and vary from professor to professor, department to department, and university to university. Also related to coursework is the possibility of grade inflation, which was also not studied.

Another limitation of this study was the small sample of qualitative data. Although the sample was a good representation of the state system, it was a sample from only one state and one state system.

One final limitation evolved around the issue of bias in testing. Although bias in testing is a valid concern, there are multiple factors that may contribute to low test scores, including poverty, inadequate schooling resources, and family and community programs, to name a few. This topic was not examined.

Recommendations for Future Research

The predictive model in this study was developed specifically to predict the outcome on the ELED:CIA Praxis II test at one particular university. A reasonable next step would be for other universities within the state system to test this predictive equation at their universities to determine if it retains its validity. If the predictive equation preserves its validity, subsequently the expansion of this model to include all Praxis II tests would be realistic. This extension of the current research could result in a much more far-reaching outcome by extending to countless additional students who could benefit from earlier intervention.

It is also the recommendation of this researcher to further evaluate the use of standardized tests as high-stakes tests for teacher education students. The certification officers overwhelmingly agreed that multiple assessments of teacher education students, at all levels, were more fair and just to all populations, and would enhance the opportunities for success in teacher education for all populations. The use of high-stakes testing appears to be a political issue (Wakefield, 2003). Standardized tests began as a requirement for teacher education students in the early 1980s, and many states instituted

standardized tests to ensure that all teacher candidates possess basic skills (Popham, 2000). However, even then, many respected individuals such as historian John Hope Franklin (1987) voiced their concerns with the use of high-stakes testing for education candidates. Additionally, many well known educational publications such as *Phi Delta Kappan* (Graham, 1987) published articles regarding the apprehension of using high-stakes testing in education. Through the years, others have noted their concern with utilization of high-stakes testing for teacher education candidates. Kohn (2000) noted that there have been strong misgivings of the use of standardized tests long before the current standards were in place with NCLB and various state policies. Wakefield (2003) noted that the use of standardized testing is a quantitative measure to determine a qualitative aptitude for teaching, and also had misgivings regarding the use of standardized testing. Blue and O'Grady (2002) argued against using a single evaluative measure to determine the ability of potential teachers. Only one certification officer interviewed had given up all hope of making changes in state law. The other eight certification officers believed that their voices needed to be heard. This continues to be an issue of great concern, and requires further examination.

Furthermore, the majority of certification officers noted the effect that standardized testing has on the pool of potential teachers. It was their perception that students who may have difficulty passing standardized tests may have incredible talent in reaching children. Berry and Darling-Hammond (2006) agree and noted that the use of standardized tests to assess the quality of potential teachers does not allow for other necessary skills such as critical thinking, making connections between ideas, and knowing how to keep on learning. The EPLC's survey of school district superintendents

in 2001 (EPLC Reports and Publications, 2003) noted that district superintendents, when hiring new teachers, considered creativity, problem-solving skills, verbal skills, mental agility, teamwork, compassion, and love of children as essential; none of which can be measured by a standardized test. Berry and Darling-Hammond (2006) pointed out the polar opposite: those potential teachers who are good standardized test takers but have no teaching skills would be certified to teach solely because of being skilled at taking (and passing) high-stakes tests.

Added to the concern of talented individuals being eliminated as teachers solely due to poor standardized test taking skills, there was concern regarding the elimination of minority populations because of their historical difficulty in passing standardized tests for a variety of reasons (i.e., bias in test questions, socio-economic background, etc.). With the expected rise in the minority population in the United States in the next 40 years, the certification officers believed that it is imperative to make changes regarding high-stakes testing. Therefore this researcher recommends future studies on the validity of high-stakes tests to assess future potential teachers.

Summary

With the persistent concern of policymakers and educators that there should be a quality teacher in every classroom (EPLC, 2003), and with teacher quality considered to be the best solution to student achievement (SDOE, 2006), the continued examination of teacher education programs and standardized testing is essential. To be just and fair to all populations and to ensure the best quality teachers are in the workforce, assessment of potential teachers is an issue that requires continued scrutiny. It is hoped that this research study exposed the necessity of examining the use of standardized testing as

high-stakes tests for potential teachers, and instilled an awareness in teacher educators of the importance of early intervention for potential teacher candidates.

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APPENDICES

APPENDIX A – Letter to Presidents

President

Dear President X:

My name is Mary Lynn Barton and I currently hold the position of Assistant to the Dean of Education at Edinboro University of Pennsylvania. I am also a doctoral candidate at Indiana University of Pennsylvania pursuing a Doctor of Education degree in Administration and Leadership Studies. I am writing to seek your assistance with my dissertation research.

The purpose of this study is to examine the ways in which standardized testing and the use of predictive models for potential teacher education undergraduate majors might have an impact on university policies and programs regarding admission, intervention strategies and program modification for teacher education programs, as well as to examine the justice and ethics of using standardized testing and predictive models as gatekeeping tools for potential teacher education candidates. In order to examine these issues, I would like to conduct telephone interviews with your teacher education certification officers or their representatives who have knowledge of admission criteria, intervention strategies and program modifications relating to teacher education candidates and programs.

Your assistance will be invaluable to me in completing my dissertation. Please know that the names of your university and your university certification officers or representatives will remain confidential. Eventually, I hope to use the results for the possible publication of articles that will assist universities as they develop best practices and processes for meeting the conditions of a highly qualified teacher in every classroom and the current requirements of standardized testing.

Please feel free to email me at barton@edinboro.edu or call me (814) 732-1093 should you have any questions. Thank you.

Sincerely,

Mary Lynn Barton
Principal Investigator
29969 Highway 77
Cambridge Springs, PA 16403
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This project has been approved by the Indiana University of Pennsylvania's Institutional Review Board for the Protection of Human Subjects (Phone: 724-357-7730).

I hereby grant permission to the principal investigator (Mary Lynn Barton) to study <University Name> regarding current procedures and perceptions regarding teacher education programs/requirements and to request interviews with teacher certification officers or their representatives responsible for the recommendation of certification of teacher education students to the state.

_____ Yes

_____ No

<President Name>, President, <University Name>

Appendix B – Informed Consent Form

Dear Colleague,

You are invited to participate in a research study dealing with standardized testing and predictive models as gatekeeping tools in teacher education. The following information is provided in order to help you make an informed decision whether or not to participate. If you have any questions, please do not hesitate to ask. You are eligible to participate because you are a teacher certification officer or a representative designated by your university president as being involved in recommending teacher candidates to the state for teacher certification, and having knowledge of admission criteria, intervention strategies, and program modifications for teacher education candidates.

The purpose of this study is to examine the ways in which standardized testing and the use of predictive models for potential teacher education undergraduate majors might have an impact on university policies and programs regarding admission, intervention strategies and program modification for teacher education programs, as well as to examine the justice and ethics of using standardized testing and predictive models as gatekeeping tools for potential teacher education candidates.

The information gained from this study may help us better understand how to identify potential teacher education candidates who may need early assistance in becoming successful as well as addressing the implications and ramifications of gatekeeping models and standardized testing. Since information gained from this study may be helpful to you in adjusting admission criteria, developing intervention strategies or modifying program requirements, a summary of the results will be supplied upon request.

Your participation in this study is voluntary. This study will be conducted via a recorded telephone interview. A hard copy of the basic interview questions will be provided to you before your telephone interview to provide an opportunity for review. The telephone interview should take approximately one half hour if you have reviewed the questions before the interview. If you choose to participate in the recorded telephone interview, all information will be held in strict confidence and will have no bearing on your current position. Your response will be considered only in combination with those from other participants. If you indicate that you do not want a recorded interview but are willing to participate in the telephone interview without recording, notes will be taken by the principal investigator, and a summary of each interview will be completed and shared with the interviewees to verify and promote accuracy. You are free to decide not to participate in this study or to withdraw (by verbally notifying the principal investigator) at any time without adversely affecting your relationship with the investigator or your school. Your decision will not result in any loss of benefits to which you are otherwise entitled. A decision to withdraw from the study after the study has begun will result in the destruction of all previously collected data pertaining to your institution. You are also free to appoint an alternate individual who has knowledge about your current programs, admissions criteria and intervention strategies to represent your university. The information obtained in the study may be published in scholarly journals or presented at

educational seminars, but your identity and your university's identity, as well as the state system, will be kept strictly confidential.

If you are willing to participate in this study, please review and complete the following information. Thank you.

Sincerely,

Mary Lynn Barton
Principal Investigator
29969 Highway 77
Cambridge Springs, PA 16403
(814) 967-2249, (814) 732-1093
barton@edinboro.edu

Dr. Beatrice Fennimore
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I consent to volunteering to be interviewed. I understand that my responses to the open-ended questions by a telephone interview will be completely confidential. In addition, I know that I will receive a transcript of my responses to verify their accuracy. I have received an unsigned copy of this Informed Consent Form to keep in my possession.

My signature below signifies that I am willing to participate in the interviews on a voluntary basis. I understand the information that I share in this discussion will be reported in such a fashion where my identity and the name of my school will be kept confidential. I also understand that I may withdraw from this study at any time by contacting the principal investigator via email, phone or addresses as indicated at the bottom of this form.

Name: _____
(print)

Name: _____
(signature)

Date: _____

Phone number or location where I can be reached: _____

Email address: _____

I certify that I have explained to the above individual the nature and purpose, the potential benefits and the possible risks associated with participating in this research study, have answered any questions that have been raised.

Date

Principal Investigator's Signature
Mary Lynn Barton

Appendix C – Interview Questions

Admission Criteria/Intervention Strategies/Program Modifications

1. Do you use a predictive model in determining admittance to the education major or program? If yes, please elaborate.
2. What are your current restrictions for teacher education candidates at 1) admission to university, 2) admission to program (candidacy), 3) student teaching and 4) graduation? (high school rank, high school grade point average, SATs, college QPA, Praxis I tests?). Do you believe the criteria you use at these transition points are fair and effective? Do you believe you should adjust criteria or do you have plans to adjust criteria? Please elaborate.
3. Have you developed any curriculum modifications (or plan to) or created any additional intervention strategies for your teacher education students to enhance pass rates on Praxis tests (I or II)? If so, what are they (required Praxis courses, one-on-one tutoring, seminars, use of websites)? Have you assessed them? Have they been successful? Please elaborate.
4. Do you believe the use of a predictive model might help or hinder in determining who might be successful? Should it be used as a gatekeeping method to prevent students from moving forward or as a means of identifying students who need assistance? Both? Please elaborate.

Justice and ethics

6. Do you believe standardized testing is an effective means of evaluating the quality or talent of potential teachers? Why or why not (is it fair and just to all populations, does it allow the consideration of talent, etc.)?
7. Do you think predictive models can or should be used as a gatekeeping method at any level for potential teachers? Is it more fair or just to use a predictive model or not to use one? How can a predictive model be utilized in order to be fair and just to all populations?
8. If a predictive model could be developed, would you use it at your university as an elimination tool, an advisement tool, a combination of both, or not at all?

Appendix D – Unusual Observations

Table 5

Unusual Observations

<u>Obs.</u>	<u>SAT Math</u>	<u>ELED: CIA</u>	<u>Fit</u>	<u>SE Fit</u>	<u>Residual</u>	<u>St Resid</u>
16	430	162.000	160.612	3.277	1.388	0.15 X
20	440	149.000	170.042	1.668	-21.042	-2.16R
28	450	149.000	169.831	2.024	-20.831	-2.16R
56	440	153.00	175.897	1.971	-22.897	-2.37R
87	590	167.000	187.268	1.346	-20.268	-2.07R
116	430	141.000	162.850	1.371	-21.850	-2.24R
136	460	160.000	179.694	1.619	-19.694	-2.02R
157	430	141.000	161.426	1.644	-20.426	-2.10R
162	430	142.000	168.370	1.413	-26.370	-2.70R
163	500	139.000	174.816	1.168	-35.816	-3.66R
173	450	193.000	171.650	1.646	21.350	2.19R
243	470	139.000	170.147	1.060	-31.147	-3.18R
280	560	196.000	176.305	1.760	19.695	2.03R
284	270	190.000	172.879	3.591	17.121	1.86 X

* R denotes an observation with a large standardized residual.

* X denotes an observation whose X value gives it large influence.