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TYPES OF EDUCATOR PREPARATION PROGRAMS AND PATHWAYS BY
RACE ON TEACHER LICENSURE ATTAINMENT IN ARKANSAS

by

Brent Miller

Dissertation

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Harding University

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Dissertation Advisor

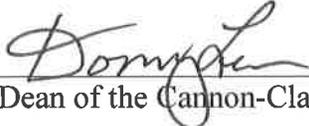
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ABSTRACT

by
Brent Miller
Harding University
May 2021

Title: Effects of Educator Preparation Programs Versus Alternative Licensure Pathways on Teacher Licensure Exams in Arkansas (Under the direction of Dr. Wendy Ellis)

The purpose of this dissertation was to examine the effect of varying pathways to educator licensure on licensure exam scores by racial groups. The study was designed to aid in developing state-level policy that could better strengthen and diversify the educator workforce in the state. For the study, Knowles' adult learning theory provided the core framework of the research. Each of the hypotheses addressed a subtest on the PRAXIS Elementary Education: Multiple Subjects exam. The research was carried out using a 3 x 2 factorial ANOVA casual comparative study. No significant interaction between educator licensure pathway and race was found. Also, the study found no significant main effect for program type or race on any of the four subtests. White test takers did outperform Non-White test takers in most instances, but it was not found to be statistically significant. One limitation that might have affected the results was that this study only examined scores for those who had attained some passing scores and submitted them to the Arkansas Department of Education, Division of Elementary and Secondary Education for probable licensure in some areas. Therefore, scores from all the candidates who took the Praxis and did not pass the exam were not available. Research

that includes all scores could indicate racial disparity. Recommendations for further research were centered around expanding the scope of research to better analyze racial groups with more scrutiny. Policy that provides more equitable opportunities and options for licensure should be explored as states continue seeking ways to maintain and diversity their educator workforce.

TABLE OF CONTENTS

| | |
|---|----|
| LIST OF TABLES..... | ix |
| CHAPTER I—INTRODUCTION | 1 |
| Statement of the Problem | 4 |
| Background..... | 4 |
| Hypotheses..... | 12 |
| Description of Terms | 13 |
| Significance | 15 |
| Process to Accomplish..... | 17 |
| Summary..... | 19 |
| CHAPTER II—REVIEW OF RELATED LITERATURE..... | 21 |
| Theoretical Framework: Adult Learning Theory | 22 |
| Historical Development of Teacher Preparation | 27 |
| Trends in Educator Preparation Programs..... | 29 |
| Educator Licensure | 31 |
| Licensure Exams..... | 40 |
| Summary..... | 48 |
| CHAPTER III—METHODOLOGY | 50 |
| Research Design | 51 |
| Sample | 52 |

| | |
|----------------------------------|----|
| Instrumentation..... | 53 |
| Data Collection Procedures | 55 |
| Analytical Methods..... | 55 |
| Limitations..... | 56 |
| Summary..... | 57 |
| CHAPTER IV—RESULTS | 59 |
| Analytical Methods..... | 59 |
| Hypothesis 1 | 60 |
| Hypothesis 2 | 64 |
| Hypothesis 3 | 68 |
| Hypothesis 4 | 72 |
| Summary..... | 76 |
| CHAPTER V—DISCUSSION..... | 78 |
| Findings and Implications | 79 |
| Recommendations | 86 |
| Conclusion..... | 90 |
| REFERENCES | 92 |

LIST OF TABLES

| | |
|--|----|
| 1. Means, Standard Deviations, and Number for Reading/English Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race | 61 |
| 2. Factorial Analysis of Variance for Reading/English Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race | 62 |
| 3. Means, Standard Deviations, and Number for Mathematics Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race | 65 |
| 4. Factorial Analysis of Variance for Mathematics Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race | 66 |
| 5. Means, Standard Deviations, and Number for Science Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race | 69 |
| 6. Factorial Analysis of Variance for Science Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race | 70 |
| 7. Means, Standard Deviations, and Number for Social Studies Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race | 73 |
| 8. Factorial Analysis of Variance for Social Studies Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race | 74 |
| 9. Summary of Statistical Significance of Educator Preparation Program Type and Race on Reading/English Language Arts, Mathematics, Science, and Social Studies Knowledge and Skills by Hypothesis | 76 |

CHAPTER I

INTRODUCTION

Preparing teachers to enter the education workforce is a process involving much training followed by an examination of content and pedagogy for eventual licensure. The traditional educator preparation program encompasses most teacher preparation candidates, with approximately three-fourths of future educators choosing this route. The preparation and credentialing of teachers began with the normal school movement in the late 19th century and has continued today (Bohan & Null, 2007). While this type of institution-granting licensure has evolved into the bachelor's degrees in teacher education at 4-year colleges and universities, the link between formal training, institutions, and the given state agency has remained over time (Tobin, 2012). Those participating in programs at traditional institutions of higher education have consistently been mostly female and White. Bohan and Null (2007) found that over 70% of normal school enrollees seeking teaching credentials were female. As of 2019, the trend continued, with approximately three-fourths of enrollees in traditional teacher education programs in Arkansas being female (Arkansas Department of Education, 2019a). Traditional educator preparation programs have been the mainstay for teacher preparation and continue to serve in that capacity. While the role of traditional educator preparation programs has been consistent, growth in alternative certification programs has taken place.

Alternative certification programs, while not new, have seen immense growth in recent years. What started in the 1980s as a small effort to thwart anticipated teacher shortages in specific areas had expanded, in 2003, to 46 states and over 144 pathways other than traditional teacher education programs (Zhao, 2005). While alternative certification programs do not inherently close diversity and gender gaps in the field of education, they do attract more male and minority participants into the teaching profession (United States Department of Education, 2015). In Arkansas, the Master of Arts in Teaching (MAT) and Arkansas Professional Pathway Educator License (APPEL) are the two primary routes to alternative licensure. The APPEL program alone accounted for 9.8% educator preparation enrollees in 2017 (Arkansas Department of Education, 2019b). These programs attract professionals to education who often bring different life experiences and perspectives than those coming from traditional preparation programs. The backgrounds of those entering alternative certification programs often align with adult learning experiences. Adult learners bring significant life experiences and a wealth of life knowledge that can be harnessed to reach their desired learning outcomes (Knowles, 1973). Understanding the correlation between alternative certification programs and adult learning theory can leverage the success of both pathways moving forward.

Regardless of the pathway to the profession, when an individual decides to become an educator, all pathways lead to the same destination: a licensure exam. In Arkansas, that exam is the PRAXIS exam. Prospective teachers complete various PRAXIS assessments, dependent upon the area for which they are seeking licensure (Educational Testing Services, 2019). Licensure exams are not only for individual

accountability but also serve as a means to hold preparation programs accountable. Licensure exams ensure that preparation programs are adequately preparing prospective teachers, according to Stotsky (2008). While efforts to ensure highly qualified teachers are educating children are commendable, significant gaps in passing rates on licensure exams exist when examining results from a racial perspective. Petchauer (2018) analyzed an Educational Testing Services study that noted White, first-time test-takers had a pass rate that was double Black first-time test takers on a PRAXIS basic skills assessment. Many pathways exist for a person in Arkansas to become an educator, but all of those pathways lead to a licensure assessment that shows significant gaps in pass rates among these two groups.

Much research has been conducted on alternative certification programs. Two examples of alternative licensure pathways in Arkansas are the Arkansas Professional Pathway Educator License (APPEL) and the Masters of Arts in Teaching (MAT) programs found at universities. Moreover, no shortage of articles, research, and reports can be found on teacher licensure exams. For state education agencies to make the best policy decisions possible, a concerted examination of research and existing data must take place. Also, studies should be viewed with the core ideal of adult learning theory to properly understand how to teach best those coming into preparation programs. Students should be educated by a diverse population of teachers that mirrors the diversity of the community in which they reside. As of 2019, the Arkansas K-12 student population was 40% Non-White, and the teacher population was 16% Non-White (Arkansas Department of Education, 2019a). Therefore, much attention must be given to how the state addresses the preparation and licensure of all adults who seek to impact children's lives.

Statement of the Problem

The purposes of this study were as follows. First, the purpose of this study was to determine the effects by race among those participating in an undergraduate traditional program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the PRAXIS Elementary Education Multiple Subjects reading/English Language arts subtest for teacher candidates in Arkansas. Second, the purpose of this study was to determine the effects by race among those participating in an undergraduate traditional program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the PRAXIS Elementary Education Multiple Subjects mathematics subtest for teacher candidates in Arkansas. Third, the purpose of this study was to determine the effects by race among those participating in an undergraduate traditional program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the PRAXIS Elementary Education Multiple Subjects science subtest for teacher candidates in Arkansas. Fourth, the purpose of this study was to determine the effects by race among those participating in an undergraduate traditional program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the PRAXIS Elementary Education Multiple Subjects social studies subtest teacher candidates in Arkansas.

Background

The learning process and people's knowledge of the learning process continue to evolve. Understanding how someone learns, the cognitive processes that learning entails, and the need for a consistent supply of educators have continued to evolve. The core

ideas of compulsory education began in the late 19th century with Horace Mann, the first commissioner of education in Massachusetts, who argued for free education to bridge the gap between the rich and the poor (Glass, 2010). He saw compulsory public education as a tool to assimilate the growing immigrant population, which was increasing, particularly on the east coast of the United States. Arkansas joined most states in passing a compulsory education law in 1909 (Katz, 1976). The need for a consistent source of teachers in the state has been a critical issue since that legislation. In Arkansas, to join the teacher workforce, one must pass a battery of PRAXIS assessments to demonstrate mastery of content. For example, to attain certification in elementary education, a teacher candidate must pass four content subtests: mathematics, science, social studies, and reading/English language arts, with a required minimum passing scores ranging from 155-159 on each assessment. Also, candidates must pass a pedagogical assessment with a passing score of 160 or greater (Educational Testing Services, 2019). An increasing dilemma for state education agencies has been to ensure that an adequate supply of teachers is available to meet the growing student population's needs. Arkansas has a variety of alternative certification pathways, but little focus has been placed on meeting adults' learning needs who may aspire to join the teaching profession.

Adult learning must be a focus for state education agencies as they determine how to increase the number of prospective educators. Jean Piaget and Malcolm Knowles each provided extensive background and research about how one learns. Jean Piaget, who studied under Alfred Binet, the first modern intelligence test creator, considered the way children develop and learn from birth into adolescence. Piaget (1931) offered four stages of how children acquire knowledge ranging from sensorimotor to formal operational. His

work regarding how children learn became the basis for understanding learning and development in students (Ahmad, Ch, Batool, Sittar, & Malik, 2016). To best educate students, teachers must understand how children learn throughout their development. Knowles expanded on the work of Piaget and began to look at how adults learn. Knowles (1973) articulated that adult learning has more internal motivates and is driven by experience. Understanding the work of contemporaries such as Piaget and Knowles should influence how educator preparation programs prepare learners.

Theoretical Framework

Adult learners have constructed many of their core beliefs based on life experiences. Scheurman (1995) stated that since adult learning is unique because of their life experiences, using constructivism to reshape perspectives becomes vital to adult learning. Adults learn from life experience; however, those teaching adults must realize that new experiences are always in the context of past experiences. Also, adult learners find much value in learning communally. The idea of developmental constructivism has become central to educator preparation programs. Those who prepare adult learners for the teaching profession have the unique challenge of helping adults overcome preconceived notions and predeveloped concepts (Scheurman, 1995). How adults learn is unique; therefore, those training future educators must consider adult learning theory. Using the principles of constructivism to better address adult learners' needs is paramount to successfully teaching adults. Shaping learning for adults is a more intricate experience because adults bring life experience and preconceived notions to the learning environment (Scheurman, 1995). Adult learning must consider the learner's experiences

and take the individual perspective of each adult. How adults learn must be taken into consideration to teach prospective educators effectively.

Malcolm Knowles extended the idea of learning to adults and began to study how learning shaped children, adolescents, and adults. Knowles (1973) developed the term *andragogy*, which is defined as any form of adult learning. The word was derived from the Greek meaning *man leading*. Knowles professed that adults required more self-direction and choice in their learning experiences. Moreover, he stated that a higher level of determination would be necessary as a learner aged. Instruction should be shaped by the learning styles of children and adults at various stages of development. If the goal for Arkansas is to have a sufficient supply of teachers, then the state must be consistent in ensuring that the learning needs of individuals preparing to enter the teaching profession are addressed.

Alternative Certification

Alternative certification programs provide routes for adults to become educators that are different from the traditional educator preparation programs found at institutions of higher education. Alternative certification programs have been a means of attracting professionals from other fields to the teaching profession (Zhang & Zeller, 2016).

Alternative certification programs also have attracted more minority and male professionals to the teaching profession. Alternative pathways were 34% male, and traditional educator preparation programs were 23% male (United States Department of Education, 2015). Also, alternative pathways included 41% from minority backgrounds, and only 24% of those enrolled in a traditional educator preparation program were of a minority background (United States Department of Education, 2015). Alternative

preparation programs attracted more males and minorities to the teaching profession. They also allowed professionals with life experiences the opportunity to enter the profession and use their expertise to influence the teaching profession positively.

The rise in alternative certification programs has been evident in states across the United States. Two key factors, the Great Recession and No Child Left Behind, led to a decrease in traditional educator preparation program enrollment, and at the same time, an increase in teacher licensure testing. Nationwide enrollment has declined by 36% during the Great Recession (Partelow & Baumgardner, 2016). The decline was met with a growing student population, so the demand for teachers was not meeting supply. Thus, the alternative certification programs began to increase in prominence across the country.

In Arkansas, three alternative certification programs are the basis for most nontraditional certifications: American Board for the Certification of Teacher Excellence, Arkansas Teacher Corp, and the Arkansas Professional Pathway to Educator Licensure (APPEL). Seven universities in the state also have Masters of Arts in Teaching (MAT) programs for professionals who already possessed a bachelor's degree (Arkansas Department of Education, 2019c). Apart from the MAT programs found at universities, alternative programs have been overseen by the state board of education in Arkansas. Each program allows for professionals who have a college degree to enter a program to ultimately become an educator in the state.

Traditional Educator Preparation Programs

Traditional educator preparation programs at colleges and universities have been the predominant path to licensure in the state. Enrollment in Arkansas educator preparation programs was 2,637 for the 2017-2018 academic year (Arkansas Department

of Education, 2019b). Educator preparation programs, which are found at institutions of higher education, are accredited by the Council for the Accreditation of Educator Preparation (CAEP, 2019b). CAEP was one of a few accreditation agencies in the state, but a merger in 2009 led to the creation of one entity, CAEP (CAEP, 2019a). Traditional educator preparation programs still prepared most future educators in the state of Arkansas. Though not accredited by the state board of education like alternative certification programs, these programs still adhere to rigorous accreditation standards put forth by CAEP and work in close conjunction with state agencies.

Educator preparation programs through colleges and universities have a much longer history than alternative certification programs. The certification of teachers began with normal schools in the late 19th century (Congressional Research Service, 2018). Normal schools evolved into teacher colleges and regional universities (Bohan & Null, 2007). Following World War II, a teacher shortage ensued, magnified by the baby boom, which began in the late 1940s. Teacher preparation programs transitioned fully into the college and university setting during this time. By the 1970s and 1980s, baby boomers were enrolling in college, leading to an abundance of teachers and a need for licensure exams to control the quality of those entering the profession (Tobin, 2012). Understanding the trajectory of traditional educator preparation programs allows one to examine how the programs have developed over time. While traditional programs remain the primary source of the nation's teacher supply, alternative preparation programs have increased significantly in recent years.

Licensure Exams

Licensing teachers is not a new concept and not one that is unique to Arkansas. Stotsky (2008) stated that two significant reasons for educator licensure existed. The first protected the public, and the second held educator preparation programs accountable. Licensure exams ensured that those educating children have at least demonstrated some level of content knowledge related to what he or she plans to teach. Also, using licensure exams ensured educator preparation programs, both by traditional and alternative certification means, prepared teacher candidates for the field of education. Much like medicine and law, educators must complete a licensure exam to demonstrate content and pedagogical knowledge to obtain a license.

The Arkansas Division of Elementary and Secondary Education requires prospective educators to complete and pass licensure exams. Arkansas does not require the basic skills, PRAXIS Core, assessment for admittance into an educator preparation program. Instead, admission into a program is based on approved acceptance standards established at the educator preparation provider. (Educational Testing Services, 2019). While the PRAXIS Core is not a requirement, licensing entities in Arkansas may use the exam for program entrance. For example, Arkansas State University provides options for students to have qualifying ACT, SAT, or PRAXIS Core scores for admittance into the teacher education program. Candidates may use any combination of scores to gain admittance. The university required an ACT score of 22 for reading and mathematics, for example. If prospective candidates have the required score for mathematics but not for reading, they could then take the PRAXIS Core for mathematics only to gain the required score for admittance, which is 150 (Arkansas State University, 2018). While universities

have begun to allow for more options regarding admittance into teacher preparation programs, the state of Arkansas does require the passing of PRAXIS content assessment for licensure in the area one is seeking teacher certification.

Race

Viewing licensure exam data from a racial perspective requires closer examination. Educational Testing Services conducted a study between 2005-2009 of 77,000 Black and White first-time test takers. Petchauer (2018) found significant gaps in the PRAXIS assessment scores, indicating attainment of basic skills. Pass rates for White first-time test takers were double that of Black first-time test takers (Petchauer, 2018). White test takers were more likely to pass an initial PRAXIS basic skills assessment. Understanding the racial impact of teacher licensing exams on prospective teachers is something that must be taken into consideration.

Race and its effect on licensure exams and teacher preparation are evident. For licensure exams, a disproportionate pass rate exists among minority populations. On the elementary education PRAXIS alone, Blacks in Arkansas saw a pass rate that was 33% below that of their White counterparts for the 2018-2019 academic year (Arkansas Department of Education, 2019e). Nettle, Scatton, Steinberg, and Tyler (2011) noted similar gaps nationally, with a 20-point gap on the Principles of Teaching and Learning K-6 assessment and a 16-point gap on the middle school mathematics assessment between White and Black populations. At both the state and national levels, gaps existed among racial groups across the various licensure exams. Race could be a factor when state departments of education begin to examine licensure practices and how they should be used to determine teacher certification.

As a result of pass rate differences, racial disparity exists in the general teacher population. In the 2018-2019 school year in Arkansas, 40% of the student population was from a minority background; however, only 16% of the teacher population was Non-White (Arkansas Department of Education, 2019a). Fewer students have access to teachers of color who have a higher level of cultural responsiveness to them as an individual. Closing the teacher-student population gap allows students access to teachers who have culturally informed relationships with them and their respective backgrounds (Milner, 2006). The importance of better diversifying the teacher workforce thus centers on the needs for students to have teachers who understand their background. Unfortunately, minority students often do not have this access and also suffer from other barriers, as well.

High poverty, minority students are more likely to be taught by noncertified teachers. Almay and Theokas (2010) determined that nationally, 22% of classes in high poverty schools were taught by noncertified teachers as compared to 11% in low poverty schools. Also, they found that one-fourth of mathematics classes in high poverty, high minority schools were taught by noncertified teachers. Not only was a racial gap present for students, but students in high poverty, high minority schools were more likely to be taught by an out-of-field teacher who was not certified for the position. Ensuring greater access for minority populations to high-quality teachers, who are from a similar background, must be a priority.

Hypotheses

1. No significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a

nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Reading/English Language Arts elementary education exam for educator candidates in Arkansas.

2. No significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Mathematics elementary education exam for educator candidates in Arkansas.
3. No significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Science elementary education exam for educator candidates in Arkansas.
4. No significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Social Studies elementary education exam for educator candidates in Arkansas.

Description of Terms

Alternative Certification. Alternative certification is a method for teachers who do not complete a traditional educator preparation program through a college or university. Alternative certification pathways may look different in each state. Alternative

certification provides a way to combat the teacher shortage and allow more professionals to attain certification in the educator field (Haj-Broussard et al., 2016).

Division of Elementary and Secondary Education. In 2019, the Arkansas Department of Education was reorganized with the Act 910, which restructured Arkansas state government, reducing the number of state agencies from 42 to 15. The reorganization included the Arkansas Department of Education, which was restructured; the oversight of P-12 public and charter schools is now within the Division of Elementary and Secondary Education (Wickline, 2019).

Educator Preparation Program. An educator preparation program is the traditional means to obtain teacher licensure. Educator preparation programs are typically 4-year programs through a college or university that lead to a bachelor's degree from the given college or university. The programs prepare future teachers in areas such as philosophies of education principles, teaching methods, and content (Banks, 2015).

Licensure Exams. In the United States, licensure exams are standardized exams that a prospective educator must pass to obtain a license to practice as an educator in a given state. Licensure exams ensure that high-quality personnel are entering the teaching profession. The exams measures the quality of teachers and their mastery of content in the area for which they are seeking licensure (Baker-Doyle & Petchauer, 2015).

Licensure Pathways. The Arkansas Department of Education (2019e) defined the licensure pathway as the pathway one takes to become a licensed educator in Arkansas.

Normal School. The normal school began in the late 19th and early 20th centuries in the Southwestern United States to educate women. The schools eventually evolved to also prepare teachers for the workforce (Bohan & Null, 2011).

Race or Ethnicity. The Arkansas Division of Elementary and Secondary Education (YEAR) groups race and ethnicity together when reporting data on student and teacher demographics (Arkansas Department of Education, 2019a).

Teacher Licensure. The licensure that one possesses, which allows them to teach in a given area, is designated as teacher licensure. A state agency must license teachers in a public school or public charter school in Arkansas. The terms teacher licensure and teacher certification are synonymous (Arkansas Department of Education, 2019e).

Teacher Pipeline. The teacher pipeline is the supply of educators entering the teaching profession through either an alternative certification pathway or a traditional preparation program. An adequate supply of teachers ensures enough educators exist to teach the population of students now and in the future. The teacher pipeline is also viewed as a school leadership pipeline as school leaders will also come from the supply of teachers available (Bankert, 2019).

Significance

Research Gaps

The path one takes to become an educator and accompanying licensure exams leave many questions that require further research. All states have a licensure assessment that aspiring educators must pass on their path to a license to teach. Goldhaber and Hansen (2009) determined that a consensus exists that those wanting to enter the teaching profession should demonstrate competency before achieving licensure. The role of

licensing teachers ensured that quality existed in the profession over quantity. However, to meet the needs of the teacher pipeline, a degree of quality and quantity must be present to ensure students' have access to certified educators (Goldhaber & Hansen, 2009). The role of teacher licensure became essential to ensure that those teaching children are of high quality. Educator licensure acts to demonstrate competency before entering the profession. While much research has been conducted concerning educator licensure, little research has been conducted that examines educator licensure through the lens of teacher traditional versus alternative licensure programs. Applying knowledge of race assessment performances to licensure pathways could be integral in designing state-level practices to better diversify the teacher workforce in Arkansas.

Possible Implications for Practice

For students' needs, academic and affective, to be met, they must be taught by educators who can best meet their needs. Having teachers of the same racial makeup as students is not an end-all because all teachers can learn to be culturally aware of their students. However, a same-race teacher should be able to reach a given student population (Milner, 2006). A Black student exposed to just one Black teacher in Grades 3-5 is 19% more likely to attend college compared to a Black student who was not taught by a Black teacher, and this percentage was even higher for minority students from poverty (Gershenson, Har, Lindsay, & Papageorge, 2017). Examining best practices and policy regarding teacher preparation and subsequent licensure practices may have implications regarding decisions moving forward in teacher preparation and licensure.

National policy has held that content knowledge is the primary way to demonstrate readiness for the education field. While content knowledge is valuable, state

and national policy should be open to shifting the conversation around demonstrating how to teach students and properly train educators (Darling-Hammond, Holtzman, Gatlin, & Helig, 2005). When considering adult learning theory, the design of preparation programs becomes more meaningful for those enrolled. This shift allows for greater emphasis on the teaching craft. While content knowledge is essential for a teacher entering the field, understanding students and how to teach is of the utmost importance.

With states striving to diversify the teacher workforce, more consideration should be given to how teachers are prepared and subsequently licensed to be practicing educators. State education agencies should begin to examine best practices and determine if current practice meets the needs of students and stakeholder groups. The research conducted in this study aimed to guide policy and practice to inform decisions regarding teacher preparation and licensure moving forward. While the process of training and credentialing teachers has made much progress over time, a concerted analysis determining if current realities are best practices for equitable access to the profession was warranted.

Process to Accomplish

Design

A quantitative, causal-comparative strategy was used in this study to examine the four hypotheses. The independent variables for this study were race (White and Non-White) and type of teacher preparation program (an undergraduate traditional program versus an APPEL program versus a nontraditional MAT program with licensure). The dependent variables for this study were the knowledge and skills of teacher candidates in Arkansas measured by the Praxis II Teaching reading/English language arts elementary

education test, the Praxis II Teaching Mathematics elementary education test, the Praxis II Teaching Science elementary education test, and the Praxis II Teaching Social Studies elementary education test, respectively.

Sample

This study's sample was scores from teacher candidates who had taken the PRAXIS Elementary Education Multiple Subjects subtests (reading/English language arts, mathematics, science, and social studies). A stratified random sampling technique was used to select the scores used for this study. First, the population of licensure test scores was stratified into the three levels of type of program (an undergraduate traditional program versus an APPEL program versus a nontraditional MAT program with licensure). Next, each level of the type of program was stratified into the two levels of race (White and Non-White). Finally, 30 scores were selected from each of the six groups: White and undergraduate traditional program, White and APPEL program, White and nontraditional MAT program with licensure, nonwhite and undergraduate traditional program, nonwhite and APPEL program, and nonwhite and nontraditional MAT program with licensure. This process of stratification was repeated for each subject area.

Instrumentation

The PRAXIS Elementary Education test was used as the instrument for this study. The test is a Multiple Subjects assessment and is divided into four subtests, reading/English language arts, mathematics, science, and social studies. Each subtest is scored on a scale of 100 to 200, and each state licensing entity sets passing scores for each of the exams (Educational Testing Services, 2019). In Arkansas, the passing score for reading/English language arts and mathematics is 157, science is 159, and social

studies is 155 (Educational Testing Services, 2019). Candidates completing the exam may take the subtests together. However, if they do not pass a subtest, they may retest in that subject area on ensuing attempts.

Data Analysis

A 3 x 2 factorial analysis of variance (ANOVA) was conducted for each hypothesis. The independent variables were race and type of program. The dependent variables for the study were scores on the PRAXIS Elementary Education in reading/English language arts, mathematics, science, and social studies, respectively.

Summary

Examining pathways to educator licensure and subsequent licensure exam scores on state-mandated exams from the perspective of adult learning theory is essential as policymakers analyze best practices. While the process of preparing and licensing teachers has undergone some alteration throughout the years, licensing teachers for the profession has remained mostly unchanged over time. Recent initiatives such as Green and Ballard's (2010) professional development school may hold promise for future teacher preparation. However, regardless of the pathway, the need to prepare teachers to educate society's future leaders remains constant. Therefore, entities must be reflective and innovative in establishing preparation programs to determine how they can better ensure that a quality, diverse teacher workforce exists for students.

The succeeding chapter will contain a review of literature focused on educator licensing. Historical analysis regarding theories of learning will be analyzed as well as the history of teacher preparation. Further literature analysis will focus on licensure practices at both traditional educator preparation programs and alternative certification

programs. Finally, race and gender will be used to further delve into the literature surrounding the licensing of prospective teachers.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Educator preparation programs remain the standard for teacher preparation in the United States. Members of the Congressional Research Service (2018) stated that of the approximately 26,000 state-approved teacher preparation programs in the United States, 70% are traditional preparation programs based within higher education institutions. Additionally, 20% were alternative certification programs based at higher education institutions, and 10% were alternative certification programs that were independent of institutions of higher education and state-approved. The Higher Education Act of 1965 provided financial support and accountability to agencies that prepared teachers, which were mostly institutions of higher education. State education agencies and higher education institutions were required to report information regarding the performance of their teacher preparation programs as part of Title IIA of the Higher Education Act of 1965 (Congressional Research Service, 2018). Although alternative teacher preparation programs have grown in number consistently, data illustrated that higher education institutions were still the predominant route to certification of teachers in the United States. Traditional preparation at higher education institutions remains the conventional route to teacher licensure, and this trend in the United States has been consistent for more than 100 years.

Theoretical Framework: Adult Learning Theory

Learning processes have been studied as people discover new and innovative ways to meet the learning needs of children and adults. Throughout history, the primary focus of education has been for the betterment of society. Plato determined that education was a means for the elite to lead effectively, and Aristotle took a similar view of learning but expressed the need for holistic education that included physical wellness, arts, and literature. Both saw education to teach the elite to sustain and ensure the advancement of the population (Turan, 2011). In more modern philosophy, John Dewey developed the idea that learning should be socially engaging and developmentally appropriate for children. Dewey proposed that rigid classroom models should be replaced by real-world, problem-solving, and active-learning experiences to meet the needs of students (Williams, 2017). Jean Piaget looked extensively at the learning of children and developed four stages of development that were fluid but defined how children learned into adolescence (Ahmad et al., 2016). Those stages were sensorimotor, preoperational, concrete operational, and formal operational. Piaget believed that children passed through each of these stages. Moreover, each child may take a month or years at each stage before moving to the next. Ultimately, the maturity and development of children determine their movement through the four stages (Ojose, 2008). Learning and the process of learning have been examined since some of the earliest writings of Ancient Greece. However, Piaget began to observe learning processes at specific stages of childhood. Each of Piaget's processes evolves into more independence until a child between the ages of 11-15 enters a more self-directed learning experience (Piaget, 1931). Although the work

Piaget did on the learning of children was essential, the learning process for adults was unique and required further examination.

Piaget became the first to examine how a child learns through different stages of development. Piaget's ideas of learning became the basis for constructivist thought in education. Constructivism in education accounts for the learner's upbringing, personality, attitude, and cultural exposure (Juvova, Chudy, Neaumeister, Plischke, & Kvintova, 2015). How a person learns was first studied in children, and that work was initially adapted for adults. Piaget's work shaped constructivism so that those teaching both children and adults have a stronger perspective on how to approach teaching and learning.

Malcolm Knowles became the first to analyze adult learning and create the notion that an adult learner was a separate and varied learner. The term *andragogy* became synonymous with Knowles (1973) and his understanding of how adults learn. Andragogy focused on the idea that the teacher may not possess all the knowledge. Adults bring experiences with them to their learning and can thus contribute to the learning environment (McGrath, 2009). Knowles (1973) stated that adult learners have specific features that distinguish them from children and adolescents. Adult learners are self-directed, internally motivated, ready to learn, and driven by experiences (Roberson, 2002). Knowles would encourage those teaching adults to use andragogy as a guide and consider that adult learners each have a unique set of skills and experiences that they bring to their learning environments. Knowles began to research the distinctive learning needs of adults, which allows those teaching adults to support their unique learning needs better.

Knowles' theory of adult learning is based on the four primary principles of *andragogy*: self-concept, role of experience, readiness to learn, and orientation of learning. Prior to Knowles (1973), his contemporaries had based ideas of adult learning primarily around the general work of learning related to children. Knowles, building on the work, realized that adults are unique individuals who bring experience and knowledge to learning that children simply do not have. Examining the major principles of *andragogy* allows Knowles' theory of adult learning to be fully understood.

Knowles' first two principles are self-concept and the role of experience. Knowles found self-concept or self-direction to be the result of an adults' development as a learner. For example, a primary grade student is very dependent on the teacher for guidance and direction. As the students mature, they are more self-directed and want to have a more direct role in their learning (Knowles, 1973). The role of experience is also paramount to adult learning. An adult brings life experience to a learning environment by merely having lived, and thus they become a resource for enhancing their learning. Ideally, learning such as working at a board or listening to lectures that one experiences in primary grades becomes less predominant and practices such as discussions and field experiences increase in importance. This shift is because an adult has experience they already bring with them that adds to the learning (Knowles, 1973). The principles of self-concept and experience are critical to adult learning because they illustrate how the adult learner has developed and must be taught differently compared to a child or adolescent.

Knowles' theory of adult learning contains two other principles: readiness to learn and orientation to learning. The core idea found in one's readiness to learn is that, as people become adults, they are no longer learning out of requirement but instead out of

necessity. Moreover, as adults, their orientation to learning shifts as their motivation moves to more problem-solving and less on subject-based learning, as in a child's learning. Knowles (1973) found that adults are ready to learn because they have to learn to achieve a task or goal they have before them. Orientation to learning correlates with this assumption because not only are they ready to learn, but the way they learn is unique (Knowles, 1973). Knowles' theory of adult learning thus outlines the four principles unique to the learning of adults and how they should be taught to meet their specific learning needs.

Though adult learning does have essential characteristics outlined by Knowles, how adults learn also has a transformative quality. Mezirow (1998), in his transformative learning theory, argued that adults have transformative experiences through significant life changes and even dilemmas. These events force adults to re-examine life, redirect decisions, and alter the stability they may have had. Having a life event that causes an adult to re-evaluate his or her situation, and even have an emotional reaction, is a critical element of transformative learning (Fleming, 2018). Adults choosing different routes to teacher licensure than the typical college or university preparation program are often doing so because of shifts in the lives they currently lead; therefore, those leading alternative programs must be understanding and create an environment of trust and build self-efficacy in adult learners (Evans, 2015). Life events may be related to economic factors or a family move, but something often occurs that prompts adults to re-evaluate themselves and make a career shift. By understanding Knowles and Mezirow, the way adults learn and address significant life experiences shape how adults are taught and engaged.

Adult learning theory must be considered when examining teacher pipeline issues and the licensing of prospective teachers. Knowles (1973) stated that an adult learner is unique. Adults have experiences that cause them to learn differently. A child is motivated by compulsory attendance and social norms to attend school. In contrast, adults have a wealth of life experiences, and events such as marriage, child-rearing, and economic shifts guide adults' desire to learn. An adult learner is often motivated by social concepts and not biological development, like a child. Adults see a need to learn based on their progression through life. For example, if they are with children, they need to acquire new learning and skills to qualify for a higher paying or more stable job situation (Knowles, 1973). Consequently, adult learners in alternative certification programs, that focus on experience and self-direction, are found to be highly prepared to enter the teaching profession. For example, the CalStateTEACH program, an alternative pathway in California, conducted a survey, and the data from the survey illustrated a healthy view of instructional readiness for alternative teacher candidates (Foster, Bishop, & Hernandez, 2008). In a survey, 95% of supervisors stated that they felt teachers from the CalStateTEACH alternative program were supportive of the instruction and curricular expectations. Understanding that the learning of adults is systematically different from the learning of children is essential, particularly when examining alternative licensure programs for teachers. Alternative programs, when considering adult learning, have high success rates. Adult learning must be considered as adults enter alternative certification pathways by acknowledging and capitalizing on the different experiences and ideas they bring to the learning environment.

Historical Development of Teacher Preparation

Institutions of higher education have an interesting history in the United States. The preparation of the teachers at institutions of higher education began predominantly as *normal schools* across the country in the late 19th and early 20th centuries (Congressional Research Service, 2018). Normal schools originated in France and quickly spread across Western Europe and into the United States. Normal schools existed for training women, primarily to be teachers. Estimates suggested that, from 1880-1910, as many as 50% of women with a college education did so through a normal school. Bohan and Null (2007) noted that normal schools were not just for women, but females made up most of the student population. For example, normal schools in California and Texas had approximately 70% female enrollments compared to 30% male. Normal schools, which were funded and overseen by individual states, have always been held to state and eventually federal governments' standards. As early as 1920, the normal schools began to disappear as demands for a more thorough curriculum that offered more than teacher certification became prevalent. Normal schools transformed into teacher colleges and regional universities over time (Bohan & Null, 2007). The early programs for the preparation of teachers included most females and were overseen by the state agency. While teacher preparation programs have evolved, those two characteristics are still mostly true. Understanding the early history of teacher preparation allows one to see how the training of teachers, though different, may not have transformed as much as time might suggest.

By the mid-20th century, normal schools had disappeared from the American education system. Diener (2008) stated that high schools became more prevalent, which

led to a stronger curriculum before college entrance for more of the population. Normal schools were seen as merely technical training and led to a movement to create more 4-year teacher preparation models. Thus, teacher preparation became a part of colleges and universities. The formalization of 4-year teacher preparation overlapped with the outbreak of World War II, which saw large numbers of female teachers leave the profession for higher-paying jobs that supported the war efforts (Tobin, 2012). Before the United States' entrance into World War II, in 1940-1941, 2,305 emergency teaching certificates were issued by states, and the number rose to 69,423 in just 2 years and to 108,932 by the end of the war. The rise of stricter teacher credentialing before World War II was quickly followed by a drastic teacher shortage. Then, baby boomers began entering schools in the 1950s and 1960s. The student population went from 26 million in 1950 to 46 million in 1972. The baby boom, which followed World War II, led to a drastic rise in the student population nationwide. With a higher student population, the years following the war led to a lessening of teacher credentials to ensure an adequate supply of teachers was available. By the 1980s, baby boomers were leaving K-12 schools for college and the workforce, leading to an abundance of teachers. At that point, states began to increase requirements for teacher certification. In the 1980s and 1990s, the rise of uniform licensure exams began to take shape (Tobin, 2012). Understanding the background of formal teacher training and how practices in licensing teachers have developed allows for a deeper understanding of the association between history, government regulation, and teacher certification. What started as localized training eventually became normal schools that developed into college and university programs. War and subsequent birth-rate patterns further shaped the training of teachers and

eventually led educators to the licensing testing culture of teacher candidates that exists today. Teacher training at institutions of higher education today follows strict accreditation standards and expectations for the training of prospective teachers.

Trends in Educator Preparation Programs

Historical events have influenced teacher education since the early 19th century. Today, traditional teacher preparation programs take on a traditional form with similar expectations regarding accreditation and the preparation of teachers. The National Council for Accreditation of Teacher Education was founded in 1954 as the governing body to provide accreditation for teacher preparation programs at institutions of higher education. In 1997, the Teacher Education Accreditation Council was founded with the same mission of accrediting teacher preparation programs. Both accreditation entities merged in 2009 to become CAEP (2019a). By 2012, Ohio had become the first state to partner with CAEP, and by 2013, CAEP was the sole governing body for the accreditation of educator preparation programs at institutions of higher education (CAEP, 2019a). The accreditation process ensures consistent standards and expectations nationally for programs that train future educators. The preparation of teachers with its holding candidates to a standard of excellence is a central focus in the training of teachers.

Educator preparation programs at institutions of higher education are held to standards by CAEP (2019b). Each state also has sets of standards that teacher candidates must meet, thus, placing further responsibility on the institution of higher education's teacher preparation program. Those wanting to teach in Arkansas and coming from a traditional educator preparation program at an institution of higher education have

specific steps they must take to obtain a teaching license (Arkansas Department of Education, 2019e). Background checks and child maltreatment checks are required for all applicants seeking a teacher license or renewing a teaching license. First-time teacher applicants must show evidence of a 4-year degree in the education area for which they are seeking the license, and their training must be completed at an institution of higher education accredited by the CAEP (Arkansas Department of Education, 2019e).

Applicants must also pass related PRAXIS licensure exams in the grade level and content area to seek licensure. Once these requirements have been met, an application provides all the necessary information and application to the Arkansas Department of Education so that a license can be issued (Arkansas Department of Education, 2019e). The process for a person to become an educator through a traditional educator preparation program in Arkansas begins at a college or university. Subsequent PRAXIS exam passage and degree program completion lead to applying for a teaching license from the state.

Although the process is multi-faceted, the progression ultimately follows a similar pattern from accredited college or university program to license testing and then applying for a teaching license.

Though traditional educator preparation programs have a long history in the United States, the ability for those programs to meet the needs of adult learners must be examined. Green and Ballard (2010) stated that Knowles' adult learning theory was based on four assumptions, one of which was that adults possess many experiences that serve as a basis and resource for learning. Despite the knowledge of adult learning, universities and traditional educator preparation programs have been slow to adopt practices that cater to the needs of the adult learner. Models such as a Professional

Development School, patterned after medical school, are a means to provide a more authentic experience based around theories of adult learning. These authentic experiences have led to higher retention and stronger preparation because learning was based on experiences and authentic practice (Green & Ballard, 2010). Knowles' adult learning theory, when applied purposely to teacher preparation programs, leads to higher retention of teachers. If preparations programs can take core ideas of adult learning to guide experiences further, the programs will have a more significant influence on students and schools. Educator preparation programs have a consistent history in the United States. Further embracing ideas of adult learning theory may promote even stronger preparation programs at institutions of higher education.

Educator Licensure

Data from the Title II Higher Education Act noted that nationally, 23% of teacher candidates in traditional higher education programs are male. Alternative pathways, in contrast, are 34% male. A similar trend is apparent when examining the racial breakdown of traditional programs versus alternative preparation programs. For those enrolled in traditional higher education programs, 26% are Non-White. However, in alternative preparation programs, 41% are Non-White (United States Department of Education, 2015). Subsequently, alternative preparation programs have a higher minority rate and male participation than traditional educator preparation programs.

Traditional Educator Preparation Programs

Arkansas offers many traditional pathways for a professional to become an educator in the state. Twenty traditional educator preparation programs exist in the state through colleges and universities (Arkansas Department of Education, 2019a). These

programs ultimately lead to a bachelor's degree in education in which one plans to teach. Enrollment in educator preparation programs in Arkansas was 2,637 in 2017-2018. The enrollment in 2015-2016 was 2,301, which does illustrate an increase in traditional program enrollment (Arkansas Department of Education, 2019b). Although traditional educator preparation programs continued to see high enrollment over this period, nationally, traditional programs saw a decrease of 36% over the same period (Partelow & Baumgardner, 2016). Although Arkansas has maintained enrollment in educator preparation programs, the distribution of certification areas has not met demand, leading to critical shortage areas (Arkansas Department of Education 2019d). Having adequate enrollment in educator preparation programs, traditional or alternative, is not enough. Instead, efforts must also be made to ensure that subject area demands are being met. With the national decrease in enrollment in educator preparation programs and the need for teachers in specific subject areas, an increase in the need for alternative pathways has developed.

The Arkansas Department of Education and the Arkansas Department of Higher Education partnered with CAEP in 2014 to oversee the accreditation of teacher education programs in Arkansas (CAEP, 2019b). The 20 educator preparation programs, public and private, are guided by the CAEP standards, and through that, accreditation may provide programs for future educators. Educator preparation programs commonly require 4 years of training, leading to a bachelor's degree from a college or university.

Alternative certification programs embrace key elements of adult learning theory, but traditional educator preparation programs have taken steps to do so as well. Knowles' emphasis on self-direction, experience, motivation, and readiness to learn can be found in

many traditional and alternative certification programs (Knowles, 1973). Professional development schools serve as a model regarding the utilization of adult learning theory in the preparation of teachers. The model is based on a traditional educator preparation program but creates a more authentic field experience for the prospective teacher. With the professional development schools' model, future teachers are interns for an entire year and are subsequently teachers and students their final year of their undergraduate work. Working under a master teacher, the intern is fully immersed in authentic learning. Moreover, Green and Ballard (2010) indicated that by embracing adult learning theory, they had seen stronger university and local district partnerships and higher retention rates for novice teachers. Although traditional educator preparation programs and alternative certification programs differ, finding alternative ways to embrace further adult learning theory within the traditional program model may be a key to future success.

Understanding adult learning must always be a central theme in the preparation of teachers as they do bring varying experiences to the field. Traditional educator preparation programs are straightforward in design, and alternative teacher preparation programs have variations, but both models of teacher preparation embrace core ideals of adult learning.

Alternative Licensure

Alternative licensure programs are present across the United States. In 1983, only four states had any form of alternative certification programs for teachers. By 2004, that number had increased to 43 states. Alternative certification programs attract experienced, educated professionals to the field of teaching (Zhang & Zeller, 2016). Much like the idea of andragogy presented by Knowles, those entering alternative certification programs are

seen to be motivated by experience and desire. Zhang and Zeller (2016) examined teachers in North Carolina who had participated in a traditional educator preparation program via a 4-year baccalaureate route and those who participated in an alternative pathway, in this case, NC Teach. When examining teachers' satisfaction and retention rates in both pathways, no significant difference between traditional and alternatively certified teachers existed. The 3-year retention rate for traditional educator preparation teachers was 86.36% compared to 89.89% for alternatively certified teachers. Little difference was found in retention rates based on the program; instead, factors such as school leadership, school culture, access to resources, and curriculum strength were suggested to play a more significant role. The need for alternative licensure programs has become clear to meet the supply of teachers needed. Alternative certification programs may help prepare teachers and retain them once they enter the profession, much like traditional preparation programs. With alternative programs now present in most states, the focus shifts to ensuring fidelity and execution for the sake of students, parents, and stakeholders.

To ensure an adequate supply of educators across the country, many states have turned to alternative certification pathways for prospective teachers. Partelow and Baumgardner (2016) stated that Section II of the Higher Education Act requires states to provide data regarding enrollment in teacher preparation programs. In 2009, the national enrollment in traditional educator preparation programs was 725,518. By 2013-2014, a 36% drop in enrollment to 464,250 had occurred (Partelow & Baumgardner, 2016). Downward trends regarding enrollment were attributed to adults returning to the workforce and not enrolling in post-secondary learning. The decline in enrollment in

traditional educator preparation programs was one key factor that has led to efforts by states and institutions of higher education to create more alternative teacher certification pathways.

The need for alternative pathways to teaching to diversify the educator workforce is clear. In 2008, 27% of Blacks and 25% of Hispanic teachers came into the teaching field through an alternative certification pathway. Only 11% of White teachers entered the field through an alternative pathway (Ulrich, 2011). Alternative certification programs attract more minority teachers to the field of education and thus allow for greater diversification of the teacher workforce. Alternative certification pathways are vital for states and exist in most states.

Alternative certification programs are present in many states; however, these programs vary from state to state. In North Carolina, the largest alternative pathway that exists is a *lateral entry*. A prospective teacher must have a bachelor's degree, 24 hours concentrated in a teachable area, and pass a content assessment (North Carolina Department of Public Instruction, 2019). The other option to obtain a license via lateral entry is to have a 2.5 GPA and 5 years of approved experience in the teaching profession. In both instances, a prospective teacher must be offered employment with a district and obtain a recommendation from the district of employment for a lateral teaching license (North Carolina Department of Public Instruction, 2019). Mississippi has three alternative pathways to licensure: Teach Mississippi Institute, Mississippi Alternative Path to Quality Teachers, and the American Board for Certification of Teacher Excellence (Mississippi Department of Education, 2019). Each pathway requires a 21 on the ACT for entry. However, each pathway has other unique components for entry, and the

components are dependent on the area in which one is seeking licensure (Mississippi Department of Education, 2019). Although each program has unique components, all focus on attracting professionals to the education profession. Moreover, although states may have similar pathways, they also have unique pathways that allow those with a bachelor's degree to enter the teaching profession. Arkansas, like other states, has alternative pathways to assist in attaining an adequate supply of teachers in the state.

Arkansas has alternative pathways in place and has worked to attract more teachers who mirror the student population, including males, to the profession. In Arkansas, nine paths exist for a prospective educator to obtain a teaching license. Although one is the traditional pathway via a college or university teacher education program, eight other alternative pathways to licensure are currently options in the state (Arkansas Department of Education, 2019e). Each pathway is unique and constitutes a continued attempt by the state to attract a new and diverse population of individuals to the profession.

Arkansas has several alternative pathways that lead to educator licensure. Seven universities in Arkansas have a Master of Arts in Teaching (MAT) program, including a licensure component. Moreover, the Arkansas Professional Pathway to Educator Licensure (APPEL) program, the American Board for the Certification of Teacher Excellence program, and the Arkansas Teacher Corps accept applicants who meet entrance requirements specified by each program. Teach for America also has a presence in the state (Arkansas Department of Education, 2019b). Enrollment in alternative licensure programs was 1,425 in 2017-2018, and 3 years previously, the enrollment was 1,436. While the numbers illustrated little change, the enrollment in APPEL, American

Board for the Certification of Teacher Excellence, and Arkansas Teacher Corps rose from 460 to 560 over the same period (Arkansas Department of Education, 2019a). Alternative certification programs in Arkansas are independent of institutions of higher education, except for MAT programs that are graduate programs at the university level. Regardless of program type and location, alternative certification programs are growing. Although alternative programs assist in addressing the need for more educators, these programs are unique compared to traditional educator preparation programs.

The APPEL program is a state-approved, alternative teacher certification program in Arkansas. The APPEL program provides a pathway to licensure for someone who has a college degree but not in education (Arkansas Department of Education, 2019c). A prospective educator can use the APPEL program to obtain licensure and begin a career in education. APPEL averages an annual enrollment of 368, which accounts for 10% of teacher licensure candidates (Arkansas Department of Education, 2019b). Twelve APPEL sites exist around Arkansas, emphasizing areas of greatest need in the state. To be admitted into the APPEL program, a participant must have at least a 4-year bachelor's degree from an accredited college or university. Applicants must also have passed required PRAXIS assessments for the area in which they are seeking licensure and subsequent employment. An application process must be completed that includes letters of recommendation and background information. A \$1,500 fee for the program is required. Applicants may appeal for conditional admittance if they cannot meet all entrance criteria (Arkansas Department of Education, 2019c). The APPEL program serves as an alternative pathway that is open to anyone with a bachelor's degree who can

pass the PRAXIS and meet the necessary admission requirements. The APPEL program represents an example of an alternative pathway to educator licensure in Arkansas.

Adult learning theory can be seen in many elements of the APPEL program. APPEL participants may seek employment as an educator after completing the first year of the program. APPEL also focuses on bringing experts (e.g., principals, superintendents, lead teachers) to provide relevant application to the prospective teachers (Arkansas Department of Education, 2019c). Adult learning theory focuses explicitly on experience and motivation. Knowles found that adults are internally motivated and bring much experience to the learning environment (Knowles, 1973). The APPEL program caters to educated adults who have life experience and want a career change. So, participants primarily come motivated and with many experiences. Other alternative programs in Arkansas also meet the needs of the adult learner.

The MAT program is an alternative certification program offered through institutions of higher education in Arkansas. MAT programs are also seen as a means to close supply and demand gaps in school districts. Schools needed teachers, and the development of MAT programs offered a solution beyond pursuing an additional 4-year bachelor's degree (Harrell, 1968). MAT programs met the need for more teacher availability in a given state. Eleven universities in Arkansas offer MAT programs as an alternative means of educator licensure through the respective institutions. Of those 11 MAT programs, 10 universities had MAT program completers totaling 329 for the 2017-2018 academic year (Arkansas Department of Education, 2019b). Because they are offered at higher education institutions, MAT programs are often more accessible to those seeking alternative teacher certification in Arkansas. MAT programs possess many

components that address adult learning theory. Many programs offer tracks that allow for either field experiences or initial employment with provisional licensure (Harding University, 2020). When examining Knowles' four principles of adult learning, those in MAT programs are ready to enter the teaching profession, oriented to the expectations, self-directed, and bring experience (Knowles, 1973). Thus, through job placement and field experience, the MAT program must ensure that it meets adult learners' varying needs. MAT programs provide a route to teacher licensure through universities and may be a better option for some seeking to become a teacher via an alternative route in Arkansas.

The American Board for the Certification of Teacher Excellence or American Board and the Arkansas Teacher Corp are two other examples of alternative certification programs in Arkansas. American Board is open to those with a bachelor's degree who can pass a background check. Arkansas allows a person to seek licensure in secondary physics, chemistry, biology, social studies, and English (Arkansas Department of Education, 2019e). Arkansas also recognizes all middle-level endorsements through the program. American Board is available in 19 states (American Board for the Certification of Teacher Excellence, 2019). Arkansas Teacher Corp also requires a bachelor's degree and uses a cohort model to select participants (Arkansas Department of Education, 2019c). Cohorts complete a 7-week summer institute. Cohort members also participate in face-to-face and virtual professional development. Currently, 15 school districts in Arkansas partner with Arkansas Teacher Corp to support their teacher pipeline (Arkansas Teacher Corp, 2019). The American Board for the Certification of Teacher Excellence program and Arkansas Teacher Corps serve as two other alternative certification

programs besides the APPEL and MAT programs. Many programs exist for adult learners to become a teacher through an alternative route in Arkansas.

Licensure Exams

Licensure exams may look different from state to state. Cavanaugh (2015) described teacher certification testing as a \$1.2 billion industry in the United States. Educational Testing Service and Pearson are the two major teacher licensure examination entities in the United States. Educational Testing Service is a non-profit company producing the PRAXIS exams, and Pearson is a corporation that administers examinations across the United States. Pearson creates teacher licensing examinations for individual states that align with given state standards. The PRAXIS serves as one example of a national licensing exam for states (Cavanaugh, 2015). Educational license testing is a significant industry in the United States. States are consistently looking at options regarding teacher licensure examinations. Indiana opted to switch from Pearson to Educational Testing Service in 2021 (U. S. News and World Report, 2019). California also awarded a 3-year, \$240 million contract to Educational Testing Service to administer the state's teacher examinations (Cavanaugh, 2015). Educator licensure is a lucrative but necessary endeavor that states undertake as they strive to license teachers. Each state has different requirements regarding licensure for teachers.

Licensure and Race

In Arkansas, racial gaps are present when examining various PRAXIS content exams that a potential educator must pass to obtain a teaching license in the state. In 2018-2019, 1,044 PRAXIS content exams were completed in Arkansas for the reading/English language arts subtest on the Elementary Education: Multiple Subjects

exam, with an overall pass rate of 84.72%. White test-takers had a pass rate of 88% compared to Black test-takers who had a pass rate of 55% on the same PRAXIS content assessment. Similar gaps can be found on other PRAXIS content assessments in Arkansas. The gifted education PRAXIS had a White pass rate of 81.93% and a Black pass rate of 50%. Finally, for 2018-2019, 18 Black individuals took 26 mathematics content knowledge exams with no passing scores attained, and among White test-takers, 226 exams were taken by 144 individuals with a 37% pass rate (Arkansas Department of Education, 2019a). The PRAXIS data from Arkansas illustrated gaps like nationwide trends. Arkansas data also illustrated two concerns: the large gap in scores between White and Non-White test takers and the gap in assessments given between White and Non-White populations. A gap exists in Arkansas between outcomes for Whites and Non-Whites, raising issues that must be addressed.

The disproportionate pass rate on the PRAXIS exam in Arkansas inevitably leads to the disproportionate representation of the races in Arkansas classrooms, as well. The United States Census Bureau (2019) stated that Arkansas's total population was 72.2% White, 15.7% Black, and 7.7% Latino, with the remaining 4.4% of mixed or other races. The K-12 student population in Arkansas was 60.0% White, 19.7% Black, 13.4% Latino, and the remaining 6.9% being other races or mixed race. In 2019, Arkansas's certified staff included 84.4% White, 13.2% Black, and 0.1% Latino (Arkansas Department of Education, 2019a). Though the data illustrated that statewide population trends and certified staff trends might be somewhat similar, a gap existed between certified staff trends and the K-12 student population. The gap for the White population was +24.4%,

but for the Black population and Latino population, the gap was -6.5% and -13.3%, respectively. With such a gap present, the effects of the gap must also be considered.

Another consequence of teacher shortages and lack of representation is a disproportionate number of teachers teaching out of the field (not in their certification area), high poverty, and high minority schools. Ingersoll (1996) found that, overall, teachers in 20% of secondary English classes did not have an English certification or degree in any English-related field. However, the percentage of students in high poverty, high minority schools taught by a teacher without an English certification or a degree in any English field increased to 33%. Non-certified teachers were more likely to teach in schools with high minority populations. The lack of licensure among teachers educating students with the highest needs illustrates a cycle that perpetuates the gap for students in schools (Ingersoll, 1996). Licensure and adult learning should be something addressed to teach students effectively.

Those within Arkansas who were pursuing a degree in education through an educator preparation program provided further insight. For 2017-2018, students enrolled in traditional educator preparation programs were 79% White and 21% Non-White. Those who completed a traditional educator preparation program in 2017-2018 were 83% White and 17% Non-White (Arkansas Department of Education, 2019b). Teachers coming out of traditional educator preparation programs do not mirror the student population in K-12 schools across Arkansas. Alternative certification and an examination of licensure practices could play a role in closing the gaps presented. Arkansas educator preparation program enrollment illustrates that the teacher workforce is steady, but enrollment is not diversified to mirror its student population.

The implications when a teacher population does not mirror the student population are evident. Black teachers often bring to the profession a strong desire for social justice and a commitment to the betterment of the Black community (Hayes, Juarez, & Escoffrey-Runnels, 2014). Gershenson et al. (2017) found that Black male students exposed to just one Black teacher in Grades 3-5 are 39% less likely to drop out of high school. Also, Black students, male and female, exposed to just one Black teacher in Grades 3-5 are 19% more likely to pursue a college education. Interestingly, when Black students are exposed to two or three Black teachers, the given data was not altered to a high degree. The exposure for a Black student to any Black teacher has a significant effect, and the influence was stronger among Black students from poverty (Gershenson et al., 2017). Having a Black teacher was important for Black students. Although efforts should be made to ensure the teacher population better matches the student population. Non-White students, at the very least, need some exposure to Non-White teachers. The diversification of the teacher workforce to better reach students of varying backgrounds is essential.

Efforts to diversify the teacher workforce take on different forms. Rogers-Ard, Knaus, Bianco, Brandehoff, and Gist (2019) argued that the inherent Whiteness in higher education and public schools was a constant barrier. Even if the demand for teachers was being met, minority students' needs would continue to be ignored because of systemic racism, whether deliberate or not. The lack of cultural awareness and addressing racial issues has created a systemic problem. One solution proposed was a greater emphasis on *grow your own* models. The idea was for schools to recruit and develop minority students in high school in hopes that they may come back to the school they attended and

essentially be a part of the change in behaviors and attitudes toward minority students (Rogers-Ard et al., 2019). More states are nearing a time when Non-White students will be the majority. For example, California's student population is 72% Non-White, but only 29% of the teachers are Non-White, a gap of 43% (Ulrich, 2011). The need for greater diversity in the workforce is evident across the nation. Efforts like grow your own initiatives are becoming more prevalent. The issue of how licensure may be a barrier for prospective minority teachers should be considered.

Trends in minority teacher recruitment are not meeting the demands. Approximately 20 states have a gap of 25 points or more between the diversity of their teachers and students (Boser, 2011). In 2019, Arkansas's diversity gap between teachers and students was 15.6% (Arkansas Department of Education, 2019a). Boser (2011) stated that 49.9% of 3-year-old children in the United States are White. The data illustrated that although a wide gap between the diversity of teachers and students does exist, the nation's student population continues to diversify. By the year 2045, estimates have suggested that the United States may have a White minority. Estimates noted that by 2045, the White population might make up 49.7% of the total United States. The remaining population breakdown estimates are 24.6% Latino, 13.1% Black, 7.9% Asian, and 3.8% other and mixed races (Frey, 2018). With the diversification gap evident and population trends representing a greater need for diversification of the teacher workforce, efforts must be made to ensure greater access to the teaching profession for diverse backgrounds. Current trends are not diversifying the teacher workforce, so state entities must examine ways to address the problem.

For greater success on licensure exams, particularly for minority teachers, adult learning theory must be taken into consideration. Petchauer (2018) noted trends among Black women attempting to pass the PRAXIS Core basic skills exam. The gap between White and Black pass rates have been examined on the PRAXIS Core exam. However, the role of experience, a key to Knowles' adult learning theory, plays a major role when examining the licensure exam process. For example, Black preservice teachers who did pass the PRAXIS Core exam on their first attempt had a pass rate on later secondary subject exams that were similar to their White test-takers. Factors that led to a higher pass rate on the initial PRAXIS Core included test-takers using strategies such as time management and selecting the passages and questions test-takers knew first. Minority test-takers noted factors such as having a supportive family and friend group and surrounding themselves with positive people who spoke encouragingly about their experiences on the exam (Petchauer, 2018). Tangible ways do exist to assist minority test-takers in the successful passage of licensing exams. Support through the lens of adult learning theory is paramount. Those seeking licensure from different backgrounds, including racial, bring a vastly different self-concept. They also have different experiences and orientations to learning that must be taken into consideration. Adult learning principles should be considered when establishing strategies to support adult learners, particularly minority adult learners.

Licensure and Gender

Teaching has been viewed as a female profession. Early normal schools and teacher colleges were, on average, comprised of 70% female students. The rise of teacher colleges in the late 19th and early 20th centuries coincided with World War I and World

War II, further ingraining women in the teaching profession (Bohan & Null, 2007). In recent years, the trend was still prevalent, with 76% of Arkansas teachers being female as of 2019 (Arkansas Department of Education, 2019a). In the United States, teaching has always been and continues to be a female-dominated profession. Approximately three-fourths of those in the preparation programs and the teaching profession itself have historically been female. Similar trends have persisted in Arkansas.

Though the exposure of minority students to minority teachers is important, the gender gap does not appear to have the same ramifications. The gender of a teacher more determines how a student learns and is affected during the learning experiences (Leraas, Kippen, & Larson, 2015). The gender of a teacher does not have the cultural and mentor-like influence that having a same-race teacher can have on a student in the school setting. However, the gender of a teacher does have an implication regarding how a student approaches the learning and the affective reaction that might exist in the given setting.

The examination of gender in Arkansas also illustrates education gaps. Arkansas has a statewide gender breakdown that is 50.9% female and 49.1% male (United States Census Bureau, 2019). The teaching population in Arkansas is 75.6% female and 24.4% male. Comparatively, the student population is 48.7% female and 51.3% male in Arkansas (Arkansas Department of Education, 2019a). The data presented illustrate the gap between male teachers and male students. However, enrollment in traditional educator preparation programs shows a similar trend, with 79% of those enrolled being female and 21% male (Arkansas Department of Education, 2019b). Although the racial gap in Arkansas is present, the gender gap was also one that also portrayed a gap.

Whereas the racial gaps in education are paramount, examining the need for a more gender-balanced educator pool should be provided. Leraas et al. (2015) found that the gender of a given teacher had mixed results regarding student achievement and the differences in classroom experiences. More consistent engagement was noted in classrooms taught by a male teacher. However, Leraas et al. noted that students also stated that they have more positive interactions and growth from female teachers outside of the classroom setting. When looking at learning, studies have been mixed. One theme witnessed was that male students were more willing to speak up and engage in in-class activities. When students did not participate, reasoning varied significantly by gender. Female students often stated they did not engage in a class setting because they struggled to formulate thoughts and fear judgment (Leraas et al., 2015). Male students stated that they frequently did not engage for fear of appearing ignorant or comments determining their overall grades (Leraas et al., 2015). Male teachers were less affected by stress in the workplace than female teachers. Differences in attitudes towards the school setting are minimal by gender (Tran, 2015). Factors such as school culture and school leadership are much stronger influences. If the school has a positive culture and strong leadership, teachers were generally happier and more diligent, regardless of gender (Tran, 2015). Although a gender gap and a racial gap were present in schools, the gender gap appeared not to be detrimental to learning. Being aware of gender gaps and perceptions by students is important, but the focus on a racially diverse teacher workforce should take precedence when considering students' needs.

Summary

Knowles outlined the characteristics of adult learning. Though the difference between adults' and children's learning became known because of Knowles' work (1973), a direct correlation to educator licensure has not been previously made. The reviewed literature outlined the need for a more diversified teacher workforce that represents the students being educated. Ulrich (2011) noted that at least 20 states in the United States have a diversity gap between the student and teacher population. Although gender gaps also exist, the gender of a teacher had more to do with the classroom experience and not overall academic success, like that of the teacher's race (Leraas et al., 2015). The idea that a state teacher licensing exam could contribute to the gaps regarding race in the teaching profession must be considered. The research notes the gaps present, but an application regarding the knowledge of said gaps to adult learning theory and educator licensing exams is still needed.

States must examine current licensure practices more closely to determine if they are contributing to racial and gender gaps in the teaching profession. For this reason, the following study examined the results of the PRAXIS Elementary Education: Multiple Subjects tests, specifically analyzing the English/language arts, mathematics, social studies, and science subtest by race, White and Non-White. Moreover, the study also examined PRAXIS results on the exam and subsequent subtest by participation in traditional educator preparation programs or alternative certification programs. By determining how licensure exam scores vary by race and gender and teacher preparation program type, state policy can be informed in determining best practices for the licensing

of educators. Also, preparation programs may be better informed to use more practices based on adult learning theory to reach adults seeking a teaching license.

Further, exam standards must be established that respond to the needs of a diverse teacher pipeline. Licensure exam standards for prospective educators must ensure a quality supply of teachers for students (Stotsky, 2008). However, many licensure exam practices persist despite wide gaps in scores across racial demographics. If state agencies desire a diverse teacher workforce that mimics the overall student and state population, analysis of exam practices may be warranted. Students of color must have access to teachers who look like they do during their educational journey (Almay & Theokas, 2010). Frey (2018) stated that by 2045, the Non-White Americans would outnumber White Americans. With the changing societal demographics, education entities must determine how to respond to demographic trends to address the needs of an increasingly diverse society. Moreover, although gender may not have long-term ramifications, like the race or ethnicity of an educator, the gender of a teacher may determine the learning experience and environment that a student understanding in the said environment (Leraas et al., 2015). The goal of teacher preparation programs is equal access for all students to a high quality, diverse teacher workforce that resembles them as individuals and responds to their cultural needs. To that end, preparation programs and state education agencies should be examining teacher preparation and licensing practices to ensure equitable opportunities for all who desire to educate the nation's future. Chapter III included the research design, sample, instrumentation, data collection procedures, analytical methods, and this study's limitations.

CHAPTER III

METHODOLOGY

The literature review suggested the need to examine what implications the educator preparation pathway had on the ability of a prospective teacher to pass the PRAXIS Elementary Education: Multiple Subjects exam successfully. Formal teacher preparation programs at higher education institutions have existed since the late 19th and early 20th century (Congressional Research Service, 2018). Subsequently, alternative preparation programs, a relatively new concept, began in the 1980s and have seen vast growth since that time (Zhang & Zeller, 2016). The literature review revealed that traditional educator preparation programs, in their overarching design, have remained mostly unchanged over time. A model such as the professional development schools that prepare teachers with increased field experiences has shown potential for more authentic learning within a traditional preparation setting (Green & Ballard, 2010). The purpose of this study was to determine the effects by race between teacher preparation candidates that enrolled in a traditional teacher preparation program versus those who chose one of two alternative preparation programs, MAT or APPEL, as measured by the PRAXIS Elementary Education: Multiple Subjects exam subtests of reading/English language arts, mathematics, science, and social studies. The hypotheses for this study were as follows:

1. No significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a

- nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Reading/English Language Arts elementary education test for teacher candidates in Arkansas.
2. No significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Mathematics elementary education test for teacher candidates in Arkansas.
 3. No significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Science elementary education test for teacher candidates in Arkansas.
 4. No significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Social Studies elementary education test for teacher candidates in Arkansas.

Research Design

A quantitative, causal-comparative strategy was used for this study. The researcher used a 3 x 2 factorial between-groups design to analyze each hypothesis. For all four hypotheses, the independent variables were the type of teacher preparation program (a traditional undergraduate teacher program, MAT program, and an APPEL

program) and race (White and Non-White). A factorial design allowed the examination of the interaction and main effects of the six groups (Non-Whites participating in a traditional undergraduate educator preparation program, Whites participating in a traditional undergraduate educator preparation program, Non-Whites participating in an MAT program, Whites participating in an MAT program, Non-Whites participating in the APPEL program, and Whites participating in the APPEL program). The dependent variable for Hypothesis 1 was knowledge and skills measured by scores on the PRAXIS Elementary Education: Multiple Subjects reading/English language arts subtest. The dependent variable for Hypothesis 2 was knowledge and skills measured by scores on the PRAXIS Elementary Education: Multiple Subjects mathematics subtest. The dependent variable for Hypothesis 3 was knowledge and skills measured by scores on the PRAXIS Elementary Education: Multiple Subjects science subtest. The dependent variable for Hypothesis 4 was knowledge and skills measured by scores on the PRAXIS Elementary Education: Multiple Subjects social studies subtest.

Sample

Scores from the PRAXIS Elementary Education: Multiple Subjects exam were used for this study. The following stratified random sampling procedure was used for each of the four subtests, reading/English language arts, mathematics, science, and social studies. First, program type scores were stratified: educators completing a traditional undergraduate teacher program, MAT program, or an APPEL program. Second, scores were stratified by race: White and Non-White. Also, an effort was made to stratify by gender for validity purposes. Finally, 40 scores were randomly selected from each of the six groups: Non-Whites participating in a traditional undergraduate educator preparation

program, Whites participating in a traditional undergraduate educator preparation program, Non-Whites participating in a MAT program, Whites participating in a MAT program, Non-Whites participating in the APPEL program, and Whites participating in the APPEL program. Therefore, each hypothesis' sample consisted of scores from 240 teachers or teacher candidates completing either a traditional or alternative teacher preparation program. This study's data contained scores from teacher candidates who had reportable scores in each of the four subtests on the PRAXIS Elementary Education: Multiple Subjects exam (reading/English language arts, mathematics, science, and social studies).

Instrumentation

The Arkansas Department of Education, Division of Elementary Education (2019e), uses the PRAXIS series by Educational Testing Services to assess the licensure of teachers in Arkansas. The PRAXIS Elementary Education: Multiple Subjects assessment is divided into four subtests: reading/English language arts, mathematics, science, and social studies. Each subtest is scored on a scale of 100 to 200, and state licensing entities set different passing scores for each of the exams. The state board of education in Arkansas establishes passing scores for each subtest reading/English language arts and mathematics is 157, science is 159, and social studies is 155 (Educational Testing Services, 2019). Each of the four subtests must be passed for licensure as an elementary teacher in Arkansas. Licensure candidates will typically attempt all four subtests, but if they do not pass one more or more subtest, they can take those individually on subsequent attempts.

For this study, the scores from each subtest of the PRAXIS: Elementary Education: Multiple Subjects exam were used. The PRAXIS assessment is designed to measure content-specific knowledge to teach students. The various PRAXIS exams are taken as a means of teacher certification in a given state. The PRAXIS series is used by 51 states, districts, and territories in the United States (Educational Testing Services, 2020). Licensing entities use the PRAXIS exams for licensing of teachers in their given state or territory. States may use the PRAXIS in conjunction with other state-approved exams. Each content exam has a set score range, and individual states and territories establish passing scores, so they often vary from state to state.

For the PRAXIS Elementary Education: Multiple Subjects assessment, each subtest is scored on a scale of 100-200. Each subtest has reporting categories, but only a summative score in the range of 100-200 is provided. However, exam takers can see how they performed on each of the categories for future preparation if they do not pass initial attempts. Categories for the reading/English language arts subtest are reading and writing, speaking, and listen. The subtest consists of 80 multiple-choice questions, and candidates are allowed 90 minutes to complete the exam. For the mathematics subtest, categories are numbers and operations, algebraic thinking, and geometry. The subtest consists of 50 multiple-choice questions, and candidates are allowed 65 minutes to complete the exam. The science subtest consists of earth science, life science, and physical science and includes 55 questions. Test takers are allowed 60 minutes to complete. Finally, the categories for the social studies subtest are United States history, geography, and world history and include 60 questions. Test takers are allowed 60 minutes to complete the test.

Data Collection Procedures

After approval by the Institutional Review Board, permission was provided by the Division of Elementary and Secondary Education, Office of Educator Effectiveness. The Assistant Commissioner for the Office of Educator Effectiveness was sent an email and subsequent letter explaining the study and requesting data from the 2019-2020 PRAXIS Elementary Education: Multiple Subjects exam. A signed letter and follow-up email provided documentation of permission granted. Scores from the 2019-2020 PRAXIS Elementary Education: Multiple Subjects subtests of reading/English language arts, mathematics, science, and social studies were collected for analysis. The Division of Elementary and Secondary Education provided scores from the PRAXIS assessment database. The collected scores from the three educator preparation programs, traditional, APPEL, and MAT, rosters were provided to ensure the correct program's scores were documented. Scores were collected from the database and placed into a Microsoft Excel spreadsheet. Names of assessment takers were replaced with codes, and other personally identifiable information was deleted. The data were stored in a secure location.

Analytical Methods

IBM Statistical Packages for the Social Sciences (SPSS) Version 26 was used to analyze the data for this study. The collected data for the four hypotheses were coded according to the type of educator preparation program and race. The following codes were used for each program (1 = traditional undergraduate educator preparation program, 2 = APPEL program, and 3 = MAT program) and race (1 = White, 2 = Non-White). Each of the four hypotheses was then analyzed using a 3 x 2 factorial between-groups ANOVA. The independent variables for each hypothesis were program type (traditional

educator preparation program versus APPEL versus MAT) and race (White versus Non-White). The dependent variables for the four hypotheses were knowledge and skills measured by scores on each of the four subtests of the PRAXIS Elementary Education: Multiple Subjects exam: reading/English language arts, mathematics, science, and social studies. A two-tailed test with a .05 level of significance was used to test the four hypotheses.

Limitations

Any study will have limitations, and those limitations should be acknowledged to evaluate the study's internal and external validity. By recognizing the possible limitations, the reader can better interpret the results in Chapter IV and the recommendations in Chapter V. First, inconsistency in preparation for the PRAXIS Elementary Education: Multiple Subjects exam could affect the data. The actual instruction and instructional outcomes might differ between the pathways and among the various educational institutions. Different instructional expectations could affect success on the exam and subsequent licensure status. If teachers did not correctly implement strategies for the licensure exam with fidelity, then the data could be influenced. Moreover, the level of direct support provided to the teacher candidates may have varied. Traditional educator preparation programs at colleges and universities frequently offer academic advisors, tutors, and resources. While similar supports may exist in the APPEL and MAT programs, they are alternative programs, and direct support in an advisory capacity is often not provided as directly as in a traditional educator preparation setting.

Second, no concise research exists that directly correlates race with both alternative teacher certification and traditional teacher certification. While no shortage of

literature exists regarding alternative programs and race in education, the two are not succinctly linked to provide a thorough analysis of their relationship, particularly in comparison to traditional teacher preparation programs at colleges and universities. Examining both types of preparation programs in conjunction with teacher licensure examinations allows for a more thorough analysis of their relationship.

Third, results for each subtest for the PRAXIS Elementary Education: Multiple Subjects exam (reading/English language arts, mathematics, science, and social studies) were randomly sampled by program type (traditional, APPEL, and MAT) from the Arkansas Department of Education, Division of Elementary and Secondary Education licensure database. The samples taken from the database were from those teacher candidates who have applied for licensure in Arkansas. This situation limits the pool for sampling, but a sufficient number was found for this study.

Fourth, due to using a casual-comparative design, the researcher was unable to manipulate the independent variables. Since this manipulation could not occur, the possibility that groups were not equivalent could threaten the study's internal validity.

Despite these limitations, the study results still provided the reader with unique insights into the varying pathways prospective educators take to become licensed teachers in Arkansas. Moreover, these pathways were then scrutinized to determine how the different pathways affected scores on licensing examinations in the state.

Summary

The researcher was able to stratify the data by race and type of preparation program to determine their effects on the knowledge and skills measured by scores for each of the subtests on the PRAXIS Elementary Education: Multiple Subjects exam for

licensure as an elementary teacher in Arkansas. The data were provided by the Division of Elementary and Secondary Education, Office of Educator Effectiveness. Only scores for those who had taken all four subtests (reading/English language arts, mathematics, science, and social studies) were used for this study. A 3 x 2 factorial ANOVA with a between-groups design was used to analyze the four hypotheses, and the results of each hypothesis is discussed in Chapter IV.

CHAPTER IV

RESULTS

The purpose of this study was to determine the effects by race between traditional educator preparation program, APPEL program, and the MAT program on knowledge and skills as measured by results on the PRAXIS Elementary Education: Multiple Subjects exam subtests. The independent variables were the type of educator preparation and race for all the hypotheses. The dependent variables for Hypotheses 1-4 were knowledge and skills from the four PRAXIS Elementary Education: Multiple Subjects exam subtests, which included reading/English language arts, mathematics, science, and social studies, respectively. Scores collected served as the study subjects and were from teacher candidates in both traditional educator preparation programs and nontraditional educator preparation programs (APPEL and MAT).

Analytical Methods

Data for this study were collected and subsequently coded for each of the four hypotheses: program type (1 = APPEL, 2 = educator preparation program, 3 = MAT) and race (1 = White, 2 = Non-White). *IBM Statistical Packages for Social Sciences (SPSS) Grad Pack 27* was used to analyze each of the four hypotheses using a 3 x 2 between-groups factorial ANOVA. The study used 180 teacher candidates who had enrolled in one of the three educator preparation programs from 2018-2020. The racial categorization of the sample population contained 90 White and 90 Non-White teacher candidates.

Histograms were used to check for assumptions of normality. Homogeneity of variances was checked with Levine's test of variance. Assumptions of normality were assessed before the statistical analysis.

Hypothesis 1

Hypothesis 1 states that no significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Reading/English Language Arts elementary education exam for educator candidates in Arkansas. To test this hypothesis, a 3 x 2 factorial ANOVA was conducted. Prior to carrying out the statistical analysis for the factorial ANOVA, data were screened for entry errors and missing values, with none found. The data were also checked for outliers and the assumptions of independence of observations, assumptions of normality, and homogeneity of variances. Descriptive statistics and inferential results were also reviewed. Table 1 illustrates the group means, standard deviations, and *n* values for scores on the reading/English language arts subtest by race.

Table 1

Means, Standard Deviations, and Number for Reading/English Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race

| Teacher Prep Program | Race | <i>M</i> | <i>SD</i> | <i>n</i> |
|---------------------------|-----------|----------|-----------|----------|
| APPEL Program | Non-White | 171.87 | 7.37 | 30 |
| | White | 172.20 | 10.80 | 30 |
| | Total | 172.03 | 9.17 | 60 |
| Undergraduate Traditional | Non-White | 165.17 | 12.86 | 30 |
| | White | 171.37 | 8.01 | 30 |
| | Total | 168.27 | 11.07 | 60 |
| Nontraditional MAT | Non-White | 170.67 | 7.64 | 30 |
| | White | 171.23 | 9.74 | 30 |
| | Total | 170.95 | 8.68 | 60 |
| Total | Non-White | 169.23 | 9.96 | 90 |
| | White | 171.60 | 9.49 | 90 |

Levene's test of equality of variance, $F(5, 174) = 2.07, p = .071$, illustrated that the assumption of homogeneity of variances was not significant and, therefore, not violated. No outliers adversely affected the analysis, as demonstrated by a histogram. The Shapiro Wilks test was used to examine normality for the six groups (APPEL Non-White, $p = .007$; APPEL White, $p = .427$; Traditional Preparation program Non-White, $p = .001$; Traditional Preparation program White, $p = .430$; MAT Non-White, $p = .021$; MAT White, $p = .068$). Three of the groups violated normality. Despite these violations, the

factorial ANOVA is robust to violations of normality (Leech, Barrett, & Morgan, 2015).

The results of the factorial ANOVA are displayed in Table 2.

Table 2

Factorial Analysis of Variance for Reading/English Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race

| Variable and source | <i>df</i> | <i>MS</i> | <i>F</i> | <i>p</i> | η^2 |
|-------------------------|-----------|-----------|----------|----------|----------|
| Teacher Prep Program | 2 | 225.62 | 2.45 | .090 | 0.027 |
| Race | 1 | 252.05 | 2.73 | .100 | 0.015 |
| TeacherPrepProgram*Race | 2 | 165.52 | 1.79 | .169 | 0.020 |
| Error | 174 | 92.28 | | | |

Results of the factorial ANOVA analysis indicated no significant interaction between race and scores on reading/English language arts subtest, $F(2, 174) = 1.79, p = .169, ES = 0.020$. Race and program type did not combine significantly to affect scores on the reading/English language arts subtest. This result had a small effect size (Cohen, 1988). In the APPEL and MAT programs, the Non-White and White groups scored, on average, approximately the same. For the traditional educator preparation program, the White participants scored, on average, approximately six points higher than the Non-White group. However, the difference was not statistically significant. Figure 1 displays the means for the six groups.

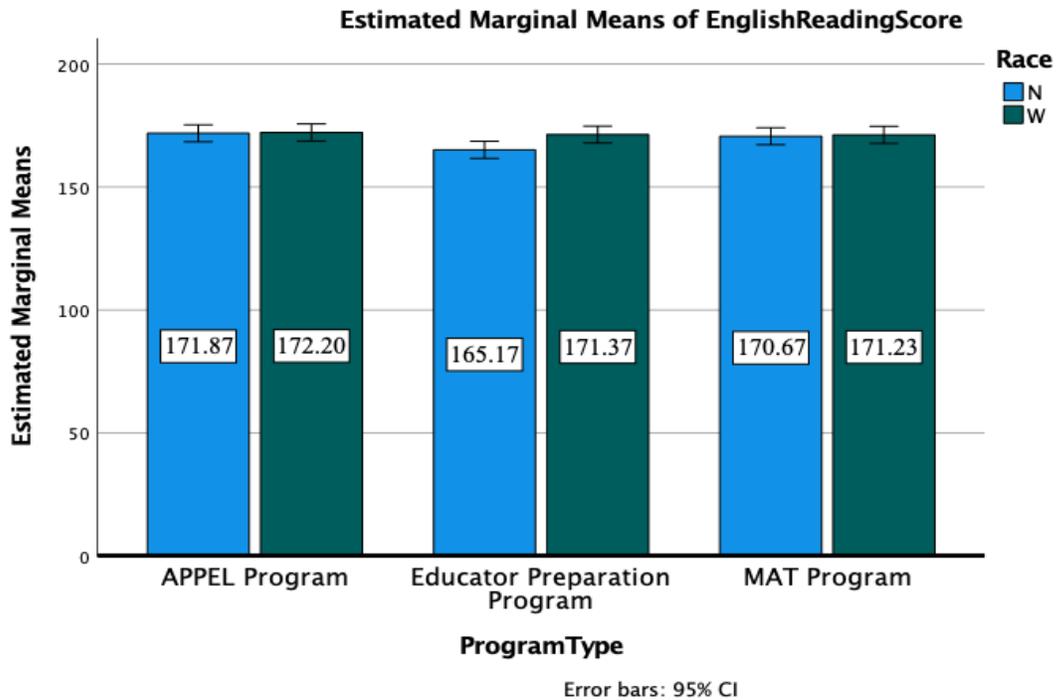


Figure 1. Means for reading/English Language arts subtest by program type and race.

Because no interaction effect existed, the main effect variables were analyzed separately. The main effect of program type was not significant, $F(2, 174) = 2.45, p = .090, ES = 0.027$. The mean on the reading/English language arts subtest was slightly higher for the APPEL program ($M = 172.03, SD = 9.17$) than the other two programs, the MAT ($M = 170.95, SD = 8.68$) and the traditional educator preparation program ($M = 168.27, SD = 11.07$). Likewise, no statistically significant main effect for race was found, $F(1, 174) = 2.73, p = .100, ES = 0.015$. The mean for White students ($M = 171.60, SD = 9.49$) was not significantly different from the mean of Non-White students ($M = 169.23, SD = 9.96$). Therefore, the results demonstrated no combined or individual effect of program type and race on reading/English language arts subtest scores.

Hypothesis 2

Hypothesis 2 states that no significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Mathematics elementary education exam for educator candidates in Arkansas. To test this hypothesis, a 3 x 2 factorial ANOVA was conducted. Prior to carrying out the statistical analysis for the factorial ANOVA, data were screened for entry errors and missing values, with none found. The data were also checked for outliers and the assumptions of independence of observations, assumptions of normality, and homogeneity of variances. Descriptive statistics and inferential results were also reviewed. Table 3 illustrates the group means, standard deviations, and *n* values for scores on the reading/English language arts subtest by race.

Table 3

Means, Standard Deviations, and Number for Mathematics Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race

| Teacher Prep Program | Race | <i>M</i> | <i>SD</i> | <i>n</i> |
|---------------------------|-----------|----------|-----------|----------|
| APPEL Program | Non-White | 171.67 | 6.53 | 30 |
| | White | 175.07 | 9.76 | 30 |
| | Total | 173.37 | 8.40 | 60 |
| Undergraduate Traditional | Non-White | 170.03 | 10.63 | 30 |
| | White | 169.93 | 15.94 | 30 |
| | Total | 169.98 | 13.43 | 60 |
| Nontraditional MAT | Non-White | 173.17 | 5.81 | 30 |
| | White | 172.43 | 6.59 | 30 |
| | Total | 172.80 | 6.17 | 60 |
| Total | Non-White | 171.62 | 7.96 | 90 |
| | White | 172.48 | 11.51 | 90 |

Levene's test of equality of variance, $F(5, 174) = 6.00, p = .000$, illustrated that the assumption of homogeneity of variances was not met. No outliers adversely affected the analysis as demonstrated by a histogram. The Shapiro Wilks test was used to examine normality for the six groups (APPEL Non-White, $p = .008$; APPEL White, $p = .190$; Traditional Preparation program Non-White, $p = .298$; Traditional Preparation program White, $p = .029$; MAT Non-White, $p = .582$; MAT White, $p = .251$). Two of the six groups violated the assumption of normality. Despite these violations, the factorial

ANOVA is robust to violations of normality (Leech et al., 2015). The results of the factorial ANOVA are displayed in Table 4.

Table 4

Factorial Analysis of Variance for Mathematics Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race

| Variable and source | <i>df</i> | <i>MS</i> | <i>F</i> | <i>p</i> | η^2 |
|-------------------------|-----------|-----------|----------|----------|----------|
| Teacher Prep Program | 2 | 197.02 | 2.03 | .134 | 0.023 |
| Race | 1 | 32.94 | 0.34 | .561 | 0.002 |
| TeacherPrepProgram*Race | 2 | 74.34 | 0.77 | .466 | 0.009 |
| Error | 174 | 96.98 | | | |

Results of the factorial ANOVA analysis indicated no significant interaction between race and scores on the mathematics subtest, $F(2, 174) = 0.77, p = .466, ES = 0.009$. Race and program type did not combine significantly to affect scores on the mathematics subtest. This result had a small effect size (Cohen, 1988). In the educator preparation and MAT programs, the Non-White and White groups scored, on average, approximately the same. For the APPEL program, the White participants scored, on average, approximately four points higher than the Non-White group. However, the difference was not statistically significant. Figure 2 displays the means for the six groups.

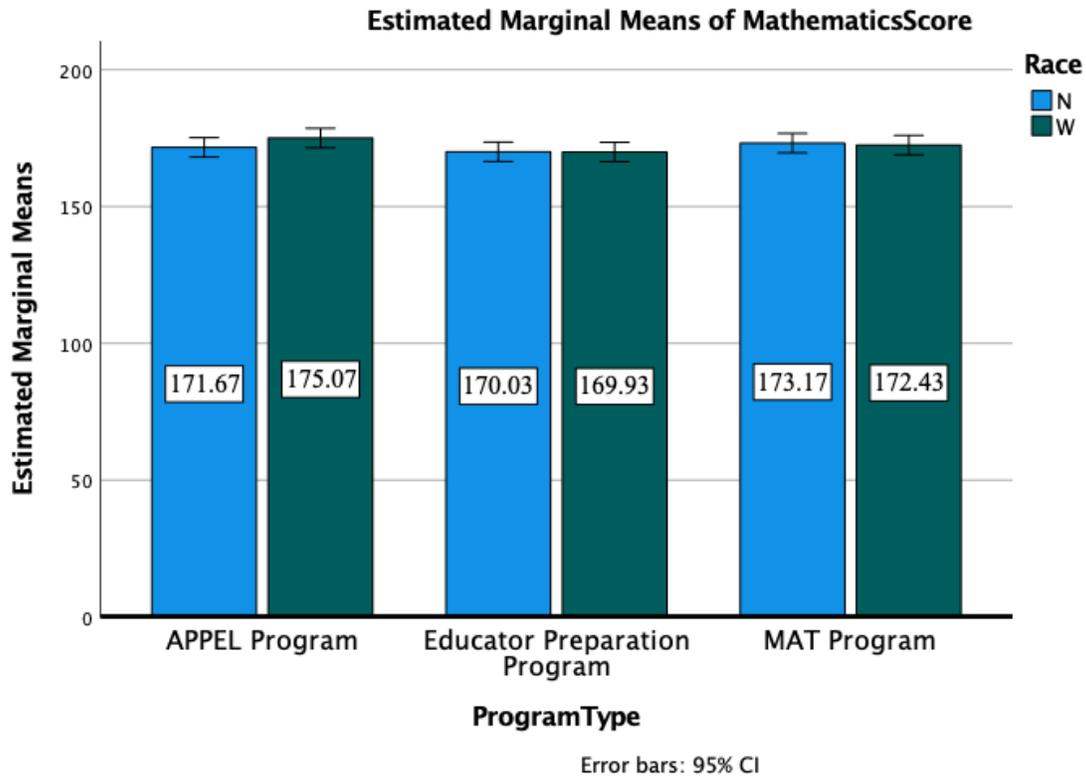


Figure 2. Means for mathematics subtest by program type and race.

Because no interaction effect existed, the main effect variables were analyzed separately. The main effect of program type was not significant, $F(2, 174) = 2.03, p = .134, ES = 0.023$. The mean on the mathematics subtest was only slightly higher for the APPEL program ($M = 173.37, SD = 8.41$) and MAT program ($M = 172.80, SD = 6.17$) than the traditional educator preparation program ($M = 169.98, SD = 13.43$). Likewise, no statistically significant main effect for race was found, $F(1, 174) = 0.34, p = .561, ES = 0.002$. The mean for White students ($M = 172.48, SD = 11.51$) was not significantly different from the mean of Non-White students ($M = 171.62, SD = 7.96$). Therefore, the results demonstrated no combined or individual effect of program type and race on mathematics subtest scores.

Hypothesis 3

Hypothesis 3 states that no significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Science elementary education exam for educator candidates in Arkansas. To test this hypothesis, a 3 x 2 factorial ANOVA was conducted. Prior to carrying out the statistical analysis for the factorial ANOVA, data were screened for entry errors and missing values, with none found. The data were also checked for outliers and the assumptions of independence of observations, assumptions of normality, and homogeneity of variances. Descriptive statistics and inferential results were also reviewed. Table 5 illustrates the group means, standard deviations, and *n* values for scores on the science subtest by race.

Table 5

Means, Standard Deviations, and Number for Science Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race

| Teacher Prep Program | Race | <i>M</i> | <i>SD</i> | <i>n</i> |
|---------------------------|-----------|----------|-----------|----------|
| APPEL Program | Non-White | 171.40 | 7.00 | 30 |
| | White | 171.60 | 10.71 | 30 |
| | Total | 171.50 | 8.97 | 60 |
| Undergraduate Traditional | Non-White | 165.87 | 15.03 | 30 |
| | White | 169.20 | 8.06 | 30 |
| | Total | 167.53 | 12.08 | 60 |
| Nontraditional MAT | Non-White | 170.73 | 5.30 | 30 |
| | White | 170.43 | 9.36 | 30 |
| | Total | 170.58 | 7.54 | 60 |
| Total | Non-White | 169.33 | 10.24 | 90 |
| | White | 170.41 | 9.38 | 90 |

Levene's test of equality of variance, $F(5, 174) = 4.58, p = .001$, illustrated that the assumption of homogeneity of variances was not met. One outlier was noted, but the decision was made to continue with the analysis. The researcher chose not to remove the outlier to demonstrate the range of scores that the sample provided and aid in future recommendations. The Shapiro Wilks test was used to examine normality for the six groups (APPEL Non-White, $p = .115$; APPEL White, $p = .048$; Traditional Preparation program Non-White, $p = .057$; Traditional Preparation program White, $p = .092$; MAT

Non-White, $p = .311$; MAT White, $p = .000$). Two of the six groups violated normality. Despite these violations, the factorial ANOVA is robust to violations of normality (Leech et al., 2015). The results of the factorial ANOVA are displayed in Table 6.

Table 6

Factorial Analysis of Variance for Science Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race

| Variable and source | <i>df</i> | <i>MS</i> | <i>F</i> | <i>p</i> | η^2 |
|-------------------------|-----------|-----------|----------|----------|----------|
| Teacher Prep Program | 2 | 258.77 | 2.72 | .069 | 0.030 |
| Race | 1 | 52.27 | 0.55 | .459 | 0.003 |
| TeacherPrepProgram*Race | 2 | 58.17 | 0.61 | .543 | 0.007 |
| Error | 174 | 95.04 | | | |

Results of the factorial ANOVA analysis indicated no significant interaction between race and scores on the mathematics subtest, $F(2, 174) = 0.61, p = .543, ES = 0.007$. Race and program type did not combine significantly to affect scores on the science subtest. This result had a small effect size (Cohen, 1988). In the educator preparation program, White participants scored approximately four points higher on average than Non-White participants. However, the difference was not statistically significant. For the APPEL and MAT programs, the White and Non-White participants scored relatively the same, on average. Figure 3 displays the means for the six groups.

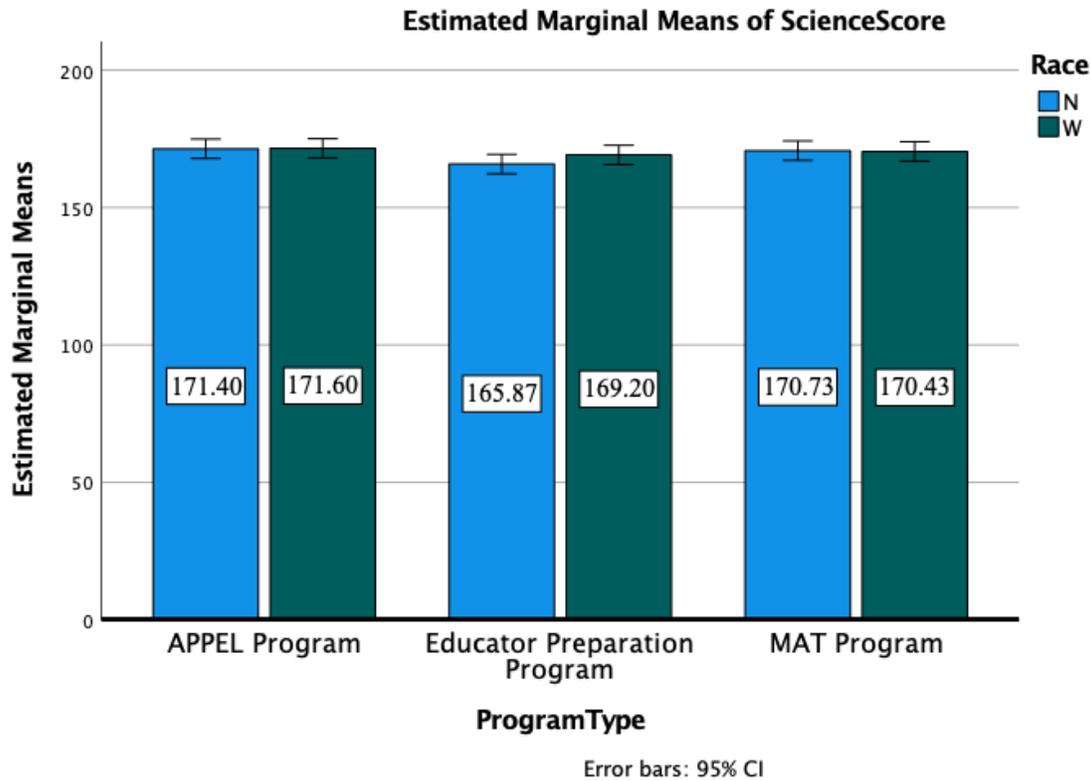


Figure 3. Means for science subtest by program type and race.

Because no interaction effect existed, the main effect variables were analyzed separately. The main effect of program type was not significant, $F(2, 174) = 2.72, p = .069, ES = 0.030$. The mean on the science subtest was lower for the educator preparation program ($M = 167.53, SD = 12.08$) compared to the APPEL program ($M = 171.50, SD = 8.97$) and the MAT program ($M = 170.58, SD = 7.54$). The means of the APPEL program and the MAT program were approximately the same. Likewise, no statistically significant main effect for race was found, $F(1, 174) = 0.55, p = .459, ES = 0.003$. The mean for White students ($M = 170.41, SD = 9.38$) was not significantly different from the mean of Non-White students ($M = 169.33, SD = 10.24$). Therefore, the results demonstrated no combined or individual effect of program type and race on science subtest scores.

Hypothesis 4

Hypothesis 4 states that no significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Social Studies elementary education exam for educator candidates in Arkansas. To test this hypothesis, a 3 x 2 factorial ANOVA was conducted. Prior to carrying out the statistical analysis for the factorial ANOVA, data were screened for entry errors and missing values, with none found. The data were also checked for outliers and the assumptions of independence of observations, assumptions of normality, and homogeneity of variances. Descriptive statistics and inferential results were also reviewed. Table 7 illustrates the group means, standard deviations, and *n* values for scores on the science subtest by race.

Table 7

Means, Standard Deviations, and Number for Social Studies Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race

| Teacher Prep Program | Race | <i>M</i> | <i>SD</i> | <i>n</i> |
|---------------------------|-----------|----------|-----------|----------|
| APPEL Program | Non-White | 166.60 | 8.63 | 30 |
| | White | 167.33 | 12.31 | 30 |
| | Total | 166.97 | 10.55 | 60 |
| Undergraduate Traditional | Non-White | 164.83 | 13.31 | 30 |
| | White | 169.73 | 11.28 | 30 |
| | Total | 167.28 | 12.48 | 60 |
| Nontraditional MAT | Non-White | 169.13 | 8.37 | 30 |
| | White | 172.00 | 10.98 | 30 |
| | Total | 170.57 | 9.79 | 60 |
| Total | Non-White | 166.86 | 10.39 | 90 |
| | White | 169.69 | 11.57 | 90 |

Levene's test of equality of variance, $F(5, 174) = 2.17, p = .060$, illustrated that the assumption of homogeneity of variances was met. One outlier was noted, but the decision was made to continue with the analysis. The researcher chose not to remove the outlier to demonstrate the range of scores that the sample provided and aid in future recommendations. The Shapiro Wilks test was used to examine normality for the six groups (APPEL Non-White, $p = .033$; APPEL White, $p = .006$; Traditional Preparation program Non-White, $p = .000$; Traditional Preparation program White, $p = .359$; MAT

Non-White, $p = .236$; MAT White, $p = .008$). Four of the six groups violated normality. Despite these violations, the factorial ANOVA is robust to violations of normality (Leech et al., 2015). The results of the factorial ANOVA are displayed in Table 8.

Table 8

Factorial Analysis of Variance for Social Studies Knowledge and Skills as a Function of Type of Teacher Preparation Program and Race

| Variable and source | <i>df</i> | <i>MS</i> | <i>F</i> | <i>p</i> | η^2 |
|-------------------------|-----------|-----------|----------|----------|----------|
| Teacher Prep Program | 2 | 238.41 | 1.98 | .141 | 0.022 |
| Race | 1 | 361.25 | 3.01 | .085 | 0.017 |
| TeacherPrepProgram*Race | 2 | 65.12 | 0.54 | .583 | 0.006 |
| Error | 174 | 120.17 | | | |

Results of the factorial ANOVA analysis indicated no significant interaction between race and scores on the mathematics subtest, $F(2, 174) = 0.54, p = .583, ES = 0.006$. Race and program type did not combine significantly to affect scores on the science subtest. This result had a small effect size (Cohen, 1988). In the educator preparation program, White participants scored approximately five points higher on average than Non-White participants, and White participants scored approximately three points higher than Non-White participants in the MAT program. However, in both the educator preparation program and MAT program, the difference was not statistically

significant. For the APPEL program, the White and Non-White participants scored relatively the same, on average. Figure 4 displays the means for the six groups.

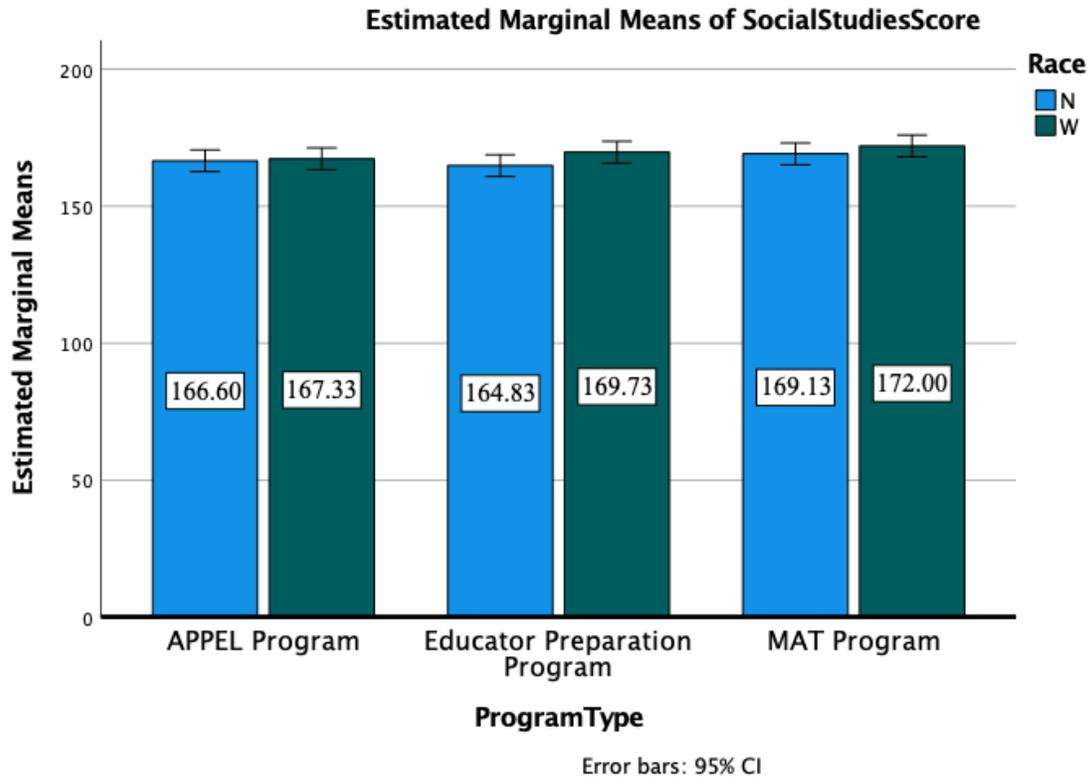


Figure 4. Means for social studies subtest by program type and race.

Because no interaction effect existed, the main effect variables were analyzed separately. The main effect of program type was not significant, $F(2, 174) = 1.98, p = .141, ES = 0.022$. The mean on the social studies subtest was slightly higher for the MAT program ($M = 170.57, SD = 9.79$) compared to the APPEL program ($M = 166.97, SD = 10.55$) and the educator preparation program ($M = 167.28, SD = 12.48$). The means of the APPEL program and the educator preparation program were approximately the same. Likewise, no statistically significant main effect for race was found, $F(1, 174) = 3.01, p = .085, ES = 0.017$. The mean for White students ($M = 169.69, SD = 11.57$) was not

significantly different from the mean of Non-White students ($M = 166.86, SD = 10.39$). Therefore, the results demonstrated no combined or individual effect of program type and race on science subtest scores.

Summary

The purpose of this study was to determine the effects of educator preparation program type and race on the PRAXIS Elementary Education: Multiple Subjects exam subtests (reading/English language arts, mathematics, science, and social studies). Table 9 summarizes the results of the interaction and main effects of the four hypotheses.

Table 9

Summary of Statistical Significance of Educator Preparation Program Type and Race on Reading/English Language Arts, Mathematics, Science, and Social Studies Knowledge and Skills by Hypothesis

| Variables by H ₀ | H1 | H2 | H3 | H4 |
|-----------------------------|------|------|------|------|
| Teacher Prep Program | .090 | .134 | .069 | .141 |
| Race | .100 | .561 | .459 | .085 |
| TeacherPrepProgram*Race | .169 | .466 | .543 | .583 |

Overall, no significant interaction was found between educator preparation program type and race for the four hypotheses. For each of the four hypotheses, no significant main effect was found for either program type or race. While mean scores did vary slightly for each of the four hypotheses, none of the mean differences were found to be significant. In addition, White participants were more likely to score higher across all

programs for each hypothesis except for three instances (mathematics educator preparation program, mathematics MAT program, and science MAT program). Again, these differences were not found to be significant in any instance. Chapter V contains a discussion of the results and will include the findings, the implications, and the recommendations.

CHAPTER V

DISCUSSION

Ensuring that states have an adequate supply of teachers to educate their students continues to be a burden with which state and federal departments of education grapple. Moreover, simply ensuring that the supply of teachers is available, while important, cannot be the end goal. Instead, policymakers must design racially-conscious programming so the teacher population can better mirror the student population. A positive step in attracting a diverse teacher workforce is providing various pathways to a teaching license. However, merely having many educator licensure pathways is only effective if teacher candidates can attain the teaching license. An analysis of possible barriers that may still exist becomes paramount as state officials strive to become more culturally responsive to teachers' and students' needs in each state.

The purpose of this study was to determine the effects by race between traditional educator preparation programs, the APPEL program, and MAT program on knowledge and skills as measured by the PRAXIS Elementary Education: Multiple Subjects exam subtests (reading/English language arts, mathematics, science, and social studies) for teacher candidates in Arkansas. The study's independent variables were program type (traditional educator preparation, APPEL, and MAT) and race (White and Non-White). The dependent variables for Hypotheses 1-4 were scores on each subtest (reading/English language arts, mathematics, science, social studies). The chapter presented results and

findings as well as conclusions for each of the four hypotheses. Implications for the findings and recommendations for policy moving forward were also presented.

Findings and Implications

Hypothesis 1

Hypothesis 1 stated that no significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Reading/English Language Arts elementary education exam for educator candidates in Arkansas. The results, when examining program type and race, indicated no statistical significance. With the lack of statistical significance, the null hypothesis could not be rejected. When examining race as a main effect, no statistical significance was found; subsequently, the null hypothesis could not be rejected. White students did score slightly higher than Non-White students for each program type; however, the result was not statistically significant. The main effect of program type on the reading/English language arts subtest was also not statistically significant. The APPEL program's average score was slightly higher than the MAT and educator preparation program, but the difference was not significant.

Hypothesis 2

Hypothesis 2 stated that no significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Mathematics elementary education exam for educator candidates in Arkansas. The results, when examining program type and race, indicated no statistical

significance. With the lack of statistical significance, the null hypothesis could not be rejected. When examining race as a main effect, no statistical significance was found; subsequently, the null hypothesis could not be rejected. White students did score slightly lower than Non-White students in the MAT and educator preparation programs; however, the result was not statistically significant. The main effect for program type on the mathematics subtest was also not statistically significant. The APPEL program's average score was slightly higher than the MAT and educator preparation program, but the difference was not significant.

Hypothesis 3

Hypothesis 3 stated that no significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Science elementary education exam for educator candidates in Arkansas. The results, when examining program type and race, indicated no statistical significance. With the lack of statistical significance, the null hypothesis could not be rejected. When examining race as a main effect, no statistical significance was found; subsequently, the null hypothesis could not be rejected. White students did score higher than Non-White students in the APPEL and educator preparation programs; however, the result was not statistically significant. The main effect for program type on the science subtest was also not statistically significant. The APPEL program's average score was slightly higher than the MAT and educator preparation program, but the difference was not significant.

Hypothesis 4

Hypothesis 4 stated that no significant difference will exist by race among those participating in a traditional undergraduate program versus an APPEL program versus a nontraditional MAT program with licensure on knowledge and skills measured by the Praxis II Teaching Social Studies elementary education exam for educator candidates in Arkansas. The results, when examining program type and race, indicated no statistical significance. With the lack of statistical significance, the null hypothesis could not be rejected. When examining race as a main effect, no statistical significance was found; subsequently, the null hypothesis could not be rejected. White students did score higher than Non-White in all three of the programs; however, the result was not statistically significant. The main effect for program type on the social studies subtest was also not statistically significant. The MAT program's average score was slightly higher than the APPEL and educator preparation program, but the difference was not significant.

Diversification and Alternative Programs

While Piaget's research into the learning process focused on children, it became the foundation for future study on learning and would be built upon by Malcolm Knowles in his adult learning theory. This study's major implication was to examine what effect preparation programs have on knowledge and skills as measured by licensure exam scores and how policymakers could better respond to recruit a more diverse supply of educators. The need to diversify the teacher workforce is not a groundbreaking discovery. Moreover, the fact that alternative pathways to licensure attract a more diverse population of teacher candidates has been well documented (United States Department of Education, 2015). With the decrease nationally in traditional educator preparation program

enrollment documented in the 2010s, research must increasingly examine ways to increase and diversify the educator pipeline (Partelow & Baumgardner, 2016). This study was designed to examine three pathways to teacher licensure in Arkansas through the lens of the licensing examination that all teacher candidates, regardless of the pathway, must complete in obtaining a teaching license. The study found that no program, regardless of race, had a major impact on subsequent licensure exam scores. Racial disparities were further examined to acquire a better perspective of both pathways and licensing exams and their relationship to the diversification of the teacher workforce. Taking all of this into consideration with adult learning theory as a framework allows for future research and decisions to be better informed to more strategically design preparation pathways that cater to the needs of those adults they are inherently designed to serve. Since the data presented did not ascertain a difference in scores for racial groups by program, it can be implied that traditional and alternative programs function at similar levels despite differing types of adult learners who participate in the programs.

As state policymakers examine teacher workforce data, the need to recruit and retain a robust educator population is paramount. Further examination regarding the role licensure examinations play in the attainment of educator licensure in Arkansas must also be studied to analyze their effect and guide future policy. A review of the literature noted that most states in the United States have forms of alternative certification for educators. Alternative pathways are seen to attract more professionals to the education profession (Zhang & Zeller, 2016). Moreover, nationally, traditional educator preparation programs saw a 36% decrease in enrollment between 2008 and 2014 (Partelow & Baumgardner, 2016). This stark drop led to an even greater emphasis on alternative teacher pathways.

While supplementing the teacher supply, alternative pathways also attract more Non-White candidates (Ulrich, 2011). Many alternative pathways to education embrace adult learning theory, which inherently attracts adults who bring a wealth of life experience to the profession. *Andragogy* acknowledges that teachers may not possess all the needed knowledge needed for given learning situations. However, adult learners bring knowledge with them through life experiences and differing motivations that enhance the learning environments (Knowles, 1973). Those seeking alternative teaching pathways are often readier to learn, self-driven, and have life experience (Roberson, 2002). This desire to learn correlates directly with Knowles' theory of adult learning and thus should be a central focus of many alternative certification programs. While the literature was clear regarding the rise of alternative educator pathways, a clearer understanding of adult learning theory would strengthen programs and allow for even greater results in alternative pathways.

Diversification and Race

Along with the programs themselves, researchers also noted the effect licensure exams have on the educator certification process. Licensing exams are an integral part of the educator certification process for those wanting to enter the profession. The PRAXIS exam is one of the primary educator licensing exams in the nation and the exam series for educator licensure in Arkansas (Cavanaugh, 2015). Since the PRAXIS is the sole licensing exam for an educator, it is important to ensure that it is equitable for all those who seek licensure in the state. Diversification of the educator workforce is only possible if all racial backgrounds have an equal opportunity to pass the licensing exam for a given state and subsequently attain an educator license. Regardless of the exam, it must be

equitable. To that end, the research indicated a significant gap in pass rates among White and Black teacher candidates taking a PRAXIS exam in Arkansas. In 2018-2019, a 33% gap in pass rates on the reading/English language arts subtest was present between Black and White test takers (Arkansas Department of Education, 2019a). However, this study did not find a significant gap between White and Non-White test takers. While White test takers did outperform Non-White test takers in more instances, it was not found to be statistically significant. Regardless of program, research had found gaps in performance, particularly between White and Black test takers; this was not found for this study when examining White and Non-White racial groupings. It is important to note that this study only examined scores for those who had attained some passing scores and submitted them to the Arkansas Department of Education, Division of Elementary and Secondary Education for probable licensure in some areas. A critical implication of this study is the understanding that programs themselves that prepare future educators do not inherently have a significant impact on subsequent licensing exam scores. While the various programs may attract different types of potential educators, the critical factor is ensuring equitable environments in both programming and particularly licensing exams, since everyone must encounter these exams, regardless of the pathway.

The need to better diversify the educator workforce was evident through the literature review. Understanding, through adult learning theory, that adult learners bring more intrinsic motivation to their learning should take a more focused role in shaping exam preparation. For example, a 21-year-old senior in college may simply be wanting to graduate. In contrast, an adult who is entering an alternative pathway at the age of 40, for example, might bring a level of motivation that is very different due to life circumstances.

Older adults may have a spouse and children. They also may have been laid off from other employment or are looking for a new employment option. Thus, understanding their motivation to succeed through the lens of adult learning theory is critical. This study sought to determine how various educator preparation pathways affected the licensing exams' results, which affects the future educator workforce. The type and makeup of the licensing examination via adult learning theory could have further implications by encouraging policymakers to understand better the motivation of those desiring to teach, mainly through an alternative pathway. Perhaps, licensing exam options that offer more demonstration of experience and not simply content memorization could implicitly direct future decisions regarding licensing exams and truly embrace adult learning theory.

A significant main effect was not found when examining program type and race regarding the PRAXIS Elementary Education subtests: Multiple Subjects exam. White test-takers in the study outperformed Non-White test-takers on most of the exam subtests across program types. However, the differences were not statistically significant. The literature review found that black teacher candidates often bring a strong desire to influence the teaching profession (Hayes et al., 2014), but barriers related to cultural understanding often hinder the preparation of Non-White teacher candidates (Rogers-Ard et al., 2019). One must thus ascertain that an implication of this study should be to use this knowledge to encourage policymakers to take a more prudent look at theories such as Knowles' adult learning theory. Knowles understood the adult learner's uniqueness and that adults' experiences shape them (Knowles, 1973). Those designing educator preparation programs to recruit for the teaching profession should be ardently focused on adult learning theory to shape thinking. Therefore, a key implication of this study should

be a stronger understanding of adult learning theory to personalize learning experiences that, in turn, better prepare a diverse population for success throughout their preparation and subsequent licensure journey.

Recommendations

Potential for Practice/Policy

This study examined the effect educator preparation program type and race had on the knowledge and skills measured by each of the subtests on the PRAXIS Elementary Education: Multiple Subjects exam for education candidates in Arkansas. This study's results could shape future policy related to the testing and subsequent licensing of educators in the state. Although the study focused on the elementary education PRAXIS exam, consideration around other PRAXIS exams and their influence on the educator workforce should also be considered.

The type of program did not have a main effect by race on the PRAXIS scores analyzed. While the various programs should always be examining ways to best prepare educators for the profession, the program type itself does not significantly affect scores based on this study. Rogers-Ard et al. (2019) found that traditional programs that prepare teachers are not consistently responsive to the needs of non-White students. Thus, educator preparation programs must strive to be better responsive to the needs of all those they are preparing to enter the educator workforce. Research also noted that non-White test takers require a different support system for success in many instances (Petchauer, 2018). That being said, the type of program did not have a significant impact on scores. While minor differences were found it was not significant. The discussion around policy

in support of preparation programs is relevant, but the policy discussion should center on licensing exams and how they impact the education community.

As the state explores options regarding educator licensure, several key points should be taken into consideration. Licensing exams for educators serve to ensure the quality of those who will be teaching the future workforce (Baker-Doyle & Petchauer, 2015). However, if said licensing procedures contain possible racial inequities, a new approach to the licensing process may need to be explored. When examining the licensing process for educators in Arkansas, culturally responsive practices must be taken into consideration. If racial gaps in pass rates are present, steps can be taken to ensure a more equitable educator licensure pathway. A course of action may include allowing for other means of licensure beyond just a content exam. Also, if a teacher candidate can score within a standard deviation on a given PRAXIS exam, for example, possibly allowing for demonstration of content knowledge through another means (e.g., portfolio, EdTPA) could lead to licensure. One may ponder whether Arkansas has alternative pathways to licensure. In essence, the state has a variety of routes to learn the skills necessary to educate students, but all routes lead to the PRAXIS, and if one cannot pass the corresponding PRAXIS exam, they cannot receive a teaching license. Therefore, a potential policy exists regarding how the state ultimately chooses to certify a practicing educator. Arkansas does have many ways to become an educator for its citizens, but all those pathways lead to the exam that research has found may be problematic for minority populations.

Educator candidates need to demonstrate knowledge of pedagogy and practice. States must ensure that the adults they are charging with educating the state's future have

the skills necessary to carry out such an important task. Arkansas may need to examine other states and how they address educator licensure. Studying other states through literature reviews, research, and professional collaboration may yield new insights into how the state could offer more robust offerings to attain an educator license while not sacrificing the quality of those entering the profession. A further policy representing a teacher candidate's ability to demonstrate more than just content mastery should be considered. While measuring content on an exam such as the PRAXIS is important, the argument can be made that content is simply something that can be memorized and learned over time. Demonstrating teaching ability and instructional strategies may need to be a future policy focus. Content knowledge is important, but it must be coupled with a demonstration of instructional practices to truly demonstrate an educator's potential effectiveness. Therefore, a potential practice needs to shift to this end to both create a more equitable opportunity for all teacher candidates and provide a broader range of actual knowledge of both content and practice.

A potential limitation can be found in the state's ability to manage a more robust teacher certification process. Policy should not be created that increases the burden on either the teacher candidate or state agency. Any systematic changes should focus on simply creating more equitable opportunities for those wanting to enter the profession. More options should not lead to a greater burden on any entity involved in the process of educator certification. This study did not find a significant main effect when examining the various program that led to licensure, but since there were noted differences in White and Non-White mean scores, some attention should be given to this gap in subsequent policy development.

Future Research Considerations

This research study did not provide sufficient evidence that educator preparation program type and race significantly influenced scores for the four subtests on the PRAXIS Elementary Education: Multiple Subjects exam. The following recommendations were offered for future research considerations:

1. This study used only one PRAXIS assessment. The PRAXIS Elementary Education: Multiple Subjects exam was selected because it was one of the most heavily tested exams in the state and provided subtests to analyze the hypotheses presented. A more robust study examining multiple PRAXIS exams would be helpful to strengthen any findings.
2. Future researchers could examine how states use the PRAXIS and other exams for licensing to determine if a consistent effect is present across multiple high stakes licensing exams.
3. The program types examined were the three most prevalent in Arkansas. Other alternative pathways are used in multiple states (e.g., American Board, Teach for America). Conducting a study that examines pathways that are used in multiple states could provide a broader range of data for further study.
4. The study examined White and Non-White as the levels of the independent variable for race. These levels were used to collect a sample due to the small numbers of elementary education candidates in alternative pathways. Future research could consider breaking down the racial demographics further to study any effects regarding program type and race.

5. Exam scores for this study were collected from the Arkansas Department of Education, Division of Elementary and Secondary Education secure database. The vast majority of scores found in this database were from those who had completed a preparation program and applied for some type of educator license. In the future, research that could include all exams taken in a given area would provide a more thorough analysis of the impact of program type and race on exam scores.
6. In general, the study's sample size, while acceptable, could be more robust for future research. The researcher was limited in scope for this study's purpose, but future research could focus on a broader capacity to build on these findings.
7. Examining different states that use various licensure exams and program types would allow researchers to compare states, programs, and exams in conjunction with race simultaneously. This procedure could allow for the study of concurrent practices to determine what is most equitable.
8. Future research could analyze state policy in response to licensure exams and alternative pathways to licensure. Researchers could examine the effectiveness of state policies in guiding and promoting a diverse educator pool. This study did not evaluate state policy to a great extent.

Conclusion

The purpose of this study was to determine the effects by race between the traditional educator preparation program, the MAT program, and the APPEL program on knowledge and skills measured by exam scores on the PRAXIS Elementary Education:

Multiple Subjects exam subtests (reading/English language arts, mathematics, science, and social studies). An overview of the results for each of the four hypotheses, implications, and recommendations for future practice was presented. This study's findings contributed to the body of knowledge in determining whether varying alternative pathways to educator licensure affect subsequent licensure exam scores. Race, White versus Non-White, was also used in the analysis to determine its influence and help to shape future policy decisions.

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