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THE RISE OF ALTERNATIVE TEACHING CERTIFICATION
IN RELATION TO STUDENTS WHO ARE IMPOVERISHED, ETHNIC MINORITIES
AND CHANGE IN TEACHER SALARY IN UNITED STATES PUBLIC SCHOOLS

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Dissertation

presented in partial fulfillment of the requirements
for the degree of

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Missoula, MT

Spring 2008

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The Rise of Alternative Teaching Certification

Chairperson: Dr. Trent Atkins

Over the last three decades, alternative teaching certification (ATC) programs and policies have been rising on the United States (US) public education landscape. In this dissertation, I investigated various dimensions of alternative teaching certification. Specifically, I discussed the theoretical applications, development, characteristics and outcomes of this teaching certification phenomenon.

Further, I conducted quantitative analysis on a population of 35 US states across two multiple regression prediction equations employing the Statistical Package for the Social Sciences (SPSS). In the first prediction equation, I regressed the numbers of alternative teaching certificates granted during the 2003-04 public school year in 35 US states on various school district, teacher and student characteristic predictor variables. In the second prediction equation, I regressed the change in teacher salary between the 1979-80 and 2003-04 public school years in 35 US states on various school district and teacher characteristic predictor variables.

Upon review of all bi-variant and multi-variant correlations for the population of 35 US states under study, results showed the numbers of individuals earning alternative teaching certificates had a weak statistical correlation with the proportions of students who were impoverished in each state. On the other hand, the numbers of individuals earning alternative teaching certification had a stronger statistical correlation with the proportions of ethnic minority students in each state. Moreover, change in teacher salary was found to have a weak statistical correlation with the numbers of individuals earning alternative teaching certification.

In sum, indicators for the numbers of urban-area school districts exhibited the strongest statistical relationships across both prediction equations. Further analysis of these findings and others are discussed in this dissertation. Implications for future research and practice are also addressed.

DEDICATION

I would like to dedicate this work to my mother who was my first, and still best, teacher.

ACKNOWLEDGEMENTS

I would like to acknowledge and thank my mother, father, brother, sister and all other members of my family, my loved friends and Alicia for encouraging and inspiring me to stay in school—for what has amounted to twenty-three years of my life. I hope now I can put all of this education to good use and make all of these important people proud. I would also like to acknowledge and thank my advisor, Dr. Trent Atkins, for his continual assistance, guidance and unconditional mentorship. Further, I would like to acknowledge and thank all of the members of my dissertation committee as well as all members of the School of Education faculty at the University of Montana for their constant support and enriching feedback. In addition, I would like to acknowledge the work of Dr. Vincent Roscignio, who inspired my research efforts as a graduate student in the Department of Sociology at The Ohio State University. This dissertation would be so much less without all of these individual's patience, kindness and thought. Finally, I would be remiss if I did not acknowledge the power of music and its capacity to enlighten and keep me strong while finishing this dissertation.

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CHAPTER ONE

INTRODUCTION

Since developing in the 1980s, alternative teaching certification (ATC) programs and policies have steadily grown in the United States (US). Today, all US states as well as the District of Columbia offer some form of alternative teaching certification (National Center for Education Information, 2007). The National Center for Education Information (NCEI) estimates nearly 59,000 individuals were issued an alternative teaching certificate during the 2005-06 public school year alone. This represented more than a thirty percent increase from 2003-04 (NCEI, 2007). Figure 1 on the next page depicts the rise in the numbers of individuals earning alternative teaching certification in the US within the last two decades.

Due to their quick rise, it is difficult to formulate a concise definition for today's many forms of alternative teaching certification. Their spread has stitched a virtual quilt of teaching certification programs and policies across the US. Regardless of the variety, the inception of most ATC programs and policies seems attributable to the diminished supply and heightened demand for certified public school teachers. Research shows this demand is particularly pronounced in mathematics and science classrooms (Miller, McKenna, and McKenna, 1998; NCEI, 2005; Thomas, Friedman-Nimz, Mahlios, & O'Brien, 2005).

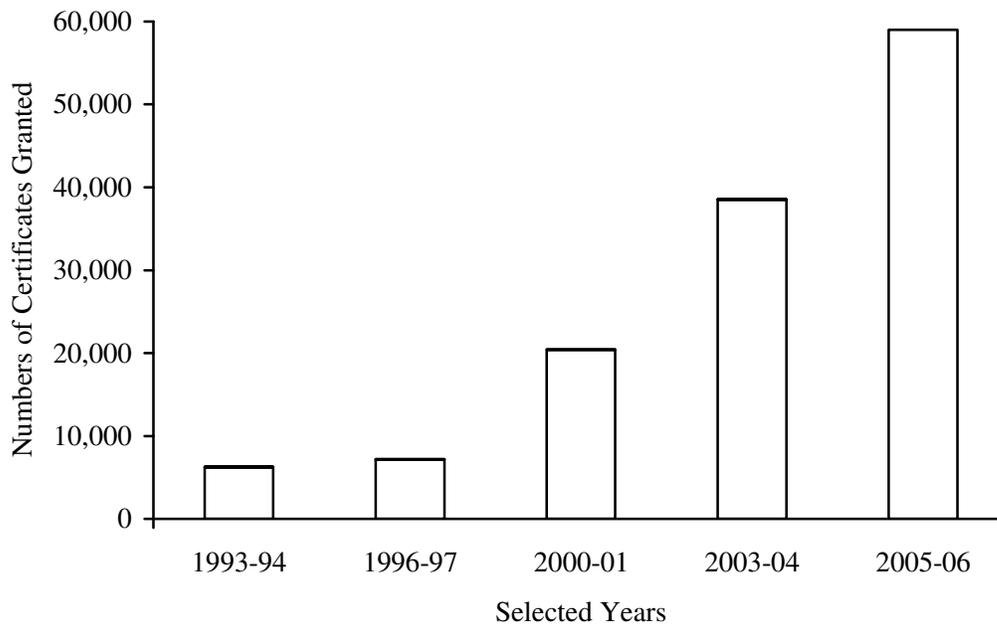


Figure 1. The numbers of alternative teaching certificates granted in the United States in selected years.

In addition to the need for certified math and science teachers, there is also a consistent demand for certified teachers in special education (deBettencourt & Howard, 2004; Rosenberg & Sindelar, 2005; Shepherd & Brown, 2003). Over the last decade, the call for special education teachers has echoed the loudest (Boe, Cook, Bobbit, & Terhanian, 1998; Brown & Shepherd, 2003; Piphio, 1998). Research indicates alternative teaching certification is adding to the numbers of certified special education teachers as well as mathematics and science teachers (Gimbert, Cristol, Wallace, & Sene, 2005; Ilmer, Nahan, Elliot, Colombo, & Snyder, 2005; NCEI, 2005).

Just as the need for certified teachers is pronounced in particular teaching fields, the need for teachers is amplified in certain geographic regions as well. Specifically, large urban and outlying rural areas throughout the United States are suffering from a dearth of certified public school teachers. Research shows individuals obtaining alternative teaching certification are filling many of these shortages (Gimbert et al., 2005; Howard, 2003; Ilmer et al., 2005; NCEI, 2005, Ng and Thomas, 2007; Olson and Wehan, 2005; Shen, 1997; Weeks, 2001).

Teaching shortages in urban areas are of particular concern with respect to the high concentrations of students from impoverished and ethnic minority backgrounds residing in American cities (Hoffman, Llogas, and Snyder, 2003; Howard, 2003; Kleiner, Porch and Farris, 2002; NCEI, 2005). Zeichner and Schulte (2001) discuss the implications of this dilemma with candor.

Because of the tremendous shortage of fully qualified teachers in many large urban school districts and the high percentages of poor students of color attending schools in these districts, we have created a system in the United States where the likelihood that one will be taught by fully qualified teachers depends to no small extent on one's social class background. (p. 268)

Whether or not Zeichner and Schulte are correct is a matter of much speculation.

Nonetheless, their claim merits further investigation.

Research shows students from impoverished and ethnic minority backgrounds in urban and rural areas are most likely at-risk for school failure (Hoffman et al., 2003; US Department of Education, The National Center for Education Statistics, 2006; Slavin, 2006). As a result, many students from impoverished and ethnic minority backgrounds are recognized as needing well-qualified teaching (Darling-Hammond, 2000; Futrell, 1999; Howard, 2003). All the while, individuals obtaining alternative teaching

certification are increasingly working in urban and rural areas. As detailed later in a review of literature, this has transpired despite research showing mixed outcomes for individuals earning alternative teaching certification (Miller et al., 1998; Sindlar, Daunic, & Rennells, 2004). As evidenced by these diverging outcomes, alternative teaching certification could potentially have a deleterious influence on the public education system. If this is so, by the time the education community finds out, it could be too late for many of this nation's most needy students.

Therefore, I strive to clarify trends running alongside the rise of alternative teaching certification in the US. In so doing, I will conduct statistical analysis on the numbers of alternative teaching certificates granted in 35 US states in relation to the proportions of public school students who are impoverished in each state. I will also analyze the numbers of alternative teaching certificates granted in 35 US states in relation to the proportions of ethnic minority public school students in each state.

Further, due to the rise in the numbers of individuals receiving alternative teaching certification, I will also clarify the relationship between changing teacher salary and alternative teaching certification. This will be done within a timeframe that covers the contemporary lifespan of ATC programs and policies in the US. Accordingly, I will measure change in teacher salary by the total change occurring between the 1979-80 and 2003-04 public school years in 35 US states. This variable will then be analyzed in relation to the total numbers of alternative teaching certificates granted during the 2003-04 public school year in each of the 35 US states under study. In-depth discussion of these issues follows.

Problem Statement

While research shows alternative teaching certification has primarily developed in response to the diminished supply and increased demand for certified teachers, teachers from the baby boom generation will continue to retire (Miller et al. 1998; NCEI, 2005; Thomas et al., 2005). Consequently, teaching vacancies throughout the United States could grow well into the twenty-first century. Coupled with this phenomenon, Ingersoll (2002) points out, unlike most professions with a yearly turnover rate hovering around 11%, anywhere from 14% to 17% of teachers leave teaching every year.

Extrapolating this trail of teacher attrition, the National Center for Education Information (2005) estimates 2.2 million teachers will be needed in the US within the next ten years. This could amount to having to hire 210,000 new teachers per year over the next decade. Still, NCEI reminds us that today's demand for teachers is both subject and geographic-specific. As established, the need for teachers will continue to be greatest in the fields of mathematics, the sciences and special education as well as in large urban and outlying rural areas (Gimbert et al., 2005; Howard, 2003; Ilmer et al., 2005; NCEI, 2005; Ng and Thomas, 2007).

As teachers gaining alternative teaching certification continue to fill these shortages and enter the teaching workforce, greater understanding of their influence on public education as well as student outcomes is warranted. Research on alternative teaching certification is further justified with respect to the fact ATC programs and policies have established footing in every state in the nation. Therefore, investigation of alternative teaching certification across state lines is timely.

Most importantly, it is crucial that research shed light on how closely the numbers of alternative teaching certificates granted in US states are expanding in concert with the populations of students who have been identified as being in need of the most-qualified teaching (Darling-Hammond, 2007; Haycock, 2001; Howard, 2003). Hence, research must begin to clarify how closely the numbers of individuals obtaining alternative teaching certification are growing in relation to the proportions of public school students from impoverished and ethnic minority backgrounds. With such research, the public education community will be able to know whether or not large proportions of alternatively-certified teachers are instructing students most in need of the best instruction in the United States.

Further, as alternative teaching certification programs and policies continue to spread across the US, it is essential to clarify if there have been corresponding shifts in teacher salary. In the 2002 publication *Meeting the Highly Qualified Teachers Challenge*, the US Department of Education highlights the potential depth of this relationship. They predict traditional teaching certification practice will become melded with current alternative teaching certification programs and policies. With respect to their interpretation of a “rational” model of future teacher preparation and recruitment, the US Department of Education reports, “In sum, a model for tomorrow would be based on the best alternate route programs of today” (p. 19).

Although the US Department of Education does not provide criteria for what constitutes the best alternative teaching certification programs, as outlined in Chapter Two, research has shown alternative teaching certification programs based upon university-school district partnerships show promise (Sindelar et al., 2004; Thomas et. al,

2005). Further, research indicates a reliable, in-depth mentoring program is crucial to facilitate the best alternative teaching certification programs (Ilmer et al., 2005; Miller et al., 1998).

Regardless of the characteristics of best practice ATC programs, alternative teaching certification has laid a foundation of practice that has existed over twenty years in the United States. Therefore, a solid framework exists against which research could analyze corresponding changes in teacher salary. Undoubtedly, in light of the US Department of Education's prognostication, there is need in the teaching community to further clarify this relationship as the future of teaching certification programs and policies could weigh in the balance.

Purpose of the Study

This quantitative study has three objectives. I will analyze the relationship between the numbers of alternative teaching certificates granted in 35 US states and the proportions of students from impoverished backgrounds in each state. I will also analyze the relationship between the numbers of alternative teaching certificates granted in 35 US states and the proportions of ethnic minority students in each state. Finally, I will analyze the change in teacher salary in 35 US states in relation to the numbers of alternative teaching certificates granted in each state.

In pursuit of investigating these issues, I will incorporate the necessary data, statistical measures and analyses as detailed in Chapter Three. Research questions specific to this study's purpose are addressed next. Relevant definitions in addition to limitations and delimitations are then outlined.

Research Questions

Analysis necessary to enact this study will hinge upon the following three research questions:

- 1.) How do the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year relate to the proportions of students who are in poverty in each state?
- 2.) How do the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year relate to the proportions of students who are an ethnic minority in each state?
- 3.) How does the change in teacher salary between the 1979-80 and 2003-04 public school years in 35 US states relate to the numbers of alternative teaching certificates granted in each state during the 2003-04 public school year?

Hypotheses

Considering research reveals teaching shortages are pronounced in large urban and outlying rural areas (Gimbert et al., 2005; Honawar, 2007; Howard, 2003; Ilmer et al., 2005; NCEI, 2005), certain hypotheses can be formulated with respect to the great proportions of students from impoverished and ethnic minority backgrounds who live in US urban and rural sectors (Farmer, Irvin, Thompson, Hutchins, and McDonough, 2006; Fram, Miller-Cribs, Van Horn, 2007; Hoffman, Llogas, and Snyder, 2003; Howard, 2003; Lee, 2004; Peng and Lee, 1992). Because relevant research shows that individuals obtaining alternative teaching certificates are increasingly teaching in large cities and rural areas across the United States, it is hypothesized that the numbers of alternative teaching certificates granted during the 2003-04 public school year in 35 US states will

have a moderate to high, positive relationship with the proportions of students who are in poverty in each state. By the same token, it is hypothesized the numbers of alternative teaching certificates granted during the 2003-04 public school year in 35 US states will have a moderate to high, positive relationship with the proportions of students who are an ethnic minority in each state.

A measure of face validity justifies these hypotheses. A review of relevant data reveals rates of alternative teaching certification have risen, generally, in most US states with higher proportions of public school students from either an impoverished or an ethnic minority background (NCEI, 2007; US Department of Education, National Center for Education Statistics, 2006). Data specific to these measures will be illustrated in later sections.

Finally, with respect to the last research question regarding the relationship between the change in teacher salary and the numbers of individuals obtaining alternative teaching certificates, relevant theoretical literature supports a particular hypothesis. As outlined in Chapter Two, in his 1979 publication, *The Credential Society*, Randall Collins remarks the expansion and acquisition of education credentials represents the dominant stratifying force of the twentieth century. Collins discusses how expansive credentialing systems have historically bolstered the professional status of a given occupation.

This study draws upon Collins' theory of credentialism with specific regard to his supposition that expansive credentialing systems will heighten the professional status of a given occupation. By using change in teacher salary as an indicator of teacher's changing professional status and drawing upon Collins' credentialism theory with respect to the capacity inherent alternative teaching certification to expand teacher credentialing,

it is hypothesized the change in teacher salary between the 1979-80 and 2003-04 public school years in 35 US states will have a moderate to high, positive relationship with the numbers of alternative teaching certificates granted during the 2003-04 public school year in each state. The definitions as well as limitations and delimitations specific to investigating these hypotheses are outlined next.

Definition of Terms

Certain parameters must be distinguished for various research variables in this study. Most importantly, definitive boundaries must be established to appropriately delineate statistics for the numbers of alternative teaching certificates granted in each state under study. Further, definitive boundaries must be established with regard to variables indicating the proportions of students from impoverished and ethnic minority backgrounds as well as change in teacher salary. A discussion of these definitions follows. A summary for each key term used in this study with a listing of other descriptors for these terms as well as accompanying definitions are found in Table 1 of Appendix A.

Certification and Licensure

I will use the term “certification” and “certificate” in reference to the procedures and documents authorizing an individual’s formal state-level recognition as a public school teacher. The terms “certification” and “certificate” will be used in place of such terms as “licensure” or “license,” which are used by many state teaching certification programs and policies. The US Department of Education (2007) maintains the process specific to certification and licensure is interrelated.

Alternative, Conditional, Emergency, Provisional, Restricted, Temporary, and Transitional Teaching Certification

I will define the concept of alternative teaching certification as well as any data specific to the numbers of alternative teaching certificates granted in US states as mutually exclusive of any concepts and data attributed to the numbers of “emergency” or “temporary” teaching certificates granted in each state. I will not, however, define the concept, nor any data attributed alternative teaching certification, as mutually exclusive of concepts or data attributed “provisional” teaching certification. The National Center for Education Information (2007) establishes these terms—“alternative” and “provisional”—are used interchangeably to name various types of non-traditional teaching certificates offered in the US.

Therefore, similar to the prerogative to use the term “certification” instead of “licensure,” I will, likewise, use the term “alternative” instead of “provisional” to indicate all non-traditional teaching certification programs and policies across US states under study. Furthermore, I will use the term “alternative” teaching certificate for what some states might entitle a “conditional” teaching certificate. In addition, I will use the term “alternative” teaching certificate to denote what some states might name a “restricted” or “transitional” teaching certificate (NCEI, 2007).

Traditional Teaching Certification

The concepts and data defining alternative teaching certification in this study will be defined as mutually exclusive of the concepts and data attributed to traditional teaching certification. Traditional teaching certification is defined as such based on the certification earned upon the completion of a four-year college or university teaching

preparation program. Data specific to these concepts are determined by the National Center for Education Information (2004, 2007) as well as the US Department of Education and the National Center for Education Statistics (2006).

Variations of Alternative Teaching Certification Descriptors in Literature

I will also use the term “alternative teaching certification” (ATC) at the exclusion of the many other descriptors used in relevant research literature. Many researchers use the term “alternative teacher certification” (ATC) (Dial and Stevens, 1993; Zeichner and Schulte, 2001). Some might leave the term “teacher” completely out of their descriptor as do Miller et al. (1998). They use the term “alternative certification” (AC). Still, others use the term “alternative route certification” (ARC) (Rosenberg and Sindelar 2005; Sindelar, Daunic and Rennels, 2004; Thomas et al., 2005).

Moreover, some research literature (US Department of Education, 2002) uses the term “alternate route” to define the same programs and policies indicated in this study by the term “alternative teaching certification.” Beyond these descriptors, Howard (2003) uses the term “alternate certification.” Undoubtedly, the variety of terms used to denote alternative teaching certification programs and policies is testament to the diversity across the United States.

Impoverished Students, Ethnic Minorities, and Change in Teacher Salary

Research variables defining the proportions of students in poverty in each state will be indicated by the proportions of students living below the federal poverty level as reported by the US Department of Education and the National Center for Education Statistics (2006). Furthermore, the proportions of ethnic minority students in each state will be indicated by the proportions of students from non-White, Euro-American ethnic

backgrounds. These proportions will comprise the summation of four different ethnic sub-groups as determined by the National Center for Education Statistics (2006). Sub-groups of ethnic minority public school students included for data in this study include “Black, non-Hispanic,” “Hispanic,” “Asian or Pacific Islander” and “American Indian/Alaska Native.”

Finally, indicators defining the change in teacher salary between the 1979-80 and 2003-04 public school years will be defined in current US dollars by the National Center for Education Statistics (2006). Additional information on the data and populations specific to these aforementioned research variables will be outlined in Chapter Three. Indicators specific to measures of other control variables will also be addressed. Next, the delimitations and limitations of this study will be noted.

Delimitations

Certain delimitations will be made in order to complete this study. As stated, I will not include the numbers of “emergency” or “temporary” teaching certificates granted in US states with the numbers of “alternative” teaching certificates granted in US states. Moreover, indicators of alternative teaching certification will be delimited by the numbers of alternative teaching certificates granted only in the 35 US states reporting data for the 2003-04 public school year. This is due to the fact the 2003-04 public school year provides the greatest number of data cases (N=35) for study. This data is provided by the National Center of Education Information (2007).

Accordingly, I will delimit all other research variable measures based on each of the 35 US states in question to data specific the 2003-04 public school year. Furthermore, I will delimit all data and subsequent statistical analysis to states within the United States

at the exclusion of any other nation. All criterion and predictor variables in this study will be delimited to US public schools at the exclusion of US private schools.

Research variables defining the change in teacher salary will also be delimited to each of the 35 US states in question. With regard to these indicators, certain delineations will be made respective of time. I will delimit the amount of change in teacher salary in every US state under study from the 1979-80 public school year to the 2003-04 public school year. This twenty-three year time period is significant in that it will capture the change in teacher salary that occurred during the entire lifespan of contemporary ATC programs and policies in the US.

Limitations

Just as many of this study's delimitations are bound by time and the availability of data, the limitations of this study are similarly bound. For the most part, this study is limited in its scope. This is due to the infancy from which alternative teaching certification is emerging in the United States. As a result, this study is limited in its capacity for generalizability. In some respects this is due to the additional US states that had established alternative teaching certification programs and policies during the 2003-04 public school year, but did not report data on the numbers of individuals obtaining alternative teaching certificates within their jurisdiction during this delimited time frame. Consequently, this excludes these states from this study.

Therefore, the results of this study cannot be generalized to the entire population of alternative teaching certification programs and polices existing in the United States during the 2003-04 school year. Likewise, the results of this study cannot be generalized to any alternative teaching certification program or policy existing at any time or in any

place outside of the times and places specific to the population of 35 US states under analysis. Any attempts to generalize findings from this study are not recommended. If attempted, this must be done with extreme caution due to both the continual growth in alternative teaching certification as well as the diversity across all policies.

Further, there are certain limitations that must be noted with regard to the construction of the research design fitted this study's final research question. Undoubtedly, there are many political, economic and sociological factors that have influenced corresponding shifts in teacher salary within the time period analyzed in this study. Indicators for each of these research dimensions, however, are beyond the scope of this study. Nevertheless, the exclusion of these variables limits this study's potential to thoroughly define the relationship between changing teacher salary and the rise of alternative teaching certification.

Significance of Study

The significance of this study is emboldened in many regards. As public schools in the US suffer from teacher attrition, the education community is searching for a solution. For the time being, relevant research shows alternative teaching certification programs and policies have been built to buttress this turnover in public school teachers (NCEI, 2005; Shepherd and Brown, 2003; Thomas et al., 2005).

As alternative teaching certification spreads across the country, the teaching community must assure all public school students will be guaranteed highly-qualified instruction. Echoing this notion, measures in the No Child Left Behind Act (NCLB, US Department of Education, 2001) mandated all public school classrooms staff a highly-qualified teacher by the end of the 2005-2006 school year. At the same time, despite

mixed outcomes, NCLB supports and encourages states to seek alternative routes to teaching certification. Within the scope of NCLB, the focus of this study is to shed light on the student populations most likely receiving alternatively-certified teaching in America. Impending results will clarify how likely student populations most in need of highly-qualified instruction are being taught by alternatively-certified teachers (Brown & Shepherd, 2003; Darling-Hammond, 2007; Howard, 2003).

Moreover, this study is significant in its capacity to further define the relationship between changing teacher salary and the rise of alternative teaching certification. In balancing the supply and demand of the teacher workforce, the teaching community will need to remain cognizant of how the spread of alternative teaching certification is compromising or improving teacher salaries in the United States. By employing a research variable indicating change in teacher salary over the contemporary lifespan of alternative teaching certification, the results of this study will highlight any possible influence the current advent of alternative teaching certification has had upon teacher salaries.

If the words of the US Department of Education (2002), as stated in *Meeting the Highly Qualified Teachers Challenge*, do indeed hold weight, modern alternative teaching certification programs and policies would typify the content of future teaching certification programs. This study will clarify whether a move to base common teaching certification policies on best-practice alternative teaching certification is suited for the advancement of teacher salaries in the United States. In so doing, this study will address the capacity of alternative teaching certification to influence the professional status of teaching as indicated by change in teacher in salary.

Summary

The results of this study will serve the education community well. Because I disaggregate data specific to research questions at the state-level while incorporating the sequential introduction of appropriate control variables, analysis will be able to more-adequately accommodate the variety amongst the different types of alternative teaching certification programs and policies across this nation. Although I delimit this study to the 2003-04 public school year, this study's findings have potential to further clarify the relationship between the numbers of alternative teaching certificates granted in US states and the numbers of students most in need of highly-qualified instruction.

This study will also help to define the relationship between teacher salary and alternative teaching certification. As I delimit change in teacher salary to the 1979-80 and 2003-04 public school years, subsequent analysis will be able to capture the lifespan of the contemporary alternative teaching certification movement in the United States.

Review of literature relevant to these research issues will now be discussed.

CHAPTER TWO

REVIEW OF LITERATURE

In considering alternative teaching certification from a broader scholarly context, this review of literature is structured by first explaining the theoretical applications of teaching certification. I will then focus on a review of the development of traditional as well as alternative teaching certification in the United States. A more thorough discussion of the characteristics of alternative teaching certification programs, including alternative teaching certification classifications, will also be undertaken. I will conclude with a review of research evaluating the outcomes and implications of alternative teaching certification programs and policies in the US.

The review of literature will follow criteria established by Boote and Beile (2005). Pieces of research literature chosen for review were selected based on the following criteria:

- degree of relevancy to alternative teaching certification;
- timeliness of publication (literature published more recently was given priority over literature fifteen years old);
- and frequency of citations in relevant literature.

Throughout this review, literature was chosen with an eye for its potential to add depth to this study. Moreover, literature was selected based on its capacity to contribute to discussion on the rise of alternative teaching certification in the United States. Literature selected for review, as distinguished by the aforementioned categories, will now be addressed.

Theoretical Applications of Teaching Certification

The complexion of alternative teaching certification is inextricably bound to the fate of traditional teaching certification. Likewise, the theoretical applications of alternative teaching certification are invariably linked to theories relevant to traditional teaching certification. Both traditional and alternative teaching certification are indelibly tied to the tremendous stock professions throughout American society place in credentials.

The Professionalization of Teaching

Colleges and universities have long been involved in the teaching profession as well as the implementation of credentials. Gaining credentials through extensive academic coursework is often advocated as the surest means to bolstering the professional status of an occupation (Haber, 1991; Kimball, 1992). Long before the work of these scholars, Max Weber (1968) wrote, “The role played in former days by the ‘proof of ancestry’ as prerequisite for equality of birth, access to noble prebends and endowments, and wherever the nobility retained social power, for the qualifications to state offices, is nowadays taken by the patent of education” (p. 1000). Ironically, Weber’s words here long ago foretold the authority education credentials would wield in defining many of the economic and socio-political facets of society today.

True to Weber’s words, the occupation of teaching has a history marked by the use of extensive education and credentials to regulate the field. As Randall Collins shows in *The Credential Society* (1979), the teaching occupation has taken a prescriptive route to professional status. Like the professions of medicine, architecture and engineering, which formed professional organizations in the 1850s, the occupation of teaching formed

the National Teachers Association. Renamed the National Education Association, this organization also started in the 1850s.

The Feminization of Teaching

Many have speculated why the teaching profession has not been able to establish the reputation afforded the field of medicine, architecture and engineering. Some point to the fact that teaching could be considered part-time work due to the long summer breaks (Kaufman, Westland, and Engvall, 1997). Moreover, for a long time, there was popular belief certain individuals were simply born with an inclination for good teaching (Kinney, 1964).

Others point out that, beginning some time around the mid-1800s, significant numbers of women began to enter the teaching profession as men, who formerly dominated the occupation, left to join the ranks of industrialized America. In so doing, this phenomenon facilitated the “feminization” of teaching. This was further amplified during the era of progressivism in the 1930s as the male-dominated administration in public education sought greater consolidation and control (Fraser, 2001).

According to Apple (as cited in Arum and Beattie, 2000), true to other occupations that have historically become feminized, “Pay is often lowered and the job is regarded as low-skilled so that control is ‘needed’ from the outside” (p. 347). As evidence, Hoffman (1981) points out when women began replacing male teachers in large numbers throughout the latter half of the 19th century, they were being hired at salaries one-third to one-half of what was being paid their male counterparts.

Nevertheless, the teaching occupation has remained steadfast in its pursuit of greater professional status. Beyond any potential influence the feminization of teaching

has had upon the occupation's professional status, Wise (2005) acknowledges a lack of standards can be just as influential. He posits the professionalization of teaching has made tremendous strides in this regard within the last two decades. During this time, Wise maintains greater adherence to standards in classrooms and teacher education programs has bolstered teaching's professional status.

Other research offers prescriptions for the professionalization of teaching. In analysis of surveys from future and current teachers as well as education professors, Shen and Hsieh (1999) questioned individuals regarding their perceptions of various ways to bolster the professional status of teaching. Participants across all three groups felt increasing teacher salary was most paramount in raising teacher's professional status. Respondents rated this survey item more important than improving teacher leadership and career opportunities as well as having higher certification standards. On the other hand, respondents felt eliminating undergraduate education majors and courses, as suggested by the Holmes Group in the 1986 report, *Tomorrow's Teachers: A Report of the Holmes Group*, was least tangible to improving teacher's professional status.

Credentialism and Teacher Education

Long before the Holmes Group's suggestion, teacher preparation programs were bound to institutions of higher education. By the early 1900s, as detailed in a later section, the once autonomous teacher preparation normal schools had, for the most part, been encapsulated by American colleges, universities and state certification agencies. Consequently, the certification of public school teachers assuredly became tied to undergraduate teacher colleges throughout the early part of the 1900s. By 1955, in fact,

35 states required public school teachers to have at least a baccalaureate degree (Sedlak and Schlossman, 1986).

As Collins argues, the growth in credentialism through the mandate of higher education coursework has become so widely canonized in the United States that it seems to be the primary medium of cultural currency moving individuals through today's social hierarchy. Expounding upon the implications, Collins (1979) states, "Cultural currency in the form of educational credentials has been the major new force shaping stratification in twentieth century America" (p. 7). According to Collins, occupations incorporating an extensive credentialing system through the implementation of additional schooling or mandated testing are essentially creating a gate-keeping device that restricts entry to that occupation. In turn, this enables said occupation to form a monopoly, so to speak, on a certain domain of knowledge or skills.

This is what the medical as well as the law, architectural and engineering occupations have historically done in order to improve their professional status. The field of teaching has tried to apply this formula as well. Still, in some ways the field of teaching does not completely align with Collins' theory of credentialism. Although the occupation of teaching has an extensive education credentialing system similar to the medical, law, architectural and engineering occupations, the teaching occupation has not earned the same professional status.

In consideration of the alternative teaching certification phenomenon, the occupation of teaching departs from the theoretical ethos of Collins' credentialism in other ways as well. This is due primarily to the fact ATC programs and policies typically require a diminished amount of academic coursework (deBettencourt & Howard, 2004;

Mantle-Bromley, Gould, McWhorter, and Whaley, 2000; Sindlar et. al, 2004). Hence, while alternative teaching certification upholds society's stock in credentials, it does so without being tied to an extended amount of college or university coursework. To this end, alternative teaching certification does not fit neatly into Collins' theory of credentialism. Because ATC programs and policies require minimal academic coursework, one might posit the occupation of teaching is breaking new professional ground with the rise of alternative teaching certification in the United States.

The Expansion of Teacher Credentialism

Beyond raising teacher salary and increasing coursework provisions to professionalize teaching, others have suggested the mere redefinition of teacher credentialing designations would further professionalize the occupation. While suggesting the abolition of colleges of education, the Holmes Groups (1986) proposed the reorganization of teaching certification classifications by rank-order. The Holmes Group maintained this action would facilitate the occupation's professional status.

Echoing the Holmes Group proposal, Troen and Boele (2005) suggested creating a "career ladder" for the teaching profession. These authors describe this as "a multi-tiered structure in which different teachers have different job descriptions and responsibilities" (p. 54). According to Troen and Boele, such a system would not only professionalize teaching, but galvanize the teaching force through supervision, mentoring and collaboration all the while drawing more academically-strong individuals into the teaching ranks.

Once again, the delineation of credentialing distinctions can best be viewed through the lens of Collins' credentialism. As mentioned, Collins' (1979) theory

identifies the expansion of credentialing systems as means to further professionalize occupations. In alliance with this perspective, in a 1986 publication Arthur E. Wise, current president of the National Council for the Accreditation of Teacher Education, notes the professionalization of teaching may cure all of education's ills. Accordingly, Wise states, "The professionalization of teaching is a possible solution to the major crisis facing American education over the next decade or so" (p. 36).

The No Child Left Behind Act (2002) may also follow in this track of increasing the professionalization of teaching. This legislation clearly called for greater regulations of the teaching occupation and specifically required highly-qualified certification status for all US public school teachers by the end of the 2005-2006 school year. Still, the federal mandates set in place by NCLB have not come without controversy. For instance, the cornerstone of NCLB measures—high-stakes testing—has been subject to much debate. Rotherham (2002) argues the institution of testing though NCLB helps to focus the education community on the needs of poor and minority students like never before. On the other hand, Jones (2004) maintains NCLB testing provisions are defined on too narrow of a subset of skills. Further, Jones posits testing across state lines is subject to many inconsistencies.

Despite the controversy, the quest to solidify the professional status of the teaching field on the rhetorical and political level continues. All the while, credentials are continually highlighted as the means to do so. True to Collins' (1979) position by which he identifies credentialism as the definitive socially-stratifying force of the twentieth century, the move to further regulate public school teachers could justify Collins' viewpoint in the twenty-first century as well.

The Future of Credentialism

Other scholars such as Gamoran (2001), in recognition of sociological theories of social reproduction, take the influence of credentialism even further. According to Gamoran, “In the United States, it is likely that by 2125, postsecondary schooling will be as nearly universal as secondary schooling is today” (pp. 144-45). This suggests that the institution of credentialism via college and university coursework is likely to extend far into the future.

In filling out the theoretical ethos of social reproduction, which aligns education credentials with social status maintenance, Gamoran (2001) goes on to say, “We can expect new distinctions to emerge; probably, differences among institutions of higher education will become more prominent to preserve the status hierarchy even as all students reach some form of higher education” (p. 145). Although Gamoran qualifies his words to the year 2125, the advent of alternative teaching certification readily applies to his idea that new distinctions among forms of higher education will emerge alongside the proliferation of credentialism. All told, it seems with the rise of alternative teaching certification programs and policies, the future is now. In this regard, Rosenberg and Sindelar (2004) go so far as to say, “A large underground economy for teaching credentials is in place in many areas of the nation” (p. 123).

Development of Teaching Certification in the United States

Historically, teachers have been certified through various avenues of post-secondary education. Along the way, teaching certification programs carved a solid foundation with the formation of the vocationally-based normal schools of the 1800s. Thereafter, certification programs expanded into the academically-structured four-year

colleges and university-based baccalaureate programs of the twentieth century. A timeline chronicling the development of teaching certification in the United States is provided in Figure 2.

Teachers of the Late 1700s and Early 1800s

In the late 1700s, long before the relationship between teaching certification and higher education was melded, there was no formal regulatory oversight of teacher training and certification. During this time, most formal education in the United States fell under the domain of the church and was, therefore, the responsibility of the clergy. With the onset of the 1800s and the movement toward a common school system, however, a greater demand for teachers ensued. Still, there was no demand for the formal regulation of teacher certification (Collins, 1979). On the other hand, teachers did have to exhibit they were of good character. As a result, teachers of the early 1800s were sometimes required to commit to good moral behavior, agreeing to involving themselves in church activities, dressing appropriately, and refraining from inappropriate conduct such as dancing. (Dial and Stevens, 1993; Kinney, 1964).

Teacher Examinations of the 1800s and Early 1900s

During the 19th century, attendance at public schools grew with a corresponding need for more teachers to be properly prepared. One of the first attempts at regulating the education of teachers in the United States began in Ohio. In 1825 county examiners were appointed throughout this state with the authority to certify prospective public school teachers.

By the late 1800s the certification authority granted to the county examiner had transferred to the state level in some US states. As the practice of teaching certification

expanded into the twentieth century, more states began instituting state-certification procedures. By 1911, there were 27 states with county or state-wide certification procedures. By 1921, this number had grown to 43 states (Dial and Stevens, 1993; Kinney, 1964).

The Life of Normal Schools

At the same time the county examiner certification practice was developing in Ohio, a different certification avenue was being paved in New England. Here, normal schools, which provided mentorship for aspiring teachers, got their start in Concord, Vermont in 1823. By the end of the century there were well over 100 of these schools throughout New England in addition to a slightly greater number of privately-run teacher preparation academies (Kinney, 1964).

By the mid-1900s, normal schools were dwindling. Their numbers had decreased from 137 in 1920 down to just a few by 1952 (Dial and Stevens, 1993). Nevertheless, along the way, these schools built the backbone that would forever bind the field of teaching with the notion that aspiring teachers need structured preparatory academic education.

Even at the pinnacle of their popularity in the late 1800s, normal schools did not train most public school teachers. The common way to achieve teaching certification in most states was passage of a county or state-administered exam. Therefore, in lieu of attending a normal school and then taking this exam, most aspiring teachers bypassed normal school preparation altogether. Instead, these future teachers simply took the county or state-administered exam to achieve certification (Kinney, 1964).

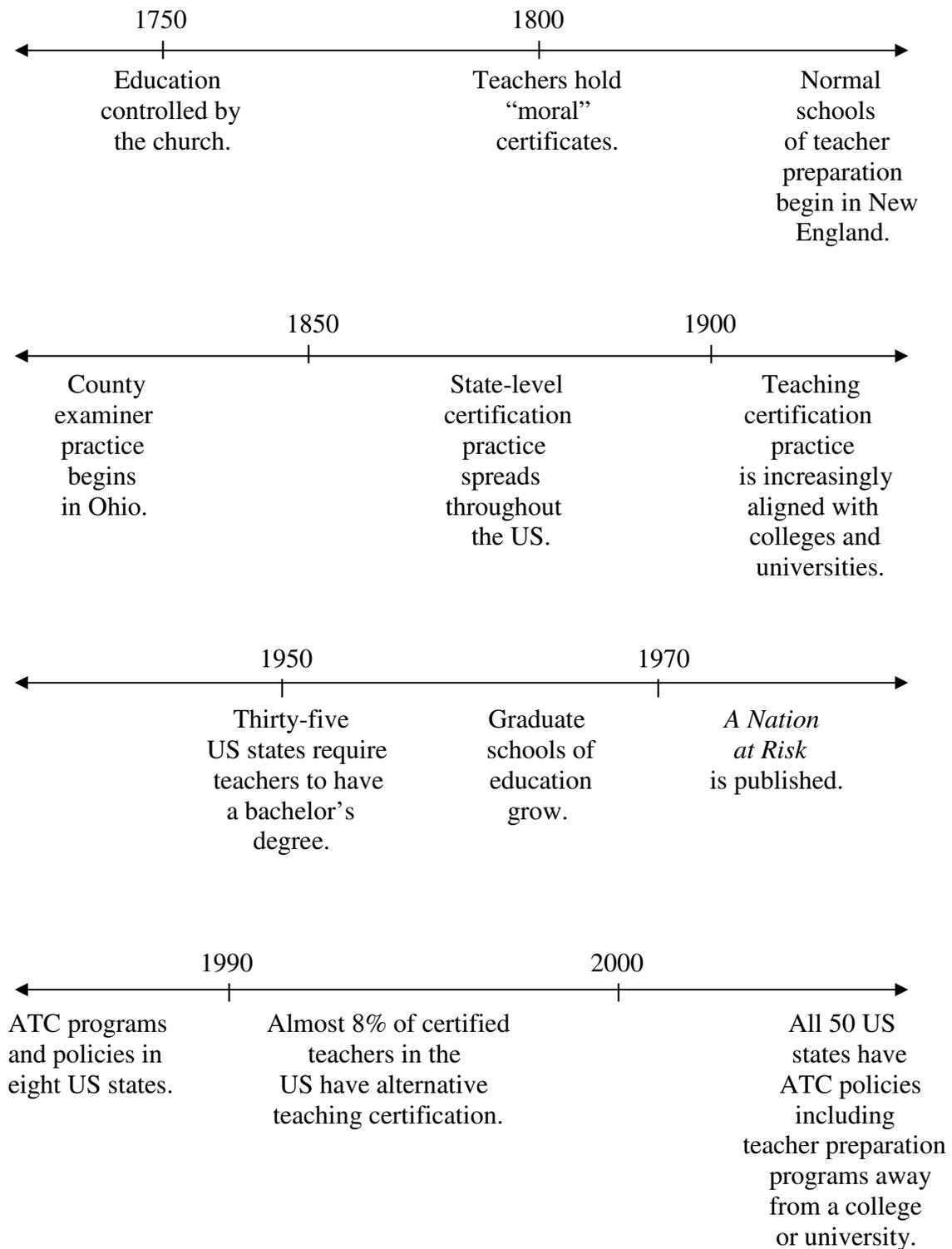


Figure 2. Timeline of the development of traditional and alternative teaching certification in the United States.

The Rise of Colleges and Universities

While teachers passed up normal school study, colleges and universities across America began losing students on a broader scale in the late 1800s. In the wake of the Civil War and its effects, students began migrating to vocational schools (Collins 1979). By 1870, in proportion to the entire population of the region, the numbers of college students in New England had shrunk drastically (Rudolph, 1962). Further, this was a time of rising literacy as elementary schools were consolidating and secondary schools were expanding to unprecedented levels throughout the United States. As a result, post-secondary education via a college or university was not deemed essential to leading a meaningful American male adulthood at the close of the nineteenth century.

Oddly enough, according to Rudolph (1962), what fueled the college and university's return to prominence in the early part of the 1900s was the promotion of its social culture. Through the vestige of fraternities, sororities and football games as well as the rivalries they inspired, colleges and universities all over the nation experienced a revival as students flooded campuses for an opportunity to cash in on these social enterprises. At the same time, normal schools were diminishing. Soon, the mass appeal focused on colleges and universities spurred the widespread incorporation of normal schools into these institutions.

Beginning in the early 20th century, the course of teacher preparation was more or less fixed over the next one hundred years. Consequently, undergraduate training via a four-year college or university gradually became a prerequisite for teacher certification. This traditional teaching certification practice developed steadily throughout the 1940s

and 50s. By mid-century, over half of the states in the US required their teachers to have a baccalaureate degree (Sedlak and Schlossman, 1986).

The Formation of Traditional Teaching Certification

As the practice of teaching certification became further aligned with colleges and universities throughout the 1960s, a variety of certification programs and policies developed. This variety was especially apparent in the myriad of state-level teaching certification exams. Despite the different types of exams, the institution of undergraduate college and university schools of teacher education continued to be the main route to teaching certification. More than likely, traditional teaching certification programs will remain on four-year college and university campuses as the practice of teaching has become framed by the college and university experience. In line with Collins' theory of credentialism, the teaching occupation's respective alignment with colleges and universities, as discussed, should bolster its professional status.

Teaching certification programs can enhance their status even more today by applying for accreditation through voluntary professional organizations. There are currently over forty accrediting organizations in the United States overseeing the training and education for occupations ranging anywhere from teaching to midwifery to funeral service. In an effort to contribute to the teaching occupation, the accreditation of teaching certification programs are governed by two regulatory bodies—the National Council for the Accreditation of Teacher Education (NCATE) and the Teacher Education Accreditation Council (TEAC). Of the two, NCATE has accredited a far greater number of programs. In a summary of the history of the NCATE, Wise (2005) estimates NCATE has accredited approximately 700 teaching certification programs to date.

Teaching Certification and Governmental Oversight

State governing offices also play an essential role in teaching certification today. In following, colleges, universities, community colleges or other education organizations draw a plan to administer a teaching certification program. In turn, this plan is submitted to each state's public education governing office for review, approval and authorization (NCEI, 2005).

Historically, as colleges, universities and other teacher preparation programs have gained approval from state governments, there has been little streamlining among the many different approaches to teaching certification across the US. Due to the patchwork of programs and policies, there is no federal teaching certificate with jurisdiction across all US state boundaries. Nevertheless, there seems to be a move towards greater centralization in the teaching profession of late. For example, both the 1983 publication, *A Nation at Risk: The Imperative for Educational Reform*, by the National Commission on Excellence in Education as well as the 2002 reauthorization of the Elementary and Secondary Education Act as No Child Left Behind (NCLB) called for heightened accountability of US public school teachers. In fact, as mentioned, by the end of the 2005-2006 school year, NCLB mandated all public school classrooms staff a highly-qualified teacher.

In general, according to the US Department of Education's publication *No Child Left Behind: A Toolkit for Teachers* (2004), a highly qualified teacher must have the three following characteristics:

- a bachelor's degree;
- full state certification, as defined by the state;

- demonstrated competency, as defined by the state, in each core academic subject he or she teaches.

While the first provision is self-explanatory, the last two provisions leave room for a lot of flexibility among each state's certification practice. Accordingly, NCLB gives states the freedom to define their specific certification policies. However, in so doing, NCLB does encourage states to establish alternative routes to teaching certification. With regard to the final provision, states are also granted flexibility to determine the demonstration of teaching competency. NCLB requires all new elementary teachers to pass a state-administered teaching test. Middle and high school teachers, on the other hand, must either pass a state-administered teaching test or take coursework equivalent to an academic major in the subject they are instructing.

As states work toward highly-qualified teaching status, the numbers of individuals obtaining alternative teaching certificates has grown. As mentioned, the numbers of individuals obtaining alternative teaching certificates in the United States jumped nearly thirty percent between the 2003-04 and 2005-2006 public school year (NCEI, 2005). It is interesting to note this sudden rise in the numbers of individuals obtaining alternative teaching certificates in 2005-06 America as NCLB measures mandating the staffing of a highly-qualified teacher in all public school classrooms drew nigh. Nevertheless, NCLB recognizes individuals with alternative teaching certification as having highly-qualified teaching status (US Department of Education, 2004).

Development of Alternative Teaching Certification in the United States

Research shows contemporary forms of alternative teaching certification have primarily developed since the early 1980s (Miller et al., 1998; NCEI, 2005; Rosenberg and Sindelar, 2005; Thomas et al., 2005). With the expansion of alternative teaching certification in the US, a wide variety of programs and policies have developed (Rosenberg and Sindelar, 2005; Zeichner and Schulte, 2001). Despite the variety, most alternative teaching certification programs and policies are similar with respect to their development in response to concerns over teaching shortages in mathematics, the sciences and special education (Gimbert et al., 2005; Ilmer et al., 2005; NCEI, 2005). Further, the centerpiece of this dissertation is chiseled by research showing most forms of alternative teaching certification have developed in part because of teaching vacancies in large urban and outlying rural areas (Dial and Stevens, 1993; Gimbert et al., 2005; Howard, 2003; Ilmer et al., 2005; NCEI, 2005).

Historical Alternative Teaching Certification Movements

The historically varied nature of alternative teaching certification is described by Haberman (1986) who studied alternative teaching certification movements during the nineteenth century. Haberman posits the concept of alternative teaching certification applies to the policy of teaching certification expedited in various school districts throughout the US during the late 1800s. Haberman points out large urban districts at this time desired a certified public school teaching force. To some degree similar to the need for certified teachers in large urban districts today, public schools in American cities faced a demand for certified teachers after the Civil War. A hodgepodge of teaching certification programs and policies was the result.

Dial and Stevens (1993) provide further detail to alternative teaching certification's history. These authors discuss the construction of alternative teaching certification in various US states in the 1960s. They note, however, most of these programs and policies were phased-out quickly as the demand for certified teachers met the supply by the 1970s.

The National Center for Education Information's 2007 publication *Alternative Teacher Certification: A State-by-State Analysis* finds Vermont has offered a form of alternative teaching certification since the early 1960s. This so-called "transcript analysis," as described by the National Center for Education Information, is also found in Maine, where teachers have been alternatively-certified for a long time. Other states such as Montana also have had a form of alternative teaching certification since 1975 when that state's legislature enacted a class 5 alternative teaching certificate.

The Birth of Contemporary Alternative Teaching Certification

A decade after Montana's legislature instituted alternative teaching certification, concerns over teaching shortages appeared on the American educational landscape. In response, the contemporary form of alternative teaching certification took root. True to the scattered century-long incidence of alternative teaching certification programs and policies across the United States, there are different accounts of the newest form of alternative teaching certification. Suell and Piotrowski (2007) as well as Zeichner and Schulte (2001) posit the first state-wide alternative teaching certification program was initiated in Virginia in 1982. California and Texas followed suit in 1983 and New Jersey did so in 1984.

Dial and Stevens (1993) offer an amendment to this chronology. They maintain New Jersey gained national recognition in 1983 after starting the first alternative teaching certification program. Thomas et al. (2005) back the timeline provided by Dial and Stevens (1993). These authors contend contemporary alternative teaching certification got its start in New Jersey in 1983. They also add ATC policies could be found in eight US states throughout the early part of the 1980s. The National Center for Education Information (2007) adds detail to this timeline. In addition to highlighting the national attention New Jersey's alternative teaching certification policies earned in 1983, NCEI maintains seven other states had formal alternative teaching certification policies by 1983.

Despite the difference in opinion regarding their origin, alternative teaching certification programs and policies grew steadily throughout the 1990s. Shen (1997) found that 7.5 percent of all teachers certified in the United States from the 1983-84 to the 1993-94 public school years did so through alternative teaching certification. Extending these numbers to the end of the twentieth century, Zeichner and Schulte (2001) show estimates suggesting more than 125,000 individuals obtained alternative teaching certification status throughout the United States from 1983 to 1999.

The Rise of Alternative Teaching Certification

Still, the most expansive development of alternative teaching certification has occurred most recently. By 2002, the US Department of Education finds 45 states having an alternative teaching certification policy. Of these states, Suell and Piotrowski (2007) purport 20 of them have developed 34 new alternative teaching certification routes in the last five years. Noting the entire breadth of their development, NCEI (2005) maintains

well over 200,000 individuals have attained alternative teaching certification status in the United States since 1985. The US Department of Education (2002) adds New Jersey is leading the way with 22 percent of its new teachers entering the teaching field with alternative teaching certification.

The recent development of alternative teaching certification programs and policies in the US is further advocated by the federal government. As mentioned, the No Child Left Behind Act supports the expansion of alternative teaching certification programs and policies. In line with the federal support alternative teaching certification receives, Western Governors University recently became the first non-traditional provider of teacher education to earn accreditation status from the National Council for the Accreditation of Teacher Education (NCATE). In note of this action, NCATE president Arthur E. Wise stated, “This decision by NCATE should signal to the education community and the public that NCATE has the capacity to review non-traditional providers to determine the quality of their teacher preparation programs” (NCATE, 2006). Wise suggests the beginning of a major shift in the traditional approach to teaching certification.

Characteristics of Alternative Teaching Certification

As Rosenberg and Sindelar (2005) indicate, much of alternative teaching certification “is hidden below the surface” (p. 125). Still, an overview of research on alternative teaching certification reveals many parallels among the programs and policies. By and large, alternative teaching certification is aimed at professional individuals who are interested in changing careers (deBettencourt & Howard, 2004; Ilmar et al., 2005). Along these lines, ATC programs and policies cater to individuals who have already

received a bachelor's degree in a collegiate discipline other than education (Gimbert et al., 2005).

Nevertheless, as established, variety across the entire spectrum of alternative teaching certification is common. Suell and Piotrowski (2007) find ATC programs and policies vary widely in terms of the timeframe attributed to each. Some alternative teaching certification programs and policies may require as little as two weeks of coursework before fieldwork while other programs may require as much as two years of coursework. Beyond coursework, some programs may require up to three years of mentoring for alternatively-certified teaching candidates. Further variety among the different forms of alternative teaching certification is reflected in the initiation of each. Suell and Piotrowski (2007) discuss how different alternative teaching certification programs may be started by a local school district, regional service center, college or university, teacher union, business community or any combination of these or other education organizations.

Despite the variety attributed the length and formation of alternative teaching certification programs and policies, in-depth analysis finds similarities with regard to the content of these programs. Alternative teaching certification programs and policies, for the most part, share the following characteristics:

- a diminished amount of coursework in pedagogy and theory (deBettencourt & Howard, 2004; Mantle-Bromley, Gould, McWhorter, and Whaley, 2000; Sindlar et al., 2004);
- a reliance on workshops and seminars delivered through on-line, distance-education services (deBettencourt & Howard, 2004; Ilmar et al., 2005);

- a practice-based approach to teacher education through extensive fieldwork (deBettencourt & Howard, 2004; Mantle-Bramley et al., 2000; Thomas et al., 2005);
- an emphasis on the work of mentors in monitoring and guiding the classroom teaching of many ATC participants (Ilmer et. al, 2005; Miller, McKenna, and McKenna, 1998);
- and a fieldwork component often shaped through partnerships between universities and local school districts (Ilmer, et. al, 2005; Thomas et. al, 2005; Sindelar et. al, 2004).

Reflecting many of these characteristics, Teach for America and Troops to Teachers are two widely-known alternative teaching certification programs. For over a decade, Teach for America has placed college graduates with liberal arts degrees as teachers in schools. Similarly, Troops to Teachers has put former military personnel in teaching positions over the last decade (Holland, 2001).

In Montana, the content and structure of alternative teaching certification programs and policies echo many of the characteristics of ATC programs elsewhere. For instance, the Northern Plains Transition to Teaching (NPTT) alternative teaching certification program has established itself at the Montana State University in Bozeman. Accordingly, similar to many other ATC programs, limited coursework and an extensive field experience are the hallmarks of this ATC program (Montana State University, 2007).

Classifications of Alternative Teaching Certification

In the interest of facilitating consistency amongst the wide array of alternative teaching certification across the United States and ensuring the reliability of its data, the National Center for Education Information (2004) delineates 11 different classes of alternative teaching certification. Because information culled from NCEI is essential to this study's research design, an overview of each class of alternative teaching certification is necessary. Table 2 on the next page offers a listing of these alternative teaching certification classifications with regard to their standing in each of the 35 US states proposed for analysis. This table also lists the numbers of alternative teaching certificates granted in each state. Thereafter, Table 3 offers a brief summary for each class of alternative teaching certification detailed in this section.

Class A

According to NCEI, Class A alternative teaching certification programs and policies are designed for those individuals who have obtained a bachelor's degree in a discipline other than education. Despite the initiation of most forms of alternative teaching certification in response to teaching shortages, it is interesting to note this class of alternative teaching certification is not formulated in response to teaching shortages per se, nor is this class limited to any specific subject or grade-level. However, Class A alternative teaching certification programs and policies do involve the guidance of a mentor as well as some coursework in theory and teaching practice. During the 2003-04 public school year, Class A alternative teaching certification routes could be found in 11 states. These states are California, Florida, Georgia, Louisiana, Maryland, Massachusetts, New Jersey, New Mexico, New York, Texas and Utah (NCEI, 2004).

Table 2

The Numbers, Proportions and Classes of Alternative Teaching Certificates (ATC) Granted in 2003-04 for US States under Study

State (N=35)	No. of ATC	^a Prop. of ATC	^b Alternative Teaching Certification Class						
			A	B	C	D	E	G	H
Alabama	2,069			x				x	
Arizona	0								
Arkansas	260	.17		x					
California	5,490	.17	xx			x		x	xx
Colorado	695	.23		xx					
Connecticut	249	.03		x				x	x
Delaware	48			x				xxx	
District of Columbia	82	.19	x						
Florida	650	.10	x						x
Georgia	1,330	.23	x			x	x	x	x
Idaho	7	.01				x			
Illinois	302	.03				x	x		
Indiana	137								
Iowa	0					x			
Kentucky	821								
Maryland	91	.03		x		x			x
Massachusetts	3,091		xx						
Mississippi	516			xx			x		
Missouri	184	.03				x			
Montana	11	.01							x
Nebraska	35								xxx
New Jersey	2,908	.29	x			x			
New Mexico	102		x						
New York	2,072	.08	x				x	x	
North Carolina	282	.09					x	x	
South Carolina	407			x					
South Dakota	8	.01		x					
Tennessee	2,132	.39				xxx		xx	
Texas	7,117	.42	x						
Utah	102	.03	xx						x
Virginia	5,206	.62				xx		xx	
Washington	88	.02		x					x
West Virginia	0								
Wisconsin	0					x			
Wyoming	10	.04				x			x

Note. Data provided by the National Center for Education Information (2007). ^aProportions of ATC relative to the total numbers of teaching certificates. ^b"x's" indicate the numbers of alternative teaching certificates offered.

Table 3

Summary of Alternative Teaching Certification (ATC) Classifications

ATC class	Characteristics
A	Non-education bachelor's degree; not aimed at teacher shortages or any specific subject or grade-level; mentoring; coursework in theory and practice;
B	Non-education bachelor's degree; aimed at teacher shortages; aimed at secondary and/or subject-specific teaching positions; mentoring; coursework in theory and practice;
C	Designed by state and/or local school district; involves review of candidate's background; coursework and in-service work designed to candidate's individual needs;
D	Designed by an institution of post-secondary education; involves review of candidate's background; coursework and in-service work designed to candidate's individual needs;
E	Non-education bachelor's degree; program is solely-based at an institution of post-secondary education;
F	Emergency teaching certification; candidates may begin teaching without on-site supervision;
G	Aimed at individuals who have a few requirements left before earning traditional teaching certification; aimed at individuals with teaching certification in another state and/or subject area;
H	Aimed at individuals with unique professional distinction;
I	States not currently implementing alternative teaching certification;

- J Aimed at individuals who do not qualify for traditional or alternative routes to teaching certification;
- K Aimed at specific populations of individuals; Teach for America; Troops to Teachers.
-

Class B

Like Class A, Class B alternative teaching certification is designed for individuals who have already earned a bachelor's degree in a discipline other than education. Similarly, Class B alternative teaching certification involves work with a mentor as well as coursework. However, Class B alternative teaching certification programs and policies, unlike Class A, are restricted to filling teaching shortages and/or secondary grade level teaching positions and/or subject-specific teaching vacancies. In 14 states during the 2003-04 public school year, Class B alternative teaching certification programs and policies were found in Alabama, Arkansas, Colorado, Connecticut, Delaware, the District of Columbia, Hawaii, Kentucky, Minnesota, Mississippi, South Carolina, South Dakota, Washington and Wisconsin (NCEI, 2004).

Class C

According to NCEI, Class C alternative teaching certification programs and policies depart from the nature of Class A and B alternative teaching certification programs and policies markedly. In so doing, Class C programs and policies are primarily designed by the state or a local school district. Class C alternative teaching certification involves review of a potential candidate's academic and professional background. Further, Class C programs and policies entail coursework and field service that is

developed according to the individual needs of the candidate. In 2003-04, Class C alternative teaching certification programs and policies were found in two states, namely, New Hampshire and Vermont (NCEI, 2004).

Class D

Class D alternative teaching certification programs and policies involve all characteristics of Class C. However, instead of designing individually-based teaching certification programs at the state or local school district level, Class D alternative teaching certification is designed by an institution of higher education. In 2003-04, these ATC programs and policies could be found in 14 states—California, Georgia, Idaho, Illinois, Iowa, Kansas, Kentucky, Louisiana, Missouri, New Jersey, Ohio, Oklahoma, Oregon, Tennessee, Virginia, Wisconsin and Wyoming (NCEI, 2004).

Class E

Class E alternative teaching certification, like Class A and B alternative teaching certification, is geared towards individuals who have earned a bachelor's degree. Unlike Class A and B, however, class E alternative teaching certification is solely based at an institution of higher education. Class E programs and policies were found in 12 states during the 2003-04 public school year. These states were Alabama, Connecticut, Delaware, Georgia, Hawaii, Illinois, Louisiana, Michigan, Mississippi, New Hampshire, New York and North Carolina (NCEI, 2004).

Class F and J

According to the National Center for Education Information, Class F alternative teaching certification essentially constitutes emergency teaching certification programs and policies. By definition, individuals earning this class of certificate are able to begin

teaching without any on-site supervision. All the while, these individuals may take traditional teaching certification courses in pursuit of full teaching certification. Stemming from class F, Class J alternative teaching certification was designed to eliminate emergency teaching certification. In so doing, Class J is classified as such because they provide preparation for those individuals not qualified to enter an alternative or traditional teaching certification route. As mentioned, this study defines alternative teaching certification as mutually exclusive of temporary and emergency teaching certification. Therefore, ATC Classes F and J will not be included in this study (NCEI, 2004).

Class G

Class G alternative teaching certification is designed for individuals who have a few requirements left to fulfill before earning traditional teaching certification. More than likely, Class G alternative teaching certification programs and policies are occupied by individuals who have teaching certification in one state but have moved to another state. Likewise, these alternative teaching certification programs and policies are geared towards individuals who have earned teaching certification in one endorsement area and would like to teach in another. During the 2003-04 public school year, Class G alternative teaching certification programs and policies were found in 15 states—California, Connecticut, Florida, Georgia, Hawaii, Maine, Michigan, Montana, Nebraska, Nevada, New York, North Carolina, Tennessee, Vermont and Virginia (NCEI, 2004).

Class H

Class H alternative teaching certification is noteworthy because these alternative teaching certification programs and policies are aimed at individuals who have earned

some special professional distinction. As defined by NCEI (2004), such a distinction could include individuals who are a well-known author or a Nobel Prize winner. This class of alternative teaching certification is offered in eight states. These states include California, Georgia, Kentucky, New Hampshire, Oregon, Utah, Washington and Wyoming (NCEI, 2004).

Class I

The National Center for Education Information reserves Class I alternative teaching certification to denote those states that are not currently implementing an alternative teaching certification program or policy. During the 2003-04 school year, six states were not implementing an alternative teaching certification program or policy. These states included Alaska, Arizona, North Dakota, Pennsylvania, Rhode Island and West Virginia.

Class K

Class K alternative teaching certification, as defined by NCEI, is reserved for those teaching certification programs and policies aimed at specific populations. For instance, the alternative teaching certification programs Teach for America as well as Troops to Teachers would be categorized under class K (NCEI, 2004). While detailed in a later section, it is worth noting this class of alternative teaching certification will not be included in statistical analysis as this class of alternative teaching certification runs across many state lines.

Outcomes of Alternative Teaching Certification

Research on alternative teaching certification outcomes is in the nascent stages. Still, a review of literature uncovers many existing studies on the effectiveness of ATC

programs and policies for both teachers and students. The variety of outcomes found in various studies, including the methodologies they employ, will be addressed next.

Mixed Outcomes

Analysis of the work of Sindelar et al. (2004) reveals some compelling distinctions with respect to outcomes for individuals certified via traditional versus alternative teaching certification routes. In sum, their study produced mixed results. By design, the authors based their research on *Praxis III* assessments. Completed by trained individuals, these assessments measure teachers along four different pedagogical domains:

- organizing content knowledge for student learning;
- creating an environment for student learning;
- teaching for student learning;
- teacher professionalism.

These authors also analyzed evaluations made by 92 different principals who served during fieldwork for the aspiring teachers under study. Using a 7-point Likert scale principals rated the strengths and weaknesses of study participants on 20 items keyed to parallel the aforementioned *Praxis III* criteria.

All told, research participants included 16 graduates from four different state university traditional teacher preparation programs in Florida. Additionally, 15 graduates of three different university-district alternative teaching certification partnership programs took part. Finally, 15 teachers from three different “add-on” alternative programs participated in this study.

Sindelar et al. (2004) found assessors rated traditionally-certified teachers better on the *Praxis* portion of the study whereas their alternatively-certified counterparts proved to have more favorable principal evaluations. Based on these findings, Sindelar et al. suggest the lower principal ratings for traditionally-certified teachers may be due to the fact alternatively-certified teachers do not have as thorough of an understanding for the inner-workings of a school. Therefore, Sindelar et al. posit the alternatively-certified teachers were rated more favorably by principals simply because their sparse knowledge did not make them seem as adversarial compared to their traditionally-certified counterparts.

Other studies also have produced mixed results in attempting to determine whether traditional or alternative teaching certification is better for teachers and students. In research investigating the performance of 41 traditionally and alternatively-certified teachers three years into their Georgia teaching careers, Miller et al. (1998) used the evaluations of two long-standing public school teachers. Using a fifteen-item, four-node rating scale, these teachers evaluated all participants according to different criteria in the pedagogical domains of effective lessons and effective pupil-teacher interactions. These teachers found no difference in the classroom performance of the two groups of traditionally and alternatively-certified teachers.

Miller et al. also conducted multiple analysis of variance (MANOVA) statistical procedures in measuring the differences in student achievement for 18 classrooms of fifth and sixth graders. Traditionally-certified teachers taught 157 participating students while alternatively-certified teachers taught 188 students in the study. Based on pre and post test scores from the Iowa Test of Basic Skills, students taught by traditionally and

alternatively-certified teachers showed no statistically significant differences in student achievement.

Favorable Outcomes

Other studies show favorable outcomes for alternatively-certified teachers compared to their traditionally-certified counterparts. In a telephone survey with 36 forced-choice questions, Mantle-Bromley et al. (2000) evaluated a traditional and an alternative teaching certification program as well as a professional teacher's development school. The authors collected data on 152 participants in an "intermountain" western state. Tracking these professionals through phone interviews three years after graduation from their respective programs, Mantle-Bromley et al. found more graduates from the ATC program had a full-time teaching job.

Additionally, using a Likert scale ranging from 1 (poorly) to 5 (very well), study participants were asked how well their teaching certification program prepared them in five pedagogical domains:

- classroom management;
- diversity;
- lesson planning;
- technology;
- teaching strategies.

Using analysis of variance (ANOVA) statistical procedures, the authors showed the individuals finishing an alternative teaching certification program consistently reported positive perceptions more often than the other certification program participants. In sum, alternatively-certified teachers were highly satisfied with how their program prepared

them with regard to four out of five of these pedagogical domains. There were no statistically significant differences amongst participating groups, however, with regard to how satisfied they were with their respective program's capacity to prepare them for lesson planning.

In a study on an alternative teaching certification program partnering with two school districts in the southeastern part of the US, deBettencourt and Howard (2004) surveyed 59 alternatively-certified special education teachers. Surveys were administered to participants three different times during their first year of teaching. The first part of the survey contained a Likert-type scale ranging from 1 (strongly disagree) to 4 (strongly agree). Items surveyed respondents' attitudes towards their teaching experience.

The second part of the survey contained open-ended questions regarding participants' perceptions of themselves as a teacher in addition to their perceptions of their mentoring experience. The authors found the teaching efficacy of individuals earning alternative teaching certification grew throughout their first year in a public school classroom. All participants surveyed felt confident enough to return for a second year of teaching.

Similarly, in a qualitative study using in-depth interviews, Simmons (2005) investigated outcomes for 18 alternatively-certified teachers. The author notes that administrators characterized these individuals as being "highly successful" in their work as a teacher. Highlights from these interviews included the many teachers who indicated the importance of the mentoring component in their alternative teaching certification program. In addition, most study participants did not believe the course work offered in traditional university-based teacher preparation programs was necessary.

Unfavorable Outcomes

Despite studies highlighting favorable outcomes for alternative teaching certification, there exists a significant body of research reporting findings to the contrary. Prominent among critics of ATC, Linda Darling-Hammond is suspicious of their potential contribution to public education. In 2002, Darling-Hammond conducted analysis on the completion of 2,956 surveys by teachers in New York City with four or fewer years of teaching experience. These teachers held a variety of traditional and non-traditional, including alternative, teaching certification. Across 39 survey items, participants were asked to rate their program's capacity to prepare them to:

- promote student learning;
- teach critical thinking and social development;
- use technology;
- understand learners;
- develop instructional leadership.

Darling-Hammond (2002) found traditionally-certified teachers felt better prepared than their non-traditionally certified counterparts in every one of these pedagogical domains except in preparation to use technology. In finding higher levels of efficacy amongst traditionally-certified teachers, Darling-Hammond's work highlights a strong connection between professional teacher education and teaching effectiveness. Darling-Hammond states, "Our study suggests that based on graduates feelings of preparedness, teacher education programs do differ in the quality of education they provide" (p. 297).

Along these lines, in a separate work, Darling-Hammond (2000) reviewed a body of research on outcomes for individuals emanating from alternative teaching certification programs. As a result, she cited high teacher attrition rates for alternatively-certified teachers from Teach for America (TFA). In a review of TFA statistics, Darling-Hammond found 58% of TFA graduates had left teaching by their third year. Darling-Hammond notes this is a two-year attrition rate approximately three times as much as the average attrition rate for new teachers.

Moreover, Laczko-Kerr and Berliner (2003) stop just short of completely invalidating alternative teaching certification. These authors conducted research on 109 matched pairs of traditionally-certified teachers and a variety of non-traditionally-certified teachers from five urban, impoverished school districts in the Southwest. Individuals participating in this study who had non-traditional teaching certification included those individuals with emergency and provisional teaching certification as well as those graduates of the Teach for America program.

The authors compared the mean scores on the Stanford Nine from different classes of students with both traditionally and non-traditionally certified teachers. Ultimately, the authors found students of traditionally-certified teachers had higher rates of achievement compared to students of non-traditionally-certified teachers. All told, Laczko-Kerr and Berliner conclude students could lose up to two months on the grade-equivalent scale, approximately 20% of their academic year, by having an “under-certified” teacher.

Implications of Alternative Teaching Certification

Regardless of the divide in the research along reports of mixed, favorable and unfavorable outcomes, as Rosenberg and Sindelar (2005) conclude, the public must continue to be vigilant of alternative teaching certification. In turn, the education community will be able to more fully grasp the potential of alternative teaching certification. In so doing, more informed decisions could be made concerning nationwide teaching certification policy. Nonetheless, due to the infant state of alternative teaching certification in the US, relevant research must be interpreted with caution as the results of most studies, as evidenced by those cited, cannot be generalized to the entire population of alternative teaching certification programs and policies across the United States.

The Diversification of Student Populations

Aside from the debate swirling around alternative teaching certification, relevant research shows alternative teaching certification programs and policies may hold potential to enrich the future course of public education in the United States. For example, as immigration to America expands at rates unseen for over a century, student populations will increasingly diversify. According to the National Center for Education Statistics, by the year 2026, 25% of all students will come from homes in which the primary language is not English (NCES, 2004).

An increasingly diverse student population has significant implications for public education. Considering over 90 percent of the teaching force in the US is of European-American descent, a greater representation of ethnic minorities is needed (National Education Association, 2003). As Howard (2003) suggests, “In addition to dealing with the teacher shortage, a push to bring more teachers of color into the teaching profession

would be an important move toward keeping pace with the changing ethnic makeup of the nation's student population" (p. 149).

Ethnic Minorities Earning Alternative Teaching Certification

According to statistics culled from the National Center for Education Information (2005), alternative teaching certification may provide the means necessary to more closely connect the teaching community with an ever-diversifying student population. Figures indicate, on average, 30% of all individuals pursuing alternative teaching certification status are non-white. In a study conducted over a decade prior to these reports, Shen (1997) analyzed data collected from the 1993 Student and School Staffing Survey. In determining the cadre of demographic characteristics typical of traditionally-certified teachers and their alternatively-certified counterparts, Shen found over 20% of individuals receiving alternative teaching certificates were of non-Euro-American backgrounds. On the other hand, Shen found just over 12% of traditionally-certified teachers were of ethnic minority descent.

Research shows ATC programs and policies are helping to balance the proportions of teacher and student minority populations in many states. In New Jersey, where modern alternative teaching certification arguably got its start, ethnic minorities comprise 33% of the student population, but only 9% of the teaching population. Since their inception, over 20% of the individuals from ethnic minority backgrounds hired as full-time teachers have gained teaching certification through New Jersey's ATC programs and policies. Table 4 on the next page depicts the percentages and numbers of ethnic minorities earning alternative teaching certification in US states.

Table 4

Percentages or Numbers of Ethnic Minorities Earning Alternative Teaching Certification during the 2005-06 Public School Year in Reporting US States

State	Ethnicity					
	Asian	American Indian/Alaskan	Black	White	Hispanic	Other
Arkansas	1	3	14	234	3	1
^a California	6.3	0.9	9.9	52.3	24.6	6
Connecticut	4	0	3	87	6	0
Delaware	2	0	22	74	2	0
^a Florida	1.7	.3	18	72	7.8	.2
Kansas	0	1	2	33	4	1
^a Kentucky	.4	.1	7	91	1.3	.2
Michigan	5	0	75	10	10	0
Mississippi	5	4	40	31	20	0
^a Missouri	1.2	.6	11.9	83	1.8	1.5
Montana	0	2	0	98	0	0
New York	5	0	15	52	1	4
^a Oregon	4	0.4	2	79	11	3.6
^a South Carolina	1	.5	36	60	2.5	0
^a Texas	2.07	0.39	14.85	51.46	29.92	1.31
Utah	2	2	0	90	4	0
Washington	0	0	4	77	7	12
Wyoming				100		

Note. Data provided by the National Center for Education Information (2007). ^a Data indicated by percentages of ethnic minorities.

Ethnic Compositions Sampled in Research under Review

Analysis of research cited in this study indicates a higher percentage of ethnic minority populations in various alternative teaching certification programs. For example, deBettencourt and Howard (2004) investigated the teaching efficacy of a sample of “career changers” who entered the teaching profession through alternative teaching certification programs in Virginia. In so doing, these authors found 20% of their sample was comprised of ethnic minority populations.

Similarly, Ilmar et al. (2005) researched a sample of 178 individuals from an urban ATC program framed upon a university-partnership with a local public school district in Detroit. Demographic information revealed the sample is 90% non-white. Undoubtedly, this group of alternatively-certified individuals will help to balance ethnic minority representation in the American teaching force.

Alternative Teaching Certification as a Vehicle for Ethnic Minorities

Some research does not always show higher percentages of ethnic minorities in respective samples of individuals earning alternative teaching certification. Still, the need to recruit more ethnic minority teachers is often pronounced. Despite the fact Thomas et al. (2005) researched a sample of alternatively-certified teachers who were, generally, of European-American descent, they point out, “In future recruitment efforts for this program targeted in an urban school district and others like it, investigating ways minority group members can be recruited is crucial” (p. 22).

Howard (2004) goes one step further in his work by placing the onus of future social change squarely on the shoulders of ethnic minorities. Howard states, “There is also a pressing need to impress upon students of color the understanding that the teaching profession can play an essential role in social change.” Howard adds, “The fact that students of color who attend predominately white institutions see relatively few faces that look like their own should be used as a wake-up call for students of color to seek change” (p. 159).

Based on the preceding analysis of the ethnic composition in various ATC programs in relevant research, alternative teaching certification may be responding to Howard’s call. Alternative teaching certification programs may represent a viable vehicle

through which more ethnic minorities can and will enter the teaching profession.

Although alternative teaching certification was conceived to meet teaching shortages throughout the United States, their legacy might yet be defined in their capacity to balance the representation of ethnic minorities in the teaching field.

A Theoretical Offshoot of Credentialism

Alternative teaching certification programs and policies recognize the stock society places in credentials, as argued by Collins (1979). However, based on the infusion of ethnic minorities to the teaching profession through alternative routes to teaching certification in the US, ATC programs and policies lend support to an offshoot of Collins' theory. As discussed, alternative teaching certification programs and policies expand the credentialing paths aspiring teachers can follow towards certification. Logic dictates that expanding credentialing avenues will widen the array of individuals with access to the teaching profession. This naturally increases the chance for minority representation. Therefore, it seems expanding the definition of credentialing opportunities, as evidenced by alternative teaching certification, could facilitate the entry of minorities to that profession.

Summary of Review of Literature

Review of relevant research literature reveals the rise of alternative teaching certification in United States public schools has an eclectic foundation. The variety of alternative teaching certification approaches are evident in the 11 classes provided by NCEI (2004). In addition to the varied nature of alternative teaching certification programs, a review of evaluative research on the outcomes of ATC programs and policies shows mixed outcomes.

Beyond some of the more vague dimensions of alternative teaching certification, review of literature on the historical development of teaching certification shows the theoretical substance of alternative teaching certification is derivative of credentialism and social reproduction. Moreover, review of literature on ATC programs and policies reveals alternative teaching certification may offer an extension to these theories. Specifically, research literature on alternative teaching certification suggests widening the credentialing routes to teaching certification increases the likelihood ethnic minorities will enter the profession.

Review of relevant literature finds the numbers of studies on outcomes for alternative teaching certification, while showing mixed results, is growing. Although these studies use an array of qualitative and quantitative methods, an expansive study on alternative teaching certification across the US employing multiple regression analysis while controlling for variables at the state-level does not seem to exist. The methodology and research design central to a study of this nature will be discussed next.

CHAPTER THREE

METHODOLOGY

This chapter provides an overview of this study's research design. A restatement of research questions and hypotheses follows. A more detailed discussion of all criterion and predictor variables, including basis for their inclusion in this study as well as discourse on the levels of data specific to each, is also undertaken. Additionally, the population of US states under analysis is addressed. Further, measures of reliability and validity are discussed. Finally, a summary of data analysis procedures are considered in the sections to follow.

Research Design

Using the Statistical Package for the Social Sciences (SPSS 15.0), I conducted quantitative correlational research. Defined by Gay, Mills, and Airasian (2006), "Correlational research involves collecting data to determine whether, and to what degree, a relationship exists between two or more quantifiable variables" (p. 191). They add, "It is important to note that the results of correlational studies do not suggest cause-effect relations between variables" (p. 12). Accordingly, I am not attempting to establish any causal connections amongst any of the research variables under study.

Still, as discussed by Shadish, Cook and Campbell (2002), facets of this study's research design reflect methods similar to those used in establishing cause and effect. By employing hierarchical, or sequential multiple regression, I specified the order a priori, based on review of relevant literature, by which I introduced the influence of particular research variables into each regression equation (Tabachnick and Fidell, 2007). This was done to control the potential sway of confounding variables in each prediction equation.

Accordingly, this study could arguably be considered quasi-experimental. Along these lines, according to Shadish et al. (2002), this study's sequential multiple regression research design readily applies to the characteristics of an experiment constructed to decipher cause and effect. These three characteristics are as follows:

- use of a manipulated cause with a subsequent observed effect;
- use of analysis to determine if variation in the cause is related to variation in the effect;
- use of methods to mitigate the potential influence of other causes on the observed effect.

Regardless of this study's quasi-experimental undertones, the expanse of ATC programs and policies under consideration leave room for the confounding influence of unforeseen variables not under analysis.

Therefore, in lieu of establishing causation amongst the research variables in question, I defined the relationships existing between the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year and the proportions of students who were impoverished in each state. Similarly, I defined the relationships existing between the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year and the proportions of ethnic minority students in each state. Finally, I defined the relationships existing between the changes in teacher salary in 35 US states between the 1979-80 and 2003-04 public school years and the numbers of alternative teaching certificates granted in each state during the 2003-04 public school year. Again, I do not imply a causal relationship is in effect amongst any of these research variables. However, I do further define the general quantitative nature of the relationships amongst these variables.

Research Questions, Hypotheses and Research Variables

As stated in Chapter One, I addressed the following three research questions:

- 1.) How do the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year relate to the proportions of students who are in poverty in each state?
- 2.) How do the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year relate to the proportions of students who are an ethnic minority in each state?
- 3.) How does the change in teacher salary between the 1979-80 and 2003-04 public school years in 35 US states relate to the numbers of alternative teaching certificates granted in each state during the 2003-04 public school year?

Hypotheses

As discussed, in pursuit of these research questions, relevant literature enlightened particular hypotheses. Research shows many individuals earning alternative teaching certification teaching in urban and rural public schools throughout the United States (Gimbert et al., 2005; Howard, 2003; Ilmer et al., 2005; NCEI, 2005, Ng and Thomas, 2007; Shen, 1997). Additionally, research shows many ethnic minority and impoverished students attending public schools in urban and rural areas (Hoffman, et al., 2003; Howard, 2003; Kleiner, et al., 2002; NCEI, 2005). Based on this cadre of research, it was hypothesized the numbers of alternative teaching certificates granted in 35 US states would have a moderate to high, positive relationship with the proportions of students who were in poverty in each state. Likewise, it was hypothesized the numbers of alternative teaching certificates granted in 35 US states would have a moderate to high, positive

relationship with the proportions of students who were an ethnic minority in each state. Statistical levels defining the strength of these correlations as hypothesized are detailed in a later section.

Finally, relevant research literature emboldened a particular hypothesis with regard to the final research question. The theoretical substance of teaching certification as applied to the work of Weber (1968) and Collins (1979) suggests the expansion of credentials in the form of extensive certification or coursework heightens the professional status of a given occupation. In line with the work of these theorists, alternative teaching certification seems to represent an expansion in credentialism for the teaching occupation. Therefore, it was hypothesized the change in teacher salary between the 1979-80 and 2003-04 public school years in 35 US states would have a moderate to high, positive relationship with the numbers of alternative teaching certificates granted during the 2003-04 public school year in each state.

As established in the following section, since I defined the numbers of US states reporting numbers of alternative teaching certificates granted during the 2003-04 public school year (N=35) as a population in and of itself, no inference was made to any larger group of alternative teaching certification programs and policies existing outside of this population. As a result, statistical hypothesis testing, which incorporates the establishment of a null and alternate research hypothesis, was not used. Research variables specific to investigating the status of alternative teaching certification in the population of 35 US states under study will now be discussed.

Criterion Variables

Statistical analysis focused on two different multiple regression prediction equations specific two different criterion research variables. Accordingly, the numbers of alternative teaching certificates granted in 35 US states as well as the change in teacher salary in each state served as the two criterion variables. In addition to functioning as a criterion variable, the numbers of alternative teaching certificates also served as a predictor variable in this study's second prediction equation. Either way, this research variable, when discussed with regard to this study's results, will be denoted as "NOATC." The 35 US states under study, including the numbers and classifications of alternative teaching certificates granted within each state's jurisdiction during the 2003-04 public school year, are listed in Table 2. This set of data was provided by the National Center for Education Information (2007).

Data for the amounts of teacher salary in each of the 35 US states under study during the 1979-80 and 2003-04 public school years was provided by the National Center for Education Statistics (2006). These figures were rounded to the nearest whole dollar and measured in current US dollars. Indicators of change in teacher salary were determined by subtracting the average amount of teacher salary during the 1979-80 public school year from the average amount of teacher salary during the 2003-04 school year in each state. In discussion of this study's findings, this criterion variable will be denoted as "SALCHG."

Predictor Variables

Predictor variables were selected with much thought as to each variable's application to the rise of alternative teaching certification and change in teacher salary.

Careful consideration was also given to each variable's standing in research literature. Based on review of literature relevant to the rise of alternative teaching certification and changing teacher salary, I incorporated three categories of predictor variables. These categories included indicators of school district characteristics, teacher characteristics and student characteristics. Particular indicators comprising these categories, in addition to the priority for each, based on their standing in relevant literature, are discussed next. Please note, notations used for predictor variables in reporting this study's findings in Tables 9, 10 and 11 will be noted in parentheses below.

School district predictor variables. In light of research showing the rise of alternative teaching certification in large urban and outlying rural areas throughout the US (Howard, 2003; NCEI, 2005; Zeichner and Schulte, 2001), and with specific regard to literature revealing a concentration of ATC programs in urban areas (Ilmer, et. al, 2005; Thomas et. al, 2005; Sindelar et. al, 2004), in this study's first prediction equation, I first and foremost controlled the total numbers of school districts in urban-area counties with populations greater than 1,000,000 in each state (URBAN). Next, I controlled the total numbers of school districts in rural-area counties with populations less than 2,500 in each state (RURAL). This data is specific to the 2003-04 public school year as determined by the National Center for Education Statistics (2006).

In answering this study's final research question regarding the relationship between changing teacher salary and the numbers of alternative teaching certificates in each state, I similarly controlled for these two school district predictor variables. Accordingly, upon construction of the second prediction equation, I first controlled the numbers of urban school districts in each state. In a review of teaching salary differentials

across the state of Michigan, Harris and Burian-Fitzgerald (2005) found, by and large, teachers in urban school districts were earning thousands of dollars more than teachers in rural school districts across Michigan.

Conducting analysis of teacher salary on a much larger scale, Chambers and Fowler (1995) analyzed the cost differences amongst public school teachers across the US. They found large school districts in urban settings tended to pay larger teacher salaries compared to other school districts. They also found teachers in rural school districts with populations less than 5,000 cost 16 percent below the national average with regard to salary. Urban school districts in areas with populations over 1,000,000, on the other hand, have teacher costs 10% above the national average. Similarly, in a review of teacher salary changes throughout 1990s, Nelson and Gould (2001) found urban teacher salaries grew faster than the average national teacher salary. Based on this collection of research, when analyzing the relationship between the change in teacher salary and the rise of alternative teaching certification, I first controlled the numbers of urban (URBAN) and then the numbers of rural-area (RURAL) school districts in each state.

Teacher characteristic predictor variables. In addition to statistically controlling the numbers of urban and rural school districts, I also controlled predictor variables indicating the longevity of the American teaching workforce in each state. Accordingly, considering Ingersoll (2005) and NCEI (2004; 2005; 2007) discuss high teacher attrition rates due to the numbers of public school teachers who leave the teaching field, in the first prediction equation, next I controlled the teaching experience in each state. This predictor variable was indicated by the proportions of working public school teachers with over 20 years of teaching experience in each state during the 2003-04 public school

year (20YEARS). These proportions were determined by dividing the total numbers of working teachers by the total numbers of teachers with more than twenty years of experience in each state. These numbers were rounded to the nearest hundredths decimal place. This data was provided by NCES (2006).

With respect to the regression equation defining the relationship between changing teacher salary and the numbers of alternative teaching certificates, after controlling for the numbers of urban and rural school districts, as with the first prediction equation, I next controlled the proportions of working public school teachers with over 20 years of experience (20YEARS). Harris and Burian-Fitzgerald (2005) found teachers with more than 20 years of experience were earning over twenty thousand dollars more than their colleagues with one year of experience on an annual basis. Moreover, Chambers and Fowler (1995) found teacher salaries generally increased annually for individuals during their first twelve to fifteen years of teaching. Thereafter, they found US teacher salaries generally increased only upon the accumulation of incremental amounts of teaching experience such as 20 to 25 years.

With regard to the last teacher characteristic predictor variable, I drew upon research highlighting the rise of alternative teaching certification in the US due to the diminished supply and increased demand for certified public school teachers (Miller, et al., 1998; NCEI, 2005; Rosenberg and Sindelar, 2005; Thomas, et al., 2005). In so doing, I designed this study to capture a picture of the teaching labor market in relation to the numbers of public school students. In order to relate the total numbers of teachers to the total numbers of students in each state under study, the average student to teacher ratio during the 2003-04 public school year in each state was controlled next in this study's

first regression equation (CLASSIZE). These ratios were rounded to the nearest whole number as determined by NCES (2006).

Indicators of student teacher ratios were also controlled in the second regression equation. Analyzing data from Tennessee's Project STAR (Student Teacher Achievement Ratio), Peevley, Hedges and Nye (2005) found teacher salaries tended to increase in districts with smaller class sizes. These and other authors (Goldhaber and Player, 2005; Stern, 1985) have discussed the calls for reductions in class sizes across the US alongside the movement to increase teacher salary. Due to the potential relationship between changing teacher salary structures and average student to teacher ratios across the US, indicators of class size, after controlling for urban and rural school district as well as teaching experience predictor variables, were controlled in this study's second regression equation (CLASSIZE). It is important to note, all indicators for school district and teacher characteristic predictor variables were entered as one whole block of predictor variables upon construction of each equation's first statistical model.

Student characteristic predictor variables. Both student characteristic predictor variables were excluded from this study's second regression equation. Nonetheless, while only being sequentially introduced in the first prediction equation, the two student characteristic predictor variables in question represent the primary category of variables in this study. Due to the bulk of research literature showing the rise of alternative teaching certification programs and policies in large urban and outlying rural areas coupled with the large proportions of impoverished and ethnic minority public school students living and learning in these areas (Gimbert et al., 2005; Hoffman, et al., 2003; Howard, 2003; Ilmer et al., 2005; Kleiner, et al., 2002; NCEI, 2005, Ng and Thomas,

2007; Shen, 1997), I am foremost concerned with the numbers of alternative teaching certificates granted in US states in relation to the proportions of impoverished and ethnic minority public school students in each state. Investigation of these relationships inspired this study's first two research questions.

To answer the first of these research questions, while controlling for aforementioned school district and teacher characteristic predictor variables, I introduced a variable indicating the proportions of impoverished public school students in each state during the 2003-04 public school year in the second statistical model of the first prediction equation (POVERTY). Data specific to this student characteristic predictor variable was provided by the National Center for Education Statistics (2006). This variable was determined by data indicating the proportions of public school students living below the federal poverty line in each state.

The federal poverty line is determined periodically by the federal government. Relevant to this study's focus on the proportions of students in poverty during the 2003-04 public school year, in 2000, the US government established a family of four could earn at most \$1,421 per month and still receive federal financial assistance. Indicators of the proportions of students living below the federal poverty line in 2003-04 were determined by the total numbers of public school students in each state divided by the total numbers of impoverished students in each state. These proportions were rounded to the nearest hundredths decimal place.

With regard to the second research question, I analyzed the proportions of ethnic minority public school students in all US states under study (ETHNICITY). Determined by the National Center for Education Statistics (2006), these proportions were based on

the aggregated totals of four ethnic minority sub-groups attending public schools during the 2003-04 school year. These sub-groups included “Black, non-Hispanic,” “Hispanic,” “Asian or Pacific Islander” and “American Indian/Alaska Native.”

The total proportions of ethnic minority students in each state were rounded to the nearest hundredths decimal place. These proportions were determined by the total numbers of public school students in each state divided by the total numbers of ethnic minority students in each state. This data was culled from the National Center for Education Statistics (NCES, 2006). Indicators for this student variable were introduced in the third statistical model for the first prediction equation while also controlling for all aforementioned school district, teacher and student characteristic predictor variables. Data for all teacher salary and student characteristic variables are found in Table 5 on the following page. On the page thereafter, data for all school district and other teacher characteristic variables are found in Table 6.

Population

The population under study, including the levels and types of data to which all variables prescribe, will now be described. One of this study’s criterion variables is indicated by the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year. According to NCEI (2004), although 44 US states, in addition to the District of Columbia, were implementing an ATC policy in 2003-04, only 33 of these states reported data on the numbers of alternative teaching certificates granted in that school year. Two other states included in this study—Arizona and West Virginia—although not implementing an ATC program or policy, did report issuing 0 alternative teaching certificates during the 2003-04 public year (NCEI 2007).

Table 5

The Proportions of Impoverished and Ethnic Minority Students and Average Teacher Salaries for Selected Years (in current US dollars) in the United States

State (N=35)	Prop. of students below the federal poverty level	Prop. of ethnic minorities	Average teacher salary 1979-80	Average teacher salary 2003-04
Alabama	.22	.40	13,060	38,325
Arizona	.18	.51	15,054	41,843
Arkansas	.26	.30	12,299	39,314
California	.18	.67	18,020	56,444
Colorado	.12	.36	16,205	43,319
Connecticut	.09	.32	16,229	57,337
Delaware	.12	.43	16,148	49,366
District of Columbia	.33	.96	22,190	57,009
Florida	.18	.49	14,149	40,604
Georgia	.17	.48	13,853	45,988
Idaho	.12	.16	13,611	41,080
Illinois	.18	.43	17,601	54,230
Indiana	.12	.18	15,599	45,791
Iowa	.12	.12	15,203	39,432
Kentucky	.18	.13	14,520	40,240
Maryland	.09	.50	17,558	50,261
Massachusetts	.11	.25	17,253	53,181
Mississippi	.24	.53	11,850	35,684
Missouri	.13	.22	13,682	38,006
Montana	.17	.15	14,537	37,184
Nebraska	.08	.20	13,516	38,352
New Jersey	.09	.42	17,161	55,592
New Mexico	.25	.67	14,887	38,067
New York	.20	.46	19,812	55,181
North Carolina	.19	.42	14,117	43,211
South Carolina	.17	.46	13,063	41,162
South Dakota	.12	.15	12,348	33,236
Tennessee	.18	.29	13,972	40,318
Texas	.22	.61	14,132	40,476
Utah	.10	.17	14,909	38,976
Virginia	.11	.39	14,060	43,655
Washington	.15	.28	18,820	45,434
West Virginia	.26	.06	13,710	38,461
Wisconsin	.14	.21	16,006	42,882
Wyoming	.10	.14	16,012	39,532

Note. Provided by the US Department of Education and the National Center for Education Statistics (2006).

Table 6

Numbers of School Districts in Urban Counties with Populations over 1,000,000 and Rural Counties with Populations under 2,500, Proportions of Teachers with Over 20 Years of Experience and Average Student to Teacher Ratios for 2003-04

State (N=35)	Urban districts	Rural districts	Teachers with over 20 years	Student to teacher ratio
Alabama	23.00	4.00	21.40	13.00
Arizona	431.00	0.00	19.11	21.00
Arkansas	12.00	28.00	24.35	15.00
California	456.00	1.00	22.07	21.00
Colorado	29.00	37.00	20.45	17.00
Connecticut	82.00	0.00	29.43	14.00
Delaware	21.00	0.00	25.74	15.00
District of Columbia	38.00	0.00	26.03	14.00
Florida	23.00	0.00	25.81	18.00
Georgia	37.00	11.00	22.31	16.00
Idaho	1.00	7.00	23.27	18.00
Illinois	467.00	11.00	29.17	17.00
Indiana	113.00	0.00	35.90	17.00
Iowa	0.00	29.00	36.70	14.00
Kentucky	32.00	22.00	22.15	16.00
Maryland	13.00	0.00	28.06	16.00
Massachusetts	244.00	0.00	29.08	14.00
Mississippi	20.00	11.00	30.28	15.00
Missouri	127.00	69.00	26.04	14.00
Montana	2.00	98.00	32.65	14.00
Nebraska	13.00	168.00	27.18	14.00
New Jersey	556.00	0.00	30.33	13.00
New Mexico	0.00	7.00	22.57	15.00
New York	394.00	0.00	22.59	13.00
North Carolina	104.00	12.00	21.85	15.00
South Carolina	8.00	0.00	30.77	15.00
South Dakota	7.00	72.00	32.35	14.00
Tennessee	21.00	6.00	31.83	16.00
Texas	451.00	49.00	21.99	15.00
Utah	20.00	5.00	22.61	22.00
Virginia	52.00	10.00	28.65	13.00
Washington	66.00	8.00	26.69	20.00
West Virginia	3.00	5.00	50.08	14.00
Wisconsin	92.00	16.00	26.85	15.00
Wyoming	11.00	8.00	33.79	13.00

Note. Provided by the US Department of Education and the National Center for Education Statistics (2006).

Twelve states, while offering some form of alternative teaching certification, did not report any data on the numbers of alternative teaching certificates granted during the 2003-04 public school year. These states included Hawaii, Kansas, Louisiana, Maine, Michigan, Minnesota, Nevada, New Hampshire, Ohio, Oklahoma, Oregon, and Vermont. Four other states—Alaska, North Dakota, Pennsylvania and Rhode Island—neither implemented an alternative teaching certification policy nor reported any data specific to alternative teaching certificates for the 2003-04 public school year. Since none of these 16 aforementioned states reported data to NCEI (2007), they will not be included in the population of 35 US states under study.

Of the population of 35 US states reporting data on the numbers of alternative teaching certificates granted during the 2003-04 public school year, a total of four states reported issuing no alternative teaching certificates. In addition to Arizona and West Virginia, which were not currently implementing ATC programs or policies, Iowa and Wisconsin, although implementing ATC policies, granted no alternative teaching certificates in 2003-04. Beyond these four states reporting they did not grant any alternative teaching certificate in 2003-04, 30 states, in addition to the District of Columbia, do report granting various numbers of alternative teaching certificates during the 2003-04 public school year. These 30 US states, in addition to the District of Columbia as well as the four states that reported issuing no alternative teaching certificate in 2003-04 will comprise the population of states under analysis as shown in Figure 3 on the following page.



Figure 3. Dotmap of US states (N=35) under study.

The type of data used to indicate the numbers of alternative teaching certificates granted in each of these states represents a discrete quantitative research variable. According to Agresti and Finlay (1997), a discrete quantitative variable indicates a variable that can only take on finite values. In other words, while a state could issue 0, 2, 12, or 2,107 alternative teaching certificates, a state could not issue 23.5667 alternative teaching certificates. Such an amount, when represented by decimal place values is considered a continuous variable.

Furthermore, data indicating the numbers of alternative teaching certificates granted in the 35 US states under study during the 2003-04 public school year is also classified as ratio-level data. Gay, Mills and Airasian (2006) define ratio-level data as having a specific numerical distance between each value in question with a true zero.

In the case of this study, the numbers of alternative teaching certificates granted in each US state have a specific distance between each count of alternative teaching certificate granted. Further, the data representing the numbers of alternative teaching certificates granted in each state could have a true zero.

With regard to the criterion variable indicating the amount of change in teacher salary in each state, similar distinctions can be drawn. Data indicating the change in teacher salary, as reported in this study, is represented by a discrete quantitative research variable. Further, this data represents ratio-level data. On the other hand, various data classifications apply to the predictor variables under study. For the most part, predictor variables are either discrete or continuous variables with ratio-level data. Refer to Table 7 of Appendix A for a listing of all indicators used in this study, including a summary of the types of variables and data levels attributed these indicators.

Generalizeability

As mentioned in Chapter One, this study is limited in its capacity to generalize its findings to the entire population of US alternative teaching certification programs and policies existing during the 2003-04 public school year. Moreover, findings from this study cannot be generalized to any US state or country outside of the United States existing at any time or place apart from the population of 35 US states under study. Hence, the generalizeability of this study is limited as its findings can only apply to the 2003-04 public school year and the 35 US states in question.

Data Collection

Data used in this study was culled from two primary sources. As discussed, the National Center for Education Information and the National Center for Education

Statistics provided all data for this study. Indicators of reliability and validity for this collection of data are discussed next.

Reliability

With respect to the array of predictor variables under analysis, not to mention the various forms of alternative teaching certification across the US states in question, measures of reliability specific to all data under analysis are crucial. Cozby (2007) defines reliability as “the consistency or stability of a measure of behavior” (p. 92). As criterion and predictor variables under analysis were derived from research organizations, the reliability standards aligned with each organization’s data collection methods are justified on their respective websites. Reliability standards for the National Center for Education Information are further justified in this organization’s various publications.

In establishing the reliability of data culled from the National Center of Education Statistics, the US Department of Education offers a list of “Statistical Standards.” This is accessible through its website’s homepage (2007). This website lists all data collection procedures as well as the reliability measures connected with these procedures.

The National Center for Education Information outlines the reliability of its data collection methods in *Alternative Teacher Certification: A State by State Analysis* (2007). Printed annually since 1991, this publication describes the data collection methods used by NCEI. Founded in 1980, the National Center for Education Information is a Washington, D.C. non-partisan, independent research organization specializing in survey research and data analysis. Since 1983, through the use of mailings, telephone calls, and electronic messaging, NCEI has conducted survey research on state certification offices

and agencies in all US states. The substance of these surveys investigates each state's status regarding alternative teaching certification.

To further legitimize the reliability of their findings, as discussed, NCEI created 11 different classes of alternative teaching certification. As a result of this classification system, expansive research on alternative teaching certification programs and policies across US state lines can now better distinguish the variety of programs and policies therein. Further, US states reporting the numbers of alternative teaching certificates granted within their jurisdiction now have the ability to delineate the nuances of their programs and policies from the nuances found in the programs and policies in other states. All told, recognition of these ATC classes further heightens the consistency with which statistical analyses can be interpreted in light of the great variety of ATC programs and policies in the US.

In validating the accuracy of data collected from state certification offices, Dr. Emily Feistritz, president of NCEI, upon inquiry, discussed the data collection methods employed by this research organization. Accordingly, Dr. Feistritz described practices involving the triangulation of data collected through quantitative and qualitative methods using e-mails, mailings and phone interviews. Moreover, she described data collection practices guided by a continual process of member checking. Member checking, as defined by Creswell (1998), typically involves a series of follow-up discussions with study participants regarding the accuracy of their reported information.

Validity

Beyond commenting on this study's non-existent generalizability, or external validity, it is necessary to also comment on this study's construct and internal validity.

In order to ensure construct validity, careful attention was given to the selection of indicators used to operationally measure the three categories of variables under study. As mentioned, these categories include school district, teacher and student characteristic criterion and predictor variables. In securing construct validity for each category of indicators, much consideration was given to relevant research literature. Specifically, attention was given to the many social dimensions exhibiting potential influence on the rise of alternative teaching certification and changing teacher salary in the US.

Internal validity, according to Gay et al. (2006), “is the degree to which observed differences on the dependent variable are a direct result of manipulation of the independent variable, not some other variable” (p. 237). Although I have not aimed to draw conclusions on the causality of the quantitative relationships in question, I have made attempts to further the internal validity of this study’s research design by ruling out important confounds to better understand specific variables of interest. In so doing, this study incorporated the sequential introduction of three particular predictor control variables across two different multiple regression prediction equations and five different statistical models. This was done in order to more adequately flush out any interactive and confounding influence amongst the quantitative research variables in question. As outlined next, the incorporation of sequential control further heightens this study’s internal validity.

Data Analysis

As established, I conducted correlational research. Accordingly, I constructed two prediction equations and five multiple regression statistical models. In the first prediction equation, I regressed the total numbers of alternative teaching certificates

granted in 35 US states in 2003-04 on various predictor variables in three statistical models. In the second equation, I regressed the total change in teacher salary between the 1979-80 and 2003-04 public school years in 35 US states on various predictor variables in two statistical models.

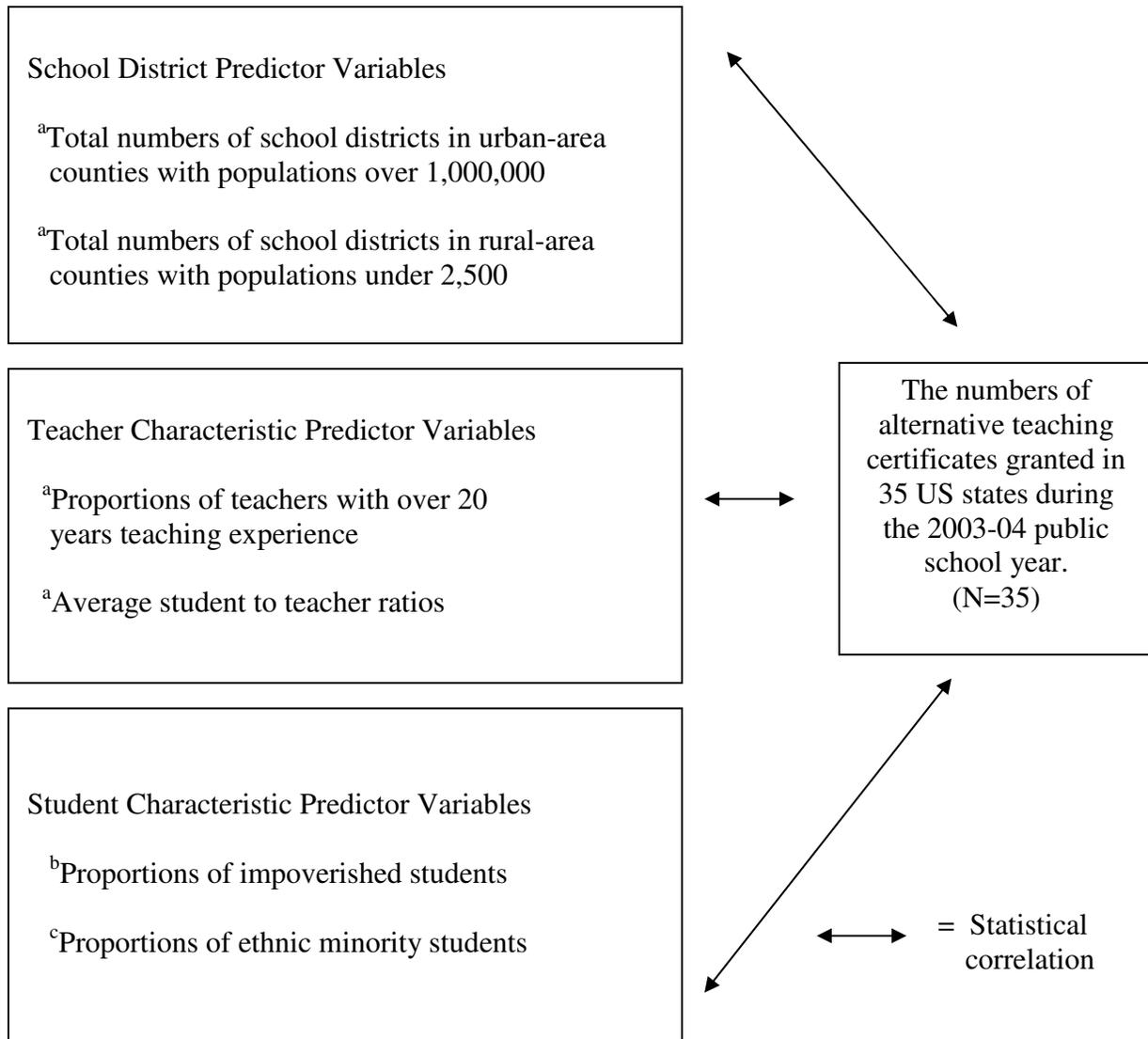


Figure 4. Operationalization of 2003-04 variables disaggregated for US public schools at the state-level (N=35). *Note.* ^a indicates predictor variable introduced in the first regression model. ^b indicates predictor variable introduced in the second regression model. ^c indicates predictor variable introduced in the third regression model.

Data analysis for the first prediction equation focused on the relationship between the numbers of alternative teaching certificates granted in 35 US states and the proportions of impoverished and ethnic minority students in each state. The first statistical model of this equation included relevant indicators in a block of school district and teacher characteristic control variables. Upon construction of the second model for this equation, I introduced a variable indicating the proportions of impoverished students in each state.

Upon construction of this equation's third statistical model, while controlling the same school district and teacher characteristic variables used in the first and second model, including the proportions of impoverished students, I introduced a variable indicating the proportions of ethnic minority public school students. Therefore, through the sequential introduction of two student characteristic predictor variables, three multiple regression statistical models were built with regard to this study's first multiple regression prediction equation. The criterion and predictor variables encompassing each of these three models are outlined in Figure 4 on the preceding page.

It is worth noting, in later multiple regression analysis, I did conduct a logarithm transformation to account for the positive skew in the distribution for indicators of the numbers of alternative teaching certificates. As discussed by Tabachnick and Fidell (2007), a log data transformation is most appropriate in accounting for skew. According to these authors, this type of data transformation can be done in addition to other data transformations such as taking the inverse or square root of data lacking normality. Although a log transformation on the numbers of alternative teaching certificates was conducted and then regressed upon all school district, teacher and student characteristic

predictor variables, the results specific to this prediction equation, while briefly discussed in a later section, are not reported in this dissertation.

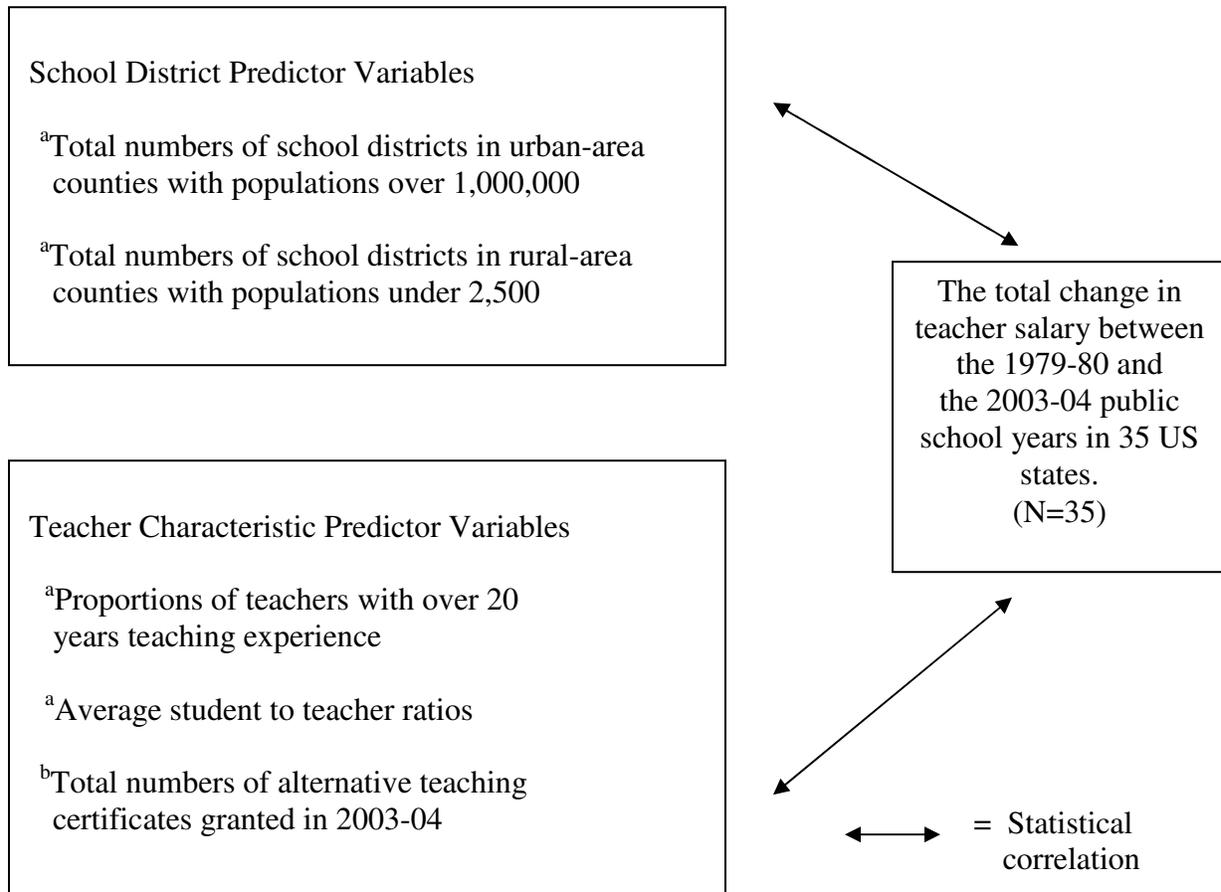


Figure 5. Operationalization of 2003-04 variables disaggregated for US public schools at the state-level (N=35) *Note.* ^a indicates predictor variable introduced in the first regression model. ^b indicates predictor variable introduced in the second regression model.

With respect to construction of this study's second prediction equation, which is needed to answer the final research question regarding the change in teacher salary, two statistical models were built. The same categories of school district and teacher characteristic predictor variables used in the first prediction equation were used in the second prediction equation. In the first statistical model of the second prediction equation, change in teacher salary in 35 US states was regressed on predictor variables

indicating the numbers of school districts in urban and rural areas as well as indicators of the proportions of experienced teachers and student to teacher ratios in each state. The criterion and predictor variables encompassing each model for this prediction equation are outlined in Figure 5 on the preceding page.

In the second statistical model for the second prediction equation, I introduced a variable indicating the numbers of alternative teaching certificates granted during the 2003-04 public school year in each state. Therefore, through the sequential introduction of one predictor variable, two statistical models were built for the second regression prediction equation. The statistical analysis procedures applied to all regression models, including a priori assumptions, will be discussed next.

Analysis Procedure

Upon running multiple regression analysis with SPSS across two prediction equations and five statistical models, I was primarily concerned with analyzing the relationships amongst the criterion variables and three particular predictor variables. Stemming from this study's three research questions, these variables, respectively, are indicated by the proportions of impoverished and ethnic minority public school students as well as the change in teacher salary in the population of 35 US states under study. In analyzing these variables, I reported and analyzed various descriptive statistics such as the mean, range and standard deviation.

Further, histograms and scatterplots were constructed and analyzed with respect to the distribution of each variable. In so doing, measures of normality were assessed allowing for the recognition of any outliers, skew or kurtosis within each data set. Moreover, measures of homoscedasticity were assessed with the analysis of scatterplots.

These tests helped define the bi-variant distributions amongst the variables in question. Further, as Tabachnick and Fidell (2007) posit, these tests measure how closely the variables under study are normally-distributed. According to these authors, homoscedasticity occurs when a given variable's distribution varies similar to another variable's distribution. On the other hand, the lack of covariance between variables indicates a heteroscedastic relationship.

Additionally, in order to more deeply analyze the quantitative relationships in question, I focused on the correlation coefficients produced by the appropriate statistical operations. Known as Pearson product-moment correlation coefficients, these coefficients range in value from -1.0 to 1.0 . A correlation coefficient of " 1.0 " denotes a perfect relationship amongst given variables whereas a correlation coefficient of " 0.0 " denotes no relationship amongst given variables (Cozby, 2007).

In following, the bi-variant and multi-variant statistical relationships for all variables were analyzed with regard to their corresponding correlation coefficients. Throughout analysis of these coefficients, special attention was given to the direction and strength of the relationships specific to each. The particular coefficient values indicating certain strength levels for the quantitative relationships under study will be outlined a priori in the next section.

Further attention was given to the nature of change in the multi-variant statistical relationships under study upon the sequential introduction of control variables. This was indicated by respective changes in the beta value, or standardized correlation coefficient, for each predictor variable across successive regression models. Moreover, the amount of variance in the criterion variables that can be predicted by the variables under study was

determined by analysis of the R square value (R^2) for each statistical model. This value indicates the common variance amongst variables. Detailed by Gay et al. (2006), “Common variance is the variation in one variable that is attributable to its tendency to vary with another variable” (p. 195). Special attention was given to corresponding shifts in the amount of common variance amongst successive statistical models in order to answer each research question.

Since I make no attempts to generalize this study’s findings to any larger population of alternative teaching certification, no probability values denoting levels of statistical significance were used. Accordingly, this study defined the 35 US states in question as a finite population. This population was distinct with respect to each state’s capacity to report the number of alternative teaching certificates granted within its jurisdiction during the 2003-04 public school year. As the population of 35 US states under study represented the census of states that reported the numbers of alternative teaching certificates granted within their jurisdiction during the 2003-04 public school year, according to Gay et al. (2006), no designation of probability values is necessary. This is due to the fact no inference is being made from this study to any cases of alternative teaching certification existing outside of this population.

A Priori Assumptions

In analyzing the correlation coefficients with regard to the strength of the quantitative relationships in question, certain ground rules were established a priori. Accordingly, I drew upon the work of Gay et al. (2006). These authors define a “low” relationship indicative of a correlation coefficient having a value below .35. In this dissertation, I also use the term “weak” to describe what Gay et al. define as a “low”

relationship. As used in this dissertation, Gay et al. define a “moderate” relationship indicative of a correlation coefficient with a value between .35 and .65. Finally, Gay et al. define a “high” relationship by a correlation coefficient with a value greater than .65. In this dissertation, I also use the term “strong” to describe what Gay et al. define as a “high” relationship. I applied these strength levels in the analysis of all bi-variant and multi-variant correlation coefficients. More importantly, I employed these strength levels in the interpretation of correlation coefficients so as to determine the integrity of each hypothesis formerly posed. Please note, these strength levels do not apply to indicators of common variance among variables.

Summary

In the last decade, alternative teaching certification programs and policies have increased across the United States. Consequently, more individuals with alternative teaching certification are teaching in disadvantaged sectors of the US. In light of these trends, research is needed to define how closely the rise of alternative teaching certification relates to students who are impoverished as well as ethnic minorities. Moreover, as alternative teaching certification makes a non-traditional foray into the professional world, research on its relationship with changing teacher salary is paramount. Further, since alternative teaching certification is tapping every state in the nation, corresponding research must stretch across state borders.

This study responds to each of these needs. The variety of ATC programs and policies existing across US state lines suggests the value of analyzing the numbers of alternative teaching certificates in a population of 35 US states. The use of multiple

regression correlational analysis with the statistical control of appropriate predictor variables accommodates the variety of characteristics existing across this population. At the same time, multiple regression analysis hones the nature of the relationships applicable to this study's research questions. Further, building a research design with the sequential introduction of relevant predictor variables allows subsequent statistical analysis to more adequately decipher the relative influence of the variables in question. Results specific to this research design are discussed next.

CHAPTER FOUR

RESULTS

This chapter will report this study's results. All results are specific to the following two multiple regression prediction equations:

$$1) (\text{NOATC}) = A + B_1 \times (\text{URBAN}) + B_2 \times (\text{RURAL}) + B_3 \times (\text{20YEARS}) + B_4 \times (\text{CLASSIZE}) + B_5 \times (\text{POVERTY}) + B_6 \times (\text{ETHNICITY});$$

$$2) (\text{SALCHG}) = A + B_1 \times (\text{URBAN}) + B_2 \times (\text{RURAL}) + B_3 \times (\text{20YEARS}) + B_4 \times (\text{CLASSIZE}) + B_5 \times (\text{NOATC}).$$

As listed, notations for research variables are in parentheses. The symbol "A" denotes the value where the regression line for each respective prediction equation crosses the Y axis. In other words, this value would be computed when all predictor variables are equal to 0. The symbol "B" denotes the beta value, or standardized correlation coefficient, specific to each research variable. This value represents the slope for each predictor variable with respect to a standardized amount of variance applicable to all predictor variables.

Descriptive statistics culled from analysis of each research variable, including means, ranges, standard deviations as well as measures of normality and homoscedasticity, are discussed next. Thereafter, bi-variant correlations as well as multi-variant correlations for research variables are noted. Finally, the change in common variance for each multiple regression model is summarized.

Descriptive Statistics

Descriptive statistics such as the means, standard deviations, ranges, including minimum and maximum values, for all research variables will be discussed in this section. Further attention will be given to each variable's measure of normality and

homoscedasticity. Descriptive statistics for all research variables are listed in Table 8 below.

Table 8

Summary of Descriptive Statistics for All Criterion and Predictor Variables (N=35)

	Mean	Range	Standard Deviation	Normality	Homosce- dasticity (equation 1) (equation 2)
Criterion Variables					
Alternative teaching certificates granted in 2003-04	1043	0-7117	1758.48	positively-skewed	n/a no
Teacher salary change between 1979-80 and 2003-04	28,686	20,888-41,108	5192.75	approaching	n/a n/a
Predictor Variables					
School districts in urban area-counties with population over 1,000,000	113	0-556	167.96	positively-skewed	no yes
School districts in rural area-counties with populations under 2,500	20	0-168	34.76	positively-skewed	no no
Proportions of teachers with over 20 years of experience	.27	.19-.50	.06	approaching	yes yes
Average student to teacher ratio	16	13-22	2.40	approaching	no no
Proportions of students in poverty	.16	.08-.33	.06	approaching	no n/a
Proportions of ethnic minority students	.36	.06-.96	.20	approaching	yes n/a

Note. n/a – “not applicable.”

Criterion Variables

The numbers of alternative teaching certificates granted. With a mean of 1043, data indicating the numbers of alternative teaching certificates granted in 2003-04 ranged anywhere from 0 in four states—Arizona, Iowa, West Virginia and Wisconsin—to 7117 in Texas. A histogram of the distribution for this criterion variable is found in Figure 6 of Appendix B. This figure indicates the numbers of alternative teaching certificates granted in the population of 35 US states under analysis is positively skewed, but approaching normality. Accordingly, there were a greater number of US states granting lower numbers of alternative teaching certificates. Still, analysis of a probability plot of the expected and normal value for each item of data for this criterion variable revealed the numbers of alternative teaching certificates is normally-distributed.

Nonetheless, as established, since I defined the 35 US states under study as a finite population, no transformations were made to the data being analyzed. This is due to the fact no inference is being made to any cases of alternative teaching certification outside of the 35 US states in question. According to Tabachnick and Fidell (2007), transformations of multiple regression data are most necessary when making inferences to larger populations from a sample under study. Because I defined the 35 US states under study as a population in and of itself, I am making no inference to any larger population. Therefore, no data transformations have been conducted.

The change in teacher salary. Descriptive statistics for the change in teacher salary showed a mean change of 28,686 US dollars between the 1979-80 and 2003-04 public school years for the population of 35 US states under study. Over this time period, Connecticut's average teacher salary experienced a maximum amount of change at

\$41,108. On the other hand, South Dakota experienced the least with \$20,888 in teacher salary change. A histogram of this data in Figure 7 of Appendix B shows the change in teacher salary is approaching normality.

Predictor Variables

School district predictor variables. The average number of urban school districts in counties with populations over 1,000,000 in 2003-04 was 113. New Jersey had the highest number of urban-area school districts with 557 while New Mexico had the lowest with 0. Analysis of a histogram for this predictor variable, as displayed in Figure 8 of Appendix B shows a distribution with a positive skew.

A scatter-plot representing the distributions for the numbers of alternative teaching certificates and the numbers of urban-area school districts in 35 US states shows a negative skew with a collection of points towards the lower end of each axis. Since this scatterplot shows skew amongst these variables, as displayed by Figure 9 in Appendix B, indicators for the proportions of urban-area school districts were not considered homoscedastic. On the other hand, a scatterplot for the change in teacher salary and the numbers of urban-area school districts (see Figure 10 of Appendix B) shows a distribution approaching normality. Therefore, with regard to the second equation, the numbers of urban-area school districts were considered homoscedastic.

The average number of rural-area school districts in counties with populations under 2,500 in 2003-04 was 20. This mean was based on a range with a minimum value of 0 which applied to 11 of the 35 US states under study. Nebraska had the greatest number of school districts in rural-area counties with 168. A histogram of this variable's data (see Figure 11 of Appendix B) shows a distribution with a positive skew. A scatter-

plot graphing the distributions for the numbers of alternative teaching certificates alongside the numbers of rural-area school districts reveals a positively-skewed distribution as well (see Figure 12 of Appendix B). Therefore, indicators for the numbers of rural-area school districts did not have homoscedasticity in the first prediction equation. A scatterplot of the distributions for the change in teacher salary and the numbers of rural-area school districts shows a distribution with a positive skew (see Figure 13 of Appendix B). Accordingly, in the second prediction equation, like the first, indicators for the numbers of rural-area school districts were not homoscedastic.

Teacher characteristic predictor variables. Indicators for the proportions of working teachers with over 20 years of teaching experience in the population of 35 US states under study had a mean of .27. Over half of the working teachers in West Virginia had over 20 years of experience. This proportion represented the upper end of the range for this variable while the lower end was held down by Arizona where .19 of all teachers had over 20 years of teaching experience. A histogram of this distribution, as displayed in Figure 14 of Appendix B, shows this distribution is approaching normality with some positive kurtosis.

A scatterplot of the distributions for the numbers of alternative teaching certificates and the numbers of experienced teachers has little skew (see Figure 15 of Appendix B). Therefore, indicators for the proportions of experienced teachers were deemed homoscedastic with regard to the first equation. In the second prediction equation, the proportions of teachers with over twenty years of experience also have little skew when plotted against each state's change in teacher salary (see Figure 16 of

Appendix B). Accordingly, this variable was deemed homoscedastic in the second equation as well.

The mean student to teacher ratio in 2003-04 across the 35 US states under study was 16. This average was based on a range with a maximum value of 22 found in Utah and a minimum value of 13, which was found in five states—Alabama, New Jersey, New York, Virginia and Wyoming. A histogram for this predictor variable, as shown in Figure 17 of Appendix B, reveals a distribution approaching normality with a slight positive skew. A scatterplot for this distribution in relation to the distribution for the numbers of alternative teaching certificates reveals positive skew as well (see Figure 18 of Appendix B). Because of the positive skew, indicators for class size were not considered homoscedastic. In the second equation, indicators for class size were not homoscedastic either because of positive skew in this variable's scatterplot with change in teacher salary (see Figure 19 of Appendix B).

Student characteristic predictor variables. The mean proportion of students from an impoverished background in 2003-04 in the 35 US states under study was .16. Data for this variable ranged from a low of .08 students in poverty in Nebraska to a high of .33 in the District of Columbia. A histogram of this data reveals a distribution approaching normality with a slight positive skew (see Figure 20 of Appendix B). A scatterplot for distributions related to the numbers of alternative teaching certificates and the proportions of impoverished students in each state, as shown in Figure 21 of Appendix B, reveals a slight positive skew. Therefore, this relationship was not homoscedastic.

The mean proportion of students from an ethnic minority background in 2003-04 in the 35 US states under study was .36. The highest proportion of ethnic minority

students was found in the District of Columbia where .96 of the students were an ethnic minority. The lowest proportion of ethnic minority students was found in West Virginia where .06 of the students were from an ethnic minority background. A histogram of this data shows a distribution approaching normality (see Figure 22 of Appendix B). A scatterplot of this distribution in relation to the numbers of alternative teaching certificates shows some normality in a curvilinear statistical relationship with a slight negative skew (see Figure 23 of Appendix B). Accordingly, indicators for the proportions of ethnic minority students were deemed homoscedastic.

Bi-variant Correlations

A summary of all bi-variant correlations are listed in Table 9 on the next page. The strength and direction for correlations between all variables are noted. Coefficients are not listed for student characteristic predictor variables with regard to their bi-variant correlations with the change in teacher salary. An overview of bi-variant correlations for all indicators in each category of predictor variables follows.

School District Predictor Variables

One of the strongest bi-variant correlations amongst all research variables was exhibited between the numbers of alternative teaching certificates (NOATC) and the numbers of urban-area school districts (URBAN). The strength of this statistical relationship was surpassed only by the strength of the relationship between change in teacher salary (SALCHG) and the numbers of urban-area school districts. These statistical relationships are denoted respectively by asterisks in Table 9. One asterisk denotes this study's strongest bi-variant correlation followed by the strength of the statistical relationship denoted with two asterisks, then three and so on.

Table 9

Bi-variant Correlations for all Criterion and Predictor Variables (N=35)

Variables	1	2	3	4	5	6	7	8
1. NOATC		.306	.547**	-.094	-.218	-.051	.048	.334
2. SALCHG			.550*	-.428	-.128	-.002	n/a	n/a
3. URBAN				-.163	-.237	.161	.005	.333
4. RURAL					.032	-.234	-.201	-.318
5. 20YEARS						-.358	-.069	-.464****
6. CLASSIZE							-.058	.088
7. POVERTY								.524***
8. ETHNICITY								

Note. Statistical correlations were not computed for variables with “n/a” meaning not applicable. * denotes the strongest bi-variant correlation. ** denotes the second strongest bi-variant correlation. *** denotes the third strongest bi-variant correlation. **** denotes the fourth strongest bi-variant correlation.

On the other hand, the numbers of urban-area school districts exhibited a weak, negative bi-variant correlation with the numbers of rural-area school districts (RURAL). Indicators for urban-area school districts also had a weak, negative relationship with the proportions of working teachers with over 20 years of teaching experience in each state (20 YEARS). While still displaying a weak, bi-variant correlation with the average student to teacher ratio in each state, the numbers of urban-area school districts had a positive statistical relationship with this variable. The numbers of urban-area school districts also had a weak, positive relationship with the proportions of impoverished students in each state (POVERTY). The numbers of urban-area school districts displayed a much stronger, positive correlation, however, with the proportions of ethnic minority students in each state (ETHNICITY). The correlation coefficient for this bi-variant relationship was .333.

The predictor variable indicating the numbers of rural-area school districts (RURAL) did not display the strong correlations with other research variables typical indicators of urban-area school districts in this study. Accordingly, the numbers of rural-area school districts had a weak, negative correlation with the numbers of alternative teaching certificates (NOATC). However, the numbers of rural-area school districts did display a moderately-strong, negative statistical relationship with the change in teacher salary in each state. The correlation coefficient for this relationship was $-.428$. This correlation was the fifth strongest amongst all variables.

Beyond this strong correlation, the numbers of rural-area school districts had a weak, positive statistical relationship with the proportions of experienced teachers (20YEARS) in each state. On the other hand, weak, negative bi-variant correlations were displayed between the numbers of rural-area school districts with average student to teacher ratios as well as the proportions of impoverished students in each state. The numbers of rural-area school districts, however, revealed a slightly stronger, negative bi-variant relationship with the proportions of ethnic minority students in each state. The correlation coefficient for this relationship was $-.318$.

Teacher Characteristic Predictor Variables

Of the two indicators for teacher predictor variables, the proportions of working teachers with over twenty years of experience in the population of 35 US states under study demonstrated the strongest bi-variant correlations. Still, this variable exhibited a weak, negative correlation with the numbers of alternative teaching certificates as well as the change in teacher salary. As mentioned, a weak, negative correlation was found between the proportions of teachers with over 20 years of experience and the

numbers of urban-area school districts. On the other hand, albeit even more weak, a positive correlation was found between the proportions of teachers with over 20 years of experience and the numbers of rural-area school districts.

A moderately-negative bi-variant correlation, which was stronger than all of the aforementioned correlations, was found between the proportions of teachers with over 20 years of experience and student to teacher ratios in each state (CLASSIZE). The correlation coefficient for this relationship was $-.358$. Much weaker than this statistical relationship, the proportions of teachers with over 20 years of experience showed a weak, negative correlation with the proportions of students in poverty in each state. However, the proportions of teachers with over 20 years of experience exhibited its strongest bi-variant correlation with the proportions of ethnic minority students in each state. This correlation coefficient was $-.464$ and represented the fourth strongest bi-variant correlation in this study.

Finally, with regard to the category of teacher characteristic predictor variables, indicators for the numbers of alternative teaching certificates apply. This variable was introduced upon construction of the second statistical model for this study's second prediction equation. With a correlation coefficient of $.306$, as displayed by the scatterplot in Figure 24 of Appendix B, this variable showed a weak, positive bi-variant correlation with the change in teacher salary across the population of 35 US states under study. Moreover, based on analysis of this scatterplot, indicators for the numbers of alternative teaching certificates displayed a negatively-skewed, curvilinear statistical relationship with the change in teacher salary. Therefore, this variable was not considered homoscedastic, as indicated in Table 8.

Student Characteristic Predictor Variables

Used only in this study's first regression equation, both student characteristic predictor variables exhibited a positive bi-variant relationship with the numbers of alternative teaching certificates granted in 2003-04. Compared to indicators for the proportions of students in poverty, however, the proportions of ethnic minority students showed a much stronger bi-variant correlation with the numbers of alternative teaching certificates. The correlation coefficient for this relationship was .334.

When their variance was correlated, the proportions of students in poverty had a moderate, positive relationship with the proportions of ethnic minority students in each state. The correlation coefficient for this quantitative relationship was .524 representing the third strongest bi-variant correlation in this study. Figure 25 of Appendix B shows a scatterplot for this statistical relationship.

Multi-variant Correlations

A summary of multi-variant correlations resulting from analysis of variables across all statistical models in both prediction equations is listed in Tables 10 and 11 on the next two pages. The strength and direction for all correlations are noted. An overview of multi-variant correlations for all predictor variable categories across each statistical model in both prediction equations is next.

School District Predictor Variables

Of all predictor variables, as is the case with this study's bi-variant correlations, indicators for the numbers of urban-area school districts in counties with a population over 1,000,000 exhibited the strongest multi-variant correlation with the numbers of alternative teaching certificates granted in the population of 35 US states under study.

Table 10

Summary of Hierarchical Regression Analysis for Variables Predicting the Numbers of Alternative Teaching Certificates Granted in 2003-04 (N=35)

Variable	<i>B</i>	<i>SE B</i>	<i>S B</i>
Model 1			
URBAN	5.587	1.167	.534
RURAL	-2.563	7.793	-.051
20YEARS	-4812.723	4738.696	-.165
CLASSIZE	-152.471	119.528	-.208
Model 2			
URBAN	5.592	1.646	.534
RURAL	-2.408	8.146	-.048
20YEARS	4765.453	4853.104	-.163
CLASSIZE	-151.035	122.798	-.186
POVERTY	380.053	4608.150	.013
Model 3			
URBAN	5.201	1.737	.497
RURAL	-.598	8.549	-.012
20YEARS	-2666.472	5622.370	-.091
CLASSIZE	-135.930	125.317	-.186
POVERTY	-1883.786	5524.189	-.064
ETHNICITY	1546.474	2045.183	.172

Note. $R^2=.343$ for model 1; $R^2=.344$ for model 2; $R^2=.357$ for model 3.

Table 11

Summary of Hierarchical Regression Analysis for Variables Predicting the Change in Teacher Salary between the 1979-80 and 2003-04 Public School Years (N=35)

Variable	<i>B</i>	<i>SE B</i>	<i>S B</i>
Model 1			
URBAN	15.525	4.363	.502
RURAL	58.247	21.025	-.390
20YEARS	-5825.179	12,785.454	-.067
CLASSIZE	-429.241	322.498	-.199
Model 2			
URBAN	16.291	5.240	.527
RURAL	-58.598	21.396	-.392
20YEARS	-6484.952	13,208.611	-.075
CLASSIZE	-450.153	336.335	-.208
NOATC	-.137	.500	-.046

Note. $R^2=.343$ for model 1; $R^2=.357$ for model 2.

Similar to the moderate, positive correlation demonstrated in this study's first prediction equation, indicators for the numbers of urban-area school districts displayed a moderate, positive multi-variant correlation in the second prediction equation as well (see Table 11). Indicators for the numbers of rural school districts in counties with populations under 2,500 in the population of 35 US states under study demonstrated a weak, negative multi-variant correlation across each of the three statistical models for this study's first prediction equation. In this study's second prediction equation, compared to its

relationship with the numbers of alternative teaching certificates, the numbers of rural-area school districts reflected a stronger multi-variant correlation with the change in teacher salary.

Teacher Characteristic Predictor Variables

Across all statistical models in the first prediction equation, the proportions of teachers with over twenty years of experience in the population of 35 US states under study showed a weak, negative multi-variant correlation with the numbers of alternative teaching certificates. In the second prediction equation, as shown in Table 11, the standardized multi-variant correlation coefficients for this predictor variable displayed a weak, negative correlation with the change in teacher salary. In both prediction equations, indicators for average student to teacher ratios also demonstrated a weak, negative multi-variant correlation across all statistical models.

Student Characteristic Variables

Multi-variant correlations for student characteristic predictor variables only applied to the first prediction equation as they were not used in the second. Upon sequential introduction in the second model of the first prediction equation, indicators for the proportions of students in poverty showed a weak, positive correlation with the numbers of alternative teaching certificates (see Table 10). When indicators for the proportions of ethnic minority students were controlled upon their introduction in the third model, indicators for the proportions of students in poverty once again showed a weak correlation. Although the strength of this correlation was similar to the prior model, it was no longer positive in the second model. On the other hand, the correlation coefficient exhibited by indicators for the proportions of ethnic minority students, upon

sequential introduction to the third model, displayed a weak, positive statistical relationship with the numbers of alternative teaching certificates granted in the population of 35 US states under study.

Change in Common Variance

As reported by SPSS, analysis of the common variance across all statistical models for both of this study's prediction equations showed some change. A summary of these values for each regression equation and accompanying statistical models, as indicated by R^2 , are displayed in Tables 10 and 11 on preceding pages. An overview of these statistics as they apply to each of this study's criterion variables follows.

The Numbers of Alternative Teaching Certificates Granted

In the first statistical model for this study's first prediction equation, when the numbers of alternative teaching certificates were regressed on indicators of urban and rural-area school districts as well as indicators of teachers with over 20 years of experience and average student to teacher ratios in the population of 35 US states under study, R^2 was .343. As revealed in Table 10, upon sequential introduction of the proportions of impoverished students in the second statistical model, R^2 changed little as it went from .343 to .344. However, upon introduction of the proportions of ethnic minority students in the third statistical model, R^2 increased to .357.

The Change in Teacher Salary

Indicators of common variance showed similar change across all statistical models in the second prediction equation as shown in Table 11. When change in teacher salary between the 1979-80 and 2003-04 public school years was regressed upon indicators of urban and rural-area school districts as well as indicators of teachers with

over 20 years of experience and average student to teacher ratios in the population of 35 US states under study, R^2 was .343. When numbers of alternative teaching certificates were controlled upon their sequential introduction in the second statistical model, R^2 increased to .357.

Multiple Regression Analysis with a Logarithm Transformation

It is worth noting, when conducted, a logarithm transformation on indicators for the numbers of individuals earning alternative teaching certification made few significant changes to the results of this study. Accordingly, indicators for the numbers of urban and rural-area school districts, proportions of experienced teachers, student to teacher ratios as well as proportions of impoverished and ethnic minority students experienced no change in the direction of their multi-variant's correlation coefficients. However, the varying strengths attributed each multi-variant statistical relationship were somewhat different than the correlations computed without the use of a data transformation.

With the log transformation, the strength of the multi-variant correlation coefficient for the proportions of ethnic minority students surpassed the strength exhibited by the multi-variant correlation coefficients for indicators of urban-area school districts and proportions of experienced teachers. As mentioned, this was not the case for the multiple regression analysis done without data transformations. When no transformations were used, the numbers of urban-area school districts and proportions of experienced teachers exerted more multi-variant statistical influence than indicators for the proportions of ethnic minority students.

Nonetheless, despite the strength indicators for the proportions of ethnic minority students enacted through use of the logarithm transformation, the weak multi-variant

influence exerted by indicators for the proportions of students in poverty did not change. In fact, the direction of the multi-variant correlation coefficient for indicators of the proportions of students in poverty changed from positive in the second model to negative in the third model. As mentioned, this also happened upon introduction of the ethnic minority predictor variable when not using the log transformation.

CHAPTER FIVE

DISCUSSION

Drawing upon appropriate statistical analysis, the following sections will discuss this study's results. First, the limitations of this study will be considered. Thereafter, discussion will focus on each research question. Finally, I will discuss this study's implications for practice and future research.

Limitations of Research

Of this study's limitations, the lack of normality and homoscedasticity among some of the research variables needs to be addressed foremost. As revealed in Table 8, histograms for three of this study's research variables showed distributions that were positively-skewed and, hence, lacked normality. Moreover, Table 8 shows five statistical relationships that are homoscedastic and another seven statistical relationships that are heteroscedastic.

Still, data transformations, although discussed, were not undertaken with regard to interpretation of this study's central findings. As established, I defined 35 US states reporting the numbers of individuals earning alternative teaching certificates in 2003-04 as a population in and of itself. Therefore, the data specific to this population stands on its own and, therefore, was not manipulated. Along these lines, as established, I am not making any inference from this population to any other. As a result, I essentially provided a snapshot of the rise in alternative teaching certification in the US.

Beyond technical issues related to this study's data, there are other limitations in this study. Most notably, this study's lack of complete data limits its generalizeability. The delimited time span specific to this study's reliance on the 2003-04 public school

year is also limiting. Along these lines, many US states only have ATC programs and policies in infant stages. Accordingly, these states might lack the necessary vehicles to properly streamline data on ATC programs and policies. This lack of consistency with regard to each state's data collection process certainly limits the potential to comprehensively analyze alternative teaching certification.

In addition, there are unquestionably many extraneously-influential variables not considered in this study. Due to the infancy from which alternative teaching certification is emerging in the United States, the causes and effects of this phenomenon are far from determined. As a result, the complexity of this issue runs deep as there are many dimensions at its core still undefined. That being said, any contemporary study on alternative teaching certification is undoubtedly limited by the many unforeseen factors contributing to its rise. This provides all the more reason for continued research on the changing face of this certification phenomenon.

Research Questions

Following is an analysis of each research question. Specific attention is given to interpretation of the strength and direction of the bi-variant and multi-variant correlation coefficients for each of the primary research variables in question. Further, in order to thoroughly address each research question and its corresponding hypothesis, discussion will focus upon the change in indicators of common variance for each prediction equation across all statistical models.

How do the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year relate to the proportions of students who are in poverty in each state?

Indicators for the proportions of students in poverty were hypothesized to have a moderate to strong, positive relationship with the numbers of alternative teaching certificates. Corresponding bi-variant and multi-variant correlation coefficients in Tables 9 and 10 paints a much different picture. Ultimately, the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year did not show a statistically moderate nor strong relationship with the proportions of students who were in poverty in each state. Therefore, my hypothesis was not met.

In answering this research question as well as the others, I turned to the statistical levels established a priori in Chapter Three. As delineated by Gay et al. (2006), these cut points helped to determine the bi-variant and multi-variant correlation strength between a given set of research variables. Considering the values .0 through .35 underscore a weak or low statistical correlation while .36 to .65 represents a moderate correlation and .66 to 1.0 indicates a strong or high correlation, the numbers of alternative teaching certificates granted during the 2003-04 public school year in 35 US states had a weak bi-variant and multi-variant correlation with the proportions of students in poverty in each state. These weak statistical relationships were indicated by the bi-variant correlation coefficient of .048 in Table 9 and the weak multi-variant standardized correlation coefficients of .013 and -.064 in statistical models two and three of Table 10.

Analysis of the direction of the multi-variant relationship between the student poverty predictor variable and the alternative teaching certificate criterion variable across the last two statistical models in Table 10 revealed intriguing results. In analyzing the predictability potential of the student poverty predictor variable in both models, the influence of indicators for the numbers of urban and rural-area school districts as well as

the proportions of experienced teachers and student to teacher ratios in each state were controlled. When indicators for the proportions of students in poverty were sequentially introduced in the second statistical model, this variable's standardized correlation coefficient displayed a positive relationship with the numbers of alternative teaching certificates.

However, when indicators for the proportions of ethnic minority students were introduced in the third statistical model, the direction of the multi-variant correlation coefficient for the proportions of students in poverty changed. As shown in Table 10, the direction of this multi-variant relationship became negative in the third model. This change in direction could be attributable to the influence supplanted by the introduction of indicators for the proportions of ethnic minority students upon construction of the third model. However, the confounding statistical relationship between indicators of student poverty and ethnic minorities in this study, as evidenced by their moderate bi-variant relationship, adds a great degree of complexity in correctly interpreting their multi-variant statistical relationships. Furthermore, the bi-variant and multi-variant correlations displayed by indicators of student poverty are so weak that the strength of these statistical relationships might as well be deemed non-existent

Analysis of the change in common variance revealed further distinctions between the predictability displayed by indicators of students in poverty and indicators of ethnic minority students. In the first statistical model, when numbers of alternative teaching certificates were regressed on indicators for urban and rural school districts as well as experienced teachers and student to teacher ratios, R^2 was .343 (see Table 10). Upon introduction of indicators for the proportions of students in poverty in the second model,

the value of R^2 went from .343 to .344. As detailed in the next section, this small change in common variance of .001 is different than the change in common variance displayed by the introduction of indicators for the proportions of ethnic minority students in the third model.

How do the numbers of alternative teaching certificates granted in 35 US states during the 2003-04 public school year relate to the proportions of students who are an ethnic minority in each state?

In comparison to the student poverty predictor variable, indicators for the proportions of ethnic minority students displayed a stronger statistical relationship with the numbers of alternative teaching certificates in each state under study. This was true for both the bi-variant and multi-variant correlations for this predictor variable. Moreover, correlation coefficients specific to the proportions of ethnic minority students displayed more consistency with regard to their direction and strength.

Nevertheless, similar to the hypothesis for my first research question, results of this study did not parallel my hypothesis for the second research question. Still, results specific to my second hypothesis regarding the statistical relationship between the numbers of alternative teaching certificates and the proportions of ethnic minority students are more in line than results specific to my first hypothesis. Nonetheless, although indicators for the proportions of ethnic minority students, true to my hypothesis, displayed a positive relationship with the numbers of alternative teaching certificates, ethnic minority indicators did not display a moderate nor strong correlation with the alternative teaching certificate criterion variable as hypothesized. Therefore, my hypothesis was not met.

By once again applying the statistical strength levels as defined by Gay et al. (2006), it was found the ethnic minority predictor variable demonstrated weak statistical correlations. As shown in Table 9, the bi-variant correlation coefficient for the numbers of alternative teaching certificates and the proportions of ethnic minority students was .334. Although the strength of this bi-variant correlation was much greater than the correlation between the alternative teaching certificate criterion variable and the student poverty predictor variable, it was still considered a weak relationship when held up against the strength levels established a priori. Nevertheless, this correlation coefficient of .334 certainly is approaching a moderately-strong statistical relationship as denoted by the coefficient range of .36 to .65 (Gay et al., 2006).

While analysis of the multi-variant correlations specific the proportions of ethnic minority students revealed much stronger multi-variant statistical relationships compared to those displayed by the student poverty predictor variable, respective correlation coefficients were still considered weak when defined by a priori statistical strength levels. As shown in Table 10, the standardized correlation coefficient for the proportions of ethnic minority students was .172. This coefficient was produced when indicators for the proportions of ethnic minority students were introduced in the third statistical model while controlling indicators for the numbers of urban and rural school districts as well as proportions of experienced teachers, student to teacher ratios and proportions of impoverished students in each state under study.

As noted, the standardized multi-variant correlation coefficient for the ethnic minority predictor variable was the third strongest predictor variable in the last statistical model. It fell behind predictor variables indicated by the numbers of urban-area school

districts, which displayed the strongest multi-variant relationship with the numbers of alternative teaching certificates, followed by indicators of student to teacher ratios. Nonetheless, although the direction of this correlation was positive, the proportions of ethnic minority students in each state did not display a moderate nor strong correlation with the alternative teaching certificate criterion variable as I hypothesized.

Still, compared to the change in common variance upon introduction of the student poverty predictor variable in the second statistical model, introduction of indicators for the proportions of ethnic minority students in the third statistical model helped to explain a greater amount of variance in the numbers of alternative teaching certificates. In the second statistical model, with the introduction of the student poverty predictor variable, the common variance, as indicted by R^2 , changed from .343 to .344. However, in the third statistical model, the introduction of the ethnic minority predictor variable changed R^2 from .344 to .357 (see Table 10).

Moreover, as mentioned, intriguingly, the standardized multi-variant correlation coefficient for indicators of students in poverty changed direction from positive to negative upon introduction of the student ethnic minority predictor variable in the third model. Changes occurred in the multi-variant correlation coefficients for most other predictor variables in this model as well. The only variable not showing any statistical change upon introduction of ethnic minority student indicators was the student to teacher ratio variable. The coefficient for this variable, -.186, stayed the same across the last two statistical models. This lack of change can be flushed out in analysis of the bi-variant correlation between the proportions of ethnic minority students and average student to teacher ratios. This bi-variant coefficient of .088 was weak.

All other predictor variables exhibited a stronger bi-variant statistical correlation with the ethnic minority predictor variable as shown in Table 9. The numbers of urban and rural school districts both exhibited a bi-variant correlation with the proportions of ethnic minority students stronger than .3. Similarly, the multi-variant correlation coefficients for these school district variables changed by a value of over .3 when indicators for ethnic minority students were introduced in the third statistical model (see Table 10). Moreover, the direction of the bi-variant relationship between the ethnic minority and urban school district predictor variable was positive and the statistical direction between the ethnic minority and rural school district predictor variable was negative. Likewise, the urban school district predictor variable maintained a positive multi-variant correlation upon introduction of the ethnic minority predictor variable and the rural school district predictor variable kept a negative correlation when the proportions of ethnic minority students were introduced in the third model.

The ethnic minority student predictor variable also influenced the multi-variant correlation coefficients specific the proportions of working teachers with over twenty years of experience. But again, the statistical change in the twenty-year teacher predictor variable's multi-variant standardized correlation coefficient in the third model can be explained in its moderately-strong bi-variant correlation with the proportions of ethnic minority students in each state. This bi-variant correlation coefficient was -.464.

How does the change in teacher salary between the 1979-80 and 2003-04 public school years in 35 US states relate to the numbers of alternative teaching certificates granted in each state during the 2003-04 public school year?

With regard to the final research question, analysis was conducted on results specific to the second prediction equation. In this equation, the change in teacher salary between the 1979-80 and 2003-04 public school years in the population of 35 US states under study was the criterion variable. On the other hand, indicators for the numbers of alternative teaching certificates granted during the 2003-04 public school year became the predictor variable.

Table 9 shows bi-variant correlations for indicators of change in teacher salary. This variable showed a weak bi-variant correlation with the numbers of alternative teaching certificates. However, this correlation coefficient of .306 is positive suggesting change in teacher salary and the numbers of alternative teaching certificates either concurrently increased or decreased. This finding aligned with my hypothesis predicting states with greater numbers of alternative teaching certificates would have a greater change in teacher salary. Nevertheless, .306 is still a weak bi-variant correlation. Accordingly, my hypothesis for the third research question was not met.

Indicators for the change in teacher salary did not exhibit as weak of a bi-variant correlation with other predictor variables. The bi-variant correlation coefficient for the change in teacher salary and the numbers of urban-area school districts was .550. Representing this study's strongest bi-variant correlation, the statistical relationship between these two variables enacted a lot of influence across both regression models of this prediction equation (see Table 11).

In the first model, when controlling for the numbers of rural-area school districts, proportions of experienced teachers and teacher to student ratios in each state, the numbers of urban-area school districts had a standardized correlation coefficient of .502.

This coefficient was the strongest amongst all predictor variables. When the numbers of alternative teaching certificates were introduced in the second model, the multi-variant correlation coefficient for urban-area school districts increased. This was due to the strong bi-variant correlation between the numbers of alternative teaching certificates and the numbers of urban-area school districts in each state.

The strong bi-variant relationship between the numbers of urban-area school districts and numbers of alternative teaching certificates was also influential with regard to the alternative teaching certification predictor variable's multi-variant relationship with change in teacher salary. Accordingly, regardless of the positive bi-variant correlation between change in teacher salary and the numbers of alternative teaching certificates, when this predictor variable was introduced in the second model, its multi-variant standardized correlation coefficient was negative. This would seem to completely disprove my hypothesis positing the change in teacher salary would have a positive, moderate to strong correlation with the numbers of alternative teaching certificates granted in each state under study.

Compared to the first prediction equation, similar changes were found in common variance across all statistical models in the second prediction equation. In the second equation's first statistical model when the change in teacher salary in the population of 35 US states was regressed on indicators of urban and rural-area school districts as well as proportions of experienced teachers and student to teacher ratios, R^2 was .343 (see Table 11). When the numbers of alternative teaching certificates were introduced in the third statistical model, R^2 increased to .357.

Although introduction of the numbers of alternative teaching certificates helped to explain a proportion of variance in the change in teacher salary, it did so in this model by having a negative multi-variant relationship. Therefore, this would suggest change in teacher salary was likely to increase in US states where the numbers of alternative teaching certificates were low in 2003-04. However, again, this finding is due in part to control of the numbers of urban-area school districts across both models in each state. This predictor variable, as mentioned, had the strongest bi-variant and multi-variant statistical relationship with the change in teacher salary. Moreover, its strong bi-variant correlation (.547) with the numbers of alternative teaching certificates helped to negate the multi-variant statistical relationship specific to the alternative teaching certification predictor variable in this prediction equation.

Implications for Practice

In sum, analysis of this study's results yields many compelling findings for future practice. Findings relevant to this study's first two research questions are most useful. Accordingly, the weak statistical relationships displayed between the numbers of alternative teaching certificates and indicators for impoverished and ethnic minority students are striking. It is just as compelling, however, to consider the strength of the positive statistical relationship between the numbers of alternative teaching certificates and the ethnic minority predictor variable when student poverty indicators were controlled. With regard to findings specific to this study's final research question, it is similarly interesting to note the implications for practice inspired by the weak statistical relationship between change in teacher salary and the numbers of alternative teaching certificates.

This study's most informative findings center on the school district variables. Indicators for urban-area school districts demonstrated the strongest bi-variant and multi-variant correlations across both prediction equations. On the other hand, indicators for rural-area school districts had a weak statistical relationship with indicators of alternative teaching certification. What is more, this variable displayed a negative statistical relationship with change in teacher salary.

Accordingly, each of these findings will be detailed in the sections to follow. Specific discussion will focus on these findings' implications for practice. Thereafter, recommendations for future research will be discussed.

The Weak Statistical Relationship between Alternative Teaching Certification and Students in Poverty

Results of this study did not show a moderate nor a strong statistical relationship between alternative teaching certification and students in poverty. All told, indicators for student poverty were a weak predictor in this study. Therefore, it is unlikely the greater proportions of individuals who earned alternative teaching certification in the 35 US states under study during the 2003-04 public school year did so in states with greater proportions of impoverished students. All the same, these findings are difficult to interpret due to the confounding nature of the statistical relationship between students who are impoverished and ethnic minorities. Moreover, as mentioned, the student poverty predictor variable's correlation coefficient is so weak that the relationship between alternative teaching certification and impoverished students may as well be deemed non-existent.

Nevertheless, the implications of this finding do not compromise the importance of assuring all students, including those who are impoverished, receive highly-qualified instruction. Moreover, based on the frustrations faced by many impoverished students in our public schools (Hoffman et al., 2003; US Department of Education, The National Center for Education Statistics, 2006; Slavin, 2006), the education community must continue to be vigilant of their needs. By spreading awareness and building strong bonds between community and schools, teachers will be able to more appropriately accommodate the continued education of students who are impoverished. Further, reliance on research-based practice will facilitate the continued achievement of these students.

The Positive Statistical Relationship between Alternative Teaching Certification and Ethnic Minority Students

For the most part, the results of this study fit my hypothesis stating alternative teaching certification would have a positive statistical relationship with the proportions of ethnic minority students. Although the strength of this correlation was weak, results of this study showed this statistical relationship remained positive even when the proportions of students in poverty were controlled. Moreover, results showed this multi-variant relationship, amongst all six controlled in this study, was one of only two displaying a positive statistical relationship with alternative teaching certification. Still, the confounding statistical relationship between ethnic minorities and students who are impoverished adds complexity to interpreting this finding.

Despite the confounding statistical relationship between ethnic minorities and students who are impoverished, review of literature relevant to this study speaks heavily

to the importance of providing alternative teaching certification candidates the skills necessary to best educate students from an ethnic minority background. Individuals earning alternative teaching certification as well as those earning traditional certification must be offered pedagogical coursework providing them skills to value and integrate multicultural content. Moreover, pedagogical coursework must help teachers understand how knowledge is constructed through many different veins intermixing culture, religion, gender, race, ethnicity, social class and ability. By the same token, certification programs must help teachers develop the tools necessary to facilitate the use of the public school environment as a means to enlighten and empower all students' cultural stake in the classroom.

The Weak Statistical Relationship between the Change in Teacher Salary and Alternative Teaching Certification

The results of this study showed the change in teacher salary had a negative multi-variant relationship with the numbers of individuals earning alternative teaching certification. Based on these results, it would seem advisable not to meld the future of teaching certification too closely with alternative teaching certification. Nevertheless, as mentioned, this study's generalizeability is limited to the 2003-04 school year and the finite population of 35 US states under analysis. Furthermore, correlation coefficients specific to this research question are so weak that they are difficult to interpret with any degree of accuracy. Ultimately, correlation coefficients specific to the statistical relationships between change in teacher salary and alternative teaching certification in this study would indicate there is no relation between these variables.

Accordingly, these results do not lend support to incorporating alternative teaching certification into Collins' theory of credentialism. However, the phenomenon of alternative teaching certification may still represent an off-shoot of Collins' theory with regard to its capacity to draw more ethnic minorities to the profession. Undoubtedly, the potential demonstrated by alternative teaching certification in bringing more ethnic minorities to the profession is emboldening, especially with respect to the ever-diversifying multicultural student body in US public schools. Unquestionably, the need for more ethnic minority public school teachers is paramount (Howard, 2003; Slavin, 2006). As a result, all teaching certification programs must continue to actively make efforts to facilitate a welcoming presence in ethnic minority communities throughout the United States.

The Moderate, Positive Statistical Relationship between Alternative Teaching Certification and Urban-Area School Districts

Arguably, the most prominent finding of this study was the statistical relationships enacted by indicators for urban-area school districts in both regression equations. Based on results, I can conclude the greatest numbers of alternative teaching certificates granted during the 2003-04 school year in the 35 US states under study were done so in states with greater numbers of school districts in urban counties with over 1,000,000 people. Therefore, of the population of 35 US states in this study, it seems the rise of alternative teaching certification during the 2003-04 school year was most prolific in those states with a lot of school districts in large cities. This finding parallels literature cited in this study stating alternative teaching certification has risen in response to teaching shortages in large urban areas.

Drawing from these results, the need to entice more teachers to large city schools is pivotal. In so doing, all teaching certification programs must foster strong partnerships with urban school districts. Through student teaching and other field experience opportunities, students of certification programs must be given the opportunity to observe and serve in urban schools. Further, certification programs must facilitate critical awareness in their students in order to help them identify stereotypical representations of urban-area school districts and students.

In so doing, these teachers will be afforded a deeper understanding for the variety of interplay amongst sociological dimensions in everyone. As a result, these education students might realize the issues typically associated with “inner city” schools do indeed ripple across the entire public education spectrum. Further, and most importantly, these aspiring teachers might choose to teach in city-center schools.

The Moderate, Positive Statistical Relationship between Change in Teacher Salary and Urban-Area School Districts

Statistical control of urban-area school districts also showed a marked influence in this study’s second prediction equation. As a result, it seems the average change in teacher salary between the 1979-80 and 2003-04 school years was greatest in those states with a greater number of school districts in counties with a population over 1,000,000 in 2003-04. This would suggest there were indeed teaching salary differentials across the population of 35 US states under study.

Further, with regard to the local, state and federal divide defining a school district’s funding structure, results from this study would seem to indicate variety at the local level. The strong correlations between change in teacher salary and the numbers of

urban-area school districts suggests a stronger financial base, on average, existed at the local-level in those states under study with a greater number of school districts in urban-area counties. In assuring the equality and equitability of public education, this finding speaks to the need for more thorough balance in the structure of local funding across all US states. In addition, this finding highlights the need for states to address teacher salary differentials.

The Negative Statistical Relationship between Change in Teacher Salary and Rural-Area School Districts

The negative statistical relationship exhibited in this study between the change in teacher salary and rural-area school districts is equally as compelling as the positive relationship between change in teacher salary and urban-area school districts. The most striking dynamic between these two statistical relationships is their difference in direction. Based on this study's results, of the population of 35 US states under study, those states with greater numbers of rural-area school districts in 2003-04 experienced a smaller change in teacher salary between the 1979-80 and 2003-04 school years.

Stemming from these findings, further evidence is provided for an unequal funding structure across the local public education level, not to mention the state-level. By the same token, this finding provides additional proof of unbalanced teacher salary structures at the local level. If salary is considered an indicator as such, the work of rural-area school teachers is valued less than the work of urban-area school teachers. In standing by the principle that compels equality amongst US public schools, the education community cannot let such inequality in salary structure persist unchecked.

Recommendations for Future Research

Many distinct recommendations for further research are inspired by this study's findings. Beyond data transformations, additional changes in the data, barring issues of availability, could be conducted. Specifically, this study would be enhanced if indicators for the numbers of alternative teaching certificates in the first prediction equation were computed as a proportion of the total numbers of individuals earning teaching certification. Therefore, this would also include individuals earning traditional teaching certification.

Secondly, this study warrants calls for more current and comprehensive data on the presence of alternative teaching certification in all US states. This speaks to the need for more complete data on the numbers of individuals earning alternative teaching certification as well as data on those individuals with alternative teaching certification teaching in public schools. Along these lines, it would be intriguing to consider the changing face of alternative teaching certification in the US. In other words, just as I have considered the change in teacher salary, future research could address the change in the numbers of individuals earning alternative teaching certification in all US states in relation to various sociological factors such as the changing compositions of student populations according to race, ethnicity, gender and social class.

Further, more updated data is needed on the proportions of ethnic minorities earning alternative teaching certification. This dynamic of alternative teaching certification shows much promise for enriching the teaching field. Therefore, the research community needs to remain cognizant as to why ethnic minorities seem to be attracted to alternative teaching certification programs. By the same token, researchers might

investigate if there are trends indicating ethnic minorities are turning away from traditional schools of teaching certification and if so, why?

All the while, as more comprehensive data becomes available, future research should continue to decipher how steadily alternative teaching certification is continuing to grow in relation to impoverished and ethnic minority students. This study is only able to capture a still-frame of the alternative teaching certification phenomenon on the ever-diversifying US teaching certification landscape. Undoubtedly, the rise of alternative teaching certification has blossomed since the 2003-04 school year. Moreover, as the 2005-06 NCLB deadline mandating the staffing of highly-qualified teachers in public school classrooms has come and gone, alternative teaching certification has engrained itself even deeper in America's system of teaching certification. These issues provide all the more reason to continue research on the apparent motivation for alternative teaching certification. Moreover, the further rise of alternative teaching certification highlights the need for continued research on this phenomenon's relationship with impoverished and ethnic minority communities.

Beyond the need to address the growth of alternative teaching certification in relation to students who are impoverished as well as ethnic minority students, future research must consider the growth of alternative teaching certification in relation to shortages of certified teachers in the sciences, mathematics, and special education. Research should consider if alternative teaching certification is helping to adequately fill these teaching vacancies. Moreover, in light of teaching shortages in special education, it would be intriguing if future research would consider the growth of alternative teaching

certification in relation to the change in the numbers of students identified for special education.

Finally, with respect to changing teacher salary in the United States, in addition to the use of more comprehensive, up-to-date data, future research might consider the control of other variables beyond the school district and teacher predictor variables in this study. The average level of education amongst the certified teaching corps in US states could be considered in relation to changing teacher salary. Additionally, future research might relate teacher salary change to overall general school expenditures in various US states. Moreover, melding with research variables in this study, future studies could be conducted on the relationship between the change in teacher salary and the proportions of impoverished and ethnic minority students in various US states

Future research must also consider the changing face of teacher professionalism in the United States. Making an untraditional foray into the realm of professional occupations, alternative teaching certification may prove yet to inspire or depress the professional status of teaching in America. With this balance at stake, the education community must continue to actively pursue research to determine the outcomes.

Conclusion

In this dissertation, I have attempted to further define alternative teaching certification in the United States. As ATC programs and policies rise, results of this study offer a snapshot of its modernization. More importantly, I have helped to decipher the nature of various statistical trends running alongside alternative teaching certification.

As a result, greater understanding of the statistical relationships among the individuals earning alternative teaching certification and the proportions of impoverished and ethnic minority students can be attained.

Furthermore, through this dissertation, I have helped to broaden the picture of changing teacher salary in the US. Specifically, results of this study decipher its relationship with alternative teaching certification. In so doing, I have helped to hone various tenets of Randall Collins' theory of credentialism. Along these lines, one might conclude the reason alternative teaching certification does not have a positive statistical relationship with changing teacher salary could be due, in part, to the diminished amount of education coursework in ATC programs and policies. As discussed, Collins posits the incorporation of educational coursework bolsters the professional status of a given occupation. Therefore, the reduced amount of coursework typically required in ATC programs and policies would suggest alternative teaching certification would not improve teaching's professional status.

On the other hand, true to Collins' theory, alternative teaching certification represents an expansion of credentialing avenues for the teaching occupation. By the letter of this theoretical tenet, according to Collins, it would seem alternative teaching certification, unlike the results from this study, would increase teaching's professional status. All told, as established, alternative teaching certification does not fit neatly into Collins' theory. Still, based on results in this dissertation whereby changing teacher salary was shown to have a weak statistical relationship with alternative teaching certification, the theoretical relationship between coursework and increasing professional status as espoused by Collins seems to be further solidified.

In sum, regardless of the statistical and theoretical relationships between the rise of alternative teaching certification and public school student populations and changing teacher salary, based on review of relevant literature, ATC programs and policies are likely to continue. Consequently, in light of their mixed outcomes, researchers must continue to study this teaching certification phenomenon. All the while, critical awareness must be practiced with regard to its expansion.

If this can be done, the education community will have an enhanced ability to streamline teaching certification programs and policies. Along these lines, traditional and alternative certification practice will have better potential to more fully cooperate and collaborate. In so doing, the collective goal assuring the best interests of our children will be enhanced for both of these teaching certification paradigms.

REFERENCES

- Agresti, A. and Finlay, B. (1997). *Statistical Methods for the Social Sciences* (3 ed.). Upper Saddle River, NJ: Prentice-Hall.
- Apple, M. (2000). Teaching and “Women’s Work.” In Arum, R. and Beattie, I, (Eds.) *The Structure of Schooling* (pp. 346-356). London: Mayfield Publishing Company.
- Boe, E. E., Cook, L. H., and Terhanian, G. (1998). The Shortage of Fully Certified in Special and General Education. *Teacher Education and Special Education*, 21. 1-21.
- Boote, D. and Beile, P. (2005). Scholars Before Researchers: On the Centrality of the Dissertation Literature Review in Research Preparation. *Educational Researcher* (34), 6, 3 – 15.
- Chambers, J. and Fowler, W. (1995). *Public School Teacher Cost Differences Across the United States*. Washington, D.C.: US Department of Education, Office of Educational Research and Improvement
- Collins, R. (1979). *The Credential Society*. New York: Academic Press, Inc.
- Cozby, P. (2007). *Methods in Behavioral Research* (9th ed.). New York: McGraw-Hill.
- Creswell, J. (1998). *Qualitative Inquiry and Research Design*. Thousand Oaks, CA: Sage Publications.
- Darling-Hammond, L. (2000). How Teacher Education Matters. *Journal of Teacher Education*, 51 (3), 166-173.

- Darling-Hammond, L., Chung, R., and Frelow, F. (2002). Variation in Teacher Preparation: How Well Do Different Pathways Prepare Teachers to Teach? *Journal of Teacher Education*, 53 (4), 286 – 302.
- Darling-Hammond, L. (1986). We Need Schools Able and Willing to Use Carnegie's "Teachers for the Twenty-First Century." *Teacher Education* 22, 29-32.
- DeBettencourt, L. and Howard, L. (2004). Alternatively Licensing Career Changers To Be Teachers in the Field of Special Education: Their First-Year Reflections. *Exceptionality* 12, 225-238.
- Dewey, J. (1938). *Experience and Education*. New York: Collier Books.
- Dial, S. and Stevens, C. (1993). Introduction: The Context of Alternative Teacher Certification. *Education and Urban Society* 26 (1), 4-17.
- Farmer, T., Irvin, M., Thompson, J., Hutchins, B., and McDonough, E. (2006). School Adjustment and the Academic Success of African American Early Adolescents in the Deep South. *Journal of Youth and Adolescence* 36 (4), 477-87.
- Feistritzer, C.E. (2004). *Alternative Teacher Certification: A State by State Analysis 2004*. Washington, D.C.: National Center for Education Information.
Retrieved March 30, 2007 from www.ncei.com.
- Fraser, J. (2001). *The School in the United States: A Documentary History*. New York: McGraw-Hill.
- Fram, M. S., Miller-Cribs, J.E., and Van Horn, L. (2007). Poverty, Race and the Context of Achievement: Examining Educational Experiences of Children in the US South. *Social Work* 52(4), 309-319.

- Futrell, M. (1999). The Challenge of the 21st Century: Developing a Highly Cadre of Teachers to Teach Our Nation's Diverse Student Population. *The Journal of Negro Education* 68, 318-344.
- Gamoran, A. (2001). American schooling and educational inequality: A forecast for the 21st century. *Sociology of Education* 74. 135-153.
- Gay, L., Mills, G., and Airasian, P. (2006). *Educational Research: Competencies for Analysis and Applications* (8ed.). Columbus, OH: Pearson.
- Gimbert, B., Cristol, D., Wallace, D., and Sene, A. (2005). A Case Study of a Competency-driven Alternative Route to Teacher Licensure in an Urban "Hard to Staff" School System. *Action in Teacher Education* 27 (1), 53-71.
- Goldhaber, D. and Player, D. (2005). What Different Benchmarks Suggest About How Financially Attractive it is to Teach in Public Schools. *Journal of Education Finance* 30 (3), 211-30.
- Green, A. Randall, R., and Francis, R. (2004). Industry into Teaching: An Alternative Model. *Asia-Pacific Journal of Teacher Education* 32 (1), 23-33.
- Haber, S. (1991). *The Quest for Authority in the American Professions, 1750-1900*. Chicago: U. of Chicago Press.
- Haberman, M. (1986). Proposals for Recruiting Minority Teachers: Promising Practices and Attractive Detours. *Journal of Teacher Education* 39 (4), 38-44.
- Harris, D. and Burian-Fitzgerald, M. (2005). *Teachers Hourly Wages: A Comparison Across Michigan Schools and Alternative Occupations*. Michigan State University: Education Policy Center.

- Hart, L. (2004). Beliefs and Perspectives of First-year, Alternative Preparation, Elementary Teachers in Urban Classrooms. *School Science and Mathematics 104* (2), 79-88.
- Haycock, K. (2001). Closing the Achievement Gap. *Educational Leadership 58* (6), 6-11.
- Hoffman, K., Llagas, C., and Snyder, T. (2003). *Status and Trends in the Education of Blacks*. Report: NCES-2003-034.
- Hoffman, N. (1981). *Women's True Profession: Voices from the History of Teaching*. Old Westbury: The Feminist Press.
- Holland, R. (2001, April – May). How to Build a Better Teacher. *Policy Review*.
- Holmes Group. (1986). *Tomorrow's Teachers: A Report of the Holmes Group*. The Holmes Group, Inc.
- Honowar, V. (2007, Aug). New Teacher Project Brings Holistic Style to Urban Districts. *Education Week 27*(1), 18-19.
- Howard, T. (2003). Who Receives the Short End of the Shortage? Implications of the U.S. Teacher Shortage on Urban Schools. *Journal of Curriculum and Supervision 18* (2), 142 – 160.
- Imer, S., Nahan, N., Elliot, S., Colombo, M., and Snyder, J. (2005). Analysis of Urban Teachers' 1st Year Experiences in an Alternative Certification Program. *Action in Teacher Education 27*, 3-14.
- Ingersoll, R. (2002). The Teacher Shortage: A Case of Wrong Diagnosis and Wrong Prescription. *NASSP Bulletin 86* (631), 16 – 31.

- Jones, K. (2004). A Balanced School Accountability Model: An Alternative to High-Stakes Testing. *Phi Delta Kappan* 85 (8), 584-590.
- Kaufman, R., Westland, C., and Engvall, R. (1997). The Dichotomy between the Concept of Professionalism and the Reality of Sexism in Teaching. *Journal of Teacher Education* 41, 27-37.
- Kimball, B.A. (1992). *The 'True Professional Ideal' in America: A History*. Cambridge: Blackwell.
- Kinney, L. B. (1964). *Certification in Education*. Englewood Cliffs, NJ: Prentice Hall.
- Kleiner, B., Porch, R., and Farris, E. (2002). *Public Alternative Schools and Programs For Students at Risk of Education Failure* (NCES 2002-004). Washington, D.C.: National Center for Education Statistics, US Department of Education.
- Laczko-Kerr, I and Berliner, D. (2003). In Harm's Way: How Uncertified Teachers Hurt Their Students. *Educational Leadership* 60 (8), 34 – 39.
- Lee, C. (2004). Racial Segregation and Educational Outcomes in Metropolitan Boston. The Civil Rights Project at Harvard University.
- Mantle-Bromley, C., Gould, L., McWhorter, B., and Whaley, D. (2000). The Effect of Program Structure on New Teachers' Employment and Program Satisfaction Patterns. *Action in Teacher Education* 22, 1-14.
- Miller, J., McKenna, M., and Mckenna, B. (1998). A Comparison of Alternately and Traditionally Prepared Teachers. *Journal of Teacher Education* 49 (3), 165-178.
- Montana State University. (2007). Licensure/Certification. Retrieved April 5, 2008 from www.montana.edu/nptt/license.

Myles, J., Cheng, L., and Wang, H. (2006). Teaching in Elementary School: Perceptions of Foreign-trained Teacher Candidates on their Teaching Practicum. *Teaching and Teacher Education* 22. 233-245.

National Center for Education Information. (2007). *Alternative Teacher Certification: A State by State Analysis*. Washington, D.C.: National Center for Education Information. Retrieved October 6, 2007 from www.teach-now.org/intro.cfm.

National Center for Education Information. (2005). *Alternative Routes to Teacher Certification: An Overview*. Washington, D.C.: National Center for Education Information. Retrieved October 6, 2007 from <http://ncei.com/Alt-Teacher-Cert.htm>.

National Center for Education Information. (2004). *Alternative Teacher Certification: A State by State Analysis*. Washington, D.C.: National Center for Education Information. Retrieved October 6, 2007 from www.teach-now.org/intro.cfm.

National Center for Education Statistics. (2004). *Language Minorities and Their Educational and Labor Market Indicators—Recent Trends*. Washington, D.C.: US Department of Education. Retrieved March 30, 2007 from www.nces.org.

National Center for Education Statistics. (2003). *The Nation's Report Card: Reading 2003*. Washington, D.C.: US Department of Education.

National Commission on Excellence in Education (1983) *A Nation at Risk: The Imperative for Educational Reform*. Washington DC: US Department of Education. Retrieved October 13, 2007 from www.ed.gov/pubs/NatAtRisk/index.

- National Council for the Accreditation of Teacher Education. (2006). *Western Governors University Receives NCATE Accreditation: First Non-Traditional Provider for NCATE; Helps Prepare Non-Traditional Candidates in High Needs Fields*. Washington, D.C.: National Council for the Accreditation of Teacher Education. Retrieved April 11, 2007 from www.ncate.org.
- National Education Association. (2003). *Status of the American Public School Teacher, 2000-2001*. Washington, D.C.: National Education Association. Retrieved March 30, 2007 from www.nea.org.
- Nelson, F.H. and Gould, J. (2001). *Teacher Salaries, Expenditures and Federal Revenue in School Districts Serving the Nation's Largest Cities, 1990-91 to 2000-01*. Washington, D.C.: American Federation of Teachers.
- Ng, J. and Thomas, K. (2007). Cultivating the Cream of the Crop: A Case Study of Urban Teachers from an Alternative Teacher Education Program. *Action in Teacher Education* 29 (1), 3-19.
- Olson, S. and Werhan, C. (2005). Teacher Preparation via Online Learning: A Growing Alternative for Many. *Action in Teacher Education* 27(3), 76-84.
- Peevely, G., Hedges, L. and Nye, B. (2005). The Relationship of Class Size Effects and Teacher Salaries. *Journal of Education Finance* 31(1), 101-109.
- Peng, S. and Lee, R. (1992). Measuring Student At-Riskness by Demographic Characteristics. Paper presented at the American Educational Research Association.
- Pipho, C. (1998). A 'Real' Teacher Shortage. *Phi Delta Kappan* 80, 181-182.

- Rosenberg, M.S. and Sindelar, P. (2004). CLD Position Statement: Alternative Routes to Certification in Special Education. *Learning Disability Quarterly* 27, 122 – 123.
- Rosenberg, M.S. and Sindelar, P. (2005). The Proliferation of Alternative Routes to Certification in Special Education: A Critical Review of the Literature. *The Journal of Special Education* 39 (2), 117 – 127.
- Rotherham, A. (2002) A New Partnership. *Education Next* 2 (1), 36-41.
- Rudolph, F. (1962). *The American College and Univeristy*. New York: Knopf.
- Sedlak, M., and Schlossman, S. (1986). *Who Will Teach? Historical Perspectives on the Changing Appeal of Teaching as a Profession*. The Rand Corporation.
- Shadish, W., Cook, T. and Campbell, D. (2002). *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Boston: Houghton Mifflin Company.
- Shen, J. (1997). Has the Alternative Certification Policy Materialized Its Promise? A Comparison between Alternately and Traditionally-Certified Teachers in Public Schools. *Educational Evaluation and Policy Analysis* 19, 276-283.
- Shen, J. and Chia-lin, H. (2001). Improving the Professional Status of Teaching: Perspectives of Current Teachers, Future Teachers, and Education Professors. *Teaching and Teacher Education* 15, 315-323.
- Shepherd, T.L. and Brown, R.D. (2003). Analyzing Certification Options for Special Education Teachers. *Teaching Exceptional Children* 35 (6), 26-30.
- Simmons, S. (2005). Shortcuts to a Meaningful Career. *Action in Teacher Education* 27, 36-44.
- Sindlar, P., Daunic, A., and Rennells, M. (2004). Comparisons of Traditionally and Alternately Trained Teachers. *Exceptionality* 12, 209-223.

- Slavin, R. (2006). *Educational Psychology: Theory and Measurement* (8ed.). Boston: Pearson.
- Stern, D. (1987). *Teachers' Salaries, Class Sizes and Student Achievement in Grades 5 And 6: Some New Evidence*. Report: ED288241.
- Suell, J and Piotrowski, C. (2007). Alternative Teacher Education Programs: A Review of the Literature and Outcome Studies. *Journal of Instructional Psychology* 34, 54-58.
- Tabachnick, B. and Fidell, L. (2007). *Using Multivariate Statistics* (5ed). Boston: Pearson.
- Troen, V. and Boells, K. (2005). Let's Professionalize Teaching. *Principal* 84 (3), 54.
- Thomas, K., Friedman-Nimz, R., Mahlios, M., and O'Brien, B. (2005). Where Are They Coming From? Beyond the Demographic of individuals Seeking an Alternative Route to Mathematics and Science Teacher Licensure. *Action in Teacher Education* 27 (1), 15-25.
- Tissington, L. and Grow, A. (2007). Alternative Certified Teachers and Children at Risk. *Preventing School Failure* 51, 23-27.
- Turner, R.L. (1990). An Issue for the 1990s: The Efficacy of the Required Master's Degree. *Journal of Teacher Education* 41. 38-44.
- Weeks, D. (2001). Under the Same Sun. *Northwest Education* 7(2), 12-19.
- US Census Bureau. (2007) *American Fact Finder*. Retrieved September 1, 2007 from <http://factfinder.census.gov>.
- US Census Bureau. (2007) *US Census Bureau Quality Standards*. Retrieved November 7, 2007 from http://www.census.gov/quality/quality_standards.htm.

- US Department of Education. (2007). Accreditation in the United States. Retrieved October 20, 2007 from www.ed.gov/admins/finaid/accred/accreditation.html#Overview.
- US Department of Education. (2007). *Answers: Teacher Certification*. Retrieved October 20, 2007 from http://answers.ed.gov/cgi-bin/education.cfg/php/enduser/std_adp.php?p_faqid=30&p_created=1095363618&p_sid=CNnIYBQi&p_accessibility=0&p_redirect=&p_lva=&p_sp=cF9zcmNoPTEmcF9zb3J0X2J5PSZwX2dyaWRzb3J0PSZwX3Jvd19jbnQ9MTAmcF9wcm9kc0mcF9jYXRzPTMmcF9wdj0mcF9jdj0xLjMmcF9wYWdlPTE*&p_li=&p_topview=1.
- US Department of Education, National Center for Education Statistics. (2006). Schools and Staffing Survey, 2003-2004. Washington, D.C: US Department of Education. Available from <http://nces.ed.gov/pubs2006/2006313.pdf>.
- US Department of Education. (2004). *No Child Left Behind: A Toolkit for Teachers*. Washington, D.C.: US Department of Education.
- US Department of Education. (2002). *Meeting the Highly-Qualified Teachers Challenge*. Washington, D.C.: US Department of Education.
- US Department of Education. (2002). The No Child Left Behind Act, Reauthorization of the Elementary and Secondary Schools Education Act, January 8, 2002. Retrieved March 30, 2007 from www.nochildleftbehind.gov.
- US Department of Education. (1998). *The Individuals with Disabilities Education Act*. Washington, D.C.: U.S. Department of Education, Author. Retrieved April 30, 2007 from <http://idea.ed.gov/>.

- US Department of Education, National Center for Education Statistics. (2007).
Statistical Standards. Washington, D.C.: US Department of Education, Author.
Retrieved April 30, 2007 from <http://nces.ed.gov/statprog/>.
- US Department of Education, National Center for Education Statistics. (2006). The
Condition of Education 2006, NCES 2006-071. Washington, DC: U.S.
Government Printing Office.
- Weber, M. (1968). *Economy and Society*. New York: Bedminster Press.
- Wise, A.E. (1986). Graduate Teacher Education and Professionalism. *Journal of Teacher
Education* 37, 36-40.
- Wise, A.E. (2005). Establishing Teaching as a Profession: The Essential Role of
Professional Accreditation. *Journal of Teacher Education* 56(4), 318-31.
- Zeichner, K. and Schulte, A. (2001). What We Know and Don't Know from Peer-
Reviewed Research about Alternative Teacher Certification Programs. *Journal of
Teacher Education* 52, 262-282.

APPENDIX A

TABLES

Table 1
Key Terms, Other Descriptors and Definitions

Key term (Other descriptors)	Definition
Alternative teaching certificate (conditional teaching certificate; provisional teaching certificate; restricted teaching certificate)	Credentialing process by which individuals can earn teacher professional status which usually includes a diminished amount of university coursework and is aimed at individuals with a bachelor's degrees.
Certificate (License)	Document assuring attainment of necessary skills and dispositions central to a particular vocational or professional status.
Certification (Licensure)	Process by which individuals can earn a particular academic, vocational or professional status.
Traditional teaching certificate	Document assuring attainment of skills and dispositions necessary to teach in a public school upon the completion of coursework at a 4-year college or university.
Traditional teaching certification	Credentialing process by which individuals earn teacher professional status through coursework from a college or university.

Table 7
*Types of Variables and Levels of Data Attributed All Student, Teacher and State
 Population Indicators*

Indicator	Variable Type	Data Levels
Criterion variables		
^a Numbers of alternative teaching certificates granted	discrete	ratio
Change in teacher salary from 1979-80 to 2003-04	discrete	ratio
Predictor variables		
Numbers of school districts in urban-area counties	discrete	ratio
Numbers of school districts in rural-area counties	discrete	ratio
Proportions of teachers with over twenty years of teaching	continuous	ratio
Student to teacher ratio	discrete	ratio
Proportions of students in poverty	continuous	ratio
Proportions of ethnic minority students	continuous	ratio

Note. ^aThis criterion variable will also be used as a predictor variable.

APPENDIX B

FIGURES

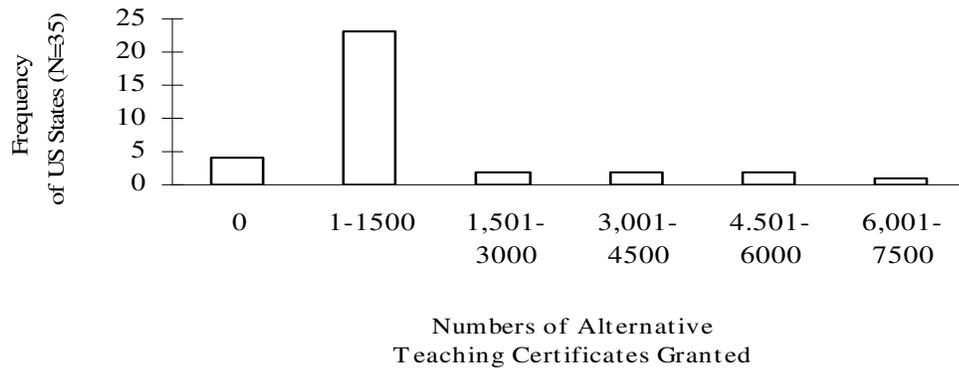


Figure 6. Histogram for frequencies of selected numbers of alternative teaching certificates granted in the population of 35 US states under study during the 2003-04 public school year. *Note.* Frequencies are computed based on how many US states under study have granted numbers of alternative teaching certificates within a randomly-chosen range of numbers as determined by the lower and upper boundaries listed.

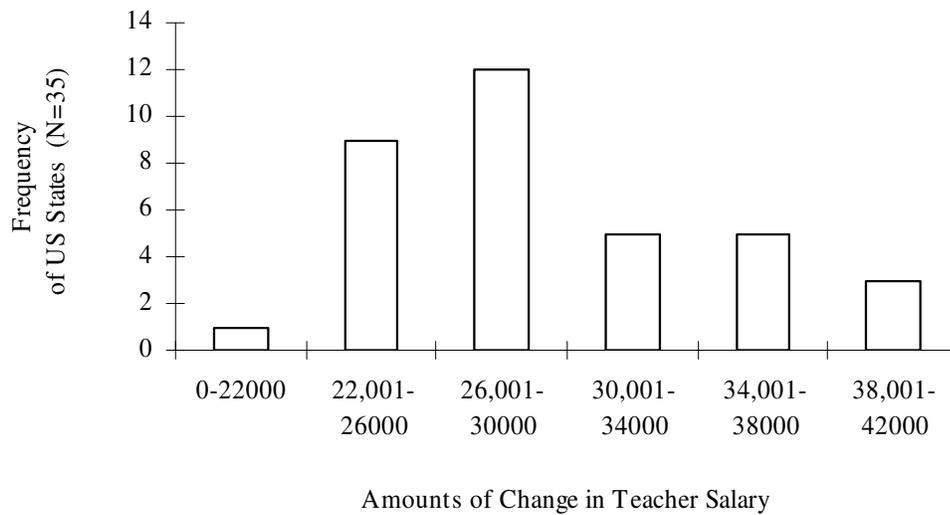


Figure 7. Histogram for the frequencies of selected amounts of change in teacher salary between the 1979-80 and 2003-04 public school years in the population of 35 US states under study. *Note.* Frequencies are computed based on how many US states under study have teacher salaries that have changed by an amount within a randomly-chosen range of numbers as determined by the lower and upper boundaries listed.

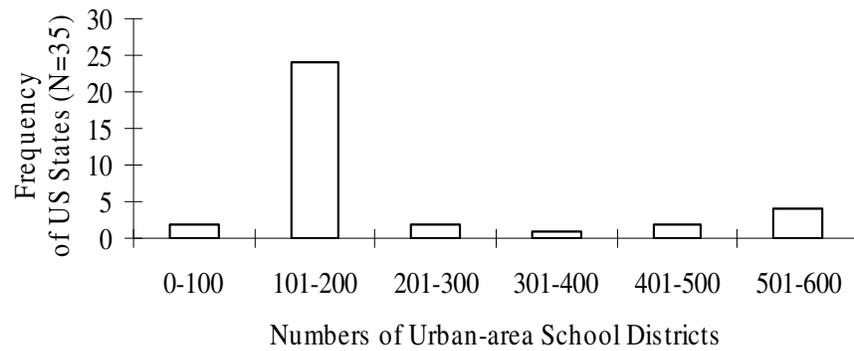
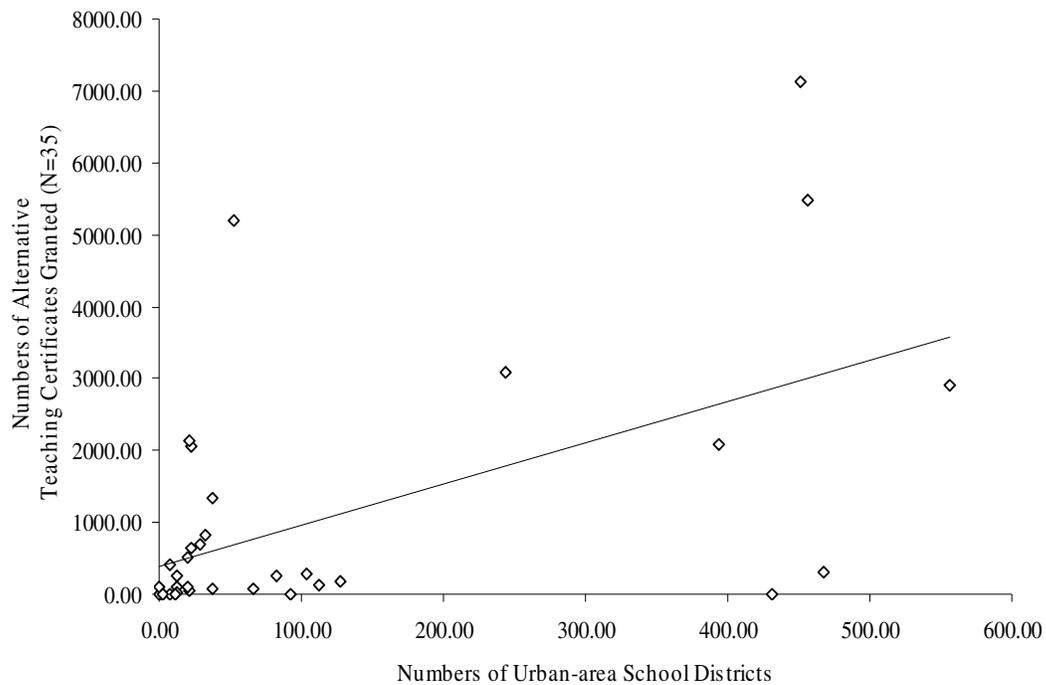


Figure 8. Histogram for the frequencies of selected numbers of urban school districts in counties with populations over 1,000,000 for the 2003-04 public school year in the population of 35 US states under study. *Note.* Frequencies are computed based on how many US states under study have amounts of urban area school districts as determined by the lower and upper boundaries listed.



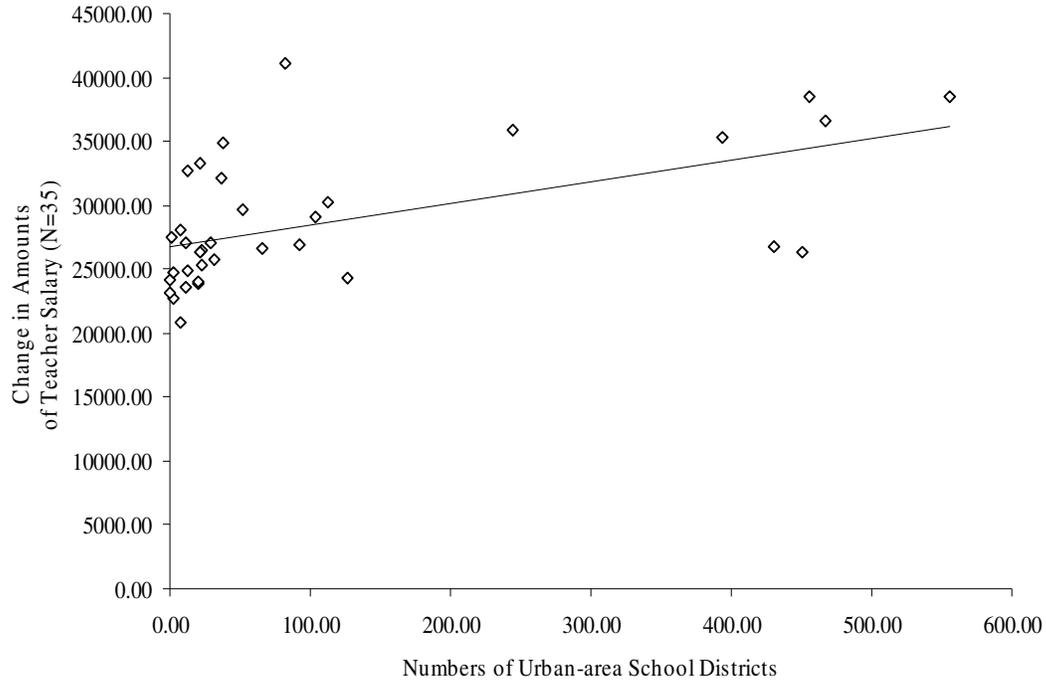


Figure 10. Scatterplot with regression line for the change in the amount of average teacher salary between the 1979-80 and 2003-04 public school years and the numbers of urban-area school districts in counties with populations over 1,000,000 in the population of 35 US states under study.

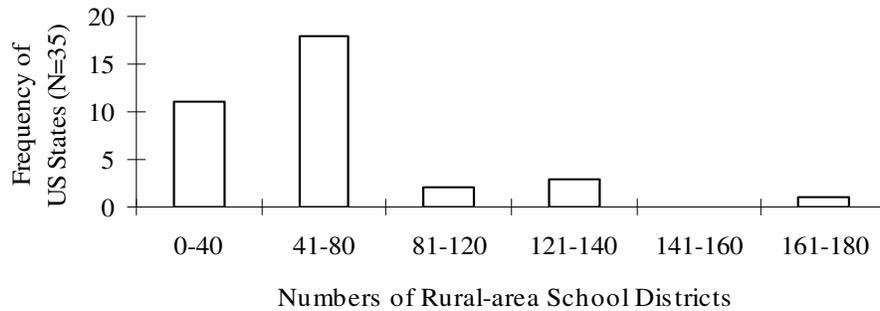


Figure 11. Histogram for the frequencies of selected numbers of rural school districts in counties with populations under 2500 for the 2003-04 public school year in the population of 35 US states under study. *Note.* Frequencies are computed based on how many US states under study have amounts of urban area school districts as determined by the randomly-chosen lower and upper boundaries listed.

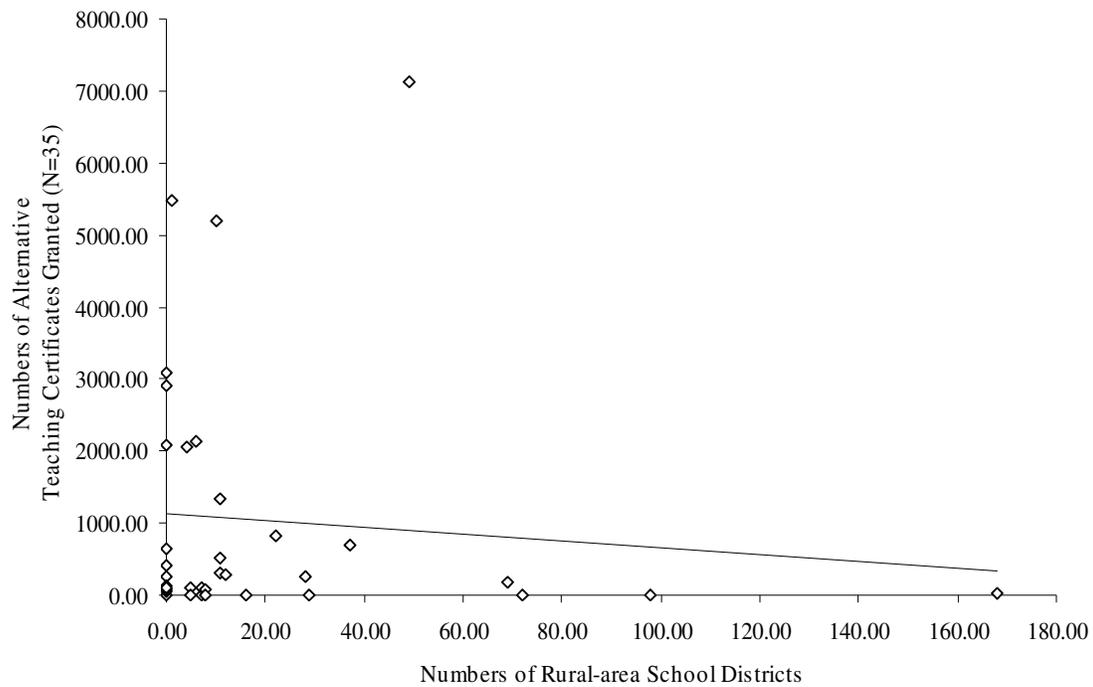


Figure 12. Scatterplot with regression line for the numbers of alternative teaching certificates granted during the 2003-04 public school year and the numbers of rural-area school districts in counties with populations under 2500 in the population of 35 US states under study.

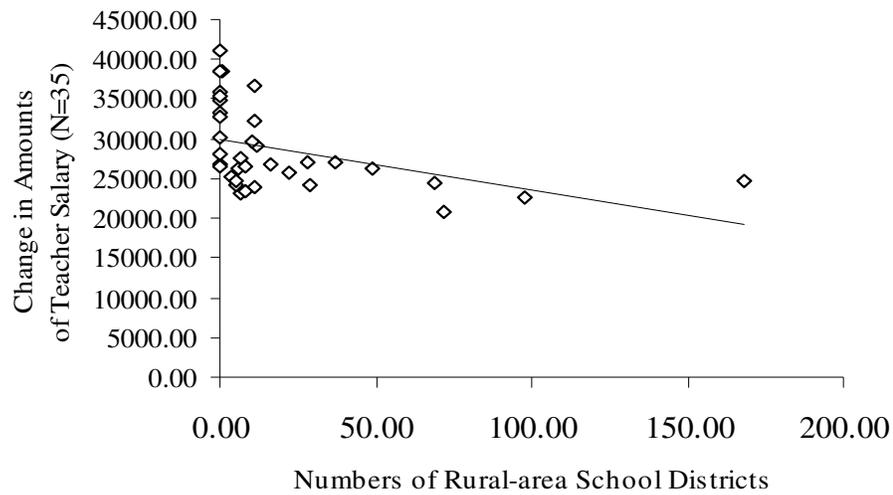


Figure 13. Scatterplot with regression line for the change in the amount of average teacher salary between the 1979-80 and 2003-04 public school years and the numbers of rural-area school districts in counties with populations under 2500 in the population of 35 US states under study.

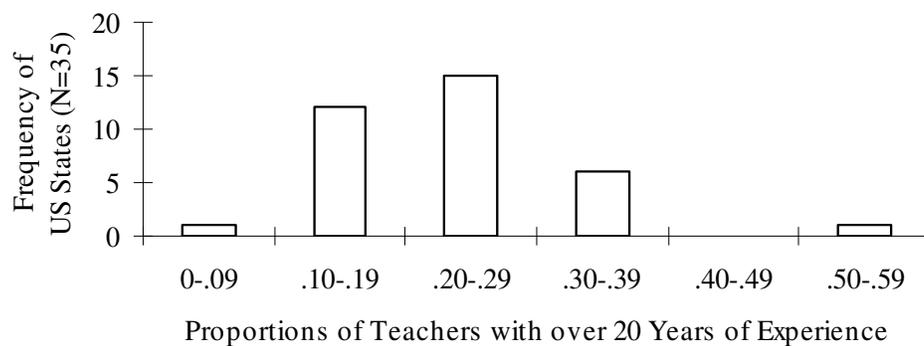


Figure 14. Histogram for the frequencies of selected proportions of amounts of teachers with over 20 years of teaching experience for the 2003-04 public school year in the population of 35 US states under study. *Note.* Frequencies are computed based on how many US states under study have amounts of experienced teachers as determined by the lower and upper boundaries listed.

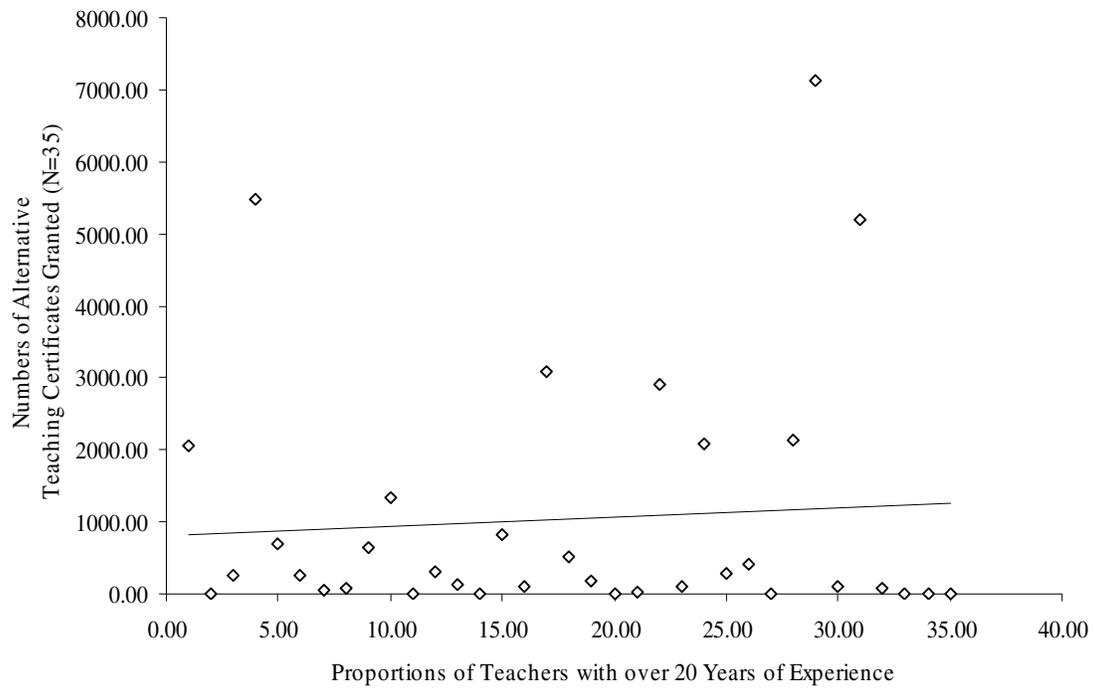


Figure 15. Scatterplot with regression line for the numbers of alternative teaching certificates granted during the 2003-04 public school year and the proportions of working teachers with over 20 years of experience in the population of 35 US states under study.

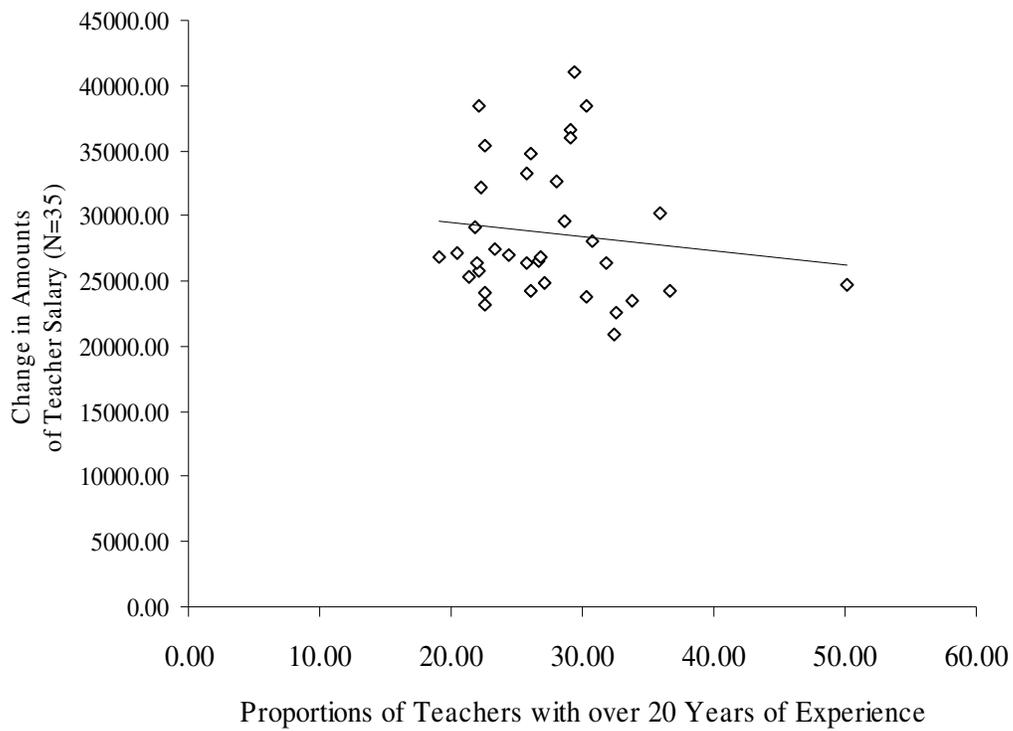


Figure 16. Scatterplot with regression line for the change in the amount of average teacher salary between the 1979-80 and 2003-04 public school years and the proportions of working teachers with over 20 years of experience in the population of 35 US states under study.

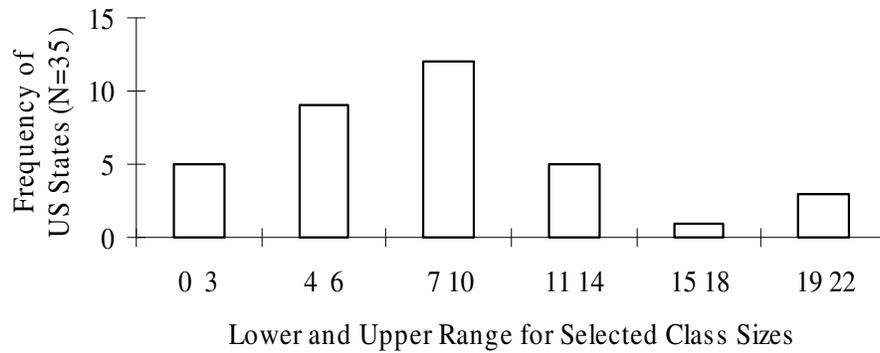


Figure 17. Histogram for the frequencies of selected lower and upper boundaries for average class sizes for the 2003-04 public school year in the population of 35 US states under study. *Note.* Frequencies are computed based on how many US states under study have amounts of experienced teachers as determined by the lower and upper boundaries listed.

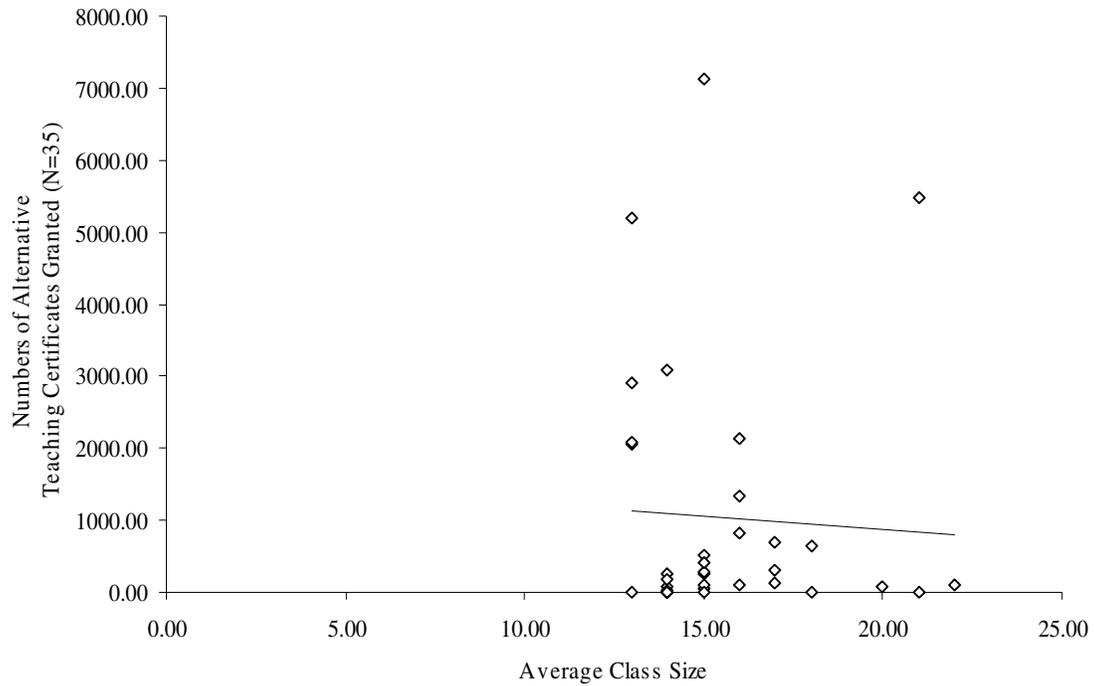


Figure 18. Scatterplot with regression line for the numbers of alternative teaching certificates granted during the 2003-04 public school year and the average student to teacher ratios in the population of 35 US states under study.

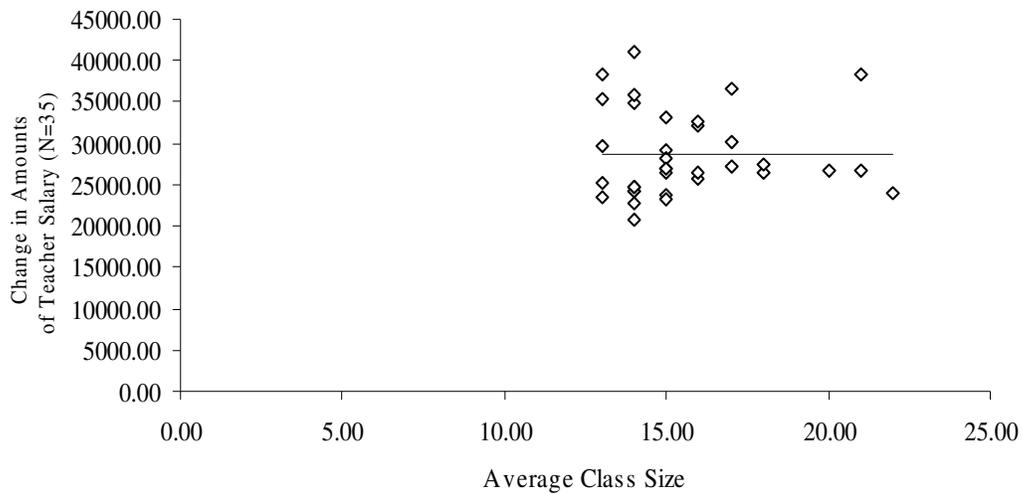


Figure 19. Scatterplot with regression line for the change in the amount of average teacher salary between the 1979-80 and 2003-04 public school years and the average student to teacher ratios in the population of 35 US states under study.

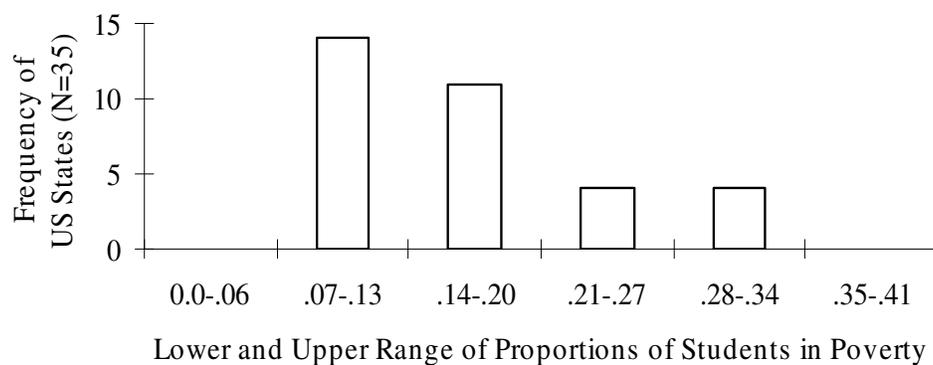


Figure 20. Histogram for the frequencies of selected lower and upper boundaries for proportions of students in poverty for the 2003-04 public school year in the population of 35 US states under study. *Note.* Frequencies are computed based on how many US states under study have proportions of impoverished students as determined by the randomly-chosen lower and upper boundaries listed.

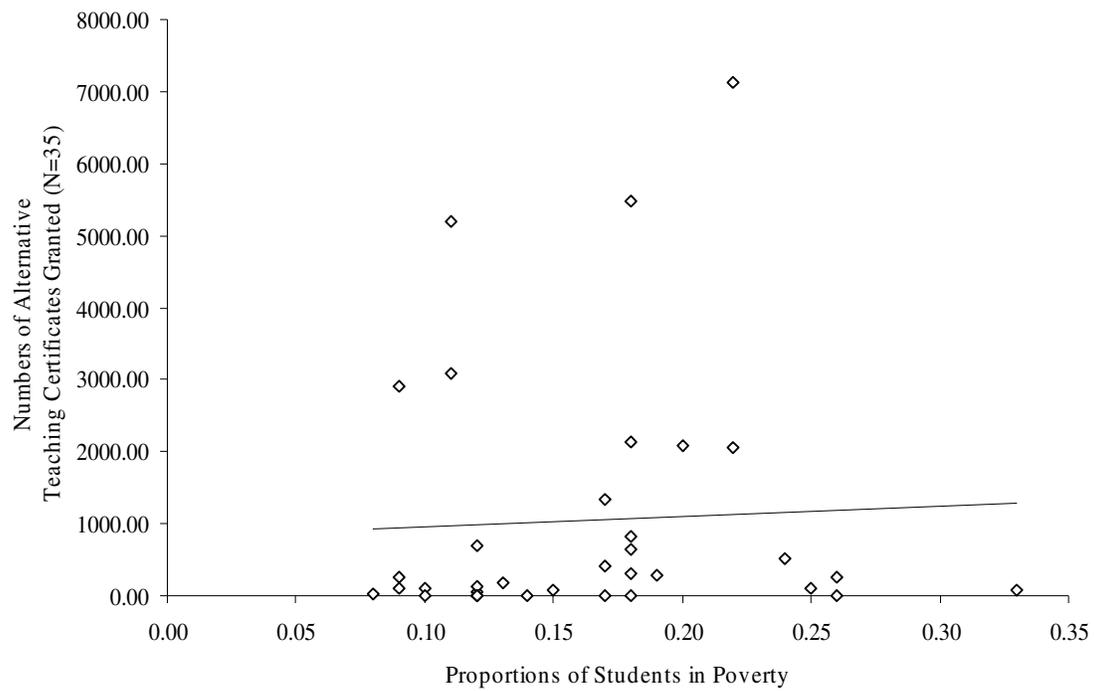


Figure 21. Scatterplot with regression line for the numbers of alternative teaching certificates granted during the 2003-04 public school year and the proportions of students in poverty in the population of 35 US states under study.

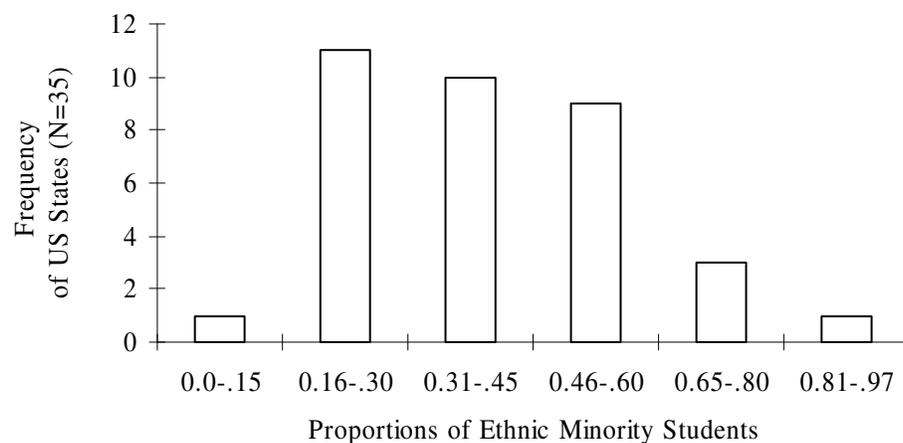


Figure 22. Histogram for the frequencies of selected lower and upper boundaries for proportions of ethnic minority students for the 2003-04 public school year in the population of 35 US states under study. *Note.* Frequencies are computed based on how many US states under study have proportions of ethnic minority students as determined by the randomly-chosen lower and upper boundaries listed.

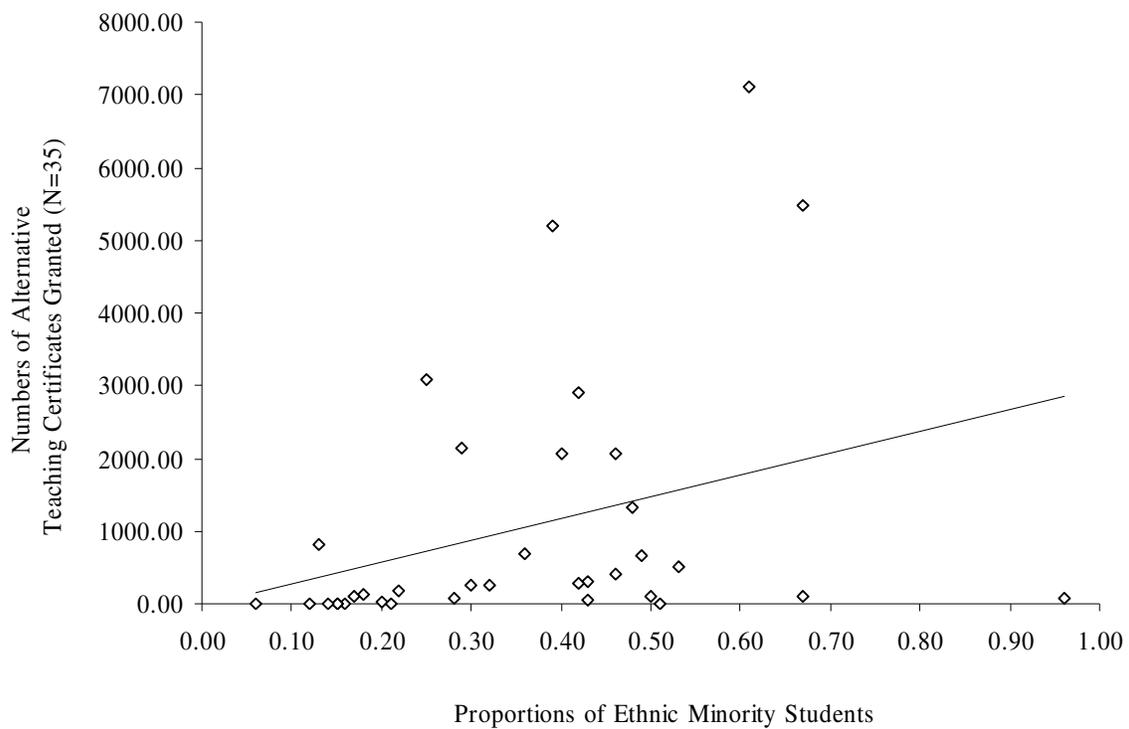


Figure 23. Scatterplot with regression line for the numbers of alternative teaching certificates granted during the 2003-04 public school year and the proportions of ethnic minority students in the population of 35 US states under study.

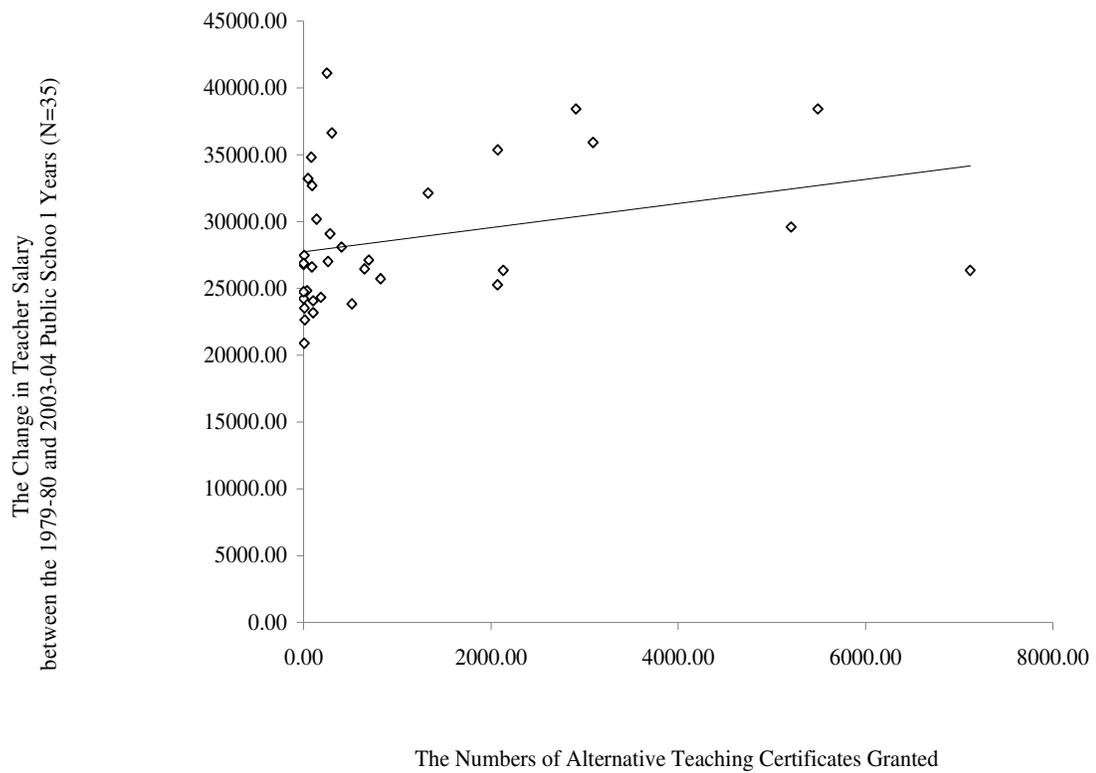


Figure 24. Scatterplot of the change in teacher salary between the 1979-80 and 2003-04 public school years and the numbers of alternative teaching certificates granted in the population of 35 US states under study.

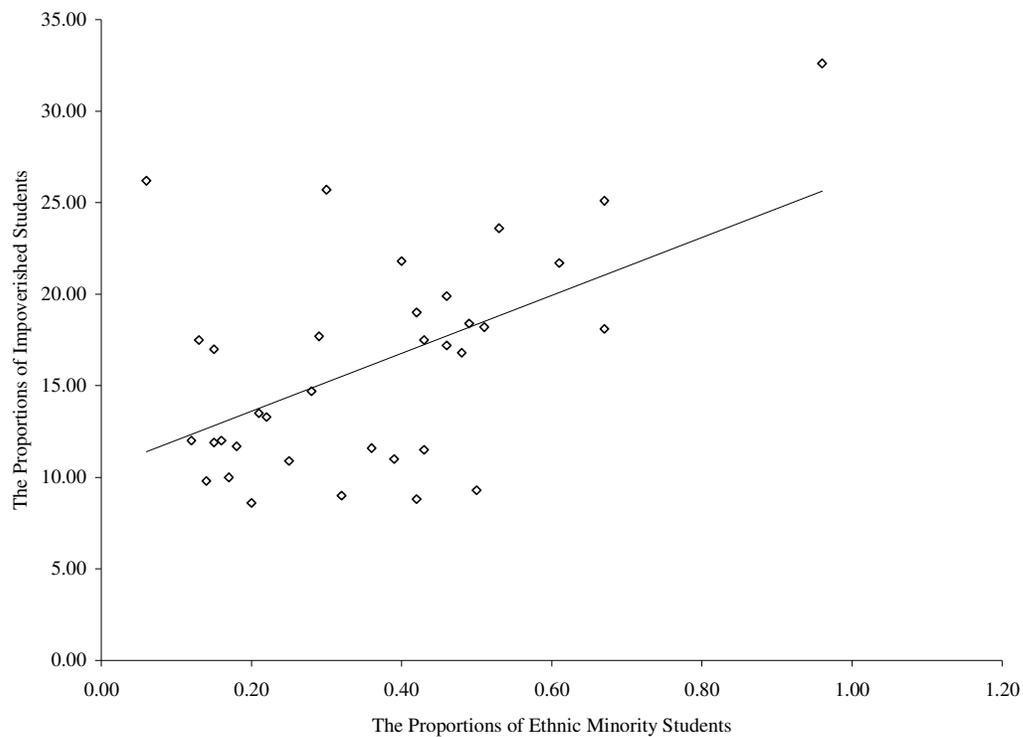


Figure 25. Scatterplot of the proportions of impoverished and ethnic minority students in the population of 35 US states under study for the 2003-04 public school year (N=35).